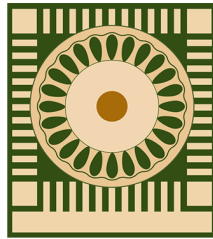


# **CITY OF HAYWARD**

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CITY OF  
**HAYWARD**  
HEART OF THE BAY

## **Agenda**

**Monday, March 13, 2017**

**4:30 PM**

**City Hall, Conference Room 1C**

## **Council Sustainability Committee**

**CALL TO ORDER****ROLL CALL****PUBLIC COMMENTS:**

(The Public Comment section provides an opportunity to address the City Council Committee on items not listed on the agenda as well as items on the agenda. The Committee welcomes your comments and requests that speakers present their remarks in a respectful manner, within established time limits, and focus on issues which directly affect the City or are within the jurisdiction of the City. As the Committee is prohibited by State law from discussing items not listed on the agenda, any comments on items not on the agenda will be taken under consideration without Committee discussion and may be referred to staff.)

**APPROVAL OF MINUTES**

1. [MIN 17-027](#) Approval of Minutes of Council Sustainability Meeting on January 9, 2017

**Attachments:** [Attachment I Minutes of Council Sustainability Meeting on January 9, 2017](#)

**REPORTS/ACTION ITEMS**

2. [ACT 17-021](#) 2017 Bicycle Masterplan Update/Pedestrian Masterplan

**Attachments:** [Attachment I Staff Report](#)

3. [ACT 17-019](#) Illegal Dumping Update

**Attachments:** [Attachment I Staff Report](#)

4. [ACT 17-018](#) Bulky Item Collection Service Participation

**Attachments:** [Attachment I Staff Report](#)

5.     [RPT 17-035](#)     Sustainable City Year Program: Fall 2016 Reports on Littering & Composting

**Attachments:**   [Attachment 1 Staff Report](#)  
                          [Attachment II Attitudes Toward Littering](#)  
                          [Attachment III Attitudes Toward Organic Waste Disposal and Composting](#)

6.     [ACT 17-012](#)     Green Infrastructure Framework

**Attachments:**   [Attachment I Staff Report](#)  
                          [Attachment II Draft GI Framework](#)

7.     [ACT 17-020](#)     Advanced Metering Infrastructure Project Update

**Attachments:**   [Attachment I Staff Report](#)  
                          [Attachment II Customer Notification Letter Template.docx](#)

8.     [RPT 17-036](#)     Proposed Sustainability Committee 2017 Agenda Planning Calendar

**Attachments:**   [Attachment I Staff Report](#)

#### **FUTURE AGENDA ITEMS**

#### **COMMITTEE MEMBER/STAFF ANNOUNCEMENTS AND REFERRALS**

#### **ADJOURNMENT**

NEXT REGULAR MEETING, 4:30 PM, MONDAY, MAY 8, 2017



# CITY OF HAYWARD

Hayward City Hall  
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**File #:** MIN 17-027

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**DATE:** March 13, 2017

**TO:** Council Sustainability Committee

**FROM:** Director of Utilities & Environmental Services

**SUBJECT**

Approval of Minutes of Council Sustainability Meeting on January 9, 2017

**RECOMMENDATION**

That the Committee reviews and approves the minutes of the Council Sustainability Committee meeting on January 9, 2017.

**ATTACHMENTS**

Attachment I      Minutes of Council Sustainability Meeting on January 9, 2017

CITY COUNCIL SUSTAINABILITY COMMITTEE MEETING  
Hayward City Hall – Conference Room 2A  
777 B Street, Hayward, CA 94541-5007

January 9, 2017  
4:30 p.m. – 6:30 p.m.

MEETING MINUTES

CALL TO ORDER: Meeting called to order at 4:32 p.m. by Chair Al Mendall.

ROLL CALL:

Members

- Al Mendall, City Council Member/CSC Chair
- Elisa Márquez, City Council Member
- Francisco Zermeño, City Council Member

Staff:

- Maria Hurtado, Assistant City Manager
- Morad Fakhrai, Director of Public Works
- David Rizk, Director of Developmental Services
- Stacey Bristow, Deputy Director of Development Services
- Jan Lee, Water Resources Manager
- Erik Pearson, Environmental Services Manager
- Fred Kelley, Transportation Manager
- Jeff Krump, Solid Waste Program Manager
- Jeremy Lochirco, Principal Planner
- Damon Golubics, Senior Planner
- Marcus Martinez, Assistant Planner
- Alicia Sargiotto, Management Analyst
- Mary Thomas, Management Analyst
- Jennifer Yee, Sustainability Technician
- Christopher Sturken, CivicSpark AmeriCorps Fellow
- Robert Goldassio, Senior Secretary
- Carol Lee, Administrative Secretary (Recorder)

Others:

- Gillian Corral, Former CivicSpark AmeriCorps Fellow
- Jillian Buckholz, Director of Sustainability, CSUEB
- Lonny Brooks, Assistant Professor of Communications, CSUEB
- Angie Mercado, California State University East Bay (CSUEB) Student
- Logan Key, CSUEB Student
- Rebecca Esparza, CSUEB Student

- Kelly Jackson, Solar City
- Rebecca Marston, Solar City
- Steven Dunbar, Hayward Resident
- Shova Ale Magar, Waste Management of Alameda County (WMAC)
- Justin Valenzuela, WMAC

## PUBLIC COMMENTS

Ms. Kelly Jackson, Solar City, described the benefits of solar photovoltaic systems and offered to meet with anyone who has questions.

For the record, Ms. Wynn Grich, who was not able to attend the meeting, requested that staff distribute documents related to Wi-Fi Radiation. Copies were provided to Committee Members.

### 1. Approval of Minutes of Council Sustainability Meeting on November 14, 2016.

The Committee approved the minutes of the Council Sustainability Committee meeting of November 14, 2016.

### 2. Downtown Specific Plan – Sustainability Discussion

Damon Galoubics, Senior Planner, presented the report and sought the Committee's input for a sustainable Downtown.

The Committee identified items such as: increasing street lighting, adding solar to municipal parking lots to offset cost of additional street lights, pedestrian and bike safety, making the roads feel safer, improving the loop, adding more electric vehicle charge stations, bike share, car share, the possibility of an in-town shuttle, adding trees and enhancing requirements for commercial frontages, increasing public art, increasing the number of waste receptacles and more frequent service, adding green business certification incentives, and attracting commercial businesses to the downtown.

Discussion ensued among Committee members and City staff regarding potential changes to the loop, the City's preparedness for the development of taller buildings, insufficient office space downtown, options for additional parking on Main Street, Mission Blvd., and Foothill Blvd., addressing the various parking demands on different days of the week and at different times of day, insufficient parking downtown, and other parking related issues.

With respect to potential changes to the downtown loop, Chair Mendall requested that staff provide the City Council with options, including the positive and negative outcomes that may result from such changes.

### 3. Sustainable Groundwater Management Act (SGMA): Options for the Formation of a Groundwater Sustainability Agency under SGMA

Water Resources Manager Jan Lee presented the report. Staff recommended that the City of Hayward become the Groundwater Sustainability Agency (GSA) for the portion of the East Bay Groundwater Plain that underlies the City, and work in collaboration with East Bay Municipal Utility District to jointly prepare a single Groundwater Sustainability Plan for the East Bay Plain Basin

In response to a question from the Committee, staff explained that Alameda County Water District is designated in state legislation as the exclusive local agency to manage groundwater in the Niles Cone Basin, which means that no other local agency can file to be a GSA for this basin.

It was moved by Council Member Zermeño, seconded by Council Member Márquez, and carried unanimously, to bring the proposed recommendation to City Council.

### 4. Compact of Mayors

Environmental Services Manager Erik Pearson introduced CivicSpark AmeriCorps Fellow Christopher Sturken, who presented the report. Staff recommended bringing the item to the City Council to authorize Mayor Halliday to sign and submit a letter to join the Compact of Mayors.

It was moved by Council Member Márquez, seconded by Council Member Zermeño, and carried unanimously, to bring the proposed recommendation to City Council.

### 5. Drinking Water Quality Update

Water Resources Manager Jan Lee presented the report, and requested direction from the Committee regarding lead testing in schools.

The Committee requested that staff be proactive in contacting schools regarding lead testing. Furthermore, the Committee requested that staff return to the Committee with an update and plan of action.

Chair Mendall suggested that staff contact CSUEB and Chabot College, and depending on the cost, partner with them to do lead testing at their campuses. The Committee further requested that the item be brought back to the Committee should cost concerns arise.

## 6. Overview of Regional Energy Efficiency Programs: Energy Council, EBEW, and BayRen

Environmental Services Manager Erik Pearson presented the report.

Discussion ensued among Committee members and City staff regarding maintaining current services, investigating which organizations oversee the various energy efficiency programs, and considering how to manage the various programs most effectively once East Bay Community Energy is fully established.

## 7. Semi-Annual Update on City's Waste Reduction and Recycling Programs

Solid Waste Program Manager Jeff Krump presented the report.

Committee members and City staff discussed the ongoing issue of illegal dumping, Waste Management's performance of the terms set forth in the Franchise Agreement, continued efforts to educate and promote the separation of organics, and upcoming compost give-away events.

The Committee requested that staff collaborate with Maintenance Services staff to prepare a report on illegal dumping in the City, that includes analyzed data of related Access Hayward requests.

## 8. Statistics on Property Assessed Clean Energy Projects

Management Analyst Mary Thomas noted that the item was an informational report, and that staff was available to answer any questions.

The Committee was pleased and commented that the metrics displayed on the website were well done.

## 9. CivicSpark Presentation

Former CivicSpark AmeriCorps Fellow Gilee Corral presented an overview of the accomplishments made during her fellowship with the City.

The Committee commended Gilee for her achievements in supporting the implementation of the Climate Action Plan, the work she had done on the greenhouse gas inventories, and the various other projects to which she contributed.

## 10. 2017 Agenda Topics

The Committee requested that staff address the issues of bike share and illegal dumping in March. Furthermore, the Committee requested that staff provide an update on PAYS with 2017 data, later in the year.

### COMMITTEE MEMBER/STAFF ANNOUNCEMENTS AND REFERRALS:

None.

ADJOURNMENT: 6:28 p.m.

| Attendance        | Present<br>01/09/17<br>Meeting | MEETINGS                                  |                                           |                                          |
|-------------------|--------------------------------|-------------------------------------------|-------------------------------------------|------------------------------------------|
|                   |                                | Present<br>to Date This<br>Fiscal<br>Year | Excused<br>to Date This<br>Fiscal<br>Year | Absent<br>to Date This<br>Fiscal<br>Year |
| Elisa Márquez     | ✓                              | 3                                         | 0                                         | 0                                        |
| Al Mendall*       | ✓                              | 4                                         | 0                                         | 0                                        |
| Francisco Zermeño | ✓                              | 4                                         | 0                                         | 0                                        |

✓ = Present    O = absent    X = excused

\* Chair



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**File #:** ACT 17-021

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**DATE:** March 13, 2017

**TO:** Council Sustainability Committee

**FROM:** Director of Public Works

**SUBJECT**

2017 Bicycle Masterplan Update/Pedestrian Masterplan

**RECOMMENDATION**

That the Committee reviews and provides feedback on the Bicycle and Pedestrian Masterplans.

**ATTACHMENTS**

Attachment I      Staff Report



DATE: March 13, 2017

TO: Council Sustainability Committee

FROM: Director of Public Works

SUBJECT 2017 Bicycle Masterplan Update/Pedestrian Masterplan

#### RECOMMENDATION

That the Committee reviews and provides feedback on the Bicycle and Pedestrian Masterplans.

#### SUMMARY

Staff requests that the Sustainability Committee review and provide feedback on key sustainability features to be included in the update of the Bicycle Masterplan and in the Pedestrian Masterplan as it is being developed as well as general feedback on the masterplans.

#### BACKGROUND

On November 20, 2007, the City Council approved an update to the 1997 Bicycle Masterplan. The 2007 Update was prepared to identify new opportunities throughout the City for the provision of bicycle facilities. The 2007 update, defined a proposed network of bicycle paths (Class I), bicycle lanes (Class II), and bicycle routes (Class III) to provide for the safe movement of bicyclists in Hayward. The attached implementation plan includes recommendations for the construction of approximately one mile of new Class I bike paths, four miles of new Class II bike lanes and two miles of Class III bike routes. The total cost was estimated to be \$1.6 million dollars.

The recommendations included in the bicycle masterplan were developed based on public input, information contained in the various neighborhood plans, and City projects and studies, such as the Route 238 Corridor Improvement Project and the South Hayward BART Concept Plan.

In some cases, alternate routing was recommended to provide a parallel bike route to streets where high auto traffic volumes, such as Mission Boulevard, or narrow pavement widths, such as Hesperian Boulevard, would cause unsuitable conditions for bicyclists.

## DISCUSSION

The City Council, through its adopted policies, has consistently created a framework with which to create an interconnected network of safe, affordable, dependable and convenient transportation options. This adopted General Plan Guiding Principle specifically stipulates that the City will:

- allow and encourage more residents, workers and students to walk, bike or take transit;
- create a more balanced and multi-modal transportation system, and
- develop policies and strategies to enhance sidewalks and walking paths.

Specifically, the adopted 2040 General Plan lists multiple mobility goals for both pedestrians and bicyclists. These goals provide for a more balanced transportation infrastructure/environment, consider pedestrian needs and design its pedestrian infrastructure, creating a pleasant and safe pedestrian environment. The 2040 General Plan also encourages implementation of the Hayward Bicycle Masterplan and the continued development of bicycle infrastructure to meet those needs.

In 2013, prior to formal adoption of the 2040 General Plan, Council adopted an award-winning Complete Streets Policy to formally express its commitment for the use of Complete Streets principles. The Complete Streets Policy reinforced the City's desire to provide safe, efficient and convenient travel along and across streets for all users, including pedestrians, bicyclists, motorists and movers of commercial goods.

On February 28, 2017, Council discussed a comprehensive Complete Streets Implementation Plan that provides a process and tools to support the implementation of the adopted Complete Streets Policy. Implementation of the Complete Streets plan is consistent with one of the three Council's strategic initiatives for this coming year. By providing specific design guidelines, a formal project checklist, training and an implementation work plan, the City can more effectively balance the needs of all modes of transportation in the downtown and throughout the City. The Complete Streets strategy two-year action plan, will include implementation steps to address milestones identified in the Bicycle and Pedestrian Masterplans.

It is anticipated that a bicycle and pedestrian plan will emerge in the downtown area as the Downtown Specific Plan consultant team evaluates constraints and develops opportunities in that core part of the City. Once a bicycle and pedestrian plan is finalized for downtown, the evaluation focus will shift to the remainder of the City. Staff and the consultant team look forward to making Hayward more people friendly and walkable, especially along A Street and Mission and Foothill Boulevards. Emphasis on bicycle and pedestrian improvements, will all be considered as part of creating a sustainable and desirable community.

## ECONOMIC IMPACT

It is anticipated that the Bicycle and Pedestrian Masterplans will help transform the downtown and other designated sectors of the City (i.e., the industrial sector) into a more walkable/bike friendly community, thus creating positive economic benefits for the City.

## FISCAL IMPACT

The combined Bicycle Masterplan Update/Pedestrian Masterplan effort is funded by the City's Measure B appropriation via the Alameda County Transportation Commission (ACTC). These funds are a component of the City's Bicycle and Pedestrian allocation as part of the countywide Measure B sales tax measure. A total of \$300,000 has been allocated in the City's approved FY-17 CIP (Fund 216) for this project.

## SUSTAINABILITY FEATURES

The Bicycle/Pedestrian Masterplans will promote sustainability and entail such features/elements to encourage the reduction of greenhouse gasses and promote multi-modal transportation alternatives. Specific sustainability features will be identified during the development of the Plans, with key input from the Council Sustainability Committee and the public.

## PUBLIC CONTACT

As part of the plan development process, the combined Bicycle Masterplan Update/Bicycle Masterplan will have an extensive public outreach component and will include additional opportunities for input from the Sustainability Committee. The outreach strategy includes stakeholder interviews, holding workshops, coordinating a design charrette, and scheduling City Council and Planning Commission meetings for review, input and discussion. Presentations to the Council Infrastructure Committee, Bike East Bay and other associated groups will also be included in the feedback / outreach strategy. The project team will reach out to Cal State East Bay, BART, HUSD and AC Transit to afford opportunities for input and participation in the plan process.

## NEXT STEPS

A scope of work will be developed with the downtown specific plan consultant to address the tasks needed to complete the combined Bicycle Plan Update/ Pedestrian Masterplan, and will incorporate feedback received this afternoon. It is anticipated that the consultant team will be given a notice to proceed in the summer of 2017. A schedule of outreach meetings will be developed and forwarded to the Sustainability Committee and will be posted on the City's website.

*Prepared by:* Fred Kelley, Transportation Manager

*Recommended by:* Morad Fakhrai, Director of Public Works

*Approved by:*

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Kelly McAdoo, City Manager



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**File #:** ACT 17-019

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**DATE:** March 13, 2017

**TO:** Council Sustainability Committee

**FROM:** Director of Maintenance Services

**SUBJECT**

Illegal Dumping Update

**RECOMMENDATION**

That the Committee reviews and comments on this report and provides direction to staff.

**ATTACHMENTS**

Attachment I      Staff Report



DATE: March 13, 2017

TO: Council Sustainability Committee

FROM: Director of Maintenance Services

SUBJECT: Illegal Dumping Update

## RECOMMENDATION

That the Committee reviews and comments on this report and provides direction to staff.

## SUMMARY

The City of Hayward takes several proactive measures to limit the volume of illegally dumped items throughout the community. The City's multifaceted approach entails collaboration between several City departments and divisions, including Code Enforcement, Utilities & Environmental Services, Maintenance Services, and the Police Department as well as the Keep Hayward Clean and Green Task Force. Through education, enforcement, and trash removal, staff proactively promotes Council's priority for a visually appealing Hayward.

## BACKGROUND

The City's General Plan 2040, adopted in 2014, includes the following goal in support of Council's safe, clean, and green priorities:

Goal ED 5.4: The City shall maintain and implement programs that are specifically designed to address Hayward's community appearance problems (graffiti, litter, abandoned vehicles, illegal dumping, weed abatement, property maintenance, illegal signs, etc.).

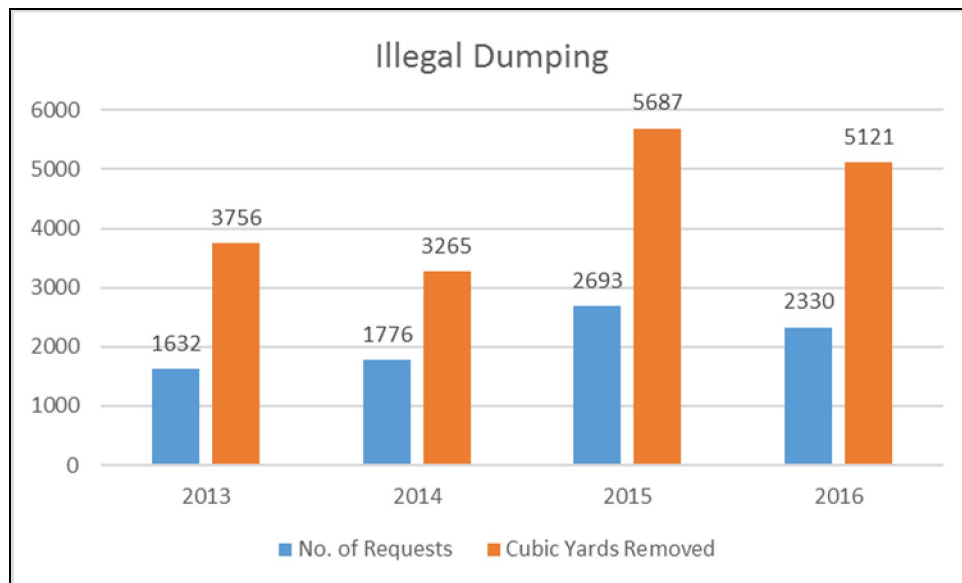
During its January 9, 2017 meeting, the Committee asked staff to provide information on illegal dumping at an upcoming meeting. This report is prepared in response to the Committee's direction.

## DISCUSSION

For many years, City staff has been active in our pursuit of a cleaner and greener community. While most property owners maintain their properties, and keep the street and sidewalk areas free from trash and debris, it is our goal that everyone help preserve the safety and

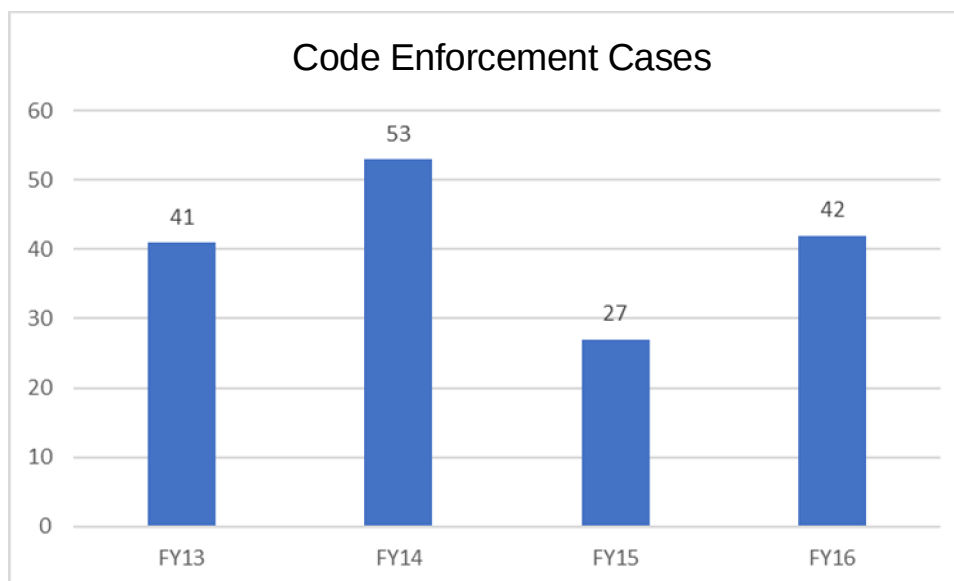
cleanliness of the public right-of-way. Below is a summary of the actions taken by the Maintenance Services Department to further this goal.

Access Hayward – Access Hayward is an on-line tool used as a means of reporting illegal dumping. It allows for the tracking of requests by location, number of occurrences, and the total cubic yardage. An increasing number of requests for clean-ups received through Access Hayward can be partially attributed to staff encouraging residents to use the tool to report items to the City. The sharp increase in trash removal in 2015 can also be attributed to the restoration of five Maintenance Worker positions as a result of the new revenues from passage of Measure C. Two positions are assigned to illegal dumping, two for removal of litter and one is assigned to graffiti abatement. The two dedicated positions assigned to illegal dumping are proving to be well assigned as their infusion correlates to more debris being removed from City streets as shown in the chart below.



Illegal Dumping Ordinance – On October 23, 2012, City Council adopted an amendment to the City’s existing Community Preservation Ordinance, (Hayward Municipal Code Section 5-7.25), addressing unlawful nuisance on private property. This provision places responsibility on occupants, tenants, and private property owners to keep the public right-of-way adjacent to their properties free of trash and debris. It is intended to ensure safe travel for pedestrian and vehicular traffic, prevent blight, and protect and promote public health, safety, and welfare. Staff utilizes the enforcement tools and remedies in the existing ordinance to address violations. The ordinance also provides a mechanism for increased communication and has produced a better-working relationship between City staff and property owners. When talking with property owners, staff often uses the opportunity to inform them of alternatives for disposing of unwanted materials, such as Waste Management bulky collection service and vouchers for free disposal at the Davis Street Transfer Station. Through this line of

communication with business and property owners the ordinance has had a positive effect, reducing the frequency and amount of trash dumped in the historic hot spots.



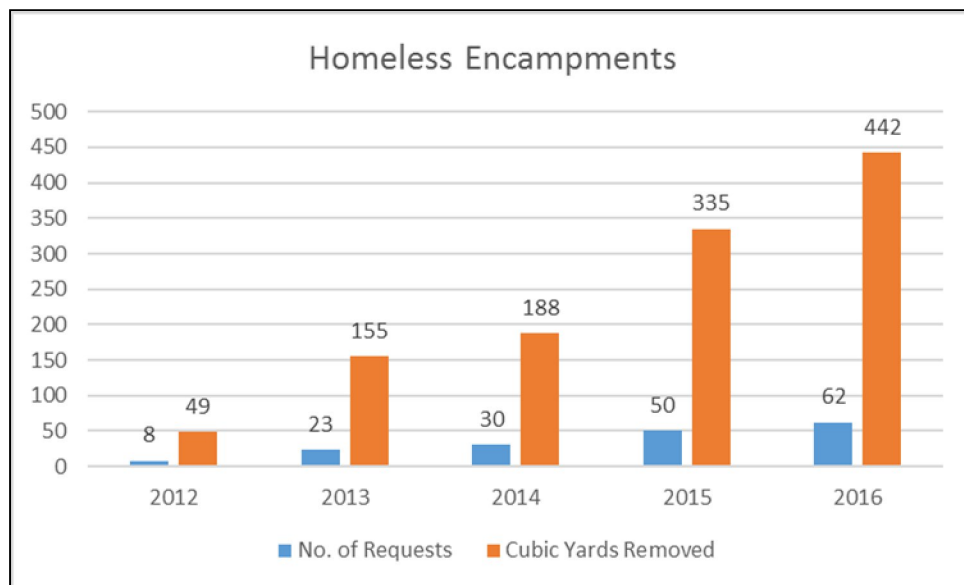
Signs – Maintenance Services utilizes different types of signage to aid in the education and enforcement of our efforts. Large LED message boards are placed in our historical “hot-spots” to educate the public and offer alternatives for disposal of unwanted items. Staff has received praise and encouragement from the community in regards to our use of these signs. Additionally, we place permanent signage in known hot spots to encourage residents to contact the Hayward Police Department if they witness someone dumping illegally.

Cameras – Maintenance Services utilizes both “still-shot” and full video surveillance cameras in various areas throughout the City. These cameras are all mobile in terms of their mounting style and charged via solar power. Staff is able to respond to areas of concern more quickly because these cameras do not depend on having electricity present at the locations selected.

Lean Innovation – Lean Innovation is a process of experimenting and incorporating customer empathy to develop solutions. When staff participated in the 2016 Lean Innovation Bootcamp, illegal dumping was included as a specific target topic of. As part of this effort, City staff identified the South Hayward Neighborhood as the area with the highest-volume of illegal dumping and contacted over 250 residents in the area. Our contacts included both single family and multi-unit dwellings. While about two-thirds of the residents contacted admitted they knew dumping items was illegal, many were not aware of the other options available to them. City staff responded to the feedback and provided these residents with Waste Management vouchers for free disposal at the Davis Street Transfer Station, information about the bulky pickup service, and additional education by way of LED message boards.

Waste Management's Assistance – The City's contract for solid waste services with Waste Management includes a requirement that the company collect up to six occurrences of illegal dumping per week. This service is used for complaints received directly by the Utilities & Environmental Services Department and not through Access Hayward. In 2016, Waste Management averaged approximately one pick-up per week.

Homeless Encampments – Over the past five years, the City has seen a substantial increase in the reports of homeless encampments. Many cases are brought to staff's attention via Access Hayward, while others are reported through the Hayward Police Department. The data below shows the number of reports requiring a staff response in the previous five fiscal years.



