Litter Reduction Toolkit for Multi-Family Dwellings

SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

February 2018

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PREFACE

This document was prepared by EOA, Inc. on behalf of the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), a program of the City/County Association of Governments of San Mateo County (C/CAG)[1]. SMCWPPP's Trash Subcommittee formed the Litter Work Group in March of 2014. The Participants of the Work Group include representatives from: Recology San Mateo County (RSMC); South San Francisco Scavenger Company (SSFSC); Republic Services; Rethink Waste (aka the South Bayside Waste Management Authority); SMCWPPP Member Agency staff; and consultants working on litter reduction efforts in San Mateo County. The goals of the Litter Work Group are to collectively identify opportunities to reduce the contributions of litter generated from disposal, collection-associated sources and illegal dumping; educate the public and those involved with litter control efforts; and coordinate and share information with the Zero Litter Initiative (ZLI) in Santa Clara County. The program acknowledges the participation of the Litter Work Group members in the preparation and review of the toolkit.

[1] SMCWPPP is a program of C/CAG, and C/CAG is a joint powers agency of the County of San Mateo and the cities and towns of Atherton, Belmont, Brisbane, Burlingame, Colma, Daly City, East Palo Alto, Foster City, Half Moon Bay, Hillsborough, Menlo Park, Millbrae, Pacifica, Portola Valley, Redwood City, San Bruno, San Carlos, San Mateo, South San Francisco and Woodside.

CONTENTS

ACRONYMS

C/CAG	City/County Agency of Governments of San Mateo County
CALGreen	Green Building Standards Code of the California Building Standards Commission
CalRecycle	California Department of Resources Recycling and Recovery
CBSM	Community Based Social Marketing
CofO	Certificate of Occupancy
COA	Conditions of Approval
CY	Cubic Yards
E-waste	Electronic Waste
FEL	Front-End Loading (Vehicle and Container Type)
HHW	Household Hazardous Waste
HOA	Homeowner's Association
LMP	Litter Management Practice
MFD	Multi-Family Dwelling
MRP	Municipal Regional Stormwater Permit
NPDES	National Pollutant Discharge Elimination System
REL	Rear-End Loading (Vehicle Type and Container Type)
RS2	Right Size – Right Service
RSMC	Recology - San Mateo County
SBWMA	South Bayside Waste Management Authority
SL	Side-Loading (Vehicle Type)
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
SSFSC	South San Francisco Scavenger Company
TCD	Trash Capture Device
TCO	Temporary Certificate of Occupancy
TMA	Trash Management Area
ZLI	Zero Litter Initiative

SECTION 1 Introduction

Purpose and Organization of Toolkit

The purpose of this document is to provide guidance and identify litter management practices (LMPs) and other tools to prevent and reduce litter at existing and newly constructed multi-family dwelling[2] (MFD) properties within San Mateo County. The content can provide information for SMCWPPP program training opportunities for municipal staff. This guidance is intended for the following audiences:

- Municipal staff from various departments;
- Staff from waste management hauling companies that collect, process and dispose of discarded materials from customers within the County;
- Elected officials and other interested community members; and
- The design and construction community of developers, architects, civil engineers, landscape architects and contractors.

The Toolkit is organized in the following manner:

- Section 1: The purpose and background for the toolkit,
- Section 2: The characteristics of multi-family dwellings and existing site considerations,
- Section 3: New buildings and the design review process,
- Section 4: Steps for using the toolkit's litter management practices, and
- Section 5: Detailed elements of each litter management practice.

Litter Impacts and Regulatory Response

Litter (i.e. trash, floatables, gross pollutants, or solid waste) is a serious problem for watersheds where it presents an aesthetic nuisance, and a serious threat to aquatic life and human health. Data suggests that plastic persists for hundreds of years in the environment. Plastics and other litter pose a threat to wildlife through ingestion or entrapment and may harbor chemicals harmful to the aquatic environment. The San Francisco Bay Regional Water Quality Control Board (Water Board) has listed multiple bodies of

Figure 1. Litter in creeks has impacts

[2] This document uses the CalRecycle definition of an MFD being a property with five dwelling units or more.

water including tributaries and shorelines of the San Francisco Bay that are impaired due to litter.

In response to concerns about urban litter impacts on receiving water bodies in the San Francisco Bay area, the Water Board included litter reduction requirements in the 2009 Municipal Regional Stormwater (MRP) National Pollutant Discharge Elimination System (NPDES) Permit for Phase I communities in the Bay Area (Order R2-2009-0074). These provisions require applicable Bay Area municipalities (Permittees) to reduce litter from their Municipal Separate Storm Sewer Systems (MS4s) by 40 percent before July 1, 2014, 70 percent by 2017, and to a point of "no adverse impacts" to water bodies by 2022. MRP 2.0 (Order R2-2015-0049), adopted on November 19, 2015, continues to require these reductions.

Litter Sources and Pathways at Multi-Family Dwellings

Litter in San Francisco Bay Area creeks and shorelines originates from a variety of sources including pedestrians, waste containers, illegal dumping, and vehicle drivers. This document focuses on MFDs due to the complex nature of this type of land use, the potential for higher levels of litter generation, and the challenging management practices related to these issues. Sources of litter at MFDs include:

- Overflowing or uncovered waste containers and dumpsters due to inadequate management of trash removal schedules or facility maintenance;
- Dispersion of household garbage and recyclable materials before, during, and after collection;
- A lack of educational efforts directed towards management and residents, particularly concerning cigarette butts, and cigarette and food packaging.
- Illegal dumping (also known as abandoned waste) is often generated by residents of MFDs – sometimes when collection services are inadequate or unavailable.
- Pet waste disposal can be an issue at MFDs due to the concentration of pets in high density MFDs and inadequate collection services or containers.

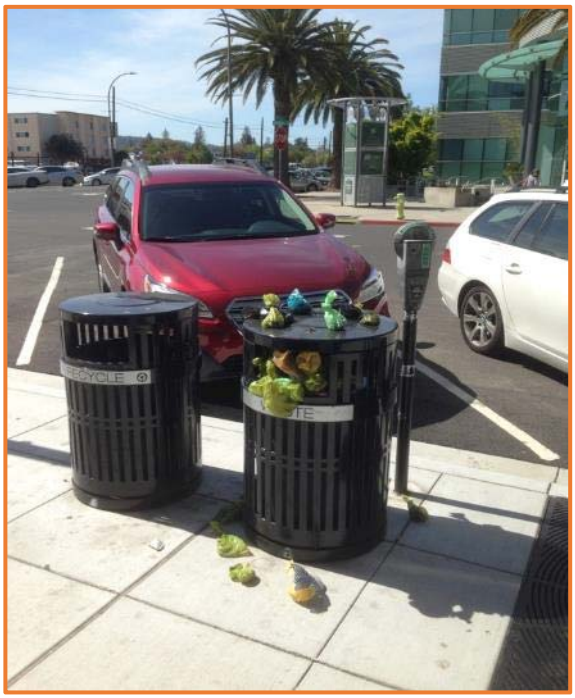


Figure 2. Pet waste disposal litter at an MFD

Housing Trends in San Mateo County

This document focuses on strategies for reducing litter at existing MFDs and also identifies opportunities to address litter during the design of new MFDs. Provision C.3 of the MRP requires new development projects to reduce pollutants, such as litter, by treating on-site

stormwater runoff with biotreatment and other types of systems. Many of the MFDs being built in San Mateo County are high-density transit oriented urban infill projects. High density housing near transit is also being built in response to climate change. The supply of affordable housing is also a major concern that is being addressed by building more MFDs.

According to the US Census Bureau's 2016 American Community Survey, in San Mateo County there are approximately 76,000 MFD units that represent about 28% of the housing units in the County. Approximately 165,000 residents or 22% of the total residents in the County lived in those MFD units. According to estimates taken from ABAG data, the number of MFD units is expected to grow by approximately 20% by 2030. Well-designed new MFD properties have the potential to greatly reduce litter generation; therefore it is important to consider structural and operational litter controls in the municipal design review process. This document will provide guidance on litter related control measures for municipal staff to consider during project reviews.

Other Litter-Related Regulatory Programs Affecting MFDs

The State of California has many regulations directed towards increasing recycling and composting at MFDs properties. There are also state laws related to the disposal of special types of materials such as electronic waste (e-waste), tires, mattresses and household hazardous waste. In 1991 the State began requiring new and expansion construction projects to provide adequate storage space for the collection of recyclables. The California Green Building Standards Code (CALGreen) contains requirements related to waste reduction with new and expanded buildings.

State policy has set a goal of 75% waste diversion by 2020[3], and there are new state laws (AB 341 and AB 1826), for diversion of multifamily recyclables and organic waste. Some agencies such as the Alameda County Waste Management Authority and Recycling Board (StopWaste) have set higher standards, with a goal of no more than 10 percent of compostables and recyclables to be disposed as refuse.

Figure 3. Overflowing containers generate litter

AB 341: As of July 1, 2012 MFD properties are required to provide recycling collection services.

[3] http://www.calrecycle.ca.gov/75Percent/

AB 1826: As of January 1, 2017 MFD properties, who generate 4 cubic yards of organic waste per week, are required to provide collection for plant debris collection services. Beginning on January 1, 2019, MFDs that generate 4 cubic yards of solid waste per week will be required to comply. That could drop to 2 cubic yards per week after January 1, 2020 depending on actions from the California Department of Resources Recycling and Recovery (CalRecycle) and would affect most MFDs at that point. This law doesn't apply to food scrap collection at MFDs – only plant debris.

CALGreen: As of January 1, 2017, the CALGreen building code standards for the issuance of residential building permits require new MFDs to provide adequate space for storage of solid waste, recyclable and compostable materials. Taller MFDs (over three habitable stories), that are being altered by 30% or more of additional habitable space, are also required to comply.

All of these regulations are driving changes in collection practices. Integrating regional litter control efforts with the statewide waste reduction and toxic product control measures will produce the most effective practices. See Appendix 5 for links to more information.

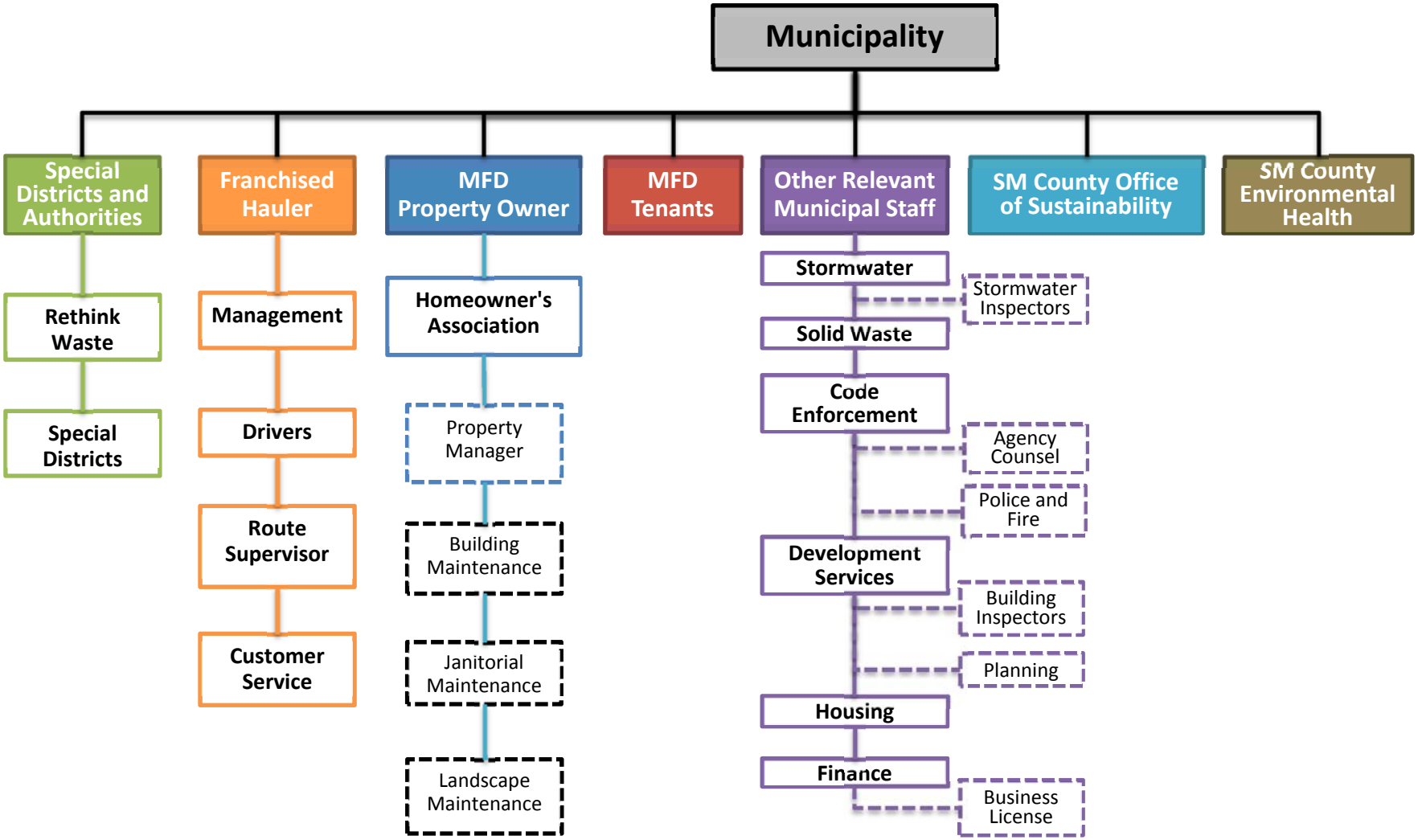


Figure 4. A Typical MFD Project Communications Hierarchy and Participants for Jurisdictions in San Mateo County (dashed lines represent related and sub-categories)

SECTION 2 MFD Characteristics and Challenges

MFD Characteristics Related to Litter

A variety of characteristics of an MFD determine whether it discourages litter proliferation; these are summarized in Table 1 below. The characteristics are divided into Structural, Financial and Operational categories to clarify the differences and organize them for other sections of this Toolkit. The Litter Management Practice (LMP) chosen for a given issue should be considered in light of the characteristics of the property. Litter generation levels on a property can vary significantly depending on the existence of factors described in Table 1. Recommendations for existing MFDs start on page 11. Recommendations for design and construction of new MFDs are found in Section 3 (page 18).