Since the adoption of Ordinance 5-7.25, the Maintenance Services Department, Utilities & Environmental Services, Code Enforcement, and Hayward Police Department have been proactive in efforts to work with property owners, tenants, as well as business owners to resolve illegal dumping. The placement of cameras in historic hot-spots known for illegal dumping reduces the frequency of this behavior and provides City staff tangible and identifiable evidence needed to locate, cite, and prosecute offenders.

#### FISCAL IMPACT

In an effort to restore and maintain City services and facilities, the Measure C sales tax was approved by Hayward voters in 2014. These additional revenues restored five FTE Maintenance Workers in Maintenance Services: two positions are assigned to illegal dumping, two for removal of litter and one to graffiti abatement. When considering staff time, after hours and weekend work, and equipment costs, litter and illegal dumping removal currently costs the City close to \$600,000 per year. This does not include bi-weekly street sweeping services, which also helps to make Hayward a cleaner and greener community.

## SUSTAINABILITY FEATURES

Reducing illegal dumping and promptly cleaning up illegally dumped material supports the City's sustainability goals. Keeping neighborhoods clean improves the community's appearance, image, and livability, and helps to minimize trash in storm drains and creeks.

## NEXT STEPS

Staff will continue to clean up illegally dumped items expeditiously while educating the public by way of the use of LED message boards, installation of signage, Waste Management vouchers, and the Waste Management bulky pickup program.

*Prepared by:* Rodney Affonso, Jr., Streets Maintenance Manager

*Recommended by:* Todd Rullman, Director of Maintenance Services

*Approved by:*

A handwritten signature in black ink, appearing to read 'K. McAdoo', is positioned above a horizontal line.

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Kelly McAdoo, City Manager



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**File #:** ACT 17-018

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**DATE:** March 13, 2017

**TO:** Council Sustainability Committee

**FROM:** Director of Utilities and Environmental Services

**SUBJECT**

Bulky Item Collection Service Participation

**RECOMMENDATION**

That the Committee reviews and comments on this report and provides direction to staff.

**ATTACHMENTS**

Attachment I      Staff Report



DATE: March 13, 2017

TO: Council Sustainability Committee

FROM: Director of Utilities & Environmental Services

SUBJECT Bulky Item Collection Service Participation

#### RECOMMENDATION

That the Committee reviews and comments on this report and provides direction to staff.

#### SUMMARY

This report provides an update on the bulky item collection services Waste Management of Alameda County (WMAC) provides Hayward residents under the City's contract with WMAC which commenced March 1, 2015. The report shows the participation level of Hayward residents from 2014-2016 and provides the level of participation from multi-family and single-family homes. The report also compares Hayward's bulky item collection program with bulky item collection programs offered by a few other Bay Area jurisdictions.

#### BACKGROUND

As part of the previous contract between the City and WMAC for solid waste, recyclable materials and organics materials services, WMAC offered, at no additional cost, one bulky item collection per year to Hayward residents living in single-family homes. The bulky collection service was expanded in March 2015 as part of the City's new contract with WMAC. The bulky service expanded to offer twice a year bulky collection services to Hayward residents in single-family homes, and also to offer comparable service to residents in multi-family dwellings. The service continues to be offered at no extra cost to residents.

Staff works with WMAC to increase participation in several on-going services and waste diversion programs, including the expanded bulky item collection program, which became available March 1, 2015, when the City's current contract with WMAC commenced.

The bulky collection service is offered as a convenience to Hayward residents and the cost is embedded in the rate structure. There is no additional cost to residents who arrange for the service. Staff had received many requests from multi-family residents and multi-family property owners for the bulky collection service, so the service was expanded to include multi-family properties beginning in March 2015. The bulky item collection program differs

slightly for residents with cart services (mainly single-family homes) and for residents of multi-family properties. Parameters of the two programs are listed below:

**Single-Family Properties and Multi-Family Properties with Cart Service:**

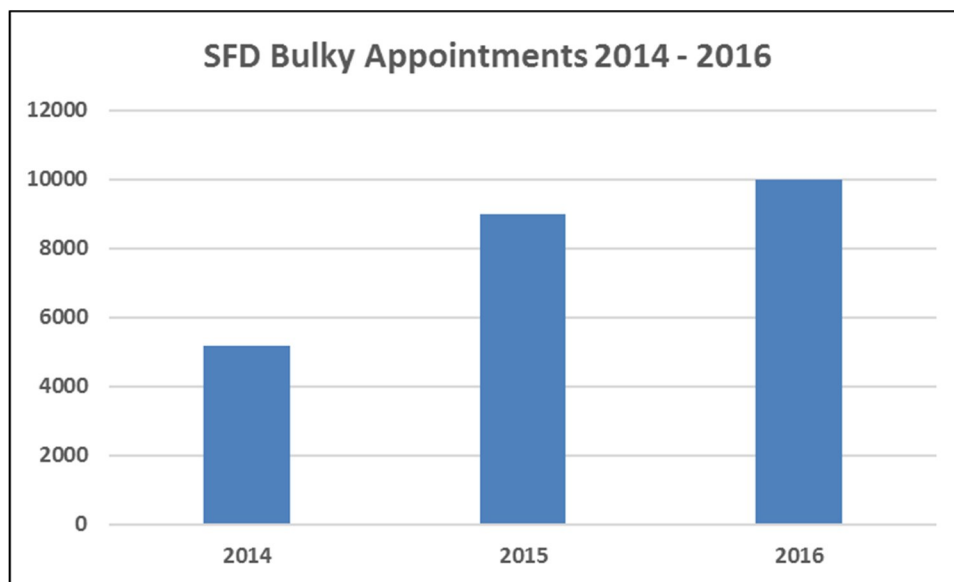
- Each household is entitled to two on-call appointments per calendar year.
- Two cubic yards of trash per household per appointment (for a total of four cubic yards per year), as well as up to three large appliances, three household furniture items, four passenger tires, two mattresses, and two television sets or two other electronic waste items.
- Items are collected from curbside, on same day as regular garbage service.

**Multi-Family Properties:**

- Contract allows for collection of four cubic yards of trash per dwelling unit per year, as well as three large appliances, three household furniture items, four passenger tires, two mattresses, and two television sets or two other electronic waste items.
- For larger complexes, the property manager or homeowner's associations may arrange for roll-off containers. WMAC staff work closely with property managers to find appropriate locations, preferably out of view from the street.

**DISCUSSION**

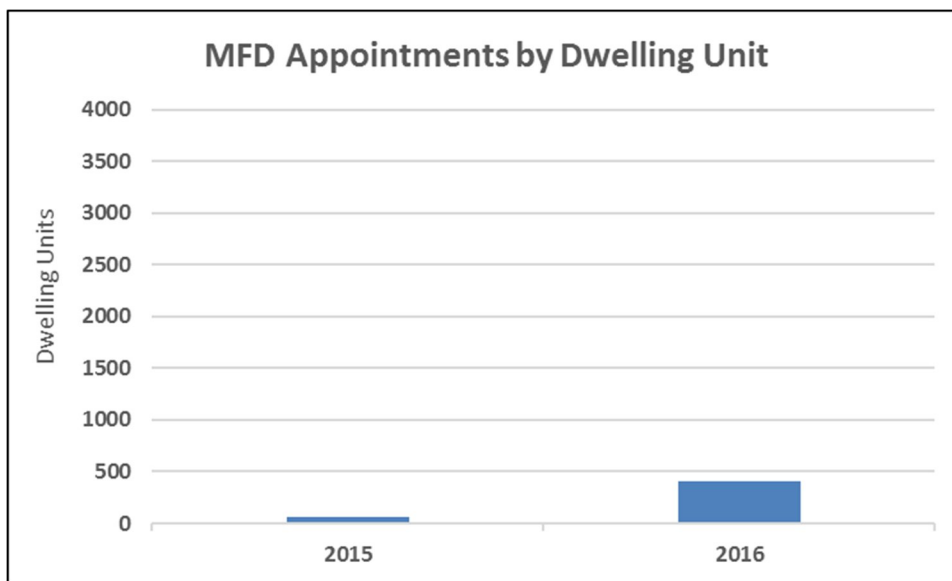
From 2014, when only a single pick-up was included in the service, to 2015, the number of bulky collections from single-family homes increased by about 73% from 5,191 collections in 2014 to 8,995 collections in 2015. In calendar year 2016, WMAC performed a total of 9,968 collections from all eligible single-family households in Hayward. These 9,968 collections are not all for unique addresses. They include repeat collections for 1,983 addresses.



**Figure 1, Bulky Collection Appointments for Hayward Single-Family Households**

While there is an appreciable increase in program participation from 2014-2016 by single-family homes, Hayward single-family home residents only used about a third of the eligible collections in 2016.

In 2015, WMAC performed sixty-five bulky collections for residents of multi-family properties. In 2016, the number of collections increased significantly as WMAC performed 410 bulky collections for multi-family properties. However, the participation level of multi-family residents is still a small fraction of those eligible for the program. About 3% of approximately 15,000 multi-family dwelling units within Hayward participated in 2016.



**Figure 2, Hayward Multi-Family Dwelling Unit Bulky Appointments 2015 and 2016 and Total MFD Dwelling Units in Hayward**

WMAC and City staff prioritize promoting the bulky item collection program to residents as part of the solid waste annual outreach plan. One reason to encourage use of the bulky collection service is to reduce occurrences of illegal dumping. In 2016, messaging about the bulky collection program was delivered to residents and property managers using the following methods:

- Bulky collection mailer sent twice annually
- Annual mailing of recycling guides to both MFD and SFD residents
- Garbage bill inserts
- Posters on the sides of Big Belly City litter receptacles
- City of Hayward and WMAC Websites
- WMAC and City staff promote the bulky program at events such as the Downtown Street Parties and the City Annual Clean-Up Day

Bulky item collection messaging is available in English and Spanish.

While the participation by Hayward residents in the program has increased over the first two years of the new contract with WMAC, residents only utilized about one-quarter of the appointments allowed by the contract. Staff will continue to prioritize promoting bulky item collection in 2017. While most Bay Area communities have switched to the “by-appointment” collection method, as is done in Hayward, staff will investigate new methods to maximize usage of the program by Hayward residents. Some potential methods include new outreach messaging about bulky item collection that informs residents of the cost to the City to collect illegally dumped material, as well as pre-arranging appointments for residents, as is done in some jurisdictions. For example, the City of San Ramon schedules curbside bulky collections for neighborhoods on the regular collection day. Each curbside customer in San Ramon receives a postcard providing guidelines for proper set out of items, and informing them when a bulky collection event is planned for their neighborhood. During the collection event, San Ramon residents can set bulky items out on their regular collection day.

The participation rate of Hayward residents in the Bulky Item Collections program in 2016, based on the number of appointments versus the number of eligible households in Hayward, is about 25%. Figure 3 below compares Hayward’s participation rate with bulky program participation rates of a few Alameda County jurisdictions.

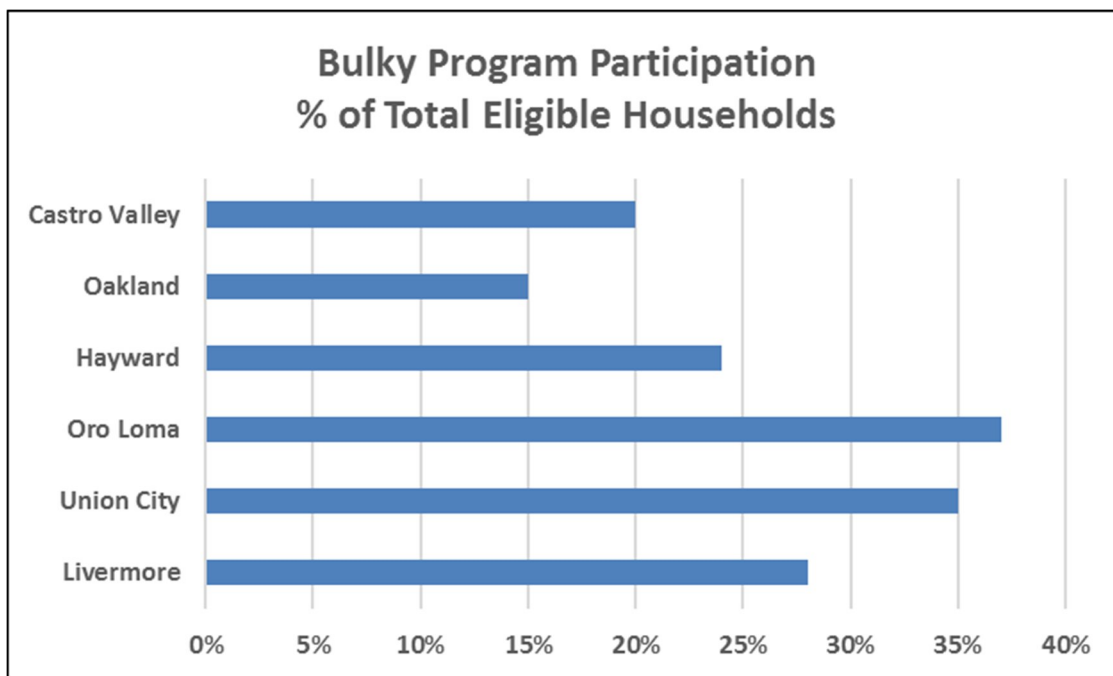


Figure 3, Bulky Program Participation as Percent of Eligible Households

Table 1 below shows the number of free collections offered annually to residents for some jurisdiction's programs as well as if free bulky services are offered to multi-family dwellings.

| Jurisdiction  | Annual Collections per Single-Family Household | Free Multi-Family Program |
|---------------|------------------------------------------------|---------------------------|
| Berkeley      | 1                                              | No                        |
| Castro Valley | 1                                              | Yes                       |
| Dublin        | 3                                              | Yes                       |
| Hayward       | 2                                              | Yes                       |
| Livermore     | 3                                              | Yes                       |
| Oakland       | 1                                              | Yes                       |
| Oro Loma      | 2                                              | No                        |
| Piedmont      | 4                                              | No                        |
| San Jose      | 2                                              | Yes                       |
| Union City    | 2                                              | No                        |

**Table 1, Number of Free Collections by Jurisdiction for SFDs and if Free Multi-Family Program Offered**

## ECONOMIC IMPACT

As stated earlier, there is no separate fee for the bulky item collections that are part of the contract. The cost of service is included in the customer rates. The rates increased by 3% on March 1, 2017 as part of the scheduled increases negotiated with the new contract, which became effective March 1, 2015.

## FISCAL IMPACT

The City contract with WMAC dedicates a portion of annual contract funds to conduct the bulky collections and also to perform outreach for these activities, so operating the bulky program will not impact the General Fund. Generally speaking, a successful bulky items collection program could save General Fund money by reducing City staff time and resources dedicated to collecting illegally dumped material.

## SUSTAINABILITY FEATURES

Solid waste management involves the safe and responsible management of discarded material from generation through processing to disposal. Reducing waste landfilled by maximizing the reuse, recycling, and composting of materials increases diversion, conserves natural resources and plays an important role in making a community sustainable. A successful bulky items collection program would also reduce the frequency of illegally dumped materials on streets and public spaces, which reduces visual blight and is an environmental benefit.

#### NEXT STEPS

Solid waste program staff will continue to work with WMAC to coordinate outreach and implementation of the bulky item collection program to Hayward residents. Since Hayward residents are not using all the appointments the contract provides them, staff will investigate methods of increasing participation in 2017.

*Prepared by:* Jeff Krump, Solid Waste Program Manager

*Recommended by:* Alex Ameri, Director of Utilities & Environmental Services

*Approved by:*

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Kelly McAdoo, City Manager



# CITY OF HAYWARD

Hayward City Hall  
777 B Street  
Hayward, CA 94541  
[www.Hayward-CA.gov](http://www.Hayward-CA.gov)

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**File #:** RPT 17-035

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**DATE:** March 13, 2017

**TO:** Council Sustainability Committee

**FROM:** Director of Utilities and Environmental Services

**SUBJECT**

Sustainable City Year Program: Fall 2016 Reports on Littering & Composting

**RECOMMENDATION**

That the Committee reviews and comments on this informational report.

**ATTACHMENTS**

|                |                                                        |
|----------------|--------------------------------------------------------|
| Attachment I   | Staff Report                                           |
| Attachment II  | Attitudes Toward Littering                             |
| Attachment III | Attitudes Toward Organic Waste Disposal and Composting |



DATE: March 13, 2017

TO: Council Sustainability Committee

FROM: Director of Utilities and Environmental Services

SUBJECT Sustainable City Year Program: Fall 2016 Reports on Littering & Composting

#### RECOMMENDATION

That the Committee reviews and comments on this informational report.

#### SUMMARY

The Sustainable City Year Program (SCYP), a partnership between the City and California State University East Bay (CSUEB), includes four projects for the 2016/2017 academic year. The projects are Trail Planning; Art Master Plan; Outreach to Increase Composting; and Outreach to Reduce Littering. For the composting and littering projects, CSUEB will prepare a report for each project for each academic quarter. This report summarizes the composting and littering reports (Attachments II and III) from the Fall 2016 quarter

#### BACKGROUND

Hayward's General Plan, adopted by Council in 2014, includes the following policy regarding City partnerships with higher education institutions:

*ED-4.1 – Town Gown and Communiversities Partnerships.* The City shall collaborate with local colleges to develop strategic “town gown” or “communiversities” partnerships that enhance the Hayward community and economy, improve the overall educational experience of college students, and assimilate college students and graduates into the Hayward community.

On [June 28, 2016](#), Council authorized a Memorandum of Understanding with CSUEB to establish the SCYP. On [November 14, 2016](#), staff provided an update to the Committee including a summary of the October kick-off event. CSUEB now refers to the SCYP as “Pioneers for Sustainable Communities”.

## DISCUSSION

In the fall of 2016, the Environmental Ethics class at CSUEB was tasked with studying the current issues and community attitudes around littering and curbside collection of organic materials. Both are issues that are difficult to address at the municipal or community level. Prevention of litter is a struggle faced by almost all communities and encouraging the collection of organics is a relatively new issue that causes confusion for many households.

*Attitudes Toward Littering* – Students in the Environmental Ethics class researched anti-littering campaigns including those in the Bay Area, across the nation, and some international examples. Some campaigns have documented clear results, but many do not. In addition to online research, students conducted windshield surveys and photographed litter throughout the community to gain an understanding of the locations and types of litter found in the community.

The students reviewed surveys that document people's perceptions of litterers, behaviors of litterers, and issues with convenience and disposal products. The primary disconnect discovered by the students was that most outreach campaigns focus on clean-ups and not on prevention of litter. Another problem noted in the report was that the City of Hayward's online program, "Access Hayward", is difficult and confusing because there are too many categories for the user to choose from. Finally, the report notes that while the Water Board focuses on litter that enters the Bay, it is also important that we address litter that affects the community, but does not necessarily reach the storm drain system.

The report mentions that the City and County of San Francisco is not covered by the Municipal Regional Permit (MRP) for storm water. This is due to the fact that San Francisco has a combined storm water and wastewater treatment system and is therefore regulated differently by the Water Board.

The report concludes that outreach to school-aged children is key to influencing behavior. The report mentions the Broken Windows Theory, which is the idea that people are more likely to litter in an area where there is already litter on the ground. However, the authors cited a study that found that outreach is more effective at preventing litter than an area already being clean.

*Attitudes Toward Organic Waste Disposal and Composting* – Environmental Ethics students also studied composting, or more specifically, how to encourage residents to participate in curbside collection of organic materials. The students evaluated online resources and commented on the City's website. One suggestion made is to provide information about why people should keep organics out of the landfill. Another suggestion is to prominently display information about the availability of countertop kitchen pails/bins. They noted that when reviewing information online, some websites focus on backyard composting while others, such as Waste Management's are more focused on curbside collection for commercial composting facilities.

The students evaluated possible reasons for people not properly sorting their organics. Their conclusion is that it is not laziness, but lack of knowledge. They note that there doesn't seem to be enough easily accessible information about why residents should be composting. For some people, it may be enough to know that it is "sustainable". For others, it may make a difference to know that composting reduces methane emissions and reduces the need for chemical fertilizers. Students also spent two mornings last fall checking green carts to see if people were putting food scraps in the carts along with yard trimmings. They found that only about 25% of households were disposing food scraps in the green cart.

Ideas for improving participating in curbside collection of organics include:

- Simply having a countertop bin may help reinforce the desired behavior.
- Positive reinforcement such as giving someone a discount on their Waste Management bill if they reduce their waste by a certain percentage.
- Or, instead of discounting Waste Management bills for residents that do compost, the City can create a fee for those that do not.
- Prizes or rewards to those who do good sorting.
- Marketing materials that tell people why they should be composting.
- A logo for organics similar to the chasing arrows used for recycling would be helpful for marketing.
- Reduce the size of available landfill curbside bins (as was done in Sonoma county).
- Attach sorting rubrics or charts to the curbside bins. (Stickers with graphics were added to carts in 2015.)

The report also emphasizes the importance of early education. The authors noted that children's habits develop during the school-aged years; between ages five and twelve. The authors go on to state,

*"All of this not only demonstrates the importance of coordination between the City, its schools, and its residents, but it also shows that it is beneficial for young children to be practicing proper sorting behaviors with a three-stream system, even if the schools are unable to make the change to a three-stream system of waste disposal, and are only capable or willing to maintain a single-stream system. There certainly would be financial benefits for the City of Hayward and the Hayward Unified School District (HUSD) if HUSD were to implement a three-stream system, as much more organic waste would be diverted from landfills, contributing to a higher diversion rate, citywide; lowering the chances of Hayward being fined for not making their mandated waste diversion percentages. HUSD would save money from diverting their waste as well, as an increase in food waste has been found in school that are offering 'healthier' options for their students."*

HUSD must comply with the requirements of AB 341 and AB 1826, California's mandatory commercial recycling and organics laws. Upon direction from the Committee, staff can make a renewed effort to reach out to HUSD, Republic (HUSD's solid waste hauler), and StopWaste to assist with compliance. StopWaste does outreach to schools, but due to limited resources, they only provide services to those that are "Priority Districts", meaning those that have committed to providing access to recycling and organics bins, training staff to support school recycling

programs, and reducing the amount of readily recyclable and compostable materials in landfill trash to less than 10% by 2020. As of yet, HUSD is not a Priority District and therefore, does not benefit from StopWaste's outreach services.

## FISCAL IMPACT

The cost of the 2016/2017 SCYP program is \$150,000, with the City and the University each paying \$75,000. The program cost is based on ten courses, so the City's cost is \$7,500 per course. In total, the composting and littering projects will have five courses, with a cost of \$37,500, which will be paid from the Recycling and Storm water Funds. In addition, Environmental Services staff is spending time working with students and faculty from the University. The US Environmental Protection Agency has also contributed by providing funding to the University of Oregon to provide technical assistance to universities in California to assist with adoption of Oregon's program model.

## SUSTAINABILITY FEATURES

The Sustainable City Year Program supports several General Plan policies, including those that strive to reduce greenhouse gas emissions. In addition, the program has the following sustainability features or benefits:

- A primary goal of the composting project will be to reduce the volume of organic material sent to landfills and to improve the City's overall solid waste diversion rate.
- Reducing litter will not only improve the community's appearance, but will also help prevent trash from entering the storm drain system and creeks, which will help the City meet its trash reduction goals mandated by the Regional Water Quality Control Board.

## NEXT STEPS

The work of the fall quarter Environmental Ethics class is being continued through the winter and spring quarters by students in the following courses:

- COMM 4107: Relational Communication in Organizations - Winter 2017
- COMM 3004: Quantitative Communication Research Methods - Winter 2017
- COMM 4107: Relational Communication in Organizations - Spring 2017
- HDEV 3203: Applying Theory and Methods of Human Development - Spring 2017

Deliverables by these courses will include:

- Press kits on composting and littering, which may include a game that can be used at public events.
- Data on composting and littering behavior.
- Implementation of suggested composting campaign.
- Written reports.

Finally, an end-of-year celebration for the Sustainable City Year Program is scheduled for May 18, 2017, from 2:00 to 4:00 p.m. at Hayward City Hall.

*Prepared by:* Erik Pearson, Environmental Services Manager

*Recommended by:* Alex Ameri, Director of Utilities and Environmental Services

*Approved by:*

A handwritten signature in black ink, appearing to read 'K. McAadoo', is positioned above a horizontal line.

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Kelly McAadoo, City Manager

# Attitudes Toward Littering

Fall 2016

Department of Philosophy

**PIONEERS FOR SUSTAINABLE COMMUNITIES REPORT**



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## ACKNOWLEDGEMENTS

This report was made possible by the collaboration and support of the City of Hayward, including:

The City Council: Barbara Halliday (mayor), Sara Lamnin, Francisco Zermeno, Marvin Peixoto, Al Mendall, Elisa Marquez, and Mark Salinas

The City Manager, Kelly McAdoo

Managements Analyst, Laurel James (and P4SC program coordinator for the City)

City Employees who helped plan and implement the projects: Erik Pearson, Mary Thomas, Jeff Krump, Elisa Wilfong, Michael Loconte, and Chris Sturken

There was also a great deal of support from CSUEB including: Lonny Brooks, Nina Haft, Jiansheng Guo, Yungi Liu, Andrea Wells, Mary D'Alleva, and Jessica Weiss

This pioneering year of P4SC would not have been possible without the generous support of Cal State East Bay President, Leroy M. Morishita.



## About Pioneers for Sustainable Communities

Pioneers for Sustainable Communities (P4SC) is a year-long partnership between Cal State East Bay and a community partner that represents local or regional government. P4SC is one of a network of campuses nationwide—the EPIC-N Network—that have adopted a model of using course-based, faculty-lead, student research to support the sustainability goals of local communities. P4SC focuses on sustainability, social justice, and quality of life in the San Francisco East Bay region. It leverages the expertise of faculty and the enthusiasm, time, and innovative ideas of students, providing thousands of hours of research to support local partner sustainability programs including: data acquisition and analysis, stakeholder surveys, geo-spatial mapping and referencing used to establish socio-environmental baselines, track progress, and facilitate planning and communications.

- **P4SC Reports** present the final results of one or more full-time equivalent courses devoted to a single P4SC project.
- **P4SC Mini-Reports** present the results of partial courses devoted to a PSC project, typically used for projects in progress.

## About Cal State East Bay

Cal State East Bay's beautiful main campus is located in the Hayward hills with panoramic views of the San Francisco Bay shoreline. Situated above the city of Hayward, the campus offers an ideal setting for teaching and learning and yet easy access to the many cities along the bay. The University has a satellite campus in Concord, a professional development center in Oakland, and a significant presence online. Founded in 1957, Cal State East Bay is one of 23 universities of the California State University system (CSU). With an enrollment of over 15,800 students, Cal State East Bay is recognized as a regionally engaged and globally oriented university with a strong commitment to academic innovation, student success, engaged service learning, diversity, and sustainability.

## P4SC Directors and Staff

Karina Garbesi, P4SC Co-Director, Professor and Director of the Environmental Studies Program, Department of Anthropology, Geography, and Environmental Studies, Cal State East Bay

Craig Derksen, P4SC Co-Director, Assistant Professor of Philosophy, Department of Philosophy, Cal State East Bay

Audrey Wade, P4SC Program Coordinator, Cal State East Bay

*With support from Jillian Buckholz, Director of the Office of Sustainability*



## About the City of Hayward

The City of Hayward was incorporated in 1876. With a population of 150,000, Hayward is the sixth largest city in the Bay Area and proudly the second most diverse City in California. A Charter City, Hayward operates under the Council-Manager form of government with a directly elected Mayor and six member City Council. Hayward is a full service City comprised of thirteen departments providing services ranging from public safety and public works to library and community services. The City strives to be a safe, clean, green, and thriving community for all of its residents. To learn more about the City of Hayward, visit [www.Hayward-ca.gov](http://www.Hayward-ca.gov).