Figure 5. Clockwise from upper left) Townhome MFD, Low-rise Apartment MFD, Mid-rise Apartment MFD (courtesy of SpiritLivingGroup.com), Hi-rise Condo MFD (courtesy of Highrises.com)

Table 1. MFD characteristics that need to be considered for reducing litter at both new and existing properties.

Structural

Building Form and Design for Hauler Access:

- Stacked units (apartments or condominiums)
- Non-stacked, attached or detached units (townhomes)
- Location of loading area for hauler's collection vehicles
  - Exterior parking area
  - Interior (parking garage)
  - Ceiling heights in access and loading areas
  - Distance from street to loading location
  - Grade (slope) and width of driveway and path to containers
  - On public street with driveway or curb ramp
  - Size of doorways
  - Access security (parking gates, doors and locks)
  - Pavement strength in hauler loading area

Building Systems for Disposing of Materials:

- Chutes and chute rooms
- Chute diverter systems
- Wheeled carts, bins and stationary bins/dumpsters
- Compactors
- Storage area & enclosure doors, walls, ceilings etc.
- Situations requiring towing of containers to loading areas (basements)
- Space for towing of containers to hauler loading area
- Space for storing of bulky materials
- Space for collection containers
- Space for discarded materials in residential units
- Signage in all areas for residents for all materials
- Outdoor containers (pet waste, cigarette butts etc.)

Financial

Whole property/site owned by one entity:

- Rental units
  - Market-based rents
  - Income-based rents

Units owned individually (condominiums or townhomes):

- Owner occupied units
- Non-owner occupied units
  - Long-term rental
  - Short-term rental
  - Timeshare

Combination/hybrid Ownership:

- Percentage of units non-owner occupied or rented
- Combined form of ownership such as co-housing

Other Financial Factors:

- Cost of providing sufficient on-site staff to manage problems
- Cost of collection services
- Incentives for property owner to subscribe for sufficient collection services
- Incentives for residents to sort and discard of materials properly
- Incentives to reduce garbage generation
- Incentives to reduce contamination in collection containers
- Investment in equipment that is garbage-oriented
- Reduced rate for compactors

Operational

- Existence of an on-site property manager or owner and degree of support staff on-site and off-site.
- Types of collection containers & vehicles used by hauler
- Number of hauler staff on-board a collection vehicle
- Days of week that services are offered by hauler
- Labor for getting containers to the collection vehicle
- Vehicle, staff & process for towing of containers to loading areas
- Complexities of bulky item collection
- Resident communication challenges
- Resident turnover rate
- Collection containers for residents within units
- Method residents use to bring materials to centralized storage areas
- Levels of landlord management/participation on-site
- Convenience for residents to dispose garbage versus recycling and composting
- Willingness of residents to separate/sort materials

Existing MFDs

Challenges and Example Scenarios

This section discusses various issues with LMPs at existing MFDs and illustrates those challenges using example situations. A suggested strategy and steps for improving existing MFDs is displayed below in Figure 6. These steps are further discussed in Section 4. (Page 37).

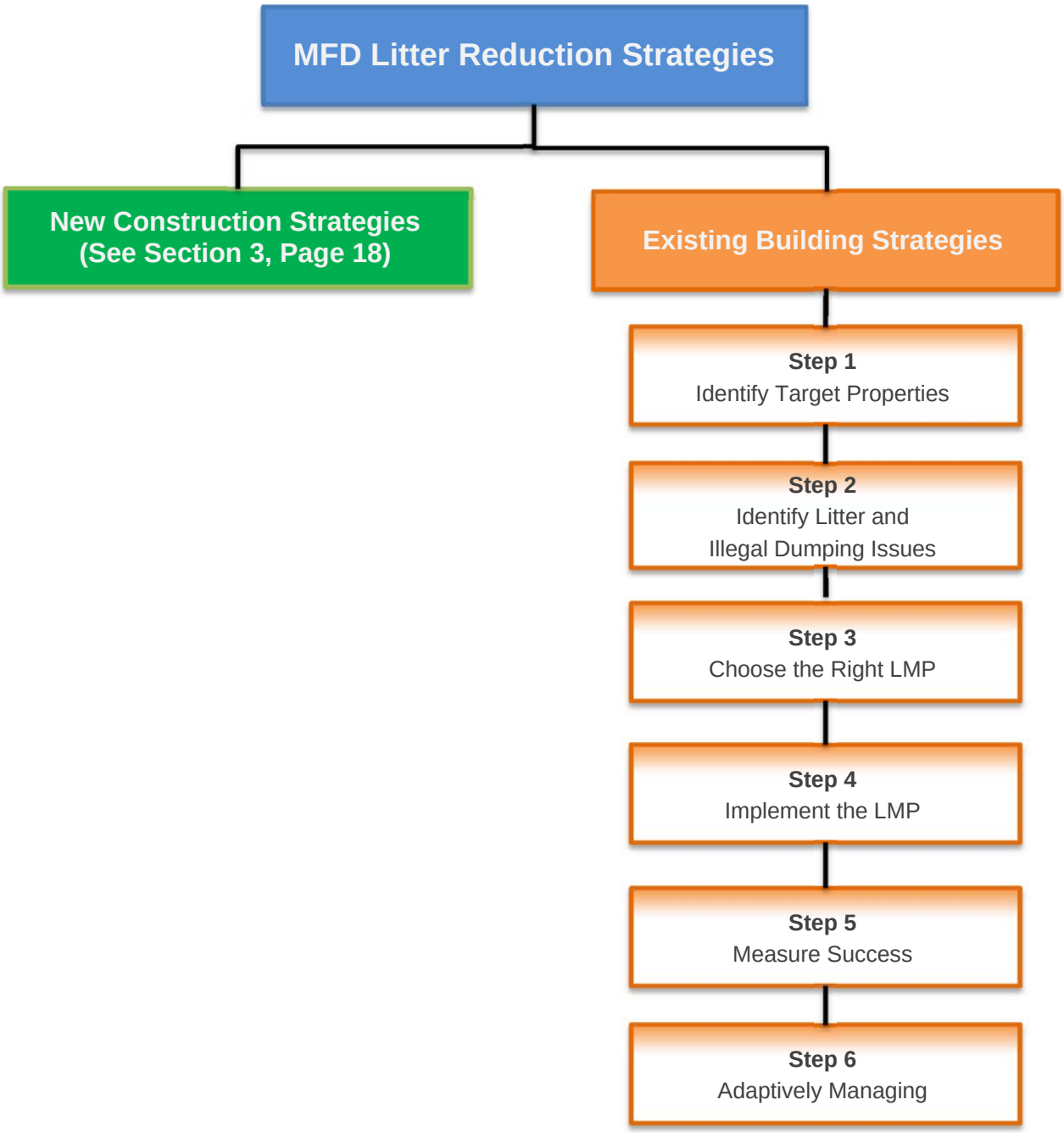


Figure 6. Strategy steps for reducing litter at existing MFDs.

Various structural characteristics of MFDs informed the six types in Figure 7 from the Zero Waste Design Guidelines (ZWDG) developed in 2017 for New York City by the New York Chapter of the American Institute of Architects (AIANY) and their Center for Architecture[4]. The types are based on the existence, location, number and type of chutes & collection containers.

Figure 7. Six types of MFD discard collection systems from the ZWDG (Courtesy of the Center for Architecture)

To illustrate how the characteristics described in Table 1 and the six AIANY ZWDG types in Figure 7 combine to create litter challenges, five MFD properties were created and are presented on the following pages. The examples include language from LMPs, standard conditions of approval (COA), and franchise agreements to reduce litter. Suggestions on how new MFDs can be designed, constructed and operated differently are also given in Section 3 to provide guidance to municipal staff who review and approve new MFD development projects. Below is a key for the abbreviations used in the four scenario descriptions:

SCENARIO KEY
Type: One of six building types described in Figure 7 from the AIANY ZWDG
Materials: G (Garbage), R (Recyclables), C (Compostables)
Total CY Volume Per Week: Material - (# Cubic Yards) for each material and total
Gal per unit Volume: Material - (# Gallons per unit) for each material
Collection Frequency: Material - (Days) for each material
Containers Type: Compactor, Bin or Carts for each material
Container Volume: Material - [(# of containers) x (volume per cont. – Gal or CY)]
Vehicles: Material - (# drivers) x (Type of Vehicle)

[4] www.zerowastedesign.org, Text & graphics: AIANY Zero Waste Design Guidelines, Courtesy of the Center for Architecture, 2017.

Example Scenario A - The View — Hi-rise Apartments

Year: 2016 **Units**: 110 **Type**: 3
Building: 15 story, Apartment
Ownership: Single
Management: On-site, live-in
Parking: Garage
Materials: G, R
Total CY Volume: G-12, R-3 (24+9=33 CY)
Gal. per unit Volume: G-44, R-16
Collection Frequency: G-M/W, R-M/W/F
Containers Type: G-Bins & R-Carts
Container Volume: G-3x4CY, R-6x96Gal
Loading Location: Parking Lot
Vehicles: G-1xFEL, R-1xSL
Collection Structure: 1 Garbage Chute
Bulky/Special Item Service: Management

The View is a 110-unit hi-rise apartment building owned by a large corporation with a unit for the on-site property manager. The parking garage has a ceiling height of 15 feet and a garbage room with a garbage chute. Under the chute is a gray 4-cubic-yard garbage (Front-End Load) FEL wheeled bin. When the first one is full it is swapped out with one of two additional bins. There are also Side-Loading (SL) wheeled carts for recyclables in the garage next to the garbage bin. Residents are encouraged to flatten cardboard boxes and put them in the recyclables carts to avoid chute blockage. Since residents must carry their recyclables to the garage, there are still large amounts of recyclable materials that are disposed of down the chute, reducing the property's diversion rate.

Since the ceiling in the parking garage is less than the 25-foot height required for servicing FEL bins and carts inside the parking garage, the hauler crew parks the collection vehicles in the parking lot. The manager's maintenance staff brings the containers out to the parking lot for service the night before. When bulky materials accumulate the manager contacts a private company to haul the materials to the transfer station.

Example Scenario B - The Riverside — Suburban Townhomes

Year: 2004 **Units:** 50 **Type**: 1
Building: Attached Townhomes
Ownership: HOA/Individual
Management: Off-site
Parking: In-unit and surface
Materials: G, R
Total CY Volume: G-9, R-5 (14 CY)
Gal. per unit Volume: G-36, R-20
Collection Frequency: G-F, R-F
Container Type: G-Bin, R-Cart
Container Volume: G-3x3CY, R-10x96Gal
Loading Location: Next to Enclosures
Vehicles: G-1xFEL, R-1xSL
Collection Structure: External Enclosures
Bulky/Special Item Service: Management

The property's townhomes are individually owned and occupied and the property management firm handles the maintenance and repairs of shared spaces and assets, oversight of a landscape maintenance company, and utilities billing including the garbage and recyclables collection service. A new account representative has to be trained about once every two years.

There are three designated un-roofed external trash enclosures located around the property. There are frequent overages, but the Homeowners Association (HOA) is required to save funds for driveway maintenance and other costs so they do not want to increase the cost of waste disposal service. The litter generated by the overflowing containers piles up in and around the enclosures until the on-site staff or the hauler driver picks it up. In the meantime, much of it blows around or washes off in the rain and ends up in storm drains, streets and nearby creeks.

The side loading refuse collection vehicles pull up to each enclosure and the drivers empty the carts. The enclosures are not quite large enough so the driver often has to move carts out of the enclosure to service them. The SL vehicles reduce litter due to the driver's ability to control the tipping inside the wind-shielded chest-high hopper on the side of the vehicle, increased visibility of the carts during tipping, and ability to shake the carts inside the hopper to fully empty them. (See Step 4 of Section 3 for more information on vehicles and litter.) Residents leave bulky materials such as tires and broken or unwanted furniture in and around the enclosures. The property manager hires a private hauler to dispose of the materials once per year and the cost is billed to the HOA. Plant debris is taken away by the landscape contractor as part of that service contract.

Example Scenario C - The Commons Affordable Apartments

Year: 1982 **Units:** 32 **Type**: 1
Building: 4, 2-story, 8-unit apartment bldgs.
Ownership: Single – County, Affordable Housing
Management: On-site, office
Parking: Surface lots
Materials: G, R, C
Total CY Volume: G-6, R-4, C-1 (11)
Gal per unit Volume: G-38, R-25, C-8
Collection Frequency: G-M, R-W, C-F
Container Type: G-Bins, R-Carts, C-Carts
Container Vol: G-2x3CY, R-8x96Gal, C-4x64Gal
Loading Location: Next to Enclosures
Vehicles: G-1xFEL, R-1xSL, C-1xSL
Collection Structure: External Enclosures
Bulky/Special Item Service: Hauler

The apartment complex for low-income residents consists of four, two-story buildings with eight units in each building and two parking lots with two unroofed trash enclosures. The City has provided the property manager with a supply of durable and washable bags printed with recycling information on them to give to new residents at move-in to store their recyclables in their units. The residents bring their garbage, recyclables and compostable materials to one of two enclosures. The hauler's vehicles park next to each enclosure on the service day.

As part of recent franchise agreement extension, the City added new MFD waste reduction and bulky/special item collection services. The agreement requires hauler staff to: contact the property manager at each MFD in the city and establish a line of communication, visit the property to assess the current level of waste reduction and services provided, suggest improvements, and set up a customized bulky/special item service for each MFD property chosen from two options defined in the franchise agreement.

The Commons has chosen to schedule bulky item collections twice per year. By appointment, the hauler typically delivers a 15 or 30-cubic-yard roll-off container on a Friday and leaves it on-site over the weekend. The tenants and the property manager can drop certain types of bulky items such as broken furniture in the container. The container is open-top and unlocked, so it is only on-site for a few days to avoid it being used for illegal dumping. In addition to removal of the roll-off container, a flatbed truck comes to take away other bulky items that require special handling such as mattresses, tires, large appliances (refrigerators, hot water heaters, dishwashers and ovens) and electronic waste (e-waste). These "special" items are not allowed in roll-off containers because they cannot be landfilled or are delicate e-waste such as televisions with leaded glass and other hazardous contents.

City, property manager and hauler staff work together to set up & adjust the services as needed. The hauler provides the City with annual reports showing diversion rates & services for each MFD property so that waste diversion trends can be measured over several years.