# Attitudes Toward Littering

## REPORT AUTHORS

Kane Shotz

Craig Derksen

## COURSE PARTICIPANTS

### **P4SC Instructor**

Craig Derksen Ph.D.

Assistant Professor of Philosophy

PHIL3151 Environmental Ethics

### **P4SC Student Participants**

The Students of Fall 2016 CSUEB PHIL3151 Environmental Ethics including:

Shavar Belgrave

Chloe Blancas

Seth Blatt

Martha Bravo-Rios

Julio Campos

Nestor Castro

Nathanael Detlefsen

Antoinette Franklin

Bradley Heusdens

Andrew Marten

Andres Navarro

Jaqueline Paine

Wesley Passman

Kane Shotz

Shanee Sims

Shruti Sivasubramanian



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# Pioneers for Sustainable Communities: Attitudes Toward Littering

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## OBJECTIVES

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The City of Hayward has identified prevention of littering as a route toward greater sustainability. They are partnering with California State University, East Bay to help meet these ends. To establish solid foundations for this strategy we are starting with a course in environmental ethics. The course will target ideas and behaviors as they relate to littering, first at the ideological and global level and gradually getting less abstract and more specific down to the littering behavior in Hayward.

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## METHODS

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The students for this class were asked to research and reflect at the same time. Rather than just report on others' work or deploy a pre-defined methodology, students were asked to refine their own process as they worked and produce information that they perceived as valuable based on the understanding that they gleaned from the process. The students were not completely free however, they were trained in methods to find, filter, organize, categorize, and present with an emphasis on being useful and



valuable. They were also tasked with identifying and exploring the theoretical basis of claims. With these methods the students were set loose on the world to discover and explore as many sources as they could. This was supplemented by visits from experts as well as a survey of litter in the city of Hayward, the results of which were submitted to the city. This report is a refinement of the results that this process produced, often in the various students' voices.

Litter is a complicated subject. Its complexity is from its contradiction. When the class started discussing litter it was obvious that it was perceived as bad (universally) but not that bad (individually), dangerous (if overdone) but not that bad (if it is done in limited degrees), something that people should not do but something that people will do (and that is ok). Basically the perception was that it was bad but not bad enough to take action. With this in mind the class started to consider anti littering campaigns and how they might influence people to take action. From there the students develop categories based on how they saw the organization of the information.

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## ANTI-LITTERING CAMPAIGNS

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### List of Campaigns:

Although anti-littering campaigns can take many forms, the ones that seem to be the most effective find creative ways to argue their point. Sometimes what seems to make these campaigns effective is not so much the content of their argument, but how they plan the campaign and how well it is executed. The main goal of public outreach is to create a lasting impression on the viewer. One of the biggest problems that campaigns face is how to go about doing this. There are a lot campaigns that have taken a creative approach to solving littering problems often with much success.

Sometimes, more than one method can be employed to achieve more success in public outreach. A proposed project in San Mateo, CA laid out a plan to use local citizen, school and business involvement and volunteer efforts to clean up trash in neighborhoods and other areas.<sup>1</sup> This program took a community based approach to solving the problem, by having neighborhood leaders, school children and businesses clean up trash in their respective areas. This encouraged a sense of pride for the residents' community that would connect to a perceived obligation for ones' own neighborhood, school or business front. What is unique about this program idea is that it emphasized the residents' responsibility over the city governments. Having the government organize these events could encourage citizens to take responsibility where they would not simply by themselves.

The *Don't Mess With Texas* campaign has received a great deal of attention. It used a variety of strategies as well, rather than a single one. One technique they used was to get celebrities that are from Texas to take selfies promoting the Don't Mess With Texas logo.<sup>2</sup> A page on the website for the campaign allows people to report a litterer



that they see on the road, by providing the website with their license plate number if it is registered in Texas, the make and color of the car, where and when the person witnessed the event. The potential litterer gets sent a litter bag and a letter telling them not to mess with Texas after the information is compared with the DMV records.<sup>3</sup> The campaign also performed studies on attitudes and behavior. In the 2013 version, it describes the people that are most likely to litter. "In general, the incidence of littering skews somewhat toward males, but more heavily toward Millennials, Hispanics, singles, and households with young children."<sup>4</sup> Most cigarette smokers who littered their cigarette butts out the window believed that cigarette butts counted as litter. They mostly did so out of habit and claimed they would not do so if there was a more convenient way to dispose of them.<sup>5</sup> This campaign performed sociological studies of Texas' local population and used this information to improve its effect on public outreach. They not only gathered information on who was more likely to litter, but also on who the campaign was reaching. For example, in the 2013 study it found that in Spanish-dominant areas, there were higher amounts of litter and a lower awareness of the true meaning of the campaign.<sup>6</sup> Information such as this can be useful when trying to develop a plan for a campaign.

The city of San Jose proposed a strategy in 2014 to reduce their litter problem by dividing their outreach campaigns into two categories: one for the general public and one for school-age children. The programs geared towards the general public include one day litter pick-up events such as the *Great American Litter Pick-Up Day*. During events such as these, the city helps train and recruits residents to pick up trash off of the street. The Environmental Services Department (ESD) in San Jose also teams up with local creek cleanup organizations such as Friends of Los Gatos Creek, the Guadalupe River Park Conservancy, and Restore Coyote Creek to help remove trash from the waterways. For school-age children, the city provides something called the *Zun Zun Program*. This uses interactive assemblies to educate kids about littering, with the goal of making education fun. They also have something called the "Be the Street" program which uses a community-based social marketing technique to educate kids. This program was so successful in gaining public attention that it used a video campaign contest to achieve 6.5 million impressions on Pandora, Facebook, and KTVU. Also the city was working on a pilot for a multi-city block art project that would show students the path that trash takes when traveling to the creek. In addition to this the ESD hosted the *Bay Area Trash Summit* in 2013. Over 300 people from 130 government agencies, nonprofits and businesses attended and discussed ideas for solutions to the common littering problems they faced.<sup>7</sup>

Some campaigns focus on cleanup events to solve their trash problem. The city of San Jose also has a program called *SHED*, that provides materials and training for residents to perform trash cleanup events, even for large groups.<sup>8</sup>

Wake County, North Carolina launched a campaign called *86it* to reduce litter in its community. The county will send residents a cleanup kit with everything they need to organize a trash cleanup event if they fill out a form. Afterwards they mail the kit back.<sup>9</sup> This technique seems to be aimed at convincing residents that they are responsible for



cleaning up litter in their community. Through this sense of responsibility, agencies encourage residents to perform cleanup events by providing them with all of the necessary materials. They are trying to create the impression that the only thing holding residents back from this is the lack of materials. Otherwise, providing them wouldn't be worth the county or city's time to begin with. This technique might temporarily reduce litter, however without dealing with the problem of what is causing the litter in the first place, it is likely to come back once removed. Unless there is a community willing to continually engage in these cleanup efforts once the trash builds up again, it is unlikely that this technique can make a real difference reducing litter.

The *Keep Virginia Beautiful* campaign attempts to get residents to pick up the trash themselves by creating a one bag of trash challenge. They encourage residents to grab a bag of trash and one of recycling as well off of the streets, take a picture of it and tag the photo with #OneBagofTrashVa. Then they are encouraged to tag their friends and family with hopes that they will also accept the challenge.<sup>10</sup> Once again we see the motivation of shame and the emphasis on the cleanup. What is different about this technique from the other two is that it attempts to use social media to spread its message, so it might have more of a chance of reaching out to a greater audience. However, the same problem exists with this technique as well. If people are still littering, then people will have to continually cleanup the trash. Even if everybody picks up a bag of trash and recycling, it will eventually come back.

This program will also send residents of North Carolina car magnets, stickers or litter bags upon request if they take a pledge online not to litter and to encourage their family and friends not to do so as well. At the bottom of the webpage for this campaign is a number which appears to be the amount of people which have taken this pledge so far.<sup>11</sup> This seems to appeal to people wanting to be accepted as part of the group, using peer pressure to encourage them to not litter. They encourage people to take the pledge by giving them free things which in return become further advertisement for the campaign.

Some programs attempt to use details and facts to convince the public to stop littering. The organization *Keep America Beautiful* launched the *Cigarette Litter Prevention Program*. This is based on spreading awareness of the problems caused by cigarette butt littering. It claims that many people do not consider cigarette butts litter and when disposal facilities are near, less people litter them.<sup>12</sup> This is an attempt to deal with a bigger issue by starting small and specifically. By offering statistics and starting with the biggest source of litter, Keep America Beautiful is attempting to tackle a big problem one step at a time in a practical way. By informing the public of the problem, they hope to convince them through education. The *Keep Oakland Beautiful* campaign in Oakland, CA is funded by a Cigarette Litter Prevention Program (CLPP) Grant from Keep America Beautiful (KAB). It used this money to put in ashtrays and ads telling people to put out their cigarette butts properly.<sup>13</sup> This is another example of a campaign focusing on a specific problem. KAB seems to be very focused on cigarette butts since they are such a big problem. The link to the grant application on KAB's website says: "Keep America Beautiful awards CLPP grants to its affiliates, local governments,



business improvement districts, downtown associations, parks and recreation areas, and other organizations dedicated to eradicating litter and beautifying their communities."<sup>14</sup> Although they are a national organization, they work with local governments and organizations to help solve America's litter problem.

An organization called *Litter Free Long Beach* have a *No Litter Zone* program where local businesses can take a pledge to remove litter from their business area and become a member. This allows them to post a No Litter Zone window cling on their shop windows, giving them recognition from the public for their environmentally friendly practices. If more than 50% of all businesses in Long Beach join, then the organization claims that they will post the businesses names on the website, giving these businesses further recognition. In addition to this, the organization allows businesses and individuals to sponsor events such as cleanups and gives recognition to those who sponsored these events.<sup>15</sup> This is an example of a campaign giving incentive to community members to get them involved in cleanup efforts. This is potentially a good way to get people involved; however the same problem that exists in many other campaigns exists here as well. The source of the litter is not being addressed.

The city of New York, NY has released a series of campaigns with a focus on reducing trash before it becomes litter. An ad campaign that was released by *GreenNYC* called the *Bring Your Own Effort*, was very effective at getting people to bring their own bags to the grocery store, mugs to places such as cafes and bottles while traveling to reduce the amount of trash and recycling produced. In 2015 the city released plans to fix or install 500 public water fountains and water bottle refilling stations. It also released plans for its Water on the Go program, which was supposed to provide temporary stations for people to refill their water bottles during the summer months.

The city also has an *Adopt a Basket* program where local business and community groups make sure that trash can liners in busy areas are changed, so trash doesn't escape the bins, and to encourage people to use them.<sup>16</sup> *GreenNYC* also released ads about changing residents' overall lifestyles in order to combat not just littering, but several environmental problems such as greenhouse gas emissions and pollution from pesticides.<sup>17</sup> This creates an interesting goal, which becomes not just to be courteous of one's local environment, but the overall environment as a whole. Indeed, litter is one part of a list of environmental problems. By including it in an overall campaign to get people to be environmentally friendly, *GreenNYC* is seeking to kill multiple birds with one stone and make the viewer feel that the problem is bigger than just litter. One effect of this might be more motivation to take action since there is more of a problem.

The Tennessee Department of Transportation (TDOT) has a *Litter Grant Program* to partner with different organizations that can help reduce the state's litter problem. In 1981, the soft drink and malt beverage industry lobbied to impose a tax on their products in the state, and the funds received from this were used to clean trash off of Tennessee's roadways. TDOT claims to have had a lot of success with this program, and it has removed over 300,000 tons of litter total since it began in 1983. Another organization that the TDOT has partnered with is *Keep Tennessee Beautiful* (KTnB).



KTnB focuses on public outreach and education, and has plans for campaigns such as *Trashercise* (which aims to combat both litter and obesity through trash cleanup), *Paint the State Green* (which focuses on community cleanup on a *Great American Cleanup Event*), and a KTnB Childrens' Book (meant to instill Tennessee pride into children and will developed by the well-known author and illustrator Guy Gilchrist).<sup>18</sup> Although the cleanup element is still present in these campaigns, there is also an effort to create a sense of responsibility among corporations, and reduce litter by affecting children through trying to invoke pride in how they view their community.

The Washington State Department of Ecology released a 3 year campaign plan titled *Litter and it Will Hurt* in 2001. Behind the campaign is the assumption that about half of the people in Washington State litter occasionally but can be persuaded not to.<sup>19</sup> The people who are the target audience of this campaign since they are the largest contributors are all people driving vehicles on roads. The campaign plan also says that the campaign will target people who don't litter but still drive as well. It seems to focus on making people aware that there are fines for littering, and making litterers believe that "their littering will be noticed and they could be caught". One of the strategies is an 800 phone number for people to report litter with. Other ways to change behavior that are stressed are the distribution of litter bags, promotion of tarps/cargo nets in order to secure truck beds, availability of disposable cigarette pouches, and increasing the number of litter receptacles and making them "cooler".<sup>20</sup> In order to gain corporate sponsorships to fund the campaign, the Department of Ecology teamed up with Belo Marketing Solutions/Northwest and Entercom Inc. which were two of the biggest broadcasting firms in Washington. They also notice the need to partner with other state agencies to complete their goals.<sup>21</sup> Since they believed that states which have litter prevention education and abatement programs for at least 5 years have the most success in litter reduction, they planned a long-term campaign. This focused on males since they made up 75% of typical litterers, and people between the ages 12-34 depending on the area.<sup>22</sup> Wholesalers, retailers and manufacturers of many commonly littered items were forced to pay a litter tax which funded this campaign. The plan not only attempted to collaborate with other government agencies, but also non-profits, and the companies which paid the litter tax.<sup>23</sup> There was a plan to advertise the campaign through local news agencies.<sup>24</sup> There was also a plan to get people to go on talk radio and describe the negative effects of litter.<sup>25</sup> Findings from pre-test focus groups conducted by the Department of Ecology found that providing a fear of punishment for littering was more effective than trying to convince litterers that it was easy not to litter.<sup>26</sup> This campaign plan took an authoritative stance on reducing litter.

Scotland launched an outreach campaign in 2014 called *Towards a Litter Free Scotland*. It planned on tackling Scotland's litter problem through prevention and not through simply cleaning it up. The methods it employed were information, infrastructure and enforcement. This worked through education, communication with the public, increasing public disposal facilities, enforcement of laws, and encouraging local community action/responsibility.<sup>27</sup> One key point that the plan relied on was the idea that areas which are already filled with litter encourage litterers to put more of it there.<sup>28</sup> There was a plan to give incentives to local communities to encourage them to



clean up areas which are not currently being cleaned and boost pride in peoples' communities. They would get to choose where this cleanup would be and would give communities control of their own environment in this sense.<sup>29</sup> One way they believed outreach could affect the public's actions was through providing an accessible, consistent message to encourage people to change their behavior.<sup>30</sup> It emphasized how increasing public recycling facilities would reduce litter and utilize reusable resources more. Another focus was how encouraging people to use reusable containers and recyclable packaging materials more would reduce trash. Getting businesses to change their packaging to create less trash was as well.<sup>31</sup>

Montgomery County, MD launched the *White Oaks Community Pilot* in order to solve the trash issue, and stop trash from getting into the Anacostia River and its Tributaries. The county decided to launch this pilot program in order to meet the EPA standards program and to learn where and why trash originates in areas, using the White Oak neighborhood as an example.<sup>32</sup> This area was selected because it already had very high levels of trash. They observed the storm drains, waterways, bus stops, streets in the area, and every piece of trash they could find in them. They had a neighborhood cleanup on earth day in which 50 volunteers cleaned up enormous amounts of trash. The conclusion from the study and follow up observation was that the area still had a large trash problem and needed further efforts to reduce litter. The study recommends having property owners put signs up discouraging people from dumping and littering on their property. It also recommends educating the public about the problem and speculates that the large amount of languages and transient nature of the residents in this neighborhood could be a big contributing factor.<sup>33</sup> A paper bag fee which was put into place in 2012 that required all retailers to charge 5 cents for paper bags, reduced the total paper bag usage by more than half in the first year. Of this fee, 1 cent went to the retailer and 4 cents to the Water Quality Protection Charge.<sup>34</sup>

The California Department of Transportation (Caltrans) published a *Litter Abatement Plan* in 2007. Its goals were to "measure performance, employ physical intervention and mechanical device innovations, emphasize litter policies and enforcement, partner with stakeholders, and increase public awareness".<sup>35</sup> It claims roads and freeways as the most common areas where trash occurs.<sup>36</sup> This is another example of a multifaceted approach to solving litter problems, with an emphasis on the freeways and roadsides. Caltrans is an agency which deals specifically with the roadsides in California, however even though their jurisdiction overlaps with the city of Hayward's, their goal is different. Hayward's trash problem according to the California Department of Water Resources relates to keeping trash out of the MS4s or waterways. Caltrans is concerned with keeping trash off of the roadsides. Although eventually the trash on the roads has potential to wash into the MS4s, this report makes no mention of regulation by the Department of Water Resources. The concern seems to be to reduce littering and improve the appearance of the environment.<sup>35</sup>

The city of Toronto's *Livegreen* organization released an ad campaign that which rearranges letters on trash in order to shame litterers. The ads say "littering says a lot about you" and rearranges trash in order for it to say words like lazy, selfish, and pig.<sup>37</sup>



This is unique because it takes objects that everybody is familiar with, such as an empty bag of Lays, Reeses Pieces, or a Gatorade bottle that is in a familiar form. They are laid out in a patch of grass, or on a sidewalk. Then Livegreen placed them in a way which portrays a message that viewers might not have normally got from them. The ads use a combination of humor and shame which is unique.

The city of Hayward, CA holds a contest once a year called *Hayward Shines*. Kids in grades 1-12 are encouraged to pick up trash, take photos of it, and throw it away. The kid and school who pick up the most trash get cash. The student with the most creative photo will be awarded too. This contest lasts for a month. The student has to download an app on their mobile phone to enter.<sup>38</sup> This is a unique approach because the campaign uses a competition to encourage more cleanup, and includes social media and smart phones in the methods for competition. This has the potential to engage more students than a simple litter pickup event would.

The city of Sydney, Australia launched a program to install *Reverse Vending Machines* (RVMS) to reduce litter in the city. They leased these machines through the company Envirobank Recycling, and the way that they work is by scanning the barcodes of beverage containers. The pedestrian inserts an empty plastic or aluminum beverage container into a slot on the machine, and gets to choose between a number of prizes that they will be entered for a chance to win. The machine automatically sorts out trash and unrecyclable material and crushes the acceptable beverage containers, which makes it so the machines can store up to 3,000 containers before requiring emptying. The machines automatically communicate to the service provider their level of fullness as well. The city placed these machines in busy areas that were also littering hot spots and launched a well targeted marketing campaign in order to inform the public and get them to use the machines. One of the main goals of this campaign was to change the attitudes of the public, by getting them to view their trash as valuable. Their target audience was workers, shoppers, tourists and residents among others. They put posters up around the areas, advertised on the machines themselves by showing the rewards on the display screen, put a page on the city of Sydney website, and other forms of advertisement.<sup>39</sup> Announcements were made on social media and television outlets about the machines.<sup>40</sup> The city spent \$22,006 on the machines, \$67,000 on marketing and \$29,600 on project evaluation costs. This is probably in Australian Dollars, but the source doesn't specify.<sup>41</sup> The city of Sydney was impressed by the results of this trial and will be using the RVM technology in the future once the company develops more advanced models.<sup>42</sup>

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## REVIEWING SOME SCHOLARSHIP

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With so many campaigns trying a variety of approaches it seems obvious that there would be work done of which approaches are best. There has been much research into the approaches as well as attempts to find technological innovations.



A study on the effect that ad campaigns for environmentally friendly products have on college students when they are and aren't deceptive was conducted.<sup>43</sup> The study says in the conclusion: "Deceptive ad claims may have little positive influence on consumers, and they have the potential to lead to negative consequences."<sup>44</sup> This suggests that viewers can tell when an ad is being deceptive. This indicates that for environmental ad campaigns, persuasion should not rely on false claims. Facts should be well supported and documented.

The *Ballot Bin* is a creative product which encourages people to put their cigarette butts into a bin by letting them voice their opinion on issues and questions. The person puts the cigarette butt into the hole which corresponds to the question they would like to answer. The website for the product claims that discounts and customization are a possibility for large orders.<sup>45</sup> Hubbub is the company which creates these and other products designed to encourage public engagement on environmental problems.<sup>46</sup> This product takes an interactive approach to prevent littering which attempts to make it fun not to litter.

The Alice Ferguson Foundation (AFF) along with the Metropolitan Washington Council of Governments (A network of government, business and concerned citizens in the Washington D.C. area) created the *Potomac River Outreach and Awareness Campaign for Trash* (PROACT). In order to create a successful campaign, these organizations commissioned *OpinionWorks* which was a local observer of public opinion, to conduct an opinion study throughout the region of the Potomac River watershed in the Washington D.C. area.<sup>47</sup> The results indicate that although litterers agree that laws make it less likely for people to litter, most think that they will not get caught despite them. The data shows that they are correct about this. They seem to have a very small chance of actually getting into trouble for littering. Also, most litterers seem to do so because of a combination of beliefs that: their litter isn't a big deal, they don't want to be around trash in their personal space, and that it is convenient for them to simply toss their trash.<sup>48</sup> Some litterers even seem to believe that they are helping people by littering. This can take the form of creating jobs for people in environmental agencies or "fun" weekend activities for cleanup crews. Litterers seemed to respond best to ads that were short, not too wordy, animated, shocking (like the Truth tobacco ads), demonstrative of the process where trash gets washed into rivers through witnessing it first-hand, featuring vulnerable children and/or celebrities or sports heroes.<sup>49</sup>

The State of Georgia's *Litter Abatement and Prevention Initiative* and the Georgia Governor's Office performed a study "to determine Georgia residents' opinions on litter, littering practices, and anti-littering programs in Georgia". It was published in 2006 and includes phone surveys of Georgia residents about their opinions on littering.<sup>50</sup> 39% of those interviewed defined litter as trash on the roadsides.<sup>51</sup> This is interesting because they do not take into account trash that is not along roadsides. The study says: "Of those who think it is acceptable to litter, the most popular acceptable reason to litter is when there is no trash receptacle nearby or when what is thrown out is biodegradable."<sup>52</sup> This indicates that many people do not view holding onto their trash until a trash can is reached as a viable option, and biodegradable material is not seen as



trash. The study says that 72% of Georgia residents believe that litterers will not be caught or punished for doing so by law enforcement.<sup>53</sup> It also says that 80% of Georgia residents support having the names of those who get caught and fined for littering posted in the newspaper. 77% believed that this would be at least somewhat effective in helping reduce litter in Georgia as well.<sup>54</sup> According to the study: "Georgia residents consider four agencies/entities to be most responsible for educating the public about litter issues and litter prevention in Georgia: schools (28%), state government (non-specific) (25%), local government (22%), and parents/family (21%)."<sup>55</sup> This indicates that people expect their government and government run agencies to be the most responsible for educating the public about litter. A survey was also created for KAB and the Georgia Department of Community Affairs in 2006. It notices that improperly covered trucks can be a major source for trash along roadsides.<sup>56</sup> It describes how litter can cost even more than clean-up costs in the long run by discouraging tourism, which damages the economy of the region.<sup>57</sup>

A brewery in Delray Beach, Florida called Saltwater Brewery has developed a biodegradable six pack holder with rings which can be eaten by marine life.<sup>58</sup> That is because they are made from wheat and barley. There is a possibility that if major manufacturers started using these rings then the price to produce them would drop considerably.<sup>59</sup>

The Department of Environment, Climate Change, and Water (DECCW) in New South Wales (NSW), Australia released a litter report for 2010 as part of a requirement for the state by the Protection of the Environment Operations Act. This was put into effect in 1997 and requires the DECCW to perform a littering report about significant areas once every two years.<sup>60</sup> It describes how the most littered items were cigarettes, although the largest amount by volume was plastics. The next largest by volume was paper products. The most littered areas in NSW were "industrial areas, car parks and along highways".<sup>61</sup> The report also describes how seasonal fluctuation of trash levels is common.<sup>62</sup> Metals were the third largest material littered by volume and glass was the fourth.<sup>63</sup> It also describes the areas with the highest to lowest amount of litter after the previously mentioned ones: beaches, residential sites, shopping centers, then recreational parks.<sup>64</sup>

NSW also released a review of litter research done by the Institute for Rural Futures, University of New England NSW in 2007. In the review it claims that the main causes of littering are: laziness, a perception that litter is not an important environmental concern, a feeling that someone else is paid to clean it up (especially in places like stadiums or theatres), location and a desire to not collect trash, and the type of item that it is. It also says that there is not solid enough evidence to claim that young people are the main cause of littering. However, many people may be more likely to litter if in a group. Older people may be less likely to admit to littering than young people as well.<sup>65</sup> It describes how placing more trash cans and ashtrays at a site had a greater influence on active than passive littering. Offering rewards for people who collected litter also showed positive results even when the awards were small. Ads which showed damage to animals or the environment showed a positive effect on young people



as well.<sup>66</sup> It describes how consumers have come to expect convenience from products. Part of this philosophy of convenience leads to a desire to dispose of the product conveniently once the consumer is done with it. Littering is considered the best way of doing this, putting at least some responsibility in the hands of the manufacturers who produce these items. Positive feedback loops for litter filled areas are described. When a person sees a littered area, they think that control has been relaxed in this location, leading many to dump more items at this site.<sup>67</sup> It claims that the soap and cleaning product industry has contributed to the increase in litter in public spaces by emphasizing the dirtiness of these public spaces. They encourage people to increase the cleanliness of their homespace in order to separate themselves from this dirty image so they can sell people more of their products. The effect that this has had on public space has been to increase the public's perception of them as dirty places, thus lowering the cleanliness standards that they held towards these areas. This is somewhat of a positive feedback loop. The dirtier people think that they are, the dirtier they become.<sup>68</sup> It describes how Norway has created a graded system of taxation for drink containers. The more the containers are recollected after use, the lower the tax is on these containers.<sup>69</sup> This makes sense since money is being made back through recycling them. This also gives an incentive to its citizens to recycle more. A project in New Zealand to clean a park saw a lot of success in part because both the adults and children were educated. This contributed because the parents were seen as role models to the kids so they had an influence through their own education even if they were not directly responsible for the littering.<sup>70</sup> It describes how children learn their disposal habits on the playground. It stresses the importance of litter education in primary and secondary schools.<sup>71</sup> It says that litter monitoring is a key practice to discovering ways to solve the problems associated with it.<sup>72</sup> At least it would help to identify the materials which contribute most to litter in order to get companies to not produce these as much if possible.