Example Scenario D - The Oaks — Suburban Apartments

Year: 1972 **Units:** 24 **Type**: 1
Buildings: Six, 2-story, 4-plex apartment bldgs.
Ownership: Single
Management: Off-site
Parking: Surface lots
Materials: G, R
Total CY Volume: G-6, R-4 (10)
Gal per unit Volume: G-50, R-32
Collection Frequency: G-M, R-W
Container Type: G-Bin, R-Cart
Container Volume: G-3x2CY, R-12x64Gal
Loading Location: Next to Garage
Vehicles: G-1xFEL, R-1xSL
Collection Structure: Garage & External Area
Bulky/Special Item Service: Hauler

The Oaks is an older market rate apartment complex consisting of six, two-story buildings with four units in each building and three parking lots with three shared trash areas in the parking lot. The residents bring their garbage to FEL containers in unenclosed locations in the parking lot and recyclable materials to one of three areas next to the garages. The hauler's vehicles drive up to each area on the service day and collect the materials. No compostables collection is offered. Since there is no on-site manager, and the property owner does not want to pay the hauler an extra fee to retrieve and return the carts to an indoor garage location, the recycling carts stay outside the garage where litter and overflowing materials accumulate. When the garbage containers overflow they also generate litter, but are sized correctly, so this does not happen frequently. There is a high level of turnover at the Oaks with new residents moving in on a regular basis and departing residents leaving mattresses and other unwanted items haphazardly around the property. Signage and education efforts are minimal. No information is given to residents when they arrive as to the procedures. Other tenants usually fill the newcomers in to the routine.

The Oaks schedules a bulky item collection twice per year. The hauler picks up the bulky materials at the recycling area on the scheduled day. The procedure set by the franchise agreement is for the tenants and the property manager to set out bulky items such as broken furniture, tires, large appliances, e-waste and mattresses the day before collection. But the tenants and manager leave items in the location year round as shown in the photo to the left. Scavengers sometimes arrive before the hauler and search through the materials that can create a mess and generate litter.

Example Scenario E - The Metro — Urban Condominiums

Year: 2010 **Units**: 100 **Type**: 2
Building: 5 story, Condominiums
Ownership: HOA, Individual
Management: On-site, live-in
Parking: Garage
Materials: G, R, C
Total CY Volume: G-6, R-6, C-1 (13x3=39)
Gal per unit Volume: G-32, R-32, C-5
Collection Frequency: All three - M/W/F
Containers Type: Compactor & Bins
Container Volume: G-2x1, R-3x2, C-1x1
Loading Location: Red Curb on Street
Vehicles: G-1xFEL, R-1xFEL, C-1xFEL
Collection Structure: 1 Garbage Chute
Bulky/Special Item Service: Management

The Metro is a lot line condo building. The HOA sets aside one unit for the on-site property manager. The parking garage has a ceiling height of 20 feet and a garbage room with a garbage chute. Under the chute is a gray 1-cubic-yard garbage compactor (3 to 1 compaction) with a wheeled metal bin. A second bin is swapped out when the first one is full. There are also Front-end-load (FEL) containers for recyclables and compostables. Five (5) gallons of compostables collection per unit per week for food scraps is typically sufficient. Resident owners are encouraged to put pizza boxes in the compostables bin to avoid chute blockage.

Since the ceiling in the parking garage is less than the 50-foot height required for servicing FEL bins inside the parking garage, the hauler parks the collection vehicle in a red zone on the street by the driveway. Each morning the maintenance staff pushes the heavy bins from the garbage room, at the far end of the garage, up the 100 feet of slightly graded garage pavement to the street, often hitting the narrow door of the garbage room. When the containers are overfull and the lids can't be completely closed, despite the best efforts of the hauler staff, litter is often blown by the wind down the street during collection. After the containers have been serviced, the maintenance staff returns them. Bulky items such as mattresses and televisions are left in the garage until the manager receives a complaint and she has the items removed by a private hauler. Some owners bring their household hazardous waste, such as batteries, to nearby take-back locations, but most dispose of them illegally down the garbage chute or bring them to the office.

SECTION 3 New MFD Characteristics & Challenges

Design and Construction Challenges

Many of the litter and waste reduction-related design challenges described in Table 1 could be addressed with targeted design review of proposed MFDs. Municipal staff should develop a process to involve the franchised hauler staff in the design review process allowing them to evaluate the draft design for practicability, service-ability and efficiency. Taking advantage of their knowledge and input early in the design review process will likely reduce operational problems for all stakeholders. Design and construction issues to review in the entitlement and building permit approval process include:

- Material disposal systems such as chutes, chute rooms
- The design of indoor and outdoor solid waste materials enclosure areas
- Collection container types
- Collection vehicle types, crew size and access to storage areas
- Bulky and special item disposal, storage and collection
- A Discard Collection Plan with service day collection location(s)
- Providing incentives for reducing waste and contamination

Figure 8 on the next page summarizes the proposed strategy and steps for reviewing new construction project plans, model conditions of approval and incorporating the hauler into the review process.