The EPA of New South Wales in Australia released a litter prevention project kit which claims that research shows that people do not want to be recognized as a litterer, and they usually do it alone. People who littered usually believed it was somebody else's responsibility to clean it up.<sup>73</sup>

A study was conducted where the teachers rewarded the students with occasional movies in exchange for keeping a clean schoolyard. This program was incredibly successful, and even when trash was introduced which the students didn't create, they still cleaned it up.<sup>74</sup> Another study found that messages making explicit demands for people not to litter actually made them want to litter more.<sup>75</sup> Another article on the subject suggests that not only are litterers not negatively reinforced properly to prevent them from gaining habits for littering, but people that don't litter are also not positively reinforced properly. This gives little incentive to do the right thing which plays a role in the littering problem that we have.<sup>76</sup>

The *Environmental Literacy Grant competition* is awarded to K-12 schools by the National Oceanic and Atmospheric Administration for environmental programs that fit its goals. Under the Advancing the Field section it says: "Projects and partners receiving support from NOAA are evaluated on their use of activity-specific, evidence-



based practices."<sup>77</sup> The U.S. EPA has awarded a total of \$244,428 in environmental education grants for three different organizations in Northern California. These are the Plumas Audubon Society in Quincy, CA, Education Outside in San Francisco, CA, and the Napa County Resource Conservation District in Napa, CA. An article says: "The grant funds will be used to educate students on the effects of climate change on wildlife, help elementary students understand the science behind their local watersheds, and to engage high-school students in stewardship, conservation, and natural resource management issues in their local community."<sup>78</sup>

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## THE DISCONNECT

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One of the most striking things to the class was that most anti littering campaigns have not focused on prevention. The contradictions that we mentioned above make dealing with litter at the source difficult. This has resulted in the emphasis on clean up that is apparent in the campaigns above. More than that it has resulted in a question of who is responsible for litter control. Since it is against the law then it is obviously the purview of law enforcement, but due to the lack of perceived severity as well as difficulty of enforcement that assignment is inadequate. What most people do not realize is that the result has been to assign the responsibility for littering to the groups in charge of protecting one of the locations that litter could harm, the water. While this made sense to the students it was obvious that they had to change their approach to litter to think about it in these terms. We found that for most people there was a significant disconnect between how they usually thought about litter and its protection by the Water Board.

The city of Hayward's Clean Water Program makes sure that the city complies with the requirements of the discharge permit given by the EPA to comply with the Clean Water Act of 1972.<sup>79</sup> The City of Hayward's *Measure C Graffiti & Illegal Dumping Strike Team* cleans up trash when illegal dumping occurs.<sup>80</sup> The page where you can fill out the form describing the illegal dumping that was witnessed for the Strike Team to clean up is called an Access Hayward Request. This site takes a lot of clicks to get to on the city website, and if I did not stumble across it searching the site I probably would have never known that this request was an option. There is a topic category of "Trash and Debris-Private Property" under the highlighted section "Community Appearance-Neighborhoods-City Codes". "Streets, Sidewalks and Lights" is a different highlighted section under the topic categories. This one contains the option "Trash and Debris-Public Property". I am guessing that these are the topics that must be selected for a formal complaint to be placed about trash on the streets or on somebody's property. However, I couldn't find any clear instructions on how to file a complaint other than to just fill out the form. This whole process is confusing and likely leads to people not wanting to put all of the effort into filing the request in the first place. If this process was



easier and better known among the public, the city would likely have a much easier time locating where the major trash areas are in Hayward.<sup>81</sup>

In a report describing a plan to reduce its trash problems, the city of Hayward describes the requirement that the Municipal Regional Stormwater Permit (MRP) has placed on the city of Hayward to reduce the amount of trash which enters its Municipal Separate Storm Sewer Systems (MS4s) by 40% by July 1, 2014.<sup>82</sup> It describes the outreach programs that were being planned to be implemented. These include handing out information at several street fairs, participation and funding of the regional Bay Area Stormwater Management Agencies Association Youth Outreach Campaign aimed at 16-24 year olds, The Countywide Program which conducts stormwater pollution prevention and anti-littering outreach to school-age children through contracts with five environmental education organizations through the Clean Water Program, media relations plans and projects for both of these agencies, and community outreach events which include a "litter outreach" kit that is given away. The city of Hayward received a total litter reduction credit of 8% for these four outreach methods.<sup>83</sup> The city's efforts to prevent trash from entering the bay are focused on enforcing littering laws, public outreach/education, street sweeping, installing trash capture devices inside MS4s, creek/channel/shoreline cleanup, banning single-use plastic bags and polystyrene foam food containers from being used by businesses, and improving management of trash bins/containers.<sup>84</sup> What is interesting is that trash cleanup efforts before trash enters the waterways are limited to street sweeping and creek/channel/shoreline cleanup. This is a result of the Water Board measuring litter for the city of Hayward in terms of how much of it ends up in the bay. The problem with this is that not all litter that is in the city enters the MS4s, and technically the city could be meeting the requirements placed on it by the MRP and still have many areas filled with litter. This requirement does help reduce the amount of trash which ends up in San Francisco Bay, however trash which doesn't enter the MS4s is a problem in Hayward as well. Since the Water Board seems to be the main agency which is in charge of ensuring that litter is being regulated/monitored in Hayward, it would be helpful in keeping the city clean if there was some sort of credit given to the city for reducing its overall litter problem instead of just what enters the MS4s. In an updated 2014 version of the previous report, it describes the different outreach programs that the city of Hayward participates in to reduce the trash load and comply with the MRP. These include distributing anti-littering materials at community events, organizing trash pick-up events, a quarterly newsletter distributed to businesses and residents, working with k-12 schools to educate students about the harms of littering and encourage students to stop littering at school and outside, the *Be the Street* youth anti-littering campaign which includes ads played online and in movie theatres, working with the Alameda County Clean Water Program (ACCWP) to study effective outreach methods at experimental sites in Livermore and possibly more areas, the Public Information and Participation (PIP) program which aims to influence both intentional and unintentional littering through public service announcements, online and movie theater advertising, and participating in outreach events, and the city's trash container management program (which includes putting



outreach materials on trash containers with the goal of encouraging residents to use them and improve water quality).<sup>85</sup>

The California EPA website for the San Francisco Bay Regional Water Quality Control Board discusses the Municipal Regional Stormwater Permit (MRP). This appears to be phase 1 of the National Pollutant Discharge Elimination System (NPDES), which aims to regulate stormwater discharge for urban areas with populations of over 100,00 people. Phase 2 of this program issues a General Permit for Discharge of Storm Water from small MS4s (municipal separate storm sewer systems) for all small MS4s in urbanized areas not covered by Phase 1. What is worth noting here is that the city and county of San Francisco are listed under the municipalities covered under the general permit instead of the MRP, even though its population is well over 100,000 and it is not just the most densely populated city in the Bay Area, but one of the most in the country. The counties which contain the other major population centers of the Bay Area including San Jose are all covered under the MRP.<sup>86</sup>

The CA Regional Water Quality Control Board released a report in 2007, which describes its *Surface Water Ambient Monitoring Program* (SWAMP). This program assesses trash levels in streams around the Bay Area to discover where the high trash areas are.<sup>87</sup> This program is part of an effort for the Water Board to find which water bodies should be included in Section 303(d) of the Clean Water Act as impaired by trash.<sup>88</sup> This means that the water bodies aren't meeting water quality standards. SWAMP scores these water bodies while taking into account both qualitative and quantitative levels of trash, and the impact that this causes to both humans and wildlife. The document describes the two main reasons for trash in streams in the S.F. Bay region as direct littering/dumping and downstream transport and accumulation.<sup>89</sup>

The Bay Area Stormwater Management Agencies Association (BASMAA) released a report on San Francisco Bay Area stormwater trash generation rates in June 2014. It says that the MRS permit for the S.F. Bay Area requires municipalities to reduce their stormwater discharge to the point of "no adverse impacts" to the water bodies by 2022.<sup>90</sup> The report describes how there was not a significant correlation between the size of the drainage area and the amount of trash found in inlet areas in the study. However, it says that this was due to other contributing factors, and that drainage area has a significant influence on the amount of trash which enters inlets nonetheless.<sup>91</sup>

Caltrans released a trash load reduction plan report for the San Francisco Bay Region in 2016. It describes public outreach programs that Caltrans has implemented to encourage Californians to litter less. The *Don't Trash California* and *Protect Every Drop* campaigns focused on educating the public about the problem of trash entering the storm drain systems.<sup>92</sup> What is interesting about this is that Caltrans seems to be mainly focused on the issue of the storm drains and not of trash in general. This might send a message to the public that littering is OK as long as it does not enter the storm drain systems. A campaign that lists other problems associated with litter as well might be more effective in reducing it.




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## THE VALUE OF OUTREACH

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While the students were impressed with the possibility of clean up and infrastructure they did not wish to ignore the possible benefits from outreach. We made a point of looking for indicators of the value of these programs.

The CA Department of Education describes the need for environmental education, the lack of funding available and the potential for higher standards for CA public schools in a report for a plan for environmental education that they developed in 2015.<sup>93</sup> It says that: "State-level funds generally come from two sources, the Environmental License Plate (ELP) and the Office of Education and the Environment (OEE). ELP funds have traditionally been the CDE's primary source of funding for state environmental education programs like the CREEC Network. The CDE receives about \$400,000 per year from the ELP, and this limited funding means that regional CREEC coordinators only serve a few hours each week, greatly limiting their capacity. The OEE provides funding for the EEI and implementing the EEI curriculum. The OEE receives approximately \$2 million a year for the EEI from environmental SPECIAL funds..."<sup>94</sup> The CREEC stands for the CA Regional Environmental Education Community. It is unlikely that for the nation's most populated state, this small amount of money is enough to teach children effectively about environmental issues. Outreach programs are possibly one way that this lack of funding for education can be remedied to an extent. It is likely that they will not be as effective as a well-funded education system on environmental problems such as littering, but may be the next best thing. Outreach programs also have the benefit of potentially reaching a wider audience than just school-age children.

A study on how to reduce litter performed from a behavioral science perspective in 2013, talks about the problem of habituation. This means that people become unaffected by certain stimuli over time after repeated exposure. This could pose a problem to litter reduction because signs and bins which are designed to grab peoples' attention and encourage them not to litter may be overlooked after repeated exposure. A possible solution is to have multiple different signs and colored or designed bins so people don't get exposed to the same ones too much.<sup>95</sup> It also describes positive reinforcement methods that have had success in reducing litter. One was a zoo that traded vouchers for trash collected by its patrons. Another is in Germany where a small redemption value is given to people who return their beverage containers to grocery stores. Chances to win prizes have also been given to people in exchange for trash collecting scavenger hunts in places like Singapore. Although negative reinforcement has seen some success, it seems to be more successful when coupled with positive reinforcement as well. The report makes the claim that all behavior that exists is a result of it being reinforced. Research shows that people are more effective at changing others' behavior through engagement than a leaflet or pamphlet tends to be. It also says that



law enforcement and fines are not likely to be effective unless there is a real threat to the perpetrator of being caught.<sup>96</sup> It describes how young people are more likely to not litter if education programs about the subject are fun.<sup>97</sup> The report says that people are more likely not to litter if there is a bin nearby, so putting more bins on the streets means less trash. It also talks about the Broken Windows Theory which suggests that if an area already has trash, people are more likely to litter there than if it doesn't.<sup>98</sup> Setting achievable goals and celebrating when they are achieved ensures reinforcement, while using a combination of this and a variety of other interventions is the most behaviorally sound way to achieve lasting change.<sup>99</sup> The report claims that railway stations had the highest amount of litter.<sup>100</sup> It talks about how when strangely shaped bins were placed in public spaces, people flocked to use them when compared with normal looking bins.<sup>101</sup> This indicates that fun designs decrease littering when it comes to trash and recycle bins.

The Mariscopa Association of Governments (MAG) released the *Don't Trash Arizona* litter prevention and education program in 2006. They conducted secondary research on litter campaigns throughout the world, and also several surveys/investigations to learn about the attitudes of the residents of Arizona, and how attitudes have changed over the years. The initial investigation found: "The secondary research found that litterers were predominately single males, aged 18 to 24—with a secondary tier of litterers aged 25 to 34. They tend to be smokers, eat/buy fast food two times per week or more, frequent bars and nightclubs, and drive pickup trucks. According to the Transportation Research Board, 55 percent of littering is deliberate, while 45 percent occurs "accidentally" when items blow or fall off vehicles. Littering most often takes place when drivers are alone, and many reported that they did not consider small items like cigarettes and candy wrappers to be litter."<sup>102</sup> It describes the percentage of the population interviewed as 46% accidental litterers in 2015.<sup>103</sup> This suggests that almost half of all people that litter may not have the intention to litter. Educating them through an outreach program may help to get people to be more careful since these accidental litterers still may care about the environment.

*Hubbub* is a non-profit organization which used to be called *Neat Streets*. They have done many different ad campaigns and partnered with the city of Westminster in 2015 which helped reduce chewing gum litter by 54% by June and 26% in July.<sup>104</sup> This is the same organization which created and distributes the Ballot Bin that was previously mentioned.

In the *Alameda County Clean Water Program* litter reduction manual, a study is mentioned which claims that in Livermore, CA, 3 multi-family dwellings (MFDs) were observed. One was a control group and nothing was done to the environment around the complex. Another had the area around it cleaned to see if people would litter less if they thought others were doing so too. The last one was exposed to outreach programs of various sorts. The MFD with the outreach programs saw the biggest decrease in litter by both volume and pieces counted individually. The one which was normally litter-free saw a small increase in litter count, but a large decrease in trash by volume, and although the control site had a small decrease in litter count, it had a significant rise in



trash by volume. The site with the outreach program had the greatest reduction of overall trash by a significant amount.<sup>105</sup>

The Texas Department of Transportation (TxDOT) conducted a follow-up litter prevention study for the *Don't Mess With Texas* litter campaign in 2009, which indicates that kids which grew up exposed to the campaign are less likely to litter than kids who weren't.<sup>106</sup> This is evidence that ad campaigns can have an impact on kids' habits towards littering. A campaign plan from Washington state, claims that during the first 6 years of the Don't Mess with Texas campaign, visible litter on the streets of Texas was reduced by 72% and that this campaign was so successful in part because of the strict fines, the targeting of young males as an audience, and "Texas incorporated litter prevention information in driver's education and license renewal information".<sup>107</sup> It describes the average taxpayer cost "over the years" in 2001 as 7 cents per resident in media buys per year for the entire state.<sup>108</sup> It has been speculated that the Don't Mess With Texas ad campaign was so successful because the people who were probably littering were "macho" guys. One of the ads featured in the campaign which includes two famous football players. One suggests that he wants to beat up litterers.<sup>109</sup> These ads appeal to the people who were littering and it seems like they effectively got them to do so less. A study done by a behavioral science organization on littering notes the Don't Mess with Texas campaign as creating a 72% reduction in litter from 1986 to 1990. Reasons for their success are noted as: "leverages the pride that Texans have for their state and includes reinforcers such as an "adopt-a highway" scheme, various social events to clean up litter and phone apps to make it easier (less punishing) to report littering".<sup>110</sup> The fact that this campaign leveraged the pride of the people of Texas seems to have contributed to its success. It seems that the more pride people have for the place where they live, the less likely they are to litter there.

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## CONCLUSION

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While there is a great deal of information to be had, one thing is striking; dealing with littering required a lot of transitions from small scale to large and back again. It is strange for a group to deal with a behavior that seems so small but has the potential for an impact when widespread. No individual behavior is problematic on its own, but as multiple people start to act or if people develop bad habits, then problems are inevitable. In this way, littering might be a demonstration for sustainability as a whole and the challenges it might face.

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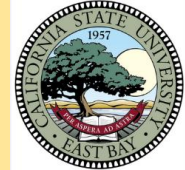
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# Attitudes Toward Organic Waste Disposal and Composting

Fall 2016

Department of Philosophy

**PIONEERS FOR SUSTAINABLE COMMUNITIES REPORT**



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## About Pioneers for Sustainable Communities

Pioneers for Sustainable Communities (P4SC) is a year-long partnership between Cal State East Bay and a community partner that represents local or regional government. P4SC is one of a network of campuses nationwide—the EPIC-N Network—that have adopted a model of using course-based, faculty-lead, student research to support the sustainability goals of local communities. P4SC focuses on sustainability, social justice, and quality of life in the San Francisco East Bay region. It leverages the expertise of faculty and the enthusiasm, time, and innovative ideas of students, providing thousands of hours of research to support local partner sustainability programs including: data acquisition and analysis, stakeholder surveys, geo-spatial mapping and referencing used to establish socio-environmental baselines, track progress, and facilitate planning and communications.

- **P4SC Reports** present the final results of one or more full-time equivalent courses devoted to a single P4SC project.
- **P4SC Mini-Reports** present the results of partial courses devoted to a PSC project, typically used for projects in progress.

## About Cal State East Bay

Cal State East Bay's beautiful main campus is located in the Hayward hills with panoramic views of the San Francisco Bay shoreline. Situated above the city of Hayward, the campus offers an ideal setting for teaching and learning and yet easy access to the many cities along the bay. The University has a satellite campus in Concord, a professional development center in Oakland, and a significant presence online. Founded in 1957, Cal State East Bay is one of 23 universities of the California State University system (CSU). With an enrollment of over 15,800 students, Cal State East Bay is recognized as a regionally engaged and globally oriented university with a strong commitment to academic innovation, student success, engaged service learning, diversity, and sustainability.

## P4SC Directors and Staff

Karina Garbesi, P4SC Co-Director, Professor and Director of the Environmental Studies Program, Department of Anthropology, Geography, and Environmental Studies, Cal State East Bay

Craig Derksen, P4SC Co-Director, Assistant Professor of Philosophy, Department of Philosophy, Cal State East Bay

Audrey Wade, P4SC Program Coordinator, Cal State East Bay

*With support from Jillian Buckholz, Director of the Office of Sustainability*



## About the City of Hayward

The City of Hayward was incorporated in 1876. With a population of 150,000, Hayward is the sixth largest city in the Bay Area and proudly the second most diverse City in California. A Charter City, Hayward operates under the Council-Manager form of government with a directly elected Mayor and six member City Council. Hayward is a full service City comprised of thirteen departments providing services ranging from public safety and public works to library and community services. The City strives to be a safe, clean, green, and thriving community for all of its residents. To learn more about the City of Hayward, visit [www.Hayward-ca.gov](http://www.Hayward-ca.gov).



# Attitudes Toward Organic Waste Disposal and Composting

## REPORT AUTHOR(S)

Jacqueline Paine

Craig Derksen

## COURSE PARTICIPANTS

### **P4SC Instructor**

Craig Derksen Ph.D.

Assistant Professor of Philosophy

**P4SC Student Participants** PHIL3151 Environmental Ethics (Fall 1016) including:

Shavar Belgrave

Chloe Blancas

Seth Blatt

Martha Bravo-Rios

Julio Campos

Nestor Castro

Nathanael Detlefsen

Antoinette Franklin

Bradley Heusdens

Andrew Marten

Andres Navarro

Jaqueline Paine

Wesley Passman

Kane Shotz

Shanee Sims

Shruti Sivasubramanian

With assistance from the students of CSUEB HUM2010 Introduction to Liberal Studies (Fall 2016)




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# Pioneers for Sustainable Communities: Attitudes Toward Organic Waste Disposal and Composting

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# OBJECTIVES

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The City of Hayward has identified composting as a route toward greater sustainability. They are partnering with California State University, East Bay to help meet these ends. To establish solid foundations for this strategy we are starting with a course in environmental ethics. The course will target ideas and behaviors as they relate to composting, first at the ideological and global level and gradually getting less abstract and more specific down to the food waste bins in Hayward.

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# METHODS

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The students for this class were asked to research and reflect at the same time. Rather than just report on others' work or deploy a pre-defined methodology, students were asked to refine their own process as they worked and produce information that they perceived as valuable based on the understanding that they gleaned from the process. The students were not completely free however, they were trained in methods to find, filter, organize, categorize, and present with an emphasis on being useful and valuable. They were also tasked with identifying and exploring the theoretical basis of claims. With these methods the students were set loose on the world to discover and explore as many sources as they could. This was supplemented by visits from experts as well as a survey of organic waste bins in the City of Hayward, the results of which were submitted



to the city. This report is a refinement of the results that this process produced, often in the various students' voices.

## COMMENTARY ON THE CITY OF HAYWARD WEBSITE

### CONTENT AND IMPRESSIONS

The overall page is very attractive, the subcategories are clear and understandable, and it is easy to navigate and find the information about composting when looking for it, but there are some issues that the students found. The comprehensive list from Waste Management about what to sort into the organic waste curbside bin is available:

[http://www.wm.com/location/california/bay\\_area/hayward/index.jsp](http://www.wm.com/location/california/bay_area/hayward/index.jsp)

but the link for the Alameda County Recycling Rules:

<http://www.recyclingrulesac.org/city/city-of-hayward/>

is displayed, but it does not work. This might be impeding education of residents because the information is not reliably accessible. The website does not have legislation information available, though waste management does here:

[http://www.wm.com/location/california/bay\\_area/hayward/index.jsp](http://www.wm.com/location/california/bay_area/hayward/index.jsp)

Stating the information on what should be sorted into residents' organic waste curbside bins, explicitly, on the website instead of having links to the information might make it more accessible without having the link problems.

The graphics on "Green Your Life" and "Green Your Business" are the same, even though they discuss different ways to be green; this repetition in graphics may make residents feel that the information available on the website is repetitive, and make them feel like they don't need to keep reading to find out more, new information, when the two sections do have fairly different information to offer.

According to the survey conducted by StopWaste, in 2005, throughout Alameda County, some residents may (still) feel they are doing their part for sustainability and caring for our environment. The city states the awards that it has received on the website, and this, alone, may be solidifying residents' rationale for not composting their organic waste. Stating the immense efforts the city went through to qualify for receiving those awards may help residents build a more accurate perspective, and adding a small section on what residents can do to continue the City's hard work may also be effective in addressing this attitude.

The "environment" link is specific to Hayward and does not give reasons as to why residents, or anyone else for that matter, should be composting. There is no encouragement for small families or businesses to compost, from the information



available of the site. There is no section outlining reasons why residents, who aren't required by law, should be composting or sorting their organic waste at all. The City of Hayward and StopWaste both fail to give ethical or financial incentives for composting; Waste Management does, somewhat, but residents may not think to look there.

Much of the information available on the City website is available anywhere and everywhere else with the help of a search engine. This is especially problematic because the majority of the information available online is geared towards home composting, and people are less likely to compost at home rather than simply sorting their organic waste into their organic waste curbside bins, because composting at home is more work. By not offering, outright, that our residents can do their part simply by sorting their waste into their correct curbside bins, and the rest will be taken care of for them, the chances of residents actually doing so diminishes. This method may just not be something the resident has thought of on their own.

The “4-R’s,” “Reduce, Reuse, Recycle, Rot” makes the “Rot” part (composting) easier to remember because we all already know the first three “R’s.” This is catchy and can help serve as a prompt, or get people to think about composting, generally. The only issue with this slogan is that the term ‘rot’ may help contribute to the “ick” factor for why people say they don’t compost. This may turn some residents off of composting, or help solidify their reasoning in not doing it; but it is doubtful that this is a majority, or that it is an important determining factor in residents’ rationale or attitudes.

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## ORGANIC WASTE DISPOSAL

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### AN INTRODUCTION TO ORGANIC WASTE

One of the research methods for this class was to catalog the students’ knowledge of, and attitudes toward, organic waste disposal. In doing so, a baseline was developed for modelling the average resident while giving us an opportunity to better track what the students learned. Initially students’ knowledge was scattered at best. Everyone had a vague sense that disposing of organic waste correctly was a good thing. However, for many, that positive evaluation was merely an implication of accepting that there was a way to dispose of organic waste ‘correctly’.

Beyond that, the students’ knowledge of organic waste disposal was haphazard and undeveloped. Students had heard some terms (‘anaerobic digestion’, ‘methane’) and made some associations (climate change) but were often unsure of the implications beyond ‘it’s bad’. Occasionally, a student would have very specific knowledge of one narrow piece of the waste process. This was where the students first realized that a lack of standardization might be a problem for educating people about organic waste. With this in mind the students were sent out to learn all that they could. They were tasked to identify and summarize sources as well as look for patterns in those sources. Some key sources are highlighted below.



The US Composting Council offers a factsheet (PDF) online that outlines many benefits of composting, including improving nutrient and biota content, while reducing the rate of plant disease in plants that have finished compost added to their soil. The factsheet also discusses physical and chemical benefits, such as improved structure and moisture management, and improved capabilities for pH balance and management, binding of contaminants such as heavy metals, degradation of compounds such as microbes and their toxic byproducts, wetland restoration, and erosion and weed control.

Link: <http://compostingcouncil.org/wp/wp-content/uploads/2015/06/compost-and-its-benefitsupdated2015.pdf>

The Santa Barbara County Resource Recovery & Waste Management Division describes composting as, “Nature’s way of recycling.” Their webpage offers that some benefits of composting are to reduce waste in the landfill, and that the product of composting is great for yards and gardens. They state that composting at home can save you money, because you can make healthy soil at home, and gives elementary instruction on how to compost at home. They do not mention their organic waste curbside bin as a good place to put their organic waste if they are not interested in composting at home.

Link: <http://www.lessismore.org/materials/72-benefits-of-composting>

MyGreenLid.com is a site that offers “4 Key Benefits to Home Composting,” and lists them as: “improving your garden,” “containing landfills and reducing pollution,” “educational opportunities,” and “saving money.” This website also sells products to help make composting at home easier, and more contained. Their focus is composting at home.

Link: <http://www.mygreenlid.com/single-post/2015/06/22/4-Key-Benefits-to-Home-Composting>

Much of the information on the benefits of composting the students found were on home composting, and focused more on how composting at home can help your garden and save money. It seemed to offer waste reduction at the landfill as a cheap secondary, and most didn’t offer the reasons as to why organic waste reduction in landfills is important; Now that the students had a better idea of what organic waste is, why it is important to keep it out of our landfills and the benefits of composting, the students wanted to know what they could do to keep it out of landfills. In class, the students found a few articles that helped them to figure out and understand the available options for proper disposal.

The EcoCycle organization is “building zero waste communities,” so their focus is more on composting for sustainability on the individual to community level, which includes more home composting, but their website offers a lot of good information about composting, such as guidelines and tips, “how to know if your product is compostable,” resources available in Colorado, and “combating fruit flies.” This website does offer guidelines for curbside pickup of compostable materials as well, with an available info-graphic.



Link: <http://www.ecocycle.org/recycle-compost-reuse/compost>

Recyclebank is a home and garden journal that discussed that the particles from garbage disposal of organic waste are treated as any other solid waste at your local water treatment facility.

Link: <https://livegreen.recyclebank.com/because-you-asked-what-happens-to-garbage-disposal-waste>

EcoMyths is an educational site that focuses on ecologically relevant information. They provide an article that discusses how using the garbage disposal in the sink is only slightly more ecological than sending it to a landfill, but that it is still a better option, but we should really try to compost, and above all else, reduce the amount of waste that we create in the first place.

Link: <https://ecomylths.org/2014/08/25/sink-disposals-vs-trashcans/>

*Expired* is a documentary about how one of the biggest contributors of food waste is due to confusion about expiration dates, and how sell by dates are often confused for expiration dates. The website for the film reports that 90% of consumers throw away their food when they see the date label thinking that it's the expiration date. This number seems a little high and may be inflated, but it is a good point to make as it pertains to our abundance of food waste. It would be interesting to know how many grocers also throw away their food waste without trying to make use of it first, by donating the usable, but unsellable products to shelters, or donating to other food distribution programs.

Link: <http://notreallyexpired.com/the-problem/>

With all of the research that the students did, it seemed evident that much of the available information is to help people start and maintain their compost piles at home, but very few offer using their organic waste curbside bin as an alternative to composting at home. It is unclear if this is because infrastructure for proper organic waste disposal is available everywhere, although it is not offered for free with landfill service in some places across the country. Some students in class, and presumably many residents, were/are not aware that it is recommended to put other compostable items such as food waste and food soiled paper products in with their yard waste into their organic waste.

## CURBSIDE PICKUP OF ORGANIC WASTE

The focus of the course was on curbside pickup of organic waste. Definitions of different receptacles are important to standardize the way we talk about the technology we are using. It was found that, in discussion, the term 'bin' was being used interchangeably to mean any of the four receptacles that were being discussed. Standardizing the language being used allowed for more effective communication. This is what was decided upon:

Countertop Bin: initial receptacle used for organic waste only; found in kitchen (on counter). Generally 1-2 gallon capacity.



Bin: initial receptacle; found in kitchen, dining hall, etc. Generally 8-12 gallon capacity.

Curbside bin: secondary receptacle for home use. Generally 30-80 gallon capacity.

Dumpster: secondary receptacle for disposal for more than a single family; found in schools, restaurants, and apartment complexes. Generally 350-7000 gallon capacity; measured in cubic yards.

Links: <http://www.losaltosgarbage.com/index.php/for-businesses/city-of-cupertino-commercial-compost-recycling-garbage#containers>

<https://www.wm.com/store/dumpster-rental/small-business-landing.jsp>

Livermore Sanitation offers countertop bins for food scraps to be collected. This is a smart practice because it provides easy and clean transport from the source to the organic waste curbside bin. Offering a countertop bin to residents may help motivate their efforts in sorting out their organic waste. Their website is fairly comprehensive and simple to navigate. It is easy to find what should be going into the organic waste curbside bin, according to their waste management service. Link: <http://livermoresanitation.com>

It is understood that organic waste curbside bins are offered for free (with Waste Management services), but the pricing on the website was not very easy to find and is not explicit in saying that it is free with landfill services. There were reports from students of multi-family dwellings not having a dumpster for organic waste. There were also reports from students explaining that multi-family dwellings that residents were not sorting their garbage correctly – using the landfill dumpster much more than necessary. Part of the problem of multi-family dwellings and the lack of proper sorting (especially due to lack of the option) could be due to the fact that organic waste dumpsters along with recycling dumpsters are not free with landfill service. Waste Management charges multi-family dwellings for both recycling and organic waste pick up, so some complexes may not offer recycling or organic waste disposal, or both. If issues of pests from organic waste dumpsters for multi-family dwellings arise, they may be solvable by increasing the rate of pickup per week. These issues are also applicable to businesses.

Waste Management rates for multi-family dwelling services link:

<http://www.cvsan.org/content/residential-services-multi-family-monthly-rates>

Waste Management rates for commercial services link:

<http://www.cvsan.org/content/commercial-services-rates>

In January of 2016, Costa Mesa, California, launched a program, which includes new organic waste curbside bins for its residents that are taking its organic wastes to a \$25 million facility. According to OC Register, within the first 6 months of this program's initiation, 7 million lbs of food waste and clippings have been saved from



going to landfills. Although this program seems to be based off of making organic waste curbside bins available to single-family homes, which Hayward has done, there are real statistics than may help gauge how much money the city might save by adding organic waste pickup for multi-family dwellings, and also the effectiveness of stating explicitly that food scraps, food-soiled paper products, and other compostables outside of yard waste should be added to organic waste curbside bins.

Link: <http://www.ocregister.com/articles/recycling-700324-food-mesa.html>

## HOME COMPOSTING

Home composting, though not a primary focus, is important to touch on, as the goal is to reduce organic waste that would, without intervention, reach our landfills. More than that, the amount of information available on home composting is so much greater than the amount available on curbside pick up, that it actually hindered efforts made to find information on curbside pick up.

People with gardens at home are the primary target for home composting, as they could use the final product of composting. Making available a very simple, how-to breakdown for home composting - what should and should not be composted at home, and why you should consider composting at home – may be able to motivate people with use for their finished compost, to begin composting at home.

There are different strategies for composting at home. The first of those is a process called aerobic digestion, where compost is made in the presence of fresh air (or oxygen). The second is ‘vermicomposting’, where certain species of earthworm are introduced to enhance the process of organic waste conversion, producing a better end product. The third is called ‘in-vessel’ composting, where large amounts of wastes are composted in the smallest amount of space possible to promote anaerobic digestion.

Links: <http://www.bioenergyconsult.com/composting-strategies/>  
<https://www.epa.gov/sustainable-management-food/types-composting-and-understanding-process>

SARE is an organization that stands for Sustainable Agriculture Research and Education. This website is best explained by its organization’s name. It focuses on sustainable agriculture – healthy soil - much of the information here can be useful for home composting. This organization offers some grant opportunity that will be explained in further detail later.

Link: <http://www.sare.org>

The website also displays a few books available for purchase, or for free; almost all are downloadable.

Link: <http://www.sare.org/Learning-Center/Books>



One book available for free on their website offers detailed information about composting including the advantages, nutrient cycles and flows, managing for high quality soil, crop rotation, and making use of compost.

Link: <http://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition/Text-Version>

The EPA has a simple breakdown of “Composting Basics”, “Benefits of Composting”, and “How to Compost at Home.” The “Composting Basics” section makes available information on “What To Compost” and “What Not To Compost And Why.”

Link: <https://www.epa.gov/recycle/composting-home>

When researching in class, the students found that some people are confused about if pet and human waste can be composted. They found that pet waste is compostable, and that composting this waste is a more environmentally friendly way of disposing of it, but that the compost that is made with, and/or has been in contact with the pet waste should not be used with any food-producing plants, because it can cause the spread of disease. This compost can be used for aesthetic plants, such as a lawn and landscaping.

Link: <http://www.plantea.com/dog-waste-compost.htm>

Here is a website that offers a specific device marketed to compost pet waste separately.

Link: <http://www.compostinstructions.com/poop-or-no-poop/>

There are ways to compost human waste, as well, but they are less convenient, as one can imagine. Here is a link to a composting toilet that can be purchased on Amazon.com. Link: [https://www.amazon.com/Natures-Head-Contained-Composting-Quarters/dp/B009Z7EKIC/ref=as\\_li\\_ss\\_tl?ie=UTF8&qid=1438096811&sr=8-1&keywords=composting+toilet&pebp=1438096843105&perid=0QoN4HJK1NoC6GXYoGVT&linkCode=sl1&tag=cleanairgarde-20&linkId=829d4551ad0d7f1f9c6e18685f82272c](https://www.amazon.com/Natures-Head-Contained-Composting-Quarters/dp/B009Z7EKIC/ref=as_li_ss_tl?ie=UTF8&qid=1438096811&sr=8-1&keywords=composting+toilet&pebp=1438096843105&perid=0QoN4HJK1NoC6GXYoGVT&linkCode=sl1&tag=cleanairgarde-20&linkId=829d4551ad0d7f1f9c6e18685f82272c)

Students also found some rather interesting information on human urine being introduced to home compost. The article stated that urine has many nutrients that are beneficial to compost and sites that urine has yielded more than four times the amount of tomatoes than plants that had not been exposed to urine, as seen in one study. There are some health concerns about using compost that has been introduced to human urine (or urine of any other animal, for that matter). There are some problematic chemicals found in urine such as hormones, and traces of narcotics, but as long as the levels of these are minimized, there should be no problem in using compost with urine with your food-producing plants. Urine as it is concerned with composting has sometimes been called ‘liquid gold,’ which makes it sound nicer.

Link: <http://www.care2.com/greenliving/pee-on-your-compost.html>



Two things that hinder people who could composting at home are not knowing how to compost at home and/or concerns about smell, pests, or money. To motivate people to compost at home, addressing these concerns in ways that are simple, yet helpful and informative could prove to be beneficial. Here is that information and one of the many ways that it can be organized:

**Concern:** Composting is complicated.

**Response:** Composting may have its intricacies, but it doesn't have to be complicated if you don't want it to be. All you need to create compost at your home is a hole, turning barrel, or bin with an opening on the bottom. Adding a variety of wastes that you already make everyday, like fruit and vegetable peels, yard clippings, egg shells, sticks, coffee grounds, leaves, and paper filters, will create a nutrient-dense compost that you can add to your garden soil to make your plants happy and healthy. As for what you should and should not put in your compost, here are some links (or a list) to help you to learn what products will grant you the healthiest yield: (insert links for or list of compostable and non compostable items here). This website contains an organized list of what is compostable.

<http://www.smallfootprintfamily.com/100-things-you-can-compost>

Links:

<http://www.recycleworks.org/compost/methods.html>

[http://www.cvswwmd.org/uploads/6/1/2/6/6126179/dirt\\_on\\_composting.pdf](http://www.cvswwmd.org/uploads/6/1/2/6/6126179/dirt_on_composting.pdf)

**Concern:** Worried about bugs.

**Response:** Many bugs will help with your composting efforts; so don't be so quick to get rid of them! Fruit flies, worms, and grubs all help transform your organic waste into compost that will help your garden thrive! On top of the benefit they have on your compost, bugs may be more inclined to stay out of your house with a more accessible and open food source outside!

Links:

<http://www.recycleworks.org/compost/methods.html>

[http://www.cvswwmd.org/uploads/6/1/2/6/6126179/dirt\\_on\\_composting.pdf](http://www.cvswwmd.org/uploads/6/1/2/6/6126179/dirt_on_composting.pdf)

**Concern:** Turning compost is hard, and is very smelly.

**Response:** Turning your compost doesn't have to be difficult. With a turntable barrel, it is virtually effortless, and if you do not want to spend the time turning your compost, you can add layers of sticks periodically to make pockets of air that the good bacteria use to break down your scraps into nutritious compost. If your compost is smelly, it probably is too wet, giving it a good turn and watering it less should fix the smell.



Links:

<http://www.recycleworks.org/compost/methods.html>

[http://www.cvswmd.org/uploads/6/1/2/6/6126179/dirt\\_on\\_composting.pdf](http://www.cvswmd.org/uploads/6/1/2/6/6126179/dirt_on_composting.pdf)

**Concern:** It costs too much to compost with all the bins, starter worms, and maintenance chemicals.

**Response:** You can make nutritious compost at home with just a shovel. You do not need to purchase a bin to compost properly, though some may choose to do so. A simple pile or hole outside will do just fine. To jumpstart the digestion of your compost, you can simply add garden soil, yogurt, or even water from a washed milk carton to help start the process.

Links:

<http://www.recycleworks.org/compost/methods.html>

[http://www.cvswmd.org/uploads/6/1/2/6/6126179/dirt\\_on\\_composting.pdf](http://www.cvswmd.org/uploads/6/1/2/6/6126179/dirt_on_composting.pdf)

#### Resources:

<http://davesgarden.com/guides/articles/view/3942>

<http://gogardenguides.com/guide/what-not-to-compost/>

<http://www.cvswmd.org/did-you-know.html>

[http://www.cvswmd.org/uploads/6/1/2/6/6126179/dirt\\_on\\_composting.pdf](http://www.cvswmd.org/uploads/6/1/2/6/6126179/dirt_on_composting.pdf)

<http://www.recycleworks.org/kids/index.html>

<http://www.recycleworks.org/compost/methods.html>

<http://www.noble.org/ag/horticulture/backyard-composting/>

<https://www.epa.gov/recycle/composting-home>

<http://www.care2.com/greenliving/pee-on-your-compost.html>

<http://www.mnn.com/lifestyle/recycling/stories/30-things-you-should-never-compost-or-recycle>

<https://www.kcet.org/home-garden/the-lazy-gardeners-guide-to-composting>

<http://www.urbangardencenter.com/how-to-compost/how-to-compost.html>

<http://www.compostinstructions.com/poop-or-no-poop/>

<http://www.plantea.com/dog-waste-compost.htm>




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## ORGANIC AND OTHER WASTE

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### ORGANIC WASTE AS A PART OF WASTE

One of the comparisons that students often relied on was comparing organic waste to recycling. Since the students were relying on this comparison so much we decided to look into it.

Currently, materials from Hayward's residential recycles are sent to Union City. Commercial recycles, organic waste, and trash are sent to the Davis Street Resource Recovery Complex. The organic waste is diverted to Redwood recycling Center in Marin County or a facility near Modesto, while the trash is sent to the Altamont Landfill. All of this information can be found on the city's website. Some time was spent looking for the exact amount of waste that different sectors in Hayward make to get a better idea as to where the students should be focusing their efforts, but nothing was found.

Students, and residents alike, may feel that waste reduction has been part of environmentalist culture for a long time, as recycling has been an environmentalist value, consistently, since 1970. But it was only just recently passed into legislation, effective last year, that businesses are required to collect recyclables, and as of 2015, "all businesses and multi-family properties are required to collect food scraps and compostable paper separately from garbage." California has created legislation to continue to motivate sustainability efforts and strive for progress that requires 75% reduction of waste entering our landfill by 2020 that will require us to increase our composting efforts and master our waste sorting skills. This percentage amounts to an estimated 23 million tons of waste that needs to be recycled or composted instead of being introduced into our landfills, in just three years.

Link to "75 Percent" legislation website: <http://www.calrecycle.ca.gov/75Percent/>

As food waste makes up an estimated "10 percent by weight of the total municipal waste stream and can be a higher portion of commercial sector wastes," it is a very important piece to consider in waste reduction as it applies to mandates and environmental responsibility. According to CalRecycle, much of the effort to increase the proper disposal of organic waste has been geared towards the commercial sector, but there have been some minor efforts in the residential sector. It is a safe assumption that grocers create massive amounts of food waste, and these places specifically should receive a lot of focus on improving their waste-sorting accuracy. CalRecycle published an in depth model for local government recycling and waste reduction which has an immense amount of useful and acute information.

Link:

<http://www.calrecycle.ca.gov/Publications/Documents/LocalAsst%5C31002001.pdf>



The expansion of the well-known “reduce, reuse, recycle” to “reduce, reuse, recycle, rot” is a simple and clever way to remind people that composting their organic waste is just as important as the three other “R’s” when it comes to waste management and sustainability. This slogan shines a clear light on composting as an equal priority, and simply an integral part of our waste management.

Link to Hayward’s page on Waste Management’s website:

[http://www.wm.com/location/california/bay\\_area/hayward/index.jsp](http://www.wm.com/location/california/bay_area/hayward/index.jsp)

Resources:

<http://www.library.hayward-ca.gov/your-environment/green-your-community/garbage-and-recycling>

<http://www.calrecycle.ca.gov/75Percent/>

[http://www.wm.com/location/california/bay\\_area/hayward/index.jsp](http://www.wm.com/location/california/bay_area/hayward/index.jsp)

<http://www.calrecycle.ca.gov/Publications/Documents/LocalAsst%5C31002001.pdf>

## THE THREE STREAM SYSTEM

The three-stream system includes landfill, recycling, and organic waste and is the currently favored system. This is replacing the two stream system that has become the accepted norm. However, it was not so long ago that we lived in a one stream system. The current dispute is not the sorting, but where it should be done, before or after pick-up from the consumer.

At least some of the Hayward’s waste passes through the Davis Street Resource Recovery Complex, where it is sorted into three streams and diverted to a waste facility that is equipped to deal with that type of waste. Davis Street is responsible for diverting more than 2 million pounds of waste, processes more than 7 million pounds of waste every day, and employs more than 300 people.

Link: <http://davisstreet.wm.com/index.jsp>

Currently, as much of our community’s organic waste gets introduced to our landfills and microbes digest it through aerobic means, as it is open to the air.

Links: <http://www.hayward-ca.gov/your-environment/green-your-community/garbage-and-recycling>

<http://forsolutionsllc.com/aerobic-vs-anaerobic-digestion/>

If anaerobic digestion methods are used to break down our organic waste and create methane gasses on the community level in local waste facilities, it may be beneficial to harvest that gas to use as a green fuel source if we can. Some waste facilities have received funding to create and implement infrastructure to capture this methane byproduct.



The Altamont Landfill in Livermore is equipped to capture the methane byproducts from anaerobic digestion of organic waste. It claims to have a 93% capture rate of methane. With a grant, Hayward may be able to donate to this facility to expand to service its organic waste, if the facility is not currently able to handle the entirety of Hayward's volume in addition to the volume they currently process. If Hayward can divert any of its waste to this facility, this could help cut fuels costs and emissions from the trucks transporting the waste to Notavo and Tracy, while helping reduce greenhouse gasses that would otherwise be entering our atmosphere, and harvesting them to make an efficient, green fuel source.

Link: <http://altamontlandfill.wm.com/green-energy/index.jsp>

Houston, Texas received \$1.05 million from the Bloomberg Philanthropies Mayors Challenge to help support their fan-favorite entry of returning to a single-stream system, that they named 'One Bin', where the waste would be sorted after curbside pickup, to improve accuracy in sorting and ease for the residents. Their infrastructure needed an overhaul to do this, so they switched from Materials Recovery Facilities (MRFs) to mechanical biological treatment with advanced resource recovery (MBTARR) systems that made more accurate sorting possible, while also allowing for recycling of certain wastes, such as food soiled paper products, to be recycled into other FDA approved paper products, and collection of compressed natural gas from their organic waste, like what is in place at the Altamont Landfill in Livermore. Houston's One Bin progress report offers infographics and further details about how their MBTARR facilities operate. There is also information on the financial impacts on the city, and how their contract minimizes the financial risks taken by the city over the contract's lifetime, as well as a 'Procurement Process', and some information on 'stakeholder engagements and legislative outreach'. Link:

[http://www.houstontx.gov/onebinforall/OBFA\\_Progress\\_Report-20151231.pdf](http://www.houstontx.gov/onebinforall/OBFA_Progress_Report-20151231.pdf)

#### Resources:

<http://www.wm.com/federal/case-studies/altamont.html>

[https://www.wm.com/location/california/bay\\_area/hayward/single-family/index.jsp](https://www.wm.com/location/california/bay_area/hayward/single-family/index.jsp)

[https://www.wm.com/location/california/bay\\_area/hayward/images/large-hw-trash.jpg](https://www.wm.com/location/california/bay_area/hayward/images/large-hw-trash.jpg)

[https://www.wm.com/location/california/bay\\_area/hayward/images/large-hw-organics.jpg](https://www.wm.com/location/california/bay_area/hayward/images/large-hw-organics.jpg)

<http://www.tri-ced.org/union-city-single-family/>

<https://wefuturecycle.com/2015/07/15/waste-management-in-germany-87-recycling-rate/>

<https://www.eia.gov/tools/faqs/faq.cfm?id=73&t=11>

<http://altamontlandfill.wm.com/green-energy/index.jsp>



<http://www.hayward-ca.gov/your-environment/green-your-community/garbage-and-recycling>

## COMPARING ORGANIC WASTE WITH RECYCLING

The comparison between organic waste and recycling was an obvious one. One approach that the students came up with in class, was to see what lessons could be taken from the adoption of recycling to help understand the adoption of proper handling of organic waste.

Historically, the first time recycling was encouraged or needed was in World War Two, but the concern for diminishing resources ended with the war, and didn't return until the first celebration of Earth Day, in 1970. Environmentalists have been working to influence people to recycle, now, for nearly five decades. During that time, there have been many attempts made by private and institutionalized entities (such as government programs and subcontracted companies) to improve recycling efforts. Hayward has forty-seven years worth of data to work with on how to influence change on people's sorting habits.

Link: <http://www.citylab.com/city-makers-connections/recycling/>

Almost immediately after the call for recycling efforts was made nationally (1971), the first legislation, the Beverage Container Deposit, was passed to encourage recycling, but the first legislation producing direct fines for incorrect sorting behaviors were not introduced until 1980, which was enacted at a local level in Woodbury, New Jersey, and continues to enforce, what is now, up to a \$1,000 fine for breaking the city's trash and recycle ordinances. Woodbury claims to have a solid waste diversion rate of more than 50 percent, currently.

Link: <http://www.woodbury.nj.us/city-departments/public-works-department/trash-recycling/>

In 2002, San Francisco published a total solid waste reduction goal of 75 percent by 2010, then revised it, to 100 percent by 2020, the next year. This is the first mention of organic waste as something that poses it as an area of concern in the CityLab article, and their 2006 entry on Seattle's introduction of fining improper sorting is this article's last mention of waste in a way that addresses recycling, organic waste, and garbage as separate waste. Beginning with their 2008 entry, waste is referred to as a whole, which emphasizes the amount of waste that is produced, as a whole, as the problem. This change in reference also encourages the reader to associate the issues with organic waste disposal with the necessity of recycling that is already widely recognized and accepted.

Link: <http://www.citylab.com/city-makers-connections/recycling/>

Adding a second stream seemed a lot to ask at the time, but now, it is the expectation, so, it should not be too difficult to add a third if Hayward adopts some of the marketing and educational tactics used for recycling that generated positive and



desired changes in residents' sorting behaviors. It is important to note that different tactics to alter or initiate sorting behaviors may vary depending on the area's demographics, mainly income and genuine concern for the environment, as will be shown later.

There is more research on recycling than composting, as the recycling effort has been long ongoing as compared to composting. Because of these reasons, references to research conducted on recycling in addition to research on composting will be used in context to its application for composting.

The students agreed, in class, that the recycling effort took about ten years from a stronger, more serious, or active initiation, until it was canonized, and that because of this, the goal of making accurate organic waste sorting habits the norm in 2018 seems a bit far fetched. Thanks to the follow up studies that have been done on recycling, we can figure out what pro recycling efforts that were made were most effective to initiate and fine-tune good sorting behaviors.

An article, titled *Behavioral Determinants of Household Participation in a Home Composting Scheme*, uses research composed on recycling to gain some insight as to what they should be keeping in mind to fuel their composting efforts. They state that common demographic variables might be considered while thinking about recycling and composting behaviors; the specific demographics of importance they found were income, age, and education level. Their research suggests that older, wealthier, and more educated people are more inclined to recycle reliably. These are some of the same demographics that showed to be of interest in the 2005 StopWaste survey for Alameda County as well, though age was not a very determining factor. The reasons for these demographics to be more inclined to incorporate two (or three) streams of waste disposal could be due to a sort of cost-effectiveness. People that are not educated about the importance of composting will be less inclined to find it to be important. Those that are educated and still don't sort properly probably don't find it to be worth their effort for some reason or another. Time could be a factor for some people; they could be too busy to care about composting, or too busy to look up if something they use should be going into their organic waste curbside bin. In the end, the studies do not indicate a strong enough correlation due to demographics, as we might like to find. The study states that attitudes about things like the inconvenience and unpleasantness of composting play a major role rather than demographic variables in differentiating between people who compost and non-composters.

Link to article discussed above:

<http://journals.sagepub.com/doi/pdf/10.1177/0013916507311900>

In class, the students also discussed what motivated them to start recycling reliably, and some suggested "Garbage Island" – the floating mass of garbage the size of Texas in the Pacific Ocean. They all seemed to remember hearing about Garbage Island, and it was agreed that Garbage Island was a motivator because it was scary. This was something tangible that the student could see pictures of, they could do research on, and they all shared an element of personal responsibility for its existence,



and could admit to such responsibility, with regret. Learning about Garbage Island was one of the real motivators to change the behavior of the students, in fear of making it worse. Then, the students became curious as to what the Garbage Island equivalent was for composting, as this could be a useful motivator for residents. Methane and methane emissions were discussed, shortly, but those did not seem hold the same weight, because we, as a society, hear about those all the time, and have become somewhat normalized to it, not to mention that there are larger contributors to greenhouse gasses that should be focused on in terms of greenhouse gasses. After some contemplation, the students arrived to the conclusion that the composting equivalent to recycling's Garbage Island could be nutrient depletion in soil used for agriculture. As consumers, they created a nutrient depletion cycle by exporting so much of locally grown foods, especially being in California, and those nutrients are not being reintroduced back into our soil. This problem will continue to get worse, causing an increase in the cost of produce because the cost of farming it is going to increase. Rectifying this issue not only has the potential to stop this cycle and reduce the cost of produce, but if we reintroduce the nutrients of more of our organic waste to the places that we grow our food, our produce is guaranteed to increase in nutrient density. This issue seems to provide a balance of ethical and economical importance, while also serving as a personal motivator that is time sensitive.

Resources: <http://journals.sagepub.com/doi/pdf/10.1177/0013916507311900>

## COMMUNITY EDUCATION

### COMMON INFORMATION AVAILABLE

When the students began this project, they were sure that people weren't composting because they (as well as us) were lazy. Everyone knows that composting is an option, but people just don't do it. As the students continued their research, they found many of the same, and frankly, useless articles saying that everyone should compost because it is good for home gardens and for the environment, but most of the students didn't have gardens, and it wasn't well understood how home composting was different from using our landfill curbside bin to dispose of 'other' types of organic waste (it seemed that most people were using their organic waste curbside bins for yard waste, but only yard waste). There were two things that became clear when the students discussed the problem as being one of laziness. First, it was an unhelpful explanation in that it did not provide any solution, merely a vague criticism. Second, the students often had reasons why it did not apply to them. Much of the understanding of organic waste was shaped by people's justifications to charges of laziness.

There were areas where education was required. Many of the students either didn't know, or hadn't realize that organic waste curbside bins should also be used to compost those things such as food scraps and food-soiled paper; some of the students didn't even know that pizza boxes could be composted, and should be instead of recycled



– this seems like something *every* college student should know. If a resident were to do a quick Internet search on composting, to find out what to compost, or how it works, etc., the majority of the information they would find would be on home composting and articles on pop culture sites telling them to ‘get over’ their woes about pests and the smell when it comes to composting and to ‘just do it’ because it’s the right thing to do. This tactic is, not only, not helpful, but it also makes it difficult for residents that are actually interested in composting to get valuable or useful information.

With enough searching, residents will find comprehensive information about composting at home, along with abstract incentives, such as ‘going green’. None of this information is helpful for those that are curious as to what they could be putting in their organic waste curbside bin. After a fair amount of research, and a presentation from the City of Hayward, the students, finally had a better understanding of what they *should* be doing as compared to what they *were* doing.

Once all of that was sorted out, the students ran into other questions about what should and should not be put into organic waste curbside bins. They had questions about pet waste, banana peels, ‘compostable’ straws and forks, Sun Chip bags, and biodegradable bags. They had no idea what to do with these things. They found that they weren’t alone here, either. During a Google search on banana peels by typing in the search bar “can banana”, the autofill suggested, “peels be composted.” There were also 218,000 ‘hits’ on this search. The students came to the conclusion that either this meant that lots of people didn’t know where to put their banana peels, or that at least that many people knew what to do with them. After some reflection, the students realized that these questions were only relevant to home composting, and that an authority available to them, and the residents to answer these hard questions about what should go into our organic waste curbside bins; Waste Management. However, this lack of education was only an issue for a small portion of organic waste and not grounds for the vast majority of organic waste going to landfills.

## RESIDENT RATIONALITY FOR NOT COMPOSTING

It is important to understand the reasons people claim to not be composting, so Hayward can invalidate those reasons. If Hayward invalidates the reasons that people claim to be not composting, and does so in a very subtle way, residents may rethink their reasons themselves, rather than if the City outright invalidate those reasons, residents may feel that they are being attacked, and become defensive, and therefore solidify themselves into those reasons. The term invalidate may seem a bit unduly harsh, but it is necessary. People will stick to their reasons until those reasons no longer seem rational. Making these reasons irrelevant, *and* pointing out that irrelevance to residents may remove their established foundation of not composting.

There are two kinds of reasons people state for why they aren’t composting - both of which are addressed in the 2005, *Summary of Composting Survey*; (1) the ‘ick’ factor, which would include pests, smells, and general aversion to handling food waste, and (2) the ‘difficult’ factor, which would include physical (“It’s a lot of work to turn a compost pile all the time”) financial (“I can’t afford to buy a lot of composting



equipment”) or educational (“I don’t know where my banana peels should go”) difficulties. Through these complaints, it is fair enough to assess that many residents are not aware that they can use their organic waste curbside bins for food scraps and compostable items rather than just yard waste. All of these concerns can be, at the very least, eased, if not completely nullified by the use of their organic waste curbside bin for the entirety of their organic waste disposal.