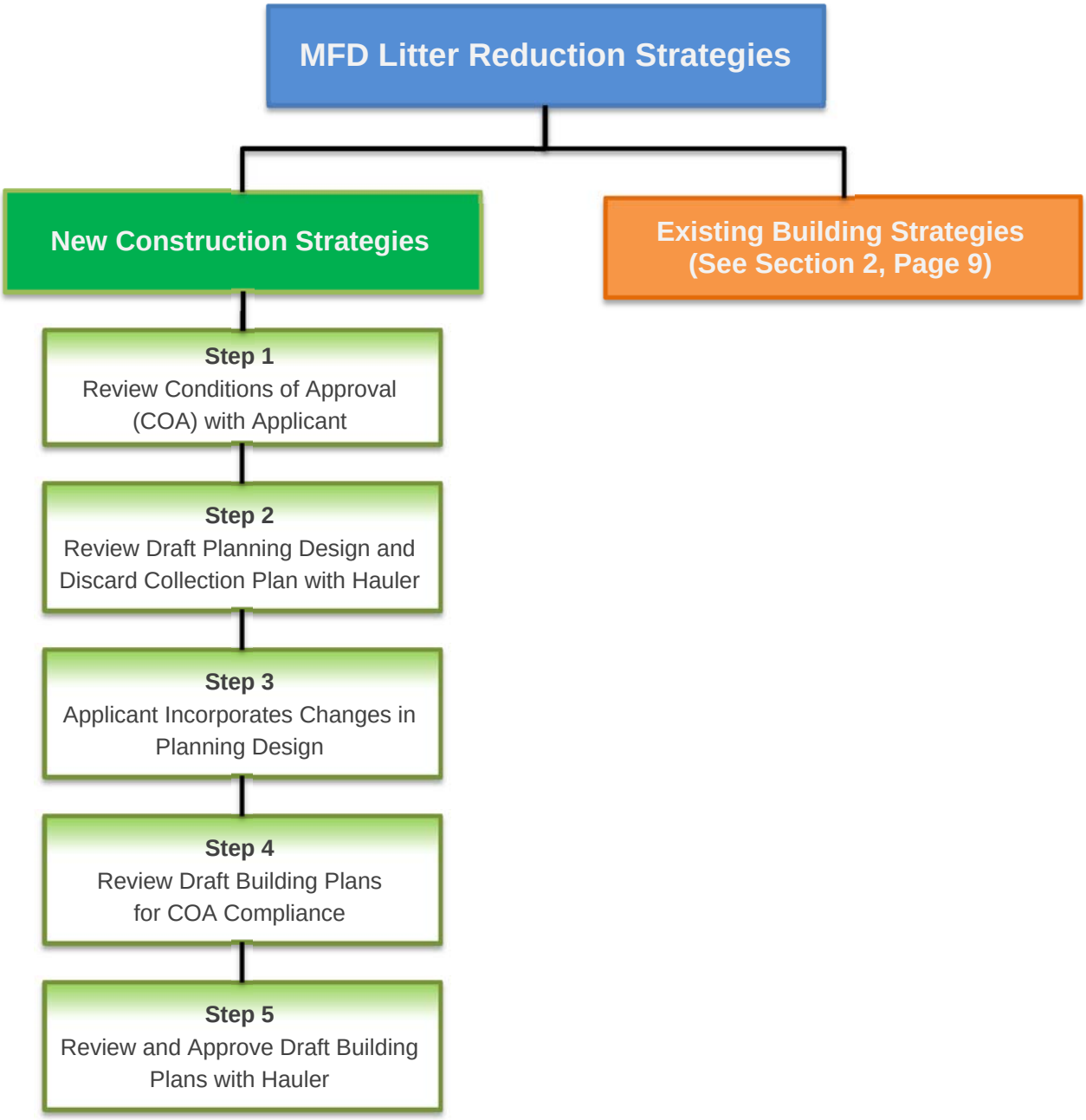


Figure 8. New MFD construction strategies

Use the steps listed above with the four subjects described on the following pages to ensure that all the design issues have been vetted by the various municipal and hauler staff.

- Conditions of Approval and Discard Collection Plan
- Service Day Staging Areas
- Chute Systems
- Design of Garbage Rooms and Enclosures

Conditions of Approval and Discard Collection Plan

A key element of the strategy in Figure 8 is the development, updating, and use of standard Conditions of Approval (COA) that contain language requiring the achievement of design elements discussed in this document. SMCWPPP has developed model conditions of approval[5] that can be used and below are some additional ones to consider. Typically, COA do not go into exhaustive detail, but give enough information to ensure that the most important issues are conveyed to the design team. COA should describe performance standards and metrics to be achieved by the design. Using performance standards lets the design team use creativity to achieve the desired goals of the project as well as the performance standards of the municipality.

It's also important to require and develop COA for both the design phase and the occupancy phase. The design can change during construction so staff should confirm that the COA performance standards have been achieved in the final project before a Certificate of Occupancy (either temporary with a TCO or final with the CofO.)

Below are examples of language for two sections of the COA (prior to building permit issuance and prior to granting a Certificate of Occupancy) that are related to MFD project review and approval:

1. Design Conditions and Site Standards (Prior to Issuance of a Building Permit).
Trash, Recycling and Composting (Discards) Facilities:
[Planning and Public Works]

- Prior to the issuance of a building permit, the Planning Director and Public Works Director shall review and approve a Discards Collection Plan from the applicant with elements required by the City and per below.

- Maintenance and Service: Trash, recycling and composting (Discards) storage areas shall include adequate space for the maintenance and servicing of containers for all materials that are provided by local hauling companies. Sewer drains, fire sprinklers, enclosures, hose bibs and roofing (if outdoors) shall be provided as per City standards.

- Adequate Space for Trash, Recyclables and Compostables: The amount of space provided for the collection and storage of recyclable materials shall be at least as large as the amount of space provided for the collection and storage of trash materials and shall reflect the estimated volumes of trash and recyclable and compostable materials to be generated providing for the separate and dedicated containers for those materials with the goal of 25% or less of the total materials generated going to a landfill. An appropriately sized and designed area for wastes banned from regular trash containers such as electronics, fluorescent lamps and batteries shall be designated. Residential properties will also provide area for bulky item collection such as mattresses, furniture, tires and white goods.

[5] www.flowstobay.org/sites/default/files/Model%20COA%20July%202016%20final.pdf

- Convenience and Accessibility: The recyclables and compostables storage and collection areas shall be equally as accessible and convenient for building users and collection vehicles as the trash collection and storage area. If chutes are planned then separate, properly labeled (as per City standards) and dedicated chutes must be provided for each and every collected stream of materials - not just for trash (non-recyclable and non-compostable materials.) The discarded materials storage rooms shall be located on an exterior wall of the building (if indoors) with adequately-sized door or gate access to the street through the wall so as to minimize distance for the collection vehicle personnel and eliminate temporary outdoor storage of containers on collection days. If the storage area is located outside then it must be easily accessible by the collection vehicles. If the storage area(s) for building users cannot be located adjacent to the street, then service-day locations easily accessible by the collection vehicles & staff, must be provided in an area on-site as per city standards.

- Equipment/Storage: All trash enclosures shall be completely screened and covered from off-site view by a solid fence or masonry wall at least six feet high and in harmony with the architecture of the building(s). Alternatively, the trash facilities may be placed within the building.

- Litter Management: The frontages of the property shall be kept clean and free of litter by the property's management, owners and/or contracted maintenance staff. Public litter containers, adequate in size and number to contain the expected volume of litter being discarded by property tenants, residents, employees, customers or others using, or walking adjacent to, the property, shall be installed, along each public facing frontage per the direction of the Public Works Director as part of the project's public improvements and on-going requirements. Appropriately designed litter containers installed along the property frontages for cigarette butts, pet wastes, retail consumer discards etc. shall be considered during the design phase appropriate to the type of land use being entitled.

2. Design Conditions and Site Standards (Prior to Issuance of a Certificate of Occupancy).
Compliance with Discards Collection Plan:
[Public Works]

- Applicant and its successors and assigns shall implement the approved Discards Collection Plan and report its activities and achievements to the Public Works Director annually as requested.

3. On-going Maintenance Requirements. (On-going during Occupancy).
[Public Works]

- Applicant and its successors and assigns shall empty on a weekly basis or more if needed, and repair or replace as needed, all litter containers installed along the property frontages.

The AIANY Zero Waste Design Guidelines also has the useful graphic shown in Figure 9 below that summarizes many design considerations for new residential construction. These items are also good candidates for COA and performance standards such as item #17 in the Figure: "Provide set out area, coordinate with street, trees, furniture, curb cuts and entrance." A condition of approval of this type triggers review during the plan check phase of these issues and further coordination between municipal staff and departments.