Link to 2005 survey:

<http://www.stopwaste.org/sites/default/files/Documents/compostsurveysummary.pdf>

There are multiple reports stating that education rather than apathy seems to be the prevailing issue among Hayward residents and their (lack of) composting habits. Giving residents comprehensive information on not just why they should compost using their organic waste curbside bins, and what they should and should not be putting into those curbside bins could help influence residents to use compost via curbside pickup. Explaining that home composting is not what we are asking of them, but also supporting the residents that wish to endeavor in that the support that they need in education and tips and tricks are both important factors in this endeavor.

Link to article discussing reasons people claim to keep them from composting:

<http://www.sustainableamerica.org/blog/i-want-to-compost-but/>

Other, somewhat outlying reasons residents may have for not sorting their organic waste are that they feel they are already doing their part in sustainability efforts by recycling and using their organic waste bins for yard waste, while some people reported not having any reason to not compost, or that they simply weren’t interested in sorting their organic waste, according to the 2005, *Summary of Composting Survey*. The City addressing this group of issues with some sort of incentive, whether it be educating them on the benefits of composting, and the consequences of their organic wastes going to landfills, to create an ethical incentive, or creating some sort of financial incentive, may be effective. Both are in use in other cities offering informational campaigns or fines for improper sorting behaviors.

Link to 2005 survey:

<http://www.stopwaste.org/sites/default/files/Documents/compostsurveysummary.pdf>

Some students, in class, admitted they were not aware of what composting was, how it was done, or what should be sorted into their organic waste curbside bins, and that a single presentation given by city officials on the environmental benefits and consequences of composting, in detail, was enough to motivate them to change their habits, and their motivation and efforts to begin to sort out his organic waste from the rest of their daily waste, and that they were actively trying to motivate others to do the same. These students may be biased, as they are in an environmental ethics course (at this time), so they obviously care enough to choose this course over another, but the majority of people care about the environment, and giving them comprehensive, comprehensible information on the benefits and consequences of sorting and not



sorting one's organic waste could be enough on its own to motivate people to change their sorting behaviors.

There doesn't seem to be enough easily accessible information about why residents should be composting. This could be motivating information to post on the StopWaste website or the City website. StopWaste also has a few videos available online and on YouTube, but their food disposal videos carried the lowest amount of views; despite some important information being presented to residents, people are still not gaining access to it. This (video on the StopWaste website) method of education doesn't seem to be effective so far. Link to StopWaste website on composting:

<http://www.stopwaste.org/preventing-waste/residents/start-with-your-soil>

Though the students initially thought laziness was the largest factor in people not composting, it is more evident, upon further research and analysis, that the real issue is a lack of education on composting and organic waste disposal as a whole. When the City emphasizes its expectations (sorting organic waste into residents' organic waste curbside bin), they are not only communicating a standard (that composting is expected behavior), but they are also alleviating many of the concerns with composting (lessening the "ick" and "difficulty" factors). The way that Hayward wants residents to compost is much easier and cleaner than the residents' (presumed) assumption of wanting them to start their own home compost system (this assumption seems fair enough to make because the majority of the composting information available is focused on home composting). As we have deduced that 'laziness' is not a significant contributing factor, especially considering that even lazy people recycle. The students have also found that residents need more information on (1) what we now expect them to do, and (2) how do meet those expectations. As will be mentioned later, incentives on an intrinsic and basic extrinsic level can serve as motivations to change one's habits or normalized behavior. New tasks are naturally uncomfortable to an extent, but offering incentives can reduce this sense of discomfort. Because there is not enough supporting evidence to show that laziness is a major factor in people's lack of composting, this factor will be removed from focus, as it has not proven to be helpful. People's efforts in recycling, though may be faulted in application by lack of proper sorting techniques, show that people care about the environment, or at least care about sorting their waste 'correctly' according to the popular behavior. Both or either sorts of caring (by the residents) will do for Hayward's purposes.

Resources:

<http://www.sustainableamerica.org/blog/i-want-to-compost-but/>

<http://www.stopwaste.org/sites/default/files/Documents/compostsurveysummary.pdf>

<https://cohCA.maps.arcgis.com/apps/dashboard/index.html#/941fe585c7b944b38f62fe16b13aa128>

<http://www.stopwaste.org/preventing-waste/residents/start-with-your-soil>



## WHAT WASTE MANAGEMENT WANTS

There are lots of articles on what can and cannot be composted, but most of these articles, whether they state it explicitly or not, are geared towards home composting. This is fairly helpful for those that are interested in home composting; but not so much for those that are motivated to do their part in sustainability efforts through composting of organic waste via curbside pickup. As it concerns the latter, the only opinion that matters for composting organic waste using organic waste curbside bins in Hayward is that of Waste Management and the disposal facility, as they are the ones that dispose of the waste. Their list of items that should be sorted into the organic waste curbside bin is as follows:

- Fruits and vegetables
- Meat, poultry, seafood (bones and shells)
- Bakery items and ingredients
- Eggs and paper egg cartons
- Milk, juices and cartons
- Plants, cut flowers, potting soil
- Coffee grounds, filters, tea bags
- Paper products (napkins, paper towels)
- Ice cream, yogurt, and cottage cheese

It should be noted that there are some items that are advertised as compostable by other groups, such as biodegradable utensils and waste bags, that Waste Management does *not* want in the organic waste curbside bins, and that educating residents on this information may influence residents to not put these items in their organic waste curbside bin, which may, in turn, improve efficiency at the Davis Street sorting and diversion facility.

One way that companies have been appealing to environmentalist consumers is by advertising their product or product packaging as compostable. The Federal Trade Commission (FTC) has regulations of the term ‘compostable’ that state, explicitly:

*A marketer claiming that an item is compostable should have competent and reliable scientific evidence that all the materials in the item will break down into, or otherwise become part of, usable compost (e.g., soil-conditioning material, mulch) in a safe and timely manner (i.e., in approximately the same time as the materials with which it is*



*composted) in an appropriate composting facility, or in a home compost pile or device.*

The most prominent issue with how this legislation affects curbside composting is that if the item that is claimed to be compostable in any of the aforementioned excerpt, is that legal use of the term ‘composting’ is met on commercial products and product packaging if it meets only one of the means listed (“appropriate composting facility, or in a home compost pile of device”). This is also subject to the other types of material that are being composted with the product or product packaging which claims to be compostable; as different organic waste materials require varying amounts of time to be effectively be digested into a useable compost. This means that items labeled and advertised as compostable, including BioBags, may not meet the requirements necessary for curbside composting and therefore should not be sorted into the organic waste curbside bin.

Links: <https://www.ftc.gov/sites/default/files/attachments/press-releases/ftc-issues-revised-green-guides/greenguides.pdf>

<http://biobagusa.com/about-biobag/regulations/>

For any additional questions as to what should or should not be composted in the organic waste curbside bin, Waste Management should be contacted directly. Link:

<https://www.wm.com/myaccount/reportProblem.do?action=getOverview&segment=custsvc>

Other Resources:

<http://www.wm.com/enterprise/food-and-retail/Retail-Solutions/organics-recycling.jsp>

<https://www.ftc.gov/sites/default/files/attachments/press-releases/ftc-issues-revised-green-guides/greenguides.pdf>

<http://biobagusa.com/about-biobag/regulations/>

## **ADDITIONAL OR SUPPLEMENTARY EDUCATION FOR THE COMMUNITY**

Educating residents of Hayward on the harms of disposing of their organic waste with their garbage and generally not minimizing their waste that will go into landfills, as we will discuss later, is an important part of rationalizing the extra effort that the City is asking of its residents. Part of this education may include details of landfill usage, and visualizations of the sheer mass of the waste that residents create on average, methane and carbon dioxide emissions from the degradation of organic waste in landfills, as well as the consequential nutrient depletion of farming soil due to a lack of efforts to reintroduce unused nutrients from organic wastes back into agricultural soil.

Informing residents on their options of methods for organic waste disposal allows them to make an informed decision as to what kind of disposal would best serve their



lifestyle. With the majority of general composting information readily available through search engines online, there are people that may assume that composting at home is the only way to compost their organic waste, especially if they aren't conscious of the option for using their organic waste curbside bin for organic wastes other than just their yard trimmings. With more options to better suit their individual lifestyle, residents may be more inclined to take action and alter their waste sorting behaviors.

There may be residents that are interested in doing their part, but are finding that their bad sorting habits are so deeply ingrained into their daily lives, that they are having a hard time remembering to sort out their organic wastes; maybe they are simply interested in making their sorting habits better or more consistent. Providing tips and tricks to break and make habits may be very beneficial to these residents. An elementary study in habits, as they pertain to waste sorting, will be shown later, in more detail, but having some of this information available to residents would help those that find themselves in situations like this.

Even with the best education, residents will still have some questions due to new products or packaging on the side of manufacturing, and evolving technologies and opportunities on the side of infrastructure. Making comprehensive and easy to use resources available to residents that make available the most up-to-date information on what should and should not be composted may be a great fallback system for residents that aren't confident in their sorting knowledge. Making these kinds of resources readily available will be great for immediate questions, but if this kind of communication is not possible or practical, the other option of encouraging residents to contact someone that might be able to oversee these resources could be a great alternative. This type of resource would be efficient on the city website, or possibly on a text messaging, or other mode of hotline. It is important to make these resources as effortless and anonymous as possible so people are able to ask their questions without feeling inconvenienced or judged.

The facts that composting is good for the environment (stated that loosely), it can, sometimes, be 'gross' (and that people should just get over that), and the benefits of composting at home are already widely available in popular media; more specifically, popular news media. The New York Times, the LA Times, Huffington Post, and Fox News all have articles published on home composting, while NPR, Huffington Post, CNN, and Fox News all have articles on legislation regarding compost. NPR also has an article relating to agriculture and adding (the farmer's) urine to compost to introduce unused nutrients from foods; but this seems not to be terribly informative rather than putting people off to composting. Huffington Post offers several articles related to composting, on coping with change and "The Solace of Honest Work," that could be helpful to future composters, but also may turn people off as composting is portrayed as being difficult. Finally, Yahoo News has an article on curbside composting in Montréal, but focuses on how to prevent flies and a foul odor; which could be helpful, but also shines a negative light on composting. It is important to be giving residents all of the information that may be useful to them, but the organization of that information is also important. Emphasizing the information commonly available is repetitive and



redundant, especially as it pertains to home composting, and repeating this information is of limited value. Offering the commonly available information, in the form of links, may be beneficial as it would create an easy access-point to the information from a singular portal, while it would also keep clutter from the base page, and only people that are interested in the information, would be accessing it.

It does not seem helpful for the City to address legislations that do not pertain to Hayward's residents, and any information given on home composting might be placed, organizationally, after any information needed for curbside composting, as those residents interested in home composting are already willing to put in more work than those that are not interested in home composting. It may be of the City's interests to emphasize the information that the popular media is not offering. Popular media is making no attempt to explain, in enough detail, why composting is important, and most people do not seem to be consciously aware of the issues regarding the abundance of waste and landfill usage, let alone seeing how disposing of organic wastes in this manner creates a negative effect on the environment, let alone that there are other, simple options (curbside composting) than managing their own compost pile at home.

Links:

<http://www.cnn.com/2013/06/20/opinion/nutter-san-francisco-composting/>

<http://www.cnn.com/2014/09/24/politics/seattle-composting-law/>

<https://ca.news.yahoo.com/composting-tips-avoid-flies-stinky-013225640.html>

<http://www.foxnews.com/real-estate/2016/08/24/how-to-make-compost-homemade-fertilizer-made-easy.html>

<http://www.foxnews.com/food-drink/2015/01/29/seattle-now-shaming-residents-for-not-composting-food-waste.html>

<https://www.nytimes.com/topic/subject/compost>

<http://articles.latimes.com/keyword/compost>

<http://www.npr.org/tags/182017318/compost>

<http://www.huffingtonpost.com/news/compost/>

<http://www.huffingtonpost.com/news/composting/>

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## CHANGING COMPOSTING BEHAVIORS

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### BREAKING DOWN BAD HABITS AND BUILDING NEW ONES

Making composting a habit is important to not only increase the rate of the behavior, but to, also, increase the rate of *correct* behavior and decreasing the rate of



*incorrect* behavior. Residents already have habits for disposing with organic waste, though, the majority of residents, about 75% according to the GIS survey, are not exhibiting the desired habits. Changing habits entails two parts, breaking down ‘bad’ habits and building ‘good’ habits. While these two can happen together, it is worth discussing them apart because they produce unique problems.

Breaking habits is harder than implementing new ones, but there are things that we can do to help residents tackle this issue. Visual cues and changing context can be very helpful in breaking habits, or to help create a new environment to build habits upon.

Changing the context of one’s bad habit would also be helpful to create a (functionally) new environment for the habit to take place. Habits are best maintained within the same context in which they have been learned. Therefore, the inverse should also be true. Asking residents to change the location of their waste collection bins, for garbage, recycling, and adding one inside for composting, will create a new environment in which they will have to learn where their three different bins are located to dispose of their waste. This gives more theoretical room to add a third bin that will be considered more actively or consciously, as they will be re-learning where to dispose of all of their waste.

A visual cue that the City could help with could include adding a countertop bin; this would be helpful to add a visual reminder to use it; if it is aesthetically pleasing, maybe there could be different styles to match residents’ kitchens, or maybe even with built in air fresheners, or simple air filters to keep the possible smells from radiating, so people will be more likely to keep the bin on their counter as a constant reminder to sort out their organic waste. Another possible visual cue the city could help with is removing availability of the largest size of landfill curbside bin for residents, but this will be explained more, later, when we discuss prompting.

Link: <http://charlesduhigg.com/how-habits-work/>

People learn and create habits by practicing them. It may not be very realistic to find ways to get adults to practice sorting their waste, especially in a way that is fun or entertaining, but maybe there could be activities that we can make available during community events, like fairs, festivals, or farmer’s markets. Adults may not be very likely to participate in these activities, even if they are made available, but with the addition of small incentives, or by creating a competitive aspect of the activity, people may be more inclined. Making the incentives, if we can afford them, related to the venue in which the activity is being held in would be important. At a fair, a small plush toy with a “sustainability” t-shirt a prize for winning would be appropriate, and we could encourage the family to keep the toy in the kitchen; when the winner of the challenge sees this toy, they will probably be more inclined to dispose of their waste properly, and with confidence, purpose, and with happy memories. At a festival, maybe a t-shirt, drink cozy, or even a coupon for their waste management bill could serve as a prize; for a farmer’s market, a piece of fresh fruit or reusable produce bag would probably suffice. The problem with this type of incentive is the monetary cost, but it may be worth an



investment, depending of the cost of not meeting the mandated percentage of waste reduction; and these activities would not be something that would be done daily, but rather only when there is a larger community event.

Though the idea of having people practice their sorting habits in a fun activity would definitely get them to think about their composting habits, it really takes an initiative to commit to change, by each individual, to bring about that change. When creating new habits, one must make a dedicated commitment, but this commitment will take time to manifest. Lasting habits are best formed with gradual commitments. LifeHack.org gives 18 points in making a habit. That may sound like a lot, but many of them are conceptually repetitive. The basics are to learn what you can about what you want to do, then, make a daily commitment that you can hold yourself to, or have someone else hold you to, that makes progress with small steps. Create an environment where you have reminders of your commitment, and do your best to stay consistent, but don't let failures to be consistent break your commitment. Link to this article:

<http://www.lifehack.org/articles/featured/18-tricks-to-make-new-habits-stick.html>

Links to other habit related articles: <http://www.briantracy.com/blog/personal-success/seven-steps-to-developing-a-new-habit/>

<http://jamesclear.com/three-steps-habit-change>

<http://99u.com/articles/17123/5-scientific-ways-to-build-habits-that-stick>

## PROPERTIES OF OPERANT CONDITIONING AND THEIR APPLICATIONS FOR COMPOSTING

Though the responsibility and power of changing residents' sorting behaviors lies on residents, the City can help enable the process of modifying these behaviors. One method of behavior modification that has lots of research and verifiability is operant conditioning. According to an article on SimplyPsychology.org, operant conditioning can be defined as, "changing of behavior by the use of reinforcement which is given after the desired response." A basic breakdown of operant conditioning would be rewarding desired behavior and/or punishing undesired behavior. For the purposes of standardization, the definitions of important terms in operant conditioning according to this article are as follows:

- Reinforcement: the application or removal of a stimulus to increase the occurrence of a behavior.
- Punishment: the application or removal of a stimulus to decrease the occurrence of a behavior.
- Reinforcer: a reward.
- Positive Stimulus: an added stimulus.
- Negative Stimulus: the removal of a stimulus.
- Primary Reinforcer: something valuable on its own.
- Conditioned Reinforcers: those reinforcers that are paired with primary reinforcers to the point where they have the same meaning as the primary



reinforcer – this happens through classical conditioning. SimplyPsychology.org also has a short, but thorough section on educational applications. They discuss praise, behavior shaping, reinforcement schedules, and feedback.

Link to article stated above: <http://www.simplypsychology.org/operant-conditioning.html>

The actual disbursement of rewards is important as well, studies have shown that variable ratio reinforcement and variable interval reinforcement are the two schedules of disbursement of rewards that have the quickest response to reinforce behavior while also having the longest lasting effects. Variable ratio reinforcement is when behavior has been rewarded after an unpredictable number of times correct behavior has been exhibited. Variable interval reinforcement is when behavior is rewarded after an unpredictable amount of time, assuming that behavior has been correct within that time frame.

Link to supporting article: <http://www.clickersolutions.com/articles/2001/ocguide.htm>

The application of operant conditioning for the purposes of helping residents improve their sorting behaviors can be very simple. It is important to remember that the value of primary and conditioned reinforcers will vary between individuals; this is why it is important to offer several kinds of reinforcers or incentives. Positive reinforcers can be as easy as giving someone a discount on their Waste Management bill if they reduce their waste by a certain percentage. This can be done on the (small) community or neighborhood level if the individual level is not possible. The community aspect would add a level of social pressure that could potentially be beneficial. If reducing people's bills is not an option, there are other ways to get a similar incentive, with positive reinforcement, such as making coupons available for local businesses that are interested in sponsoring 'a greener community' or through positive punishment, by raising the garbage prices for those that do not reduce their landfill volume.

As far as incentives go, for adults in the Bay Area, ethical incentives tailored towards environmental health and sustainability may be enough to suffice, as the Bay Area is a fairly liberal area. These moral incentives would be easier to administer and may be more cost effective as it would only entail an informational ad campaign. We can get local businesses involved here as well if we can get discounted, or free, advertising space. Businesses might be interested in participating in this exchange because they will have the image of being 'environmentally conscious' as well as being known for investing in their community and the ethical high ground those labels imply. Relying solely on reinforcement rather than implementing a punishment in addition is generally recommended for some situations, but for Hayward's purposes, as the residents and the city officials don't have constant direct contact to make a lack of recognition of bad behavior influential, introducing a positive punishment may also be a good incentive.



## ETHICAL AND SOCIAL INCENTIVES

For those residents that genuinely and actively care about the environment, there are certain ethical incentives that, if brought to their attention, may be enough to motivate, and sustain said motivation. Sustainability is of importance to many of these people. One university that implemented a composting program in their dorms conducted a survey of the students living in the dorms before the program began and after the program had been in place for about a year. They describe their findings on proper sorting techniques as “improving.” The article that describes this program and survey states, “If you provide the opportunity and you do the appropriate amount of education, can you change behavior?” Prosser asked. “It appears, at least on some levels, that we can.” They attribute their lack of a “high level of composting” campus wide, specifically to a lack of space for the infrastructure and technology, as well as the recognition that not all students will be interested. Sustainability is not just ‘good for the environment,’ but it is also a lifestyle that is culturally important to strive for. Sustainability relies on everyone, and those that find it to be of value, and find composting to be part of living sustainably, will compost if they have the opportunity and education to do so.

Link to article: <http://www.dbknews.com/2016/04/12/umd-compost-on-campus/>

Most people probably don’t know just how much waste they make individually, as a household, or especially as a nation. An interactive article, called *Land of Waste*, expresses, explicitly, how much waste we are making as a country, and really shows the nation’s lack of attention to the environment. The article states that the United States makes “roughly 728,000 tons of daily garbage,” and that California has the fourth highest ‘tons of weight per person’ in the nation. The site also offers an activity where you can enter in an address, and it will show the statistics to the nearest landfill of that address. Addressing these astronomical numbers in the programs the city intends on implementing may help residents to realize the weight of the problem with waste disposal into landfills.

Link to interactive article: <https://www.saveonenergy.com/land-of-waste/>

The EPA offers some, more detailed reason why composting is important. Their website states that composting “reduces methane emissions, reduces and in some cases eliminates the need for chemical fertilizers, promotes a higher yield of agricultural crops, aids in habitat restorations, can be used to remediate soils contaminated by hazardous waste, capture and destroy 99.6 percent of industrial volatile chemicals in contaminated air, and provide cost savings over conventional soils.” These details may help residents see the importance of composting instead of just being told that it is “good for the environment.”

Link to the EPA website: <https://www.epa.gov/sustainable-management-food/reducing-impact-wasted-food-feeding-soil-and-composting#benefits>



## FINANCIAL INCENTIVES

For those residents that the ethical incentives don't quite reach, the City of Hayward can offer financial incentives. This sounds expensive, but doesn't have to be. Another reason that this kind of financial incentivizing might work quite is because coupons and discounts from certain retailers can be of a high incentive to some residents. The students have found, in their research, that there is a certain income demographic variable for people that are not composting that might be greatly inclined to alter some of their behaviors to save money.

There is an emphasis on legislations for fining improper sorting behaviors as it pertains to the history of recycling. An article on How Stuff Works explains, "The success of recycling traces to wide public acceptance, the improved economics of recycling, and laws requiring recycling collections or enforcing recycled content in certain manufacturing processes."

Link: <http://science.howstuffworks.com/environmental/green-science/recycling1.htm>

Fee-based legislation as a method of positive punishment for residents not adopting required behavior as it pertains to composting has been in places within the United States since about 2009, and has been in place for recycling in the U.S. since 1980. This method, as it is being implemented by more cities across the nation, must show some sort of return, whether it be in changing residents' behaviors, or by collecting extra revenue that has benefitted sustainability efforts, by those cities, in some form or another, or both.

Link: <http://www.citylab.com/city-makers-connections/recycling/>

Instead of discounting Waste Management bills for residents that do compost, the City can create a fee for those that do not. This fee could bring money to advertising or community outreach programs, or even to infrastructure to help deal with the added effort in sorting for those that aren't sorting at home. Making businesses completely liable for their waste disposal is something that may initially take a little while, but could pay off in the end. Either way, there are ways to offer financial incentive with investments and without investments. This has been a way that some areas have increased their residential composting efforts, and even though some studies suggest that financial rewards are not a great incentive because they are generally not long-term, we really only have to keep some of the incentives around until residents build better habits. According to Mercury News, Hayward garbage rates are set to increase 10% by 2018 and with a max of 6% annually till 2021. Offering lower rates for those residents that are exhibiting the ideal sorting techniques could give residents motivation to be more mindful of their sorting. There could even be a tiered system, where there are several set fees for degrees of variation from the ideal sorting behaviors that might look something like:

Ideal Sorting: 0\$; Mostly Sorted: X\$; Some Sorting: 2X\$; Not Sorted: 3X\$



Some benefits of this approach would be that this could be simple and straightforward and that it can be used for residents and businesses alike. Some cons of this approach could be that it may require legislative action depending on how the fees were added, and if those fees were to be distributed to the city for community outreach or advertising, or if they were collected and kept by Waste Management.

Link to Mercury News article: [www.mercurynews.com/2015/01/03/hayward-garbage-rates-could-go-up-10-percent-in-march/](http://www.mercurynews.com/2015/01/03/hayward-garbage-rates-could-go-up-10-percent-in-march/)

Hayward has successfully enacted pieces of legislation to help the recycling and composting causes. Vermont has also enacted some pieces of legislation. They have made recycling food waste (or composting) universally mandatory by 2020. Their website offers a lot of information on what organic waste is, what composting is, what residents' composting options are, and why it is important; all in one webpage.

Link to Universal Recycling legislation: <http://dec.vermont.gov/waste-management/solid/universal-recycling>

Link to Organic Waste webpage for the legislation: <http://dec.vermont.gov/waste-management/solid/materials-mgmt/organic-materials>

The city of Cleveland gave their residents new curbside bins that are equipped with RFID chips in their recycling bins to see if they are at the curb; if bin is not making it to the curb, city workers examine landfill bin to check for recyclables. If recyclables are present over 'x'%, that residence is subject to fine of \$100. "The chips will allow city workers to monitor how often residents roll carts to the curb for collection. If a chip shows a recyclable cart hasn't been brought to the curb in weeks, a trash supervisor will sort through the trash for recyclables. Trash carts containing more than 10 percent recyclable material could lead to a fine..." A positive punishment of \$100 seems as if it is a high enough fine to deter that behavior. This fine might be unrealistically high for some of Hayward's lower income residents, but anything less may not be effective for Hayward's higher income residents. It also might not be seen as fair to charge residents different fines for the same infraction, even if it is based on income. This fine would definitely serve as an incentive.

Link to RFID program: [http://blog.cleveland.com/metro/2010/08/city\\_of\\_cleveland\\_to\\_use\\_high-.html](http://blog.cleveland.com/metro/2010/08/city_of_cleveland_to_use_high-.html)

Recycling or composting "points" may be offered to individual residents or neighborhoods that are exhibiting proper sorting behavior. These points can be redeemed as a sort of coupon at certain retailers. These retailers would be incentivized to participate because this program would bring them business and be a source of advertising for them, but would also showcase them as a company that is willing to invest in their community and sustainability, generally. This is a pretty simple and straightforward program that could be easily tailored to Hayward residents, and could be helpful for small and local businesses that could use the publicity. Some cons of this program might be a lack of interest by companies in Hayward, or this might look like a sort of mailing list, to where the residents don't find it useful, because their coupons or



discounts don't apply to them in a useful manner. Link to recycling points idea origin: <http://www.recyclebank.com/>

Random, small prizes given by representatives and corporations to people that are seen sorting their waste properly in public places could be a good method for providing a sort of (mainly financial) incentive. Having a 'task force' of city employees or volunteers going to different businesses that create a lot of waste, or that have a habit of not sorting properly, and giving out small prizes, such as gift cards and the like, to people that are seen sorting properly can not only benefit that person receiving the prize, but all those who witness the transaction and hear about it. An extravagant transaction may also draw more attention. This may add up quickly, but it doesn't have to. Finding key prizes for key areas, with appropriate extravagance could go a long way. Word of mouth goes a very long way, and hearing about how the city is giving back to residents that are doing their part in waste reduction would be very good publicity. This has been done through a program called "Caught Green Handed" and has been used in a town called Charlotte (not specified as Charlotte, NC, or otherwise) as well as in Cleveland, Ohio. The program advertises itself and its effective time frame, then has about three active months of giving back to some community members that are seen sorting correctly.

Link to "Caught Green Handed": <http://earth911.com/inspire/undercover-prize-patrol-on-the-lookout-for-green-handed-acts/>

## ADVERTISING AND PROMPTING

Advertising an informational campaign is a good way to target certain demographics with current information available on who is more likely to already be composting, and who we want to target to increase composting efforts. StopWaste has published an advertising campaign, but it is unclear with the research done, when the campaign was circulating. San Francisco is also running an ad campaign similar to the StopWaste Campaign. Both use basic humor to tell people that they should be composting; but none of these ads are telling residents *why* they should be composting. Some general advice on advertising states that ads should be focused on positive emotions, which these ads do, but students in class recall the 'scarier' information as being an actual, and more effective motivator for both recycling and composting. These personal reflections may be biased, but the bias will reach a certain demographic of people. The students were not able to find StopWaste ads on the StopWaste website, but there are many images available on Pinterest; they are the ads where food scraps and organic waste curbside bins are 'talking' to each other. San Francisco has two kinds of humor ads out, one is a plain green background with black and white text, while the other has some imagery of foods with text. Examples of each are shown below.