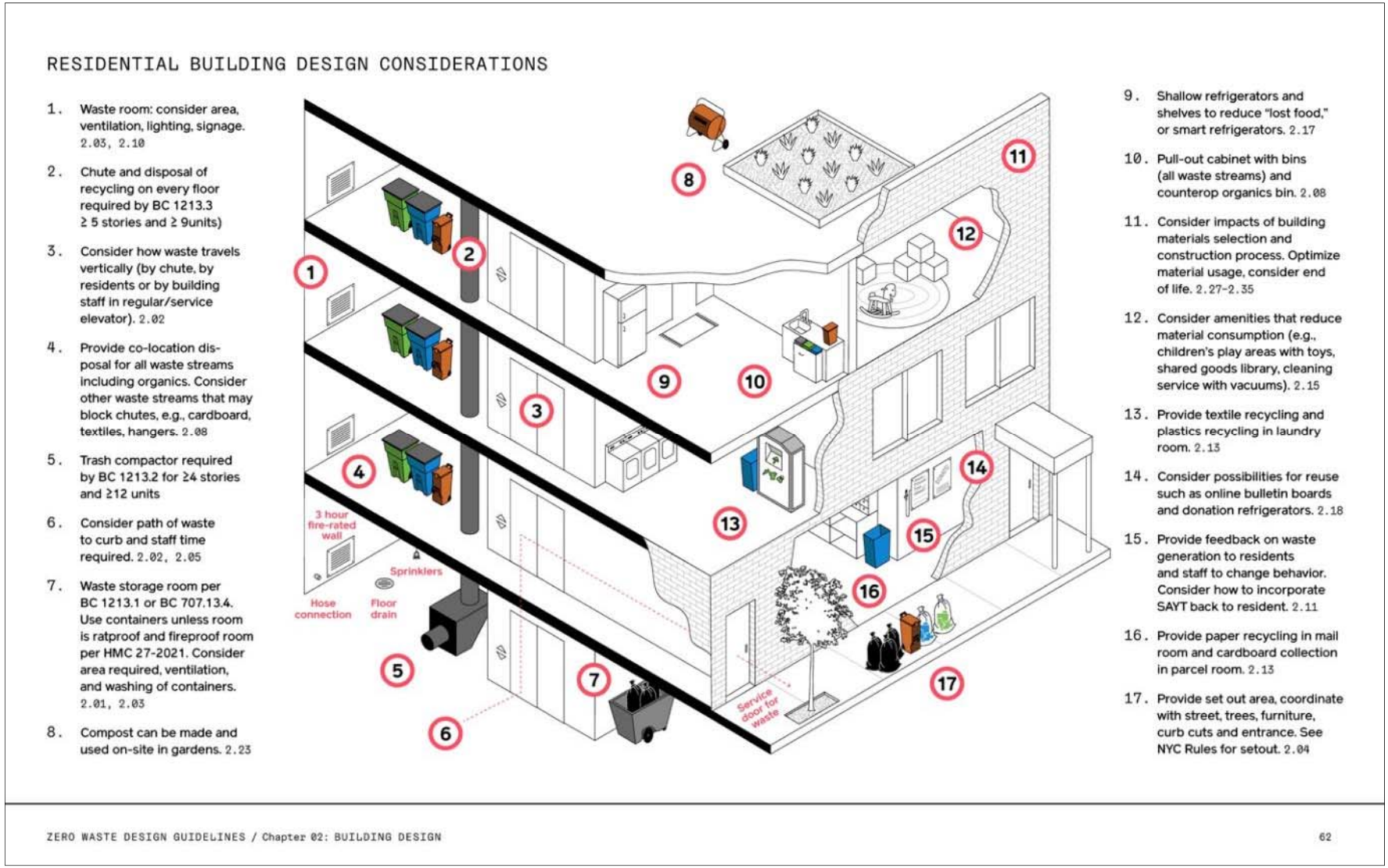


Figure 9. Residential Building Design Considerations (AIANY ZWDG, courtesy of the Center for Architecture).

Rethink Waste (the South Bayside Waste Management Authority) is an organization in San Mateo County consisting of twelve member agencies: ten cities/towns, a sanitary district and the County. The member agencies of Rethink Waste coordinate with Recology - San Mateo County (RSMC) in the design review process of new development projects such as MFDs. RSMC has developed guidelines and a process for reviewing new projects – see Appendix 1. Other municipalities in San Mateo County also work with their franchised haulers to review development plans.[6] Allowing franchised hauler staff to review a draft project plan early in the process can reduce problems and conflicts later. Service day staging areas, chute systems, garbage rooms and enclosures account for the most common design problems and given the trend in San Mateo County towards more dense and taller MFD housing development, issues such as the design, maintenance and operation of chutes systems are likely to become common in the future.

In 2016, StopWaste (the Alameda County Waste Management Authority) published a useful factsheet[7] entitled "Space Guidelines for Recycling, Organics and Refuse Services for Designers of Multi-Family & Commercial Buildings." The factsheet provides the following text and graphic (Figure 10) on sizing of trash rooms and the calculations for providing adequate storage space for the various collection containers:

> "In a multifamily setting, for once-a-week collection (the norm), a reasonable rule of thumb is to **provide 50 gallons or ¼ cubic yard (CY) of container capacity for every three residents**. This would be the sum of the volumes of refuse, recycling and organics carts (or bins), with volumes **in the proportions of 40% for refuse, 40% for recyclables, and 20% for organics**. This does not include plant debris from landscape maintenance at the site; that volume is site-specific and will need to be estimated separately and added, unless the landscapers remove all of the solid waste that they generate." (StopWaste, 2016)

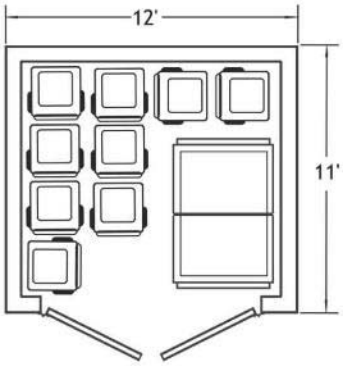
The designer should first contact the franchised hauler or other permitted hauler to determine what types and sizes of containers are available for use at the property in question once it has been built. Using that information, the numbers and calculations above and the information in Figure 10, a designer can determine the space needed for various types of collection containers to produce a Discard Collection Plan for the property and the design of each storage area on the site where collection containers will be located. The Plan will also describe how the collection containers will be brought to the loading area where the collection vehicles will empty the containers into the vehicle. This Plan should be shared with the municipal staff and the hauler(s) for their review and approval as part of the plan check process.

[6] Find haulers for each municipality on the County's interactive map: www.smcsustainability.org/waste-reduction/curbside-collection

[7] http://www.stopwaste.org/sites/default/files/Building-Guidelines-Final-Apr8.pdf

Storage Space Floor Area

Bin sizes can vary in all dimensions; check with the local collection companies for exact dimensions. The typical space needed for a 6 cubic yard bin is about 8' wide, 6' deep (front to back) and 6' tall at the back, sloping down to 4 feet tall at the front[8]. Generally, 4 cubic yard or smaller bins can be provided with wheels, and larger bins cannot, for safety reasons. Bins without wheels will need to be situated so that the collection truck can service them head-on, without moving them. Most 96-gallon carts fit comfortably in a footprint that is 28x36"; they are around 46" tall. Most 64-gallon carts require a 26x30" footprint and are around 42" tall.



Bins and carts typically have hinged lids that must be lifted; these can damage low ceilings. In addition to space for the containers themselves, space is needed to walk among them and shift them around.

Where an enclosure will contain both carts and bins, an area that is 150% of the sum of bin and cart footprints will probably be needed. Enclosures that contain only carts or only bins will require less extra space because the containers fit together more easily.

Average Container Footprints

64-gallon cart	5½ sq. ft.
96-gallon cart	7 sq. ft.
4-cubic yard bin	28 sq. ft.
6-cubic yard bin	48 sq. ft.