Link to some StopWaste ads on Pinterest: <https://it.pinterest.com/pin/44191640066871741/>



Link to San Francisco's advertising campaign company, Singer Associates:  
<http://singersf.com/projects/sunset-savenger-company-recycling-and-composting-advertising-campaign/>



It may be risky to go against what advertising specialists state is 'best,' but the Truth campaigns for anti-tobacco products have been largely successful, and this campaign uses negative information as a part of their campaign. Hayward may be able to have a similar success because in an informational ad campaign, advertisers are looking to increase awareness, knowledge, and to alter behaviors, not to sell products (which is what most advertising is geared towards, and therefore, probably research oriented towards). When researching what kind of ads to run for Hayward's composting, it is important to account for the fact that our ads do not have an intention to sell a product, the City has the intention of changing behaviors, and looking at advertisements that have the same focus, and seeing which succeed and which fail from there will give



them more accurate information to make better informed decisions about which ads to run.

Link to informational page about Truth: <https://www.thetruth.com/about-truth>

A symbol that represents composting, such as the three arrow triangle for recycling would be very helpful for residents to successfully sort their organic wastes. The recycling symbol was designed in 1970 with the beginning of what is sometimes called the ‘Environmental Movement’, by an engineering student, Gary Anderson, at the University of Southern California for a contest funded by the Container Corporation of America (CCA). Because the CCA never trademarked the logo, the design “entered public domain as a universally recognizable icon for recycling.” Because the recycling symbol is well established, people have used it as a guide to know what can and cannot be recycled. Obviously, this hasn’t created perfect composting habits, but it has helped guide residents on recycling items they would have, otherwise, thrown away.

Links: <http://www.citylab.com/city-makers-connections/recycling/>

<http://www.businessinsider.com/gary-anderson-the-man-who-created-the-recycling-logo-2012-7>

There is only so much that the City can do about making a composting symbol canon, but there are things that can be done, that would bring attention, and possibly also bring grant money. Recreating a contest to establish a symbol, probably across Alameda County, or the entire Bay Area, could be effective in bringing national attention to this issue with the proper media coverage. Mandating that manufacturers within city limits differentiate on their products and/or product packaging if that item in compostable through curbside composting (as those that are composting at home will probably have more incentive to do their own research about what is best for their compost pile or bin), being persistent in calling for and encouraging larger government or institutional bodies that have more influence to incorporate something similar to the recycling logo for curbside composting, or simply insisting that the FTC changes their regulations on the term compostable to what may be composted through curbside composting. The City is not obligated to participate in composting efforts to this extent, but it may provide a sense of pride in the city and its efforts in its residents, and, therefore, motivate residents to do their part in sustainability efforts. This would take a lot of effort of the City’s part, and is a high-risk, high-reward gamble, on time and money.

Sonoma county set a waste reduction goal as part of an annual event, then reduced the size of available landfill curbside bins, so that both of the recycle and compost bins were significantly larger than the landfill curbside bin, to better represent, visually, what the ideal, and acceptable, waste ratio is. This will be a visual cue, or prompt, each time that person takes out their trash, recycling, or organic waste. Given, this kind of measure would be geared more towards residents in single-family homes, but passersby that may also see the difference in sizes for these curbside bins may also



make the same connections we are hoping for in our residents that live in single-family homes.

Link to article: <http://www.kj.com/blog/tomato-festival-waste-diversion-success>

Other ways to prompt residents may include attaching sorting rubrics or charts to the curbside bins themselves or making aesthetically pleasing countertop bins available, so people would be more likely to leave the bins on their counters as a reminder to compost. Attaching guidelines to the curbside bins may not be as effective, as it will only be seen as the waste is being taken out, but it might get residents to think more about how they are sorting. Making aesthetically pleasing countertop bins could get costly, but the City could also simply just give residents tips on how to decorate their own to match their decorating style. This may take some time and effort, but this kind of information exchange can be done through the mail, and could possibly be incentivized by rewarding citizens a discount for their Waste Management bill, or a chance to win some larger raffle prize, if they share a photo of their decorated container on social media and ‘tagging’ the city in the photo; this also a good opportunity for community-based advertising.

It is important for the city to be providing educational opportunities and resources to improve their knowledge about composting to residents. Advertising is an effective way to do this. Although advertising can become very expensive quickly, recruiting public schools to put in design efforts is an option and it is a great way to increase community awareness of the issues at hand, and how to solve them. The recruitment of local businesses, and working together with them as a large part of the community can reduce these costs dramatically.

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## COORDINATION

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### THE IMPORTANCE OF COORDINATION

One thing that might be obvious based on the contents of this report is the lack of coordination. We tried to talk about ‘organic waste’, but ‘compost’, ‘green waste’, ‘food waste’ and a variety of other phrases kept creeping in. The lack of a well-known symbol is discussed above. We also found that there was a lack of coordination on the level of the people working to solve the problem. There was no coordinated language or expectations or behaviors. While we lack the ability to enforce any coordination, we hoped to encourage it.

### SOME KEY PLAYERS

To help with coordination efforts, we have done some research to find the contact information of some key players.



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Hayward CalRecycle Office of Local Assistance and Market Development

Kathleen Strickley

(916) 322-1848

Kathleen.Strickley@CalRecycle.ca.gov

Kaoru Cruz (Supervisor)

(916) 341-6249

Kaoru.Cruz@CalRecycle.ca.gov

City of Hayward Contacts

Jeff Krump

(510) 583-4725

Jeff.Krump@hayward-ca.gov

Mary Thomas

Mary.Thomas@hayward-ca.gov

StopWaste Alameda County Primary Disposal Reporting System (DRS) Contact

Nisha Patel

(510) 891-6500

npatel@stopwaste.org

Brian Mathews

(510) 891-6500

BMathews@stopwaste.org

Anette Henderson

(510) 891-6512

ahenderson@stopwaste.org

StopWaste Alameda County Request for Proposals



Meghan Starkey

(510) 891-6513

mstarkey@stopwaste.org

Hayward Unified School District

Interim Superintendent

Dr. Matt Wayne

mwayne@husd.k12.ca.us

Senior Executive Assistant to the Superintendent

Lisa Cote

(510) 784-2640

lcote@husd.k12.ca.us

Link to Hayward Unified School District, Site Based Decision Making Team:

<http://haywardusd-ca.schoolloop.com/SBDM>

California State University, East Bay

Jillian Buckholz

CSU East Bay

sustainability@csueastbay.edu

(510) 885-3709

Waste Management

Waste Management of Alameda County (WMAC)

Sales: (510) 613-8700

Customer Service: (510) 613-8710

Link to Waste Management site with contact information local for the City of Hayward:

<https://www.wm.com/find-a-facility.jsp?address=94544#/?address=94544%20usa&radius=80500>



## GRANTS

“SARE grants fund research and education projects exploring: marketing, sustainable communities, integrated systems, pollinators, and local and regional food systems,” among more, which are not necessarily relevant to Hayward’s interests. It is not apparently evident if Hayward qualifies for any of the grants offered by SARE, but it could be worth doing more research here.

Link: <http://www.sare.org/Grants>

CalRecycle offers multiple grants mainly geared towards improving or creating infrastructure “for aerobic composting and anaerobic digestion and recycling.” The Altamont Landfill was recently awarded a grant from CalRecycle to introduce one of those infrastructures. CalGrant “funds will be used to provide technical training or permitting, inspection and enforcement, to purchase personal protective equipment, supplies, and field equipment for inspectors, and to provide educational materials, professional membership funds, and subscriptions.”

Link: <http://calrecycle.ca.gov/Climate/GrantsLoans/default.htm>

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## EARLY EDUCATION

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### THE IMPORTANCE OF EARLY EDUCATION

The Office of Workforce Management of the National Oceanic and Atmospheric Administration (NOAA) states in one of their articles, *Encouraging Health Habits in Your School-Aged Child*, “The health habits your child develops during the school-aged years - the wide span between five and 12 - often become habits for life.” Although this article is obviously geared towards personal health choices, it is still, nonetheless, applicable to composting and other sorting behaviors. An article in *Psychology Today*, titled *Adolescence and the Development of Habits*, it is stated, “practice can make permanent because by repeating ways of acting, a young person forms habits for good or for ill, [and] whether good habits or bad, people are by repetition ruled because human beings are not simply creatures of habit; they are captives of it.” People rely on heuristics and habits for so many of our daily functions, that we wouldn’t be able to identify most of them, and the vast majority, if not all, of our heuristics and habits remain unchecked and untested for their efficacies. As childhood habit are likely to form lifelong habits, it is important to form healthy and productive habits in early childhood, to maximize this effect. As waste disposal is often one of those habits that people are not examining, if young children learn about proper sorting habits in school, it will not only encourage good sorting habits among the children, but may also cause adults (parents, teachers, and other adults in contact with those students’ educations) to examine those habits, and possibly adjust them to something they would find more appropriate. Link



to NOAA article:

[http://www.wfm.noaa.gov/workplace/RaisingChildren\\_Handout\\_3.pdf](http://www.wfm.noaa.gov/workplace/RaisingChildren_Handout_3.pdf)

Link to Psychology Today article: <https://www.psychologytoday.com/blog/surviving-your-childs-adolescence/201201/adolescence-and-the-development-habits>

Dr. David Whitebread and Dr. Sure Bingham of the University of Cambridge author an article, titled *Habit Formation and Learning in Young Children*, that discusses, at quite extensive detail, how habits are formed and maintained, and how children learn through different means and methods, specifically with the focus of finance management. Whitebread and Bingham state that the individual child's "beliefs about the intrinsic value of any learning activities they undertake," as well as their emotional responses to the activity, and level of interest in the activity itself, are all influential motivators in the child's active participation of, and therefore learning through, the activity. Whitebread and Bingham also imply that these activities would be most effective as physical games, or things of the like, to create long-lasting sorting behaviors with a longer-lasting and effective understanding of what ought to be sorted, where, as compared to a digital game or activity, performing the same task(s) in real time. These University of Cambridge authors state, "several studies have found that children join in simple 'saving' behaviours not because they understand the concepts behind this form of 'delay of gratification', but because they enjoy participating in "adultlike" behaviour, or wish to comply with parental expectations."

Link: <https://mascdn.azureedge.net/cms/the-money-advice-service-habit-formation-and-learning-in-young-children-may2013.pdf>

All of this not only demonstrates the importance of coordination between the City, its schools, and its residents, but it also shows that it is beneficial for young children to be practicing proper sorting behaviors with a three-stream system, even if the schools are unable to make the change to a three-stream system of waste disposal, and are only capable or willing to maintain a single-stream system. There certainly would be financial benefits for the City of Hayward and the Hayward Unified School District (HUSD) if HUSD were to implement a three-stream system, as much more organic waste would be diverted from landfills, contributing to a higher diversion rate, citywide; lowering the chances of Hayward being fined for not making their mandated waste diversion percentages. HUSD would save money from diverting their waste as well, as an increase in food waste has been found in school that are offering 'healthier' options for their students.

In addition to these economic benefits, the benefits of the students of the institutions overseen by HUSD having reliably accurate and long-lasting sorting behaviors benefits the student, where they live, and the environment as a whole, in ways that cannot be calculated. There are many school districts that have enacted programs in their cafeterias to implement 'Reduce, Reuse, Recycle, Rot.' It may be a mistake to not use waste as an opportunity to teach youth life-long sustainability practices and educate them the relevance of resource conservation and how composting is a part of this equation.



A pilot program in Oakland, California, was propagated at a small, neighborhood level of government and has been greatly supported and encouraged by higher levels of local government. This program has integrated a district wide standard for waste disposal and has established committees to oversee ongoing sustainability efforts as they pertain to Oakland's school district. Link to pilot program:

[http://www.stopwaste.org/sites/default/files/Sequ\\_Peral%20Garden%20Case%20Final\\_o.pdf](http://www.stopwaste.org/sites/default/files/Sequ_Peral%20Garden%20Case%20Final_o.pdf)

The city of Davis, California, also implemented a similar pilot program, as the one seen in Oakland, in 2012.

Link to Davis Farm to School Homepage: <http://www.davisfarmtoschool.org>

Link to analysis and cost statistics of this program:

<http://www.davisfarmtoschool.org/3079-2/school-composting/>

In a report documenting the importance of implementing the importance of operant conditioning in shaping behavior of young students, it is explained, "When a student makes many mistakes it means that one step does not lead logically to the next step or the steps in the process may be too large. The learning situation may become punishing and aversive to the student who is making errors, which often results in a decline of natural motivation to learn." What this means is that if children are going to be taught to compost, the need to be taught in the correct way to maintain a more natural motivation that will be longer-lasting than motivations that are external to them. Although the City of Hayward doesn't have control over HUSD, the City can still encourage HUSD to adopt such a program or programs by creating incentives for the district through grants, free or discounted materials, partnerships, and/or other supporting resources.

Link: <http://files.eric.ed.gov/fulltext/ED085289.pdf>

StopWaste offers a school program that incorporates a three-stream system.

Link: <http://www.stopwaste.org/recycling/schools/school-districts>

Here is a PDF that was originally published by Alameda Waste Management. It is geared toward children to teach them about composting. There is also a helpful table to be printed out and given to children to write down the items in their lunchboxes to help them decide whether they should be composted, recycled, reused, or thrown in the trash.

Link:

[http://www.cvswwmd.org/uploads/6/1/2/6/6126179/do\\_the\\_rot\\_thing\\_cvswwmd1.pdf](http://www.cvswwmd.org/uploads/6/1/2/6/6126179/do_the_rot_thing_cvswwmd1.pdf)

This is an easy to read slide show for children that explains how to make and place different types of compost bins and piles. The first few slides talk about what composting is and the science behind it. Later on, it explains how to set up a bin or pile. This can be used to teach children how to set up their own piles at home, or in preparation for creating a garden with a compost set up at the school.



Link: <http://aggie-horticulture.tamu.edu/kindergarden/kidscompost/CompostingForKids.pdf>

There is a video on YouTube that is intended for child audiences, that has been made by children. The video explains the importance of composting and gives a lot of examples of what to put in compost bins at school.

Link: <https://www.youtube.com/watch?v=dRXNo7Ieky8>

Composting Council has a PDF that explains, step by step, how to initiate composting behaviors at an early age.

Link: <http://compostingcouncil.org/wp/wp-content/uploads/2015/06/Composting-at-School-0307.pdf>

The School Garden Project is an organization that explains ways to successfully implement a composting plan for school gardens. This PDF offers advice on ways to influence school employees and faculty, as well as the local community involved in implementing composting programs at schools. This document also offers methods to educate children about sorting out their organic waste and how to transform these behaviors into habits. This method advises nominating a ‘compost monitor’ that would be available to the children to help assist them if need be, for about the first two weeks, until students are confident in their sorting behaviors.

Link: <http://schoolgardenproject.org/wp-content/uploads/2013/06/Cafeteria-Composting-Manual-for-printing.pdf>

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## MISCELLANEOUS RESOURCES

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### FOR ORGANIC WASTE

#### **Real Foodies Compost – San Francisco**

Link: <https://www.realfoodiescompost.com/>

This website is part of an advertisement campaign being organized by the San Francisco Department of the Environment. The name implies a certain urban or environmentalist elitism that can be incentive for certain people to showcase some social hierarchy through consciousness of environmental health and names their target audience as those that would identify, or would like to identify as ‘foodies.’ The website offers ‘cool’ recipes for foodies. The modern website design is minimized and user friendly, making composting seem easy, because the website is easy to navigate - with an intuitive feel. The site gives a lot of specific examples that could clear up a lot of confusion related to sorting (in San Francisco). Other than making it easier, the website does not offer much incentive and is reliant on the reader to already be educated on the



consequences of not composting/the benefits of composting. The site makes it clear that the intention is not to get people to compost at home, but rather to sort the organic waste into their organic waste curbside bins.

### **Victoria, Australia Non-Profit Webpage**

Link: <http://environmentvictoria.org.au/content/organic-waste>

The attitude of this web page is geared toward donations. This assumption comes from a couple of reasons, no matter which page you're on within their site, a large bright colored orange donation tab is always available. On each of their four main tabs at the top that read, "Learn, Act, Give, Share" most begin with a strong attempt to sway you to donate, such as, "Now imagine yourself getting involved in one of the many ongoing campaigns and programs designed to restore and protect Victoria's precious waterways." This phrase is used over and over again throughout their webpage. They also have a pie chart that shows total expenditure: 2,373,663 dollars, 15 percent on fundraising, 13 percent on administration, and 72 percent on campaigns.

There is a lot of good general information, but not a lot of detailed information. For example, one tab that people would be likely to click on, "Get into Composting," would have lots of valuable information. It was surprising to see that it only had a short general paragraph, explaining how greenhouse gasses are bad and that we should start composting. They provided a separate source below the paragraph that goes into more detail but only discusses a small portion of composting. This mainly consisted of encouraging people to buy a compost bin, providing a very small list of some compostable items, and bullet pointing a couple concerns people might have. This is particularly interesting as it claims to be a non-profit site that is selling these bins.

### **StopWaste Video**

Link: <https://www.youtube.com/user/stopwasteorg/about>

StopWaste has a channel on YouTube showcasing the efforts already being put forth by Alameda County. Most of the articles on the Hayward site contain a YouTube video, and although StopWaste isn't on all of them, they still cover a lot of aspects of sustainability. Food disposal videos carried the lowest amount of views, despite the information being there, people are still not seeing it.

### **Inhabit Movie**

Link: <http://inhabitfilm.com/>

This film brings composting full circle. This film could make people want to compost because it shows how composting in other places really helps permaculture thrive on different levels. It is generally more geared to people interested in home composting, but may also be helpful for those that are just interested in composting to initiate the sorting behaviors they are interested in. The film is less than ten dollars to buy or rent, so it is accessible to most people if they are interested.



## **Waste Diversion in European Countries**

Link:

[http://ec.europa.eu/environment/waste/studies/pdf/financingmunicipalwaste\\_management.pdf](http://ec.europa.eu/environment/waste/studies/pdf/financingmunicipalwaste_management.pdf)

This article discusses a weight-based collection scheme for European countries and explains that households introduced to a weight-based collection scheme had improved their organic waste removal by nearly 40 percent.

Link: <http://www.eea.europa.eu/media/newsreleases/highest-recycling-rates-in-austria>

This article goes into depth about a singular trash system that is reported to be very successful.

## **2005 StopWaste Survey for Alameda County**

Link:

<http://www.stopwaste.org/sites/default/files/Documents/compostsurveysummary.pdf>

This is a report from a telephone survey from October of 2005, with reports from all around Alameda County. There were some basic, but seemingly unavoidable issue with the sample population that should be addressed as there issues could have skewed the results from what would have been a more accurate representation of the total population for the county. The 'list' population "[was] selected from a list of users who had purchased a composter worm bin through ACWMA between 1991 and September of 2005," and the Random DigitalDial (RDD) population "was selected using a representative and randomly drawn sample of Alameda County residents," (p. 3). Those from the list population are financially invested in composting, but are only known to be involved with or interested in home composting. Those in the RDD sample had to consent to take the survey, which means that at least some of the people agreed to take the survey were interested in composting, or at least complying with what the county is asking of them; this is not necessarily the population that we will encounter with all of our Hayward residents. It is fair to assume that those in the RDD sample were at least somewhat interested in composting or the environment, generally. It is also important to note that both population samples must have "had a yard or garden at their place of residence," which excludes some residents that composting with the three-stream system wouldn't exclude (p. 3). One way to avoid these issues of conflict in surveying is to include a survey with Waste Management billing and to residents of multi-family residents that offers some sort of financial incentive to complete the survey.

## **Single Stream Systems**

Link: <http://www.container-recycling.org/assets/pdfs/reports/2009-SingleStream.pdf>

This is an article about the economic and environmental impacts of single-stream systems.



Link: [www.mdpi.com/2079-9276/4/2/384/pdf](http://www.mdpi.com/2079-9276/4/2/384/pdf)

This is an article about single stream systems and their reliance on infrastructure for proper waste sorting, management, and disposal. It is generally presumed that single-stream systems cost less than multi-stream systems, but due to their reliance on infrastructure, the costs are actually higher than multi-stream systems. The article also implies that the efficacy of the multi-stream systems is of better quality than that of the single-stream systems as well. There is a lot of specific data available from 223 municipalities over a ten-year period here.

### **Excess Food Waste**

Link: <http://notreallyexpired.com/the-problem/>

Here is a website that explains the confusion on the "sell by" or "use by" dates on food/milk. It seems to be like an organization to educate or spread awareness on date labels. On their website, it says that it is reported that 90 percent of consumers throw away their food when they see the date label thinking that it is the expiration date. Confusion on date labels is part of why there is so much food waste. Clearing up this confusion on date labels would help decrease the amount of food waste in landfills. The website also offers a video that explains the confusion on milk label.

### **Costco**

No Link

The Costco on Hesperian Boulevard has initiated a three stream system for the waste that the store produces. According to a short discussion that a couple of students had with an assistant manager there, the employees of Costco are enthusiastic about doing their part in sustainability. Although the three stream bins are available, much of the waste is still not sorted properly and an employee is responsible for sorting through each bin to be certain that the waste is sorted correctly. The students that visited this establishment observed 35 people dispose of their waste in the food court, and found that 60 percent of those observed (across children, adults, and seniors) did not sort their waste properly. Those students also observed that the signage available for the waste bins were not detailed, though the 'compostable' bin had an infographic directly on the bin that labeled the bin as 'food and food-soiled paper', which seems as if it should be forward enough. Maybe patrons that are shopping are too distracted to be trusted to even notice signage, let alone notice that there are separate bins for different types of waste.

### **BioEnergy Consult**

Link: <http://www.bioenergyconsult.com/>

BioEnergy Consult is an organization, which has worked on several successful projects on waste management and policy formulation. There are advisors on the website that the city of Hayward could work with in association to waste to energy, solid waste management, waste recycling and composting.



## Zero Waste Events

Link: <http://www.ecocycle.org/recycle-compost-reuse/compost>

Here is a link for "zero waste events" which is a great idea in getting the city of Hayward together to participate in composting. There could even be incentives in order to draw a larger crowd in Hayward.

## Master Compost and Solid Waste Course

Link: [www.recycleworks.org/academy](http://www.recycleworks.org/academy)

The county of San Mateo offers a free 8-week course focusing on home composting. More details are available through the link.

## For Sustainability, Generally

### Real Foodies Compost – San Francisco

Link: <https://www.realfoodiescompost.com/>

The *Real Foodies Compost* website offers environmentally friendly information such as San Francisco's carpooling and business incentives to encourage said carpooling, renewable and efficient energy options (incentives and financing), how to go about recycling more unconventional items like electronics or furniture as well as companies that will pick up these items to recycle them for you.

### A Biodegradable Plastic

Link:

<https://www.acs.org/content/acs/en/pressroom/newsreleases/2016/august/edible-food-packaging-made-from-milk-proteins-video.html>

This article discusses the discovery of making plastic from a milk protein called Casein. This is a biodegradable plastic that could be useful for dry packaging (only) as the plastic dissolves with water. With further research and technology, this could be a useful option soon.

### Bay Area Sunshares

Link: <https://fremont.gov/2295/SunShares-Program>

Daly City joined nearly 40 cities and employers across the Bay Area to offer discounts on solar systems and zero-emission vehicles

This project would be great for the city of Hayward to get involved to help their composting and clean energy techniques.

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## CONCLUSION

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How do you draw a conclusion from so many sources and so many voices? Perhaps the myriad of voices and ideas is conclusion enough. Hopefully, an expression of some of the voices is a start. Consider how hard it is to focus on the relevant parts of the issue. That might provide more insight than anything into the attitudes toward organic waste and compost.



# CITY OF HAYWARD

Hayward City Hall  
777 B Street  
Hayward, CA 94541  
[www.Hayward-CA.gov](http://www.Hayward-CA.gov)

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**File #:** ACT 17-012

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**DATE:** March 13, 2017

**TO:** Council Sustainability Committee

**FROM:** Director of Utilities and Environmental Services

**SUBJECT**

Green Infrastructure Framework

**RECOMMENDATION**

That the Committee reviews, comments and recommends approval of the Green Infrastructure Framework by Council.

**ATTACHMENTS**

|               |                    |
|---------------|--------------------|
| Attachment I  | Staff Report       |
| Attachment II | Draft GI Framework |



DATE: March 13, 2017

TO: City Council Sustainability Committee

FROM: Director of Utilities & Environmental Services

SUBJECT: Green Infrastructure Framework

#### RECOMMENDATION

That the Committee reviews, comments and recommends approval of the Green Infrastructure Framework by Council.

#### SUMMARY

This report provides a follow up to the September 12, 2016 [report](#) regarding the newly adopted Municipal Regional Permit (MRP 2.0) and its requirements related to green infrastructure. This report provides the CSC with green infrastructure background and the steps City staff has completed to date, including the requirement to draft and approve by Council a green infrastructure framework by June 30, 2017, in order to comply with the MRP 2.0.

#### BACKGROUND

*Municipal Regional Permit* – The National Pollutant Discharge Elimination System (NPDES) program was established in 1972 by the Federal Clean Water Act (CWA). In 1986, the NPDES program was amended to regulate stormwater runoff and established a permitting structure for municipal discharge to the waters of the state. In October 2009, the first *regional* stormwater permit, the Municipal Regional Permit (MRP), was adopted by the San Francisco Bay Regional Water Quality Control Board (Water Board). The MRP, adopted as a five-year permit, requires stormwater pollution prevention control measures for both public and private properties and activities including development and specific controls for pollutants of concern identified by the Water Board.

Since 2003, Provision C.3 in the City's stormwater permit required stormwater controls for development projects. Provision C.3 specifically addresses the control of stormwater impacts associated with new development and redevelopment projects. With the adoption of the MRP in 2009, Provision C.3 was expanded to apply to projects that create 10,000 square feet or more of impervious area. The MRP was renewed as MRP 2.0 in November 2015 and included a revised Provision C.3 with increased prescriptive requirements for development and a significant new requirement for Green Infrastructure Planning and Implementation. An example of the green infrastructure required by C.3 is illustrated below:



In the MRP 2.0, Green Infrastructure was also required to reduce both PCBs and mercury pollution to the bay by treating a minimum number of acres of old industrial areas known to contain legacy PCB and mercury contamination. Specifically, it is estimated the City has to treat forty-three acres of industrial area to reduce PCBs and mercury by 2020. It is estimated the City has to treat 797 acres of old industrial areas and 865 acres of urban areas to reduce PCBs and mercury by 2040.

#### Green Infrastructure Planning and Implementation

MRP 2.0 requires local agencies, including Hayward, in the next five years, to develop and begin to implement a Green Infrastructure Plan. This Plan is intended as a framework, developed by municipalities, to guide development and redevelopment to include the treatment of stormwater (capture for reduction, filtration and absorption or recharging of groundwater). The purpose of this Plan is to, over time, reduce the adverse water quality impacts of urbanization and urban runoff on receiving waters as well as reduce PCBs and mercury from entering the Bay. The intent to green cities is illustrated below as green infrastructure will protect the Bay with treated stormwater:



The requirements for the Plan include a description of how the Permittee will shift impervious surfaces and stormwater drain infrastructure from gray, or traditional storm drain infrastructure where runoff flows directly into the storm drain and then the receiving water, to a green and more sustainable system.

## DISCUSSION

To implement the new Green Infrastructure requirements, Water Pollution Source Control (WPSC), a division of Utilities & Environmental Services, has been organizing the effort to draft the required Green Infrastructure (GI) framework, which is due in June of 2017. The longer-term GI Plan due in 2019. A “GI Team” was formed to create the framework, Plan, and implementation of these associated plans. The GI Team includes staff from Planning, Building, Streets and Maintenance, Engineering and Transportation, Fire, and Economic Development. To date, Planning and Engineering and Transportation have participated in a small workgroup to draft the City’s GI framework. Other departments will participate with the final draft prior to adoption. WPSC staff is taking the lead to organize and track progress of the GI Team and assist with the process of developing and presenting the framework and Plan to Council and the CSC.

The GI Team has developed a Framework included as Attachment A to this report. The Framework explains the steps the City will follow to develop the longer-term GI Plan as well as list the commitment of the City to comply with the GI goals in the MRP. The GI Team will continue to meet, prepare updates, and solicit input from the Council Sustainability Committee and appropriate City staff who will be tasked with implementing the GI requirements. As required by the MRP 2.0 Green Infrastructure section, the GI Team will conduct outreach to other City staff and the development community involved in planning and constructing infrastructure. The GI Team will also develop training materials to assist City staff who will be involved in designing and overseeing GI projects.

Implementation of the GI requirements will also be organized and managed by the GI Team. To start, the Team has begun reviewing all capital improvement projects to incorporate GI features into the design as feasible. Review of projects and reporting of why or why not GI was incorporated into the projects is part of the GI requirements. Next the GI Team will identify public projects, particularly in older industrial areas of Hayward where GI can be incorporated and develop project descriptions with the idea of submitting projects as proposals for grant funding in the near future. The cost associated with redeveloping old industrial areas is estimated to range from \$200,000 to \$365,000 per acre. There is great incentive to organize future projects in order to apply for grants to help pay for these costs. For more information on what staff will be and has been implementing towards the GI requirements please refer to the September 12, 2016 report.

## ECONOMIC IMPACT

The development community will share in the cost to implement green infrastructure as required by the current C.3 requirements. The development community will also share in the cost of implementing green infrastructure and other control measures to ensure PCBs and mercury do not enter the storm drain system. City staff will be looking at older industrial

areas in Hayward to determine where reduction of PCBs and mercury is possible either through development/redevelopment or through stormwater mitigation measures through our inspection program. The enhanced stormwater inspection enforcement will result in costs to some Hayward businesses. These enhanced enforcement actions will include implementation of routine stormwater inspection requirements with a strong emphasis on operation and maintenance of C.3 facilities as well as PCB and mercury controls. It should be noted that given the regional and statewide network of the GI requirement, the cost impacts will not be unique to Hayward.

## FISCAL IMPACT

Implementation of MRP 2.0 will impact staff resources though the exact costs are unknown at this time. The funding for MRP-related activities is currently provided by the stormwater enterprise fund. The City's local stormwater program is funded by property tax revenue; however, expenditures have been and are expected to increase every year without the likelihood of any increase in the tax. The City is challenged with finding innovative tools and other resources to complete the above mentioned tasks. In addition to the requirements described in this report, it will also be a challenge to fund the other provisions in the MRP 2.0, mainly the aggressive trash reduction activities required by Provision C.10 to reach 100% trash reduction by the year 2022. To comply with the MRP 2.0 requirements, WPSC staff has pursued grant funding opportunities both locally and regionally to offset some of these costs. Staff will continue to pursue funding opportunities to meet the MRP requirements, specifically for Provision C.10 (trash) and C.3 (green infrastructure).

Staff will also continue to work collaboratively as a member of the ACCWP to comply with the MRP 2.0 as regional projects can satisfy some of the MRP requirements. Finally, the City will carry the majority of the cost of implementing large scale public projects during the next five years of the MRP 2.0 called for in the Green Infrastructure Plan to meet the PCBs and mercury wasteload allocation limits. The Green Infrastructure Plan will include details about public versus private responsibilities and will include cost estimates for both. However, the timeframe for the pollutant reductions is a municipal requirement. Infrastructure provided by private development will likely help the City comply, but the timing associated with future private development is uncertain.

## SUSTAINABILITY FEATURES

The Sustainability features include efficiency and water conservation by creating more green landscape and filtration of stormwater, reduction of air emissions by creating more green landscape, and consistency with the City's Complete Streets Policy by creating more open space.

## PUBLIC CONTACT

No public meetings have been scheduled to discuss the new MRP 2.0 requirements. Staff will conduct comprehensive outreach with developers during the development of the Green Infrastructure Plan.

## NEXT STEPS

Staff will continue to enhance the current stormwater program to comply with the MRP 2.0 requirements, specifically the C.3 green infrastructure plan, and will continue to proactively pursue funding opportunities. WPSC will continue to engage with other City staff, namely Planning, Building, Streets and Maintenance, Engineering and Transportation, and Economic Development, continue and expand the GI Team, and develop the GI Framework for CSC review and recommendation of approval by City Council by June 30, 2017 as well as implementing control measures specifically for C.3 and GI. WPSC will continue to participate in countywide and regional collaborations to support GI and C.3 compliance.

Following is a summary of the key requirements and deadlines included in the MRP 2.0 Provision C.3:

|                                                                                     |                |
|-------------------------------------------------------------------------------------|----------------|
| Develop and Approve a Green Infrastructure Framework<br>(requires Council adoption) | June 30, 2017  |
| Prepare a Green Infrastructure Plan<br>(requires Council adoption)                  | September 2019 |

*Prepared by:* Elisa Wilfong, Water Pollution Control Administrator

*Recommended by:* Alex Ameri, Director of Utilities & Environmental Services

*Approved by:*



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Kelly McAdoo, City Manager

## City of Hayward Framework for Green Infrastructure Plan Development

This Framework for Green Infrastructure Plan Development is organized as follows.

- Section 1: Purpose
- Section 2: Municipal Stormwater Permit Deadlines
- Section 3: Specific Tasks for Plan Development
- Section 4: Timeframe for Plan Development
- Section 5: Staffing Assignments
- Section 6: Budget

### 1. Purpose

The purpose of the Green Infrastructure Plan is to guide the identification, implementation, tracking, and reporting of green infrastructure projects. “Green infrastructure” refers to a sustainable system that slows runoff by dispersing it to vegetated areas, harvests and uses runoff, promotes infiltration and evapotranspiration, and uses bioretention and other low impact development practices to clean stormwater runoff. The Green Infrastructure Plan will be developed in accordance with Green Infrastructure Plan requirements in Provision C.3.j of the Municipal Regional Stormwater Permit (Regional Water Quality Control Board Order No. R2-2015-0049, adopted on November 19, 2015), which states in part:

....the [Green Infrastructure] Plan is intended to describe how Permittees will shift their impervious surfaces and storm drain infrastructure from gray, or traditional, storm drain infrastructure where runoff flows directly into the storm drain and then to the receiving water, to green—that is, to a more resilient, sustainable system that slows runoff by dispersing it to vegetated areas, harvests and uses runoff, promotes infiltration and evapotranspiration, and uses bioretention and other green infrastructure practices to clean stormwater runoff.... The Plan is intended to serve as an implementation guide and reporting tool... to set goals for reducing, over the long term, the adverse water quality impacts of urbanization and urban runoff on receiving waters.

### 2. Municipal Stormwater Permit Deadlines

Provision C.3.j.2.(1) of the Municipal Regional Stormwater Permit requires the City of Hayward, by June 30, 2017, to approve a framework or workplan to develop a Green Infrastructure Plan. The complete Green Infrastructure Plan must be submitted to the Regional Water Quality Control Board by September 30, 2019.

### 3. Specific Tasks for Plan Development

Preparation of the Green Infrastructure Plan will require the following specific tasks.

#### Identify Green Infrastructure Projects

Future green infrastructure projects will be identified for inclusion in the Green Infrastructure Plan. This will include documentation of existing plans for private and public development projects that would be subject to MRP Provision C.3 requirements for development projects to include stormwater treatment facilities. Examples of projects include private residential developments and public street improvements. The Green Infrastructure Plan will also document the continuing implementation and results of the City of Hayward's process, initiated in Fiscal Year 2015-16, to review planned capital improvement projects that are not subject to Provision C.3 stormwater treatment requirements, to identify the potential for incorporating green infrastructure. Additionally, a tool developed by the Alameda Countywide Clean Water Program will be used to identify, map, and prioritize potential green infrastructure projects that may be included in the Green Infrastructure Plan.

#### Develop Tracking Procedures

Guidance provided by the Clean Water Program will be used to develop procedures for estimating the pollutant load reduction benefits of green infrastructure projects, and for tracking and reporting on completed projects. The procedures will be described in the Green Infrastructure Plan.

#### Incorporate Guidelines and Typical Designs

The Green Infrastructure Plan will incorporate guidelines for streetscape and green infrastructure project design and construction, and green infrastructure typical design drawings and specifications. This will be based on example guidelines, typical design drawings, and specifications provided by the Clean Water Program. The City of Hayward will evaluate the materials provided by the Clean Water Program for consistency with local standards, and will revise existing guidelines, standard specifications, design details, and procedures as needed.

#### Update Planning Documents

Planning documents, including those listed below, will be reviewed, and relevant sections of these documents will be modified, as needed, for implementing green infrastructure in public and private development projects to support the implementation of the Green Infrastructure Plan. This will include the following planning documents:

- General Plan, specific plans, and area plans
- Complete streets plan, active transportation plan
- Pavement rehabilitation work plan
- Tree Inventory plan

- Other plans that may affect the future alignment, configuration, or design of roadways, parking lots, buildings, and other impervious surfaces.

#### Evaluate Funding Sources

An evaluation of funding sources for potential future public green infrastructure projects will be included in the Green Infrastructure Plan. Guidance provided by the Clean Water Program may be used to develop an in-lieu fee for private development projects that are constrained from fully meeting stormwater treatment measures onsite, as a potential funding source for future public green infrastructure projects.

#### Training and Outreach

Staff will receive training on green infrastructure planning, implementation, design, and maintenance at inter-departmental meetings by attending training sessions provided by the Clean Water Program. Updates and opportunities for input on the preparation of the Green Infrastructure Plan will be provided to the City Council and City Council Sustainability Committee. Outreach to the general public and development community will be conducted in coordination with the Clean Water Program.

#### Compile Green Infrastructure Plan

Documentation of the tasks described above will be compiled into the Green Infrastructure Plan for review by the City Council Sustainability Committee and City Council.

#### Implement the Green Infrastructure Plan

Staff will present a resolution for adoption by Council to approve and begin implementing the Green Infrastructure Plan.

#### Submit Plan to the Water Board

The Plan and approved resolution, will be submitted to the Regional Water Quality Control Board (Water Board) with the City of Hayward's 2019 Annual Report of Stormwater Program Implementation.

#### 4. Timeframe for Plan Development

The schedule for conducting specific tasks is presented below. Adoption of the Green Infrastructure Plan is scheduled to be completed by June 30, 2019. The Plan and adopted resolution must be submitted to the Regional Water Board by September 30, 2019.

##### Schedule of Specific Tasks

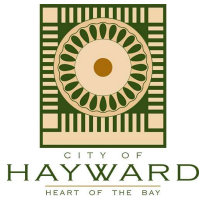
| Task                        | FY 2016-17 |    | FY 2017-18 |    |    |    | FY 2018-19 |    |    |    | FY 2019-20 |    |
|-----------------------------|------------|----|------------|----|----|----|------------|----|----|----|------------|----|
|                             | Q3         | Q4 | Q1         | Q2 | Q3 | Q4 | Q1         | Q2 | Q3 | Q4 | Q1         | Q2 |
| Identify Projects           |            |    |            |    |    |    |            |    |    |    |            |    |
| Develop Tracking Procedures |            |    |            |    |    |    |            |    |    |    |            |    |
| Incorporate Guidelines      |            |    |            |    |    |    |            |    |    |    |            |    |
| Update Planning Documents   |            |    |            |    |    |    |            |    |    |    |            |    |
| Evaluate Funding Sources    |            |    |            |    |    |    |            |    |    |    |            |    |
| Training and Outreach       |            |    |            |    |    |    |            |    |    |    |            |    |
| Compile Plan                |            |    |            |    |    |    |            |    |    |    |            |    |
| Adopt Plan                  |            |    |            |    |    |    |            |    |    |    |            |    |
| Submit Plan to Water Board  |            |    |            |    |    |    |            |    |    |    |            |    |

#### 5. Staffing Assignments

Staff from Environmental Services will direct the preparation of the Green Infrastructure Plan.

#### 6. Budget

Development of the Green Infrastructure Plan will be developed in-house by City staff using currently budgeted resources.



# CITY OF HAYWARD

Hayward City Hall  
777 B Street  
Hayward, CA 94541  
[www.Hayward-CA.gov](http://www.Hayward-CA.gov)

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**File #:** ACT 17-020

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**DATE:** March 13, 2017

**TO:** Council Sustainability Committee

**FROM:** Director of Utilities & Environmental Services

**SUBJECT**

Advanced Metering Infrastructure Project Update

**RECOMMENDATION**

That the Committee discusses and comments on the proposed features to be included in a customer engagement web portal and provides staff direction on recommended features.

**ATTACHMENTS**

|               |                                       |
|---------------|---------------------------------------|
| Attachment I  | Staff Report                          |
| Attachment II | Customer Notification Letter Template |



DATE: March 13, 2017

TO: Council Sustainability Committee

FROM: Director of Utilities and Environmental Services

SUBJECT: Advanced Metering Infrastructure Project Update

#### RECOMMENDATION

That the Committee discusses and comments on the proposed features to be included in a customer engagement web portal and provides staff direction on recommended features.

#### SUMMARY

In April 2016, the City Council authorized execution of a contract to purchase and install an Advanced Metering Infrastructure (AMI) Project. Project implementation has begun and close to 2,000 meters have been replaced, as of the end of February. The project maintains a strong focus on customer service and outreach. Staff is currently pursuing development of a customer engagement web portal to enhance the benefits of the project to customers and is seeking Committee input on selection criteria.

#### BACKGROUND

The City receives all its water supply from the San Francisco Public Utilities Commission (SFPUC) and distributes the water to residential, commercial, industrial, and governmental customers. Customers are billed for actual water use as measured by water meters, which are manually read on a bimonthly basis. For context, the City has approximately 34,000 customer endpoints (water meters).

Even with safety procedures in place, City meter readers have been prone to injury due to the repetitive nature of the work. Bimonthly meter reading also provides customers with limited and outdated consumption information, which can be inefficient in terms of conservation efforts because customers are unaware of their consumption throughout the bill period; and leaks can go undetected for weeks or months.

In recent years, the use of a technology known as Advanced Metering Infrastructure (AMI) has become more widespread in the water utility industry. AMI enables two-way communication over a fixed network between the utility system and metering endpoints (customers). This allows meters to be read, monitored, and managed from a remote, central location rather than relying on the physical read of a meter in the field by an employee.

AMI systems can provide many benefits, including allowing meters to be read more frequently (e.g. daily or hourly). The resultant interval data can be used for purposes beyond billing, such as consumption reporting, leak detection, tamper alerts, as well as to populate a customer web portal, which allows customers to see detailed water usage information and better understand and manage their water use.

The City's current meter stock is, on average, over forty years old, and needs replacement independent of how the meters are read. The AMI installation process would also provide the opportunity to update the current meter stock throughout the service area and allow the City to establish a comprehensive meter inventory with GPS coordinates for mapping purposes, and clean up any errors that have occurred during the transition from a paper-based system to an electronic inventory. AMI data would provide the City the opportunity to consider transitioning to monthly utility billing, as well as redeploy staff resources towards preventative maintenance activities and customer service.

In 2013, staff began to study the feasibility of implementing AMI in Hayward. Given the significant investment of resources, staff determined that it would be in the City's best interest to pilot-test three different AMI systems and to obtain equipment pricing for City-wide implementation of various systems. The intention was to have the success of the pilot program aide in the selection process to procure an AMI vendor for the City-wide AMI program. In summary, staff found that the vendor that best met the City's objectives was Aclara. On April 5, 2016, the Council authorized the City Manager to execute a contract with Aclara for the purchase and installation of an AMI system.

## DISCUSSION

### Project Kick-Off

Upon execution of the contract in late April, staff commenced project implementation. Prior to beginning the installation aspect of this project, there was significant preparation work required to facilitate a smooth project rollout. Activities during this time were predominately data driven (e.g. refining reports for number of meters by size, type, account, location, etc.) to ensure proper integration between the City's meter inventory and utility billing software, and the Aclara installation work order software. Staff also worked with Aclara to prepare installation schedules by route, complete a detailed meter box lid survey (as all lids will be replaced or modified as part of this project), and oversee the initial hardware ordering of meters and meter transmission units (MTUs).

City staff spent a significant amount of time reviewing installation procedures with the contractors who would be out in the field performing the work. The nature of the installation work requires extremely close coordination with Field Services staff, who are relied upon to provide timely direction to the contractor should they encounter any issues during the meter replacement and programming process. The details and protocols for this coordination (commonly referred to as the "return to utility" or RTU process) have been discussed at length, but will continue to be developed as the project proceeds.

While a contractor will handle all existing meter replacements, City staff will begin installation of AMI meters for new development moving forward. For this reason, in December 2016, a group of Field Services, billing, customer service, and administrative staff completed three-days of training with Aclara, which covered installation and programming of the MTUs and use of the Aclara software.

Another major project implementation task was refining locations for the twenty-seven data collector units (DCUs) installed throughout the City to collect meter reads and transmit them to a central server, as well as preparing the subject DCU sites for installation. Installation of DCUs began in December 2016. To date, twenty-two have been installed, and five are pending installation. The pending locations continue to be studied to determine the best placement to maximize reception for the reading area.

#### Meter Replacement To-Date

As of the end of February, just under 2,000 meters have been installed and programmed in various areas of the City. The replaced meters are currently reading at a 98% reception rate. The reception rate is defined as the number of transmissions received over a thirty-day period. The City's system is programmed to provide hourly reads (i.e. twenty-four reads per day per meter, or 720 reads over a thirty-day period). The required reception standard in the contract is 98.5%. The reasons behind the project not quite meeting reception standards at this point are 1) five of the DCUs have not yet been installed, which affects reception in that a meter may not have a DCU in close enough proximity to send a read, and 2) not all meter box lids have been replaced to allow better signal transmission, so a portion of the MTUs are not able to transmit through the existing concrete lid. This has been the case in a specific size of oval shaped lids where the replacement lid ordered had a small gap which staff deemed to be unacceptable and is therefore actively pursuing a solution.

#### Future Customer Web Portal

As mentioned previously, the interval consumption data generated from this project will populate a future customer engagement web portal, which would allow customers to see detailed water usage information and better understand and manage their water use. These portals, which can be accessed on a computer or smart phone, are becoming an increasingly popular tool to help customers monitor their consumption and allow the utility to communicate directly and in a timely manner with their customers. Staff expects to prepare and release a Request for Proposals (RFP) for selection of a customer engagement web portal vendor in the spring. There are many vendors which provide this service, but as is the case with AMI vendors, each product's features can vary slightly.

### Proposed Features:

Preliminarily, staff has identified the following features to be highlighted and included in the RFP:

- Mobile and web based customer engagement platform design;
- Intuitive, functional, and customizable presentment of current and historical consumption data (graphs, charts, etc.);
- Ability for customer to customize alert thresholds (e.g. hours/days of continuous flow, water bill amount budgeting);
- Comparison tool between similar customers (i.e. how your usage compared to your “neighbors”);
- Real-time customer notifications (including text, email, IVR notification types) for outage, leak, and other communications;
- Water waste reporting including ability to snap photo and geocode address;
- Ability to view temperature and rainfall data on top of usage data;
- Multi-language support allowing customer to choose language type;

Staff requests that the Committee discusses and comments on the proposed features to be included in a customer engagement web portal listed above and provides staff direction on recommended features.

### ECONOMIC IMPACT

The economic benefits of AMI to customers include greater control over water consumption, given increased interval data and a future customer portal and smartphone application, including prompt water leak notification. Most customers will also benefit from having more accurate meters because they will not be subsidizing a small percentage of customers with low-read meters and these customers will more equitably share their proportional cost of water. And, the system should aid in the community achieving greater water conservation results over time.

### FISCAL IMPACT

The Adopted FY 2017 Capital Improvement Program (CIP) includes \$13.5M in the Water Replacement Fund for implementation of this project. This project will be entirely funded by the Water Enterprise and therefore has no impact on the General Fund.

## SUSTAINABILITY FEATURES

Energy: Electricity/natural gas/other fossil fuels.

Leaks in the water distribution system or at customer sites represent not only lost water, but in some cases wasted energy to distribute it. With the timelier consumption information provided by AMI systems, the City can be proactive when it comes to leak detection. The DCU's for this project will also be solar powered.

Water: Efficiency and conservation.

The more frequent water consumption data made available as result of this project will provide detailed information to help measure the overall effectiveness of targeted conservation initiatives. This information can be used to inform customers about potential leaks or overly high consumption. Analyzing data by frequent time intervals could also enable the City to look at consumption profile data for education and awareness related to conservation. Customers will also be able to be notified of unusual increased or continuous water usage, which could be the result of a leak, because it will be easier to pinpoint the timing of the increased water usage with more frequent reads. Remote notification of leaks allows for the ability to alert customers to an issue before substantial water waste or excessive charges occur.

Air: Air emissions of pollutants.

Eliminating the requirement for manual meter reading also reduces the number of vehicle miles traveled by City staff, which is in support of the Climate Action Plan goals of reducing greenhouse gas emissions.

Solid Waste: Waste reduction and diversion.

This project will generate construction waste. However, given that most water meters are made of brass, much of the waste can be recycled. The concrete meter box lids that are being replaced with polymer lids as part of the project will also be recycled.

Purchasing: Consistent with the City's Environmentally Preferred Purchasing Policy.

The City's current meter stock is, on average, over forty years old, and needs replacement independent of how the meters are read. The new water meters are expected to last for at least the life of the AMI system (twenty years), and are considered a long-term investment. This complies with the subject purchasing policy, as it states that the maximization of life cycle economics is a factor to consider when determining that a product or service has environmentally preferable attributes. The meters are also mostly made of brass, which is a recyclable material. Other vendors offer a plastic/composite body meter that was specifically not chosen for this project.

## PUBLIC CONTACT

The AMI project is arguably one of the most visible and customer-centric projects that the Utilities and Environmental Services Department has implemented in many years. The project affects every customer of the Hayward water system, and therefore customer outreach is a key component to a successful implementation.

In addition to having information about the project on the City's webpage, <https://www.hayward-ca.gov/your-government/AMI>, in advance of having a meter replaced, each customer also receives a notification letter explaining the process and what to expect during and after the replacement has been completed (Attachment I). A typical meter replacement for a residential customer can take less than thirty minutes, during which time the water service to the customer is shut off. On the day of the replacement, the contractor will attempt to contact the customer by knocking on the door in advance of beginning work to inquire if it is a good time for them to complete the replacement. If the customer expresses that they would prefer another time, the contractor will work with them to find an agreeable alternative. If the customer is not present, or does not answer the door, the contractor will verify if the water is running by checking the meter for movement, which can indicate that someone may be using the water but cannot come to the door, before shutting off the water. To replace a large commercial meter, it can take a few hours or more, therefore appointments will be made to minimize any impact to operations.

## NEXT STEPS

The project is scheduled to be completed in December 2018, with an average of 1,200 meters completed each month. There is a potential for the pace to be increased, once some continued success has been demonstrated.

The customer web portal RFP is tentatively scheduled to be released in late March with an anticipated award by the City Council in May.

*Prepared by:* Corinne Ferreyra, Senior Management Analyst

*Recommended by:* Alex Ameri, Director of Utilities and Environmental Services

*Approved by:*



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Kelly McAdoo, City Manager



March 3, 2017

Dear Water Customer,

Your water meter is scheduled to be replaced in the coming weeks as part of the City's comprehensive meter replacement project. The new meter will be installed in the existing meter box (typically located at the property frontage, near the street) by trained professionals. You do not need to be present for the installation. The process, which will occur during normal working hours, should take approximately 30 minutes, with the water turned off for 15 minutes. Once the work is completed, a notification will be placed on your front door confirming that the meter has been replaced.

The average age of a water meter in the City is over 40 years. While the City's excellent water quality has contributed to a longer useful life, meter manufacturers typically recommend replacing meters at much shorter intervals. New meters will be equipped to electronically transmit water usage to the City over a secure communication network. This technology, referred to as "Advanced Metering Infrastructure," (AMI) allows the City to improve water resource management and customer service. AMI can also be used to inform water customers and City staff in real time if there is a sharp, sustained increase in water usage at a home or business due to a water service line break or plumbing fixture leak.

As part of this project, the City is also in the process of developing a customer web portal, which is an online tool to allow interested customers access to their water usage data from their computers or smart phones. Features of the portal will include real time access to billing information, the ability to create a water budget and receive notifications if usage exceeds established thresholds. This tool will assist customers in managing their water expenses and monitoring their water usage. This portal is expected to be available by spring 2017 and will be publicized on the City's website and on your water bill.

More information regarding the project, including frequently asked questions, can be found at [www.hayward-ca.gov/AMI](http://www.hayward-ca.gov/AMI) or by calling Customer Service at 510-583-4600.

Sincerely,

City of Hayward  
Utilities & Environmental Services Department





# CITY OF HAYWARD

Hayward City Hall  
777 B Street  
Hayward, CA 94541  
[www.Hayward-CA.gov](http://www.Hayward-CA.gov)

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**File #:** RPT 17-036

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**DATE:** March 13, 2017

**TO:** Council Sustainability Committee

**FROM:** Director of Utilities & Environmental Services

**SUBJECT**

Proposed Sustainability Committee 2017 Agenda Planning Calendar

**RECOMMENDATION**

That the Committee reviews and comments on the proposed Sustainability Committee's 2017 agenda planning calendar.

**ATTACHMENTS**

Attachment I      Staff Report



DATE: March 13, 2017

TO: Council Sustainability Committee

FROM: Director of Utilities & Environmental Services

SUBJECT Proposed Sustainability Committee 2017 Agenda Planning Calendar

#### RECOMMENDATION

That the Committee reviews and comments on the proposed Sustainability Committee 2017 agenda planning calendar.

#### DISCUSSION

For the Committee's consideration, below is the proposed 2017 agenda planning calendar.

|                                                            |
|------------------------------------------------------------|
| May 2017                                                   |
| Energy Performance and Disclosure – Alternative Approaches |
| East Bay Community Energy Update                           |
| Water Consumption Update & SFPUC Outlook                   |
| Recycled Water Update                                      |
| July 2017                                                  |
| Pay As You Save (PAYS)                                     |
| Sustainable City Year Program                              |
| WMAC Franchise Agreement Annual Report (July)              |
| 2015 GHG Inventory                                         |
| September 2017                                             |
| Car Sharing                                                |
|                                                            |
| Unscheduled Items                                          |
| Stormwater Trash Reduction Requirements                    |
| Review of Mountain Tunnel Shutdown (January 3 – March 3)   |
| Laundry to Landscape Ordinance                             |
| Downtown Specific Plan -A/Mission/Foothill                 |

## NEXT STEPS

Following the Committee's input and direction, staff will finalize the Sustainability Committee 2017 agenda planning calendar.

*Prepared by:* Erik Pearson, Environmental Services Manager

*Recommended by:* Alex Ameri, Director of Utilities & Environmental Services

*Approved by:*

A handwritten signature in black ink, appearing to read 'K. McAdoo', is positioned above a horizontal line.

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Kelly McAdoo, City Manager