Continuing with the example above for a multifamily setting, if the 60 units are in three buildings, each with an outdoor enclosure for discards, then each enclosure should hold one 4-cubic yard bin, five 96-gallon recycling carts and four 64-gallon organics carts. The total comes to 128 sq. ft., or less than one standard parking space.

$$\underbrace{28\ \text{sq. ft.}}_{\text{One 4-Cubic yard garbage bin}} + \underbrace{5 * 7\ \text{sq. ft.}}_{\text{Five 96-gallon recycling carts}} + \underbrace{4 * 5.5\ \text{sq. ft.}}_{\text{Four 64-gallon recycling carts}} = \underbrace{85\ \text{sq. ft.}}_{\text{Total Container Footprint}}$$

$$\underbrace{85\ \text{sq. ft.}}_{\text{Total Container Footprint}} * \underbrace{1.5}_{\text{150% Additional Operation Space}} = \boxed{\underbrace{128\ \text{sq. ft}}_{\text{Total Allocated Space}}}$$

8 Example Bin Sizes: http://www.tigersanitationutah.com/services/commercial/sizes-and-dimensions/
Example Cart Sizes: http://www.sanjoseca.gov/index.aspx?nid=2372
Examples do not consitute an endorsement of any service provider. Sizes vary, check locally.

Figure 10. Guidelines for calculating the required storage area for discards. (Courtesy of Stopwaste)

A site-specific Discard Collection Plan for the property should be developed and submitted as part of the planning stage documents. The waste management collection plan will cover the following topics discussed at the beginning of this section with maps of the site and descriptions of services provided by the hauler and property management staff: Additional resources are included in Appendix 1 and are further discussed below.

An example Discard Collection Plan (Waste Management Plan) is shown below in the graphic from the AIANY ZWGD:

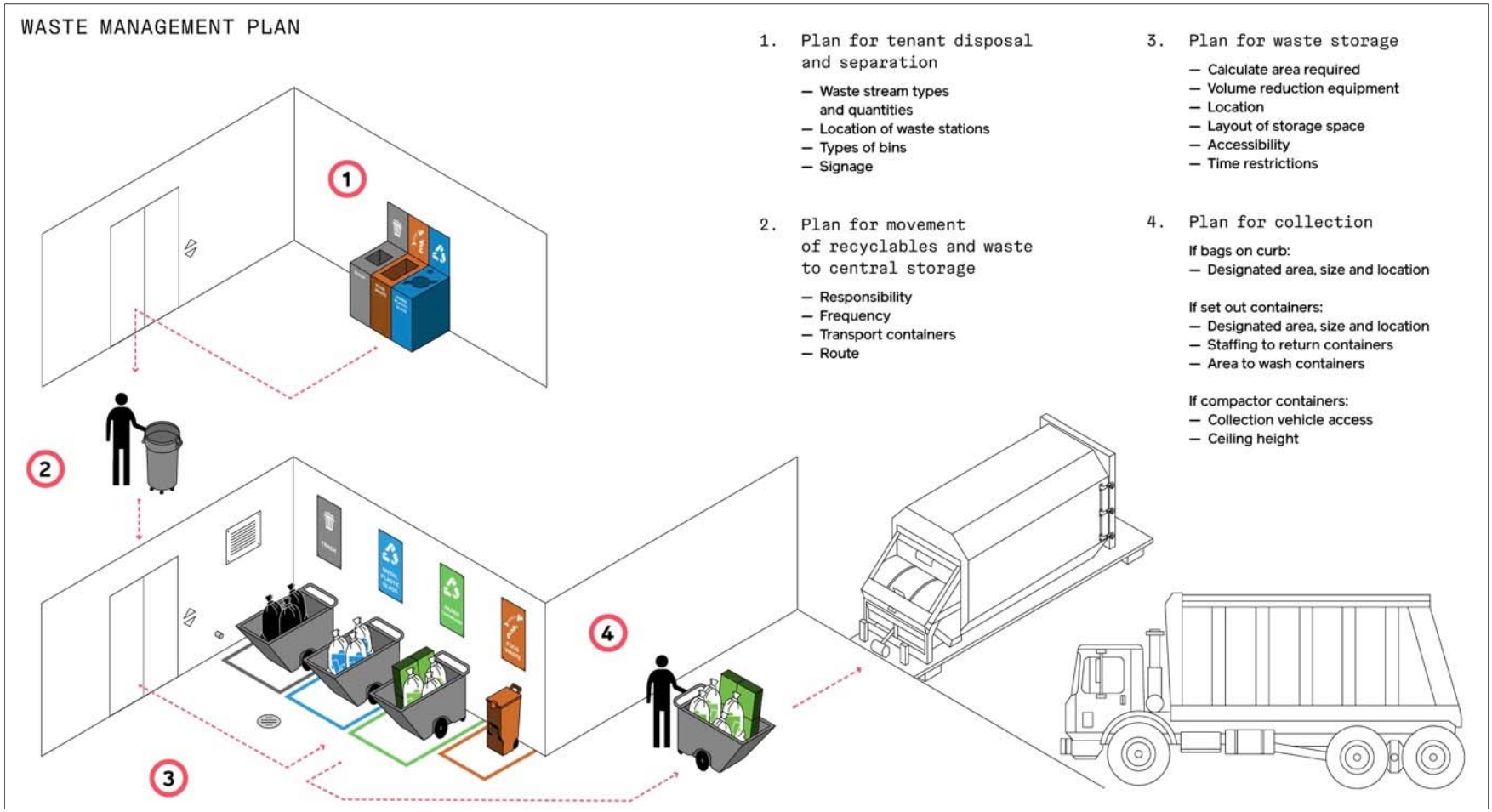


Figure 11. Some typical elements of a Discard Collection Plan (or Waste Management Plan), (Courtesy of AIANY Zero Waste Design Guidelines).

Service Day Staging Areas

Problem: Containers set out for service can block sidewalks and roadways and generate litter when stored outside for collection. Wind can blow litter from containers that are overflowing and scavengers sometimes create litter by rifling through waste and recycling collection containers.

Considerations: The best-designed buildings allow the collection vehicle to drive directly up to the area where the containers are stored – preferably indoors. This situation allows the driver access to the containers without having to move them a long distance and minimizes the risk of litter generation. If that is not possible and the collection vehicle can't drive directly up to the indoor garbage room or outdoor garbage enclosure where containers are located, then the property could be built with a designated staging area where full containers can be serviced more easily on the day of collection by hauler staff and vehicles without blocking the street or sidewalks.

Staging areas are often needed at properties where the building takes up most or all of the site and there is no option to service containers inside the building. At these types of buildings (typically in a more urban location) the containers could be brought by the property manager, maintenance staff or a contracted service day bin-moving company to a designated service day storage location at the property boundary next to the public right of way where a sidewalk and public roadway with a curb ramp and yellow-curb loading zone are located. The full containers could be brought to the staging area the night before the service day and returned to the garbage room or enclosure accessible to residents on the evening of the collection day after they are emptied.

For lot-line buildings, a designated room with exterior roll-up or large double doors facing the sidewalk could be provided where the containers can be accessed easily by the hauler staff on the service day. A good example of this type of design is shown on the following page in Figure 12. This MFD has a chute room located directly behind the roll-up door with a clear pathway and smooth level surface to the street with a curb cut. This makes moving heavy containers easier - reducing worker injuries. More photographs of the MFD are on page 32 in Figures 17 and 18.

The building design documents could clearly show the location of the staging area with calculations demonstrating that the staging area is large enough to accommodate the containers set out on each service day.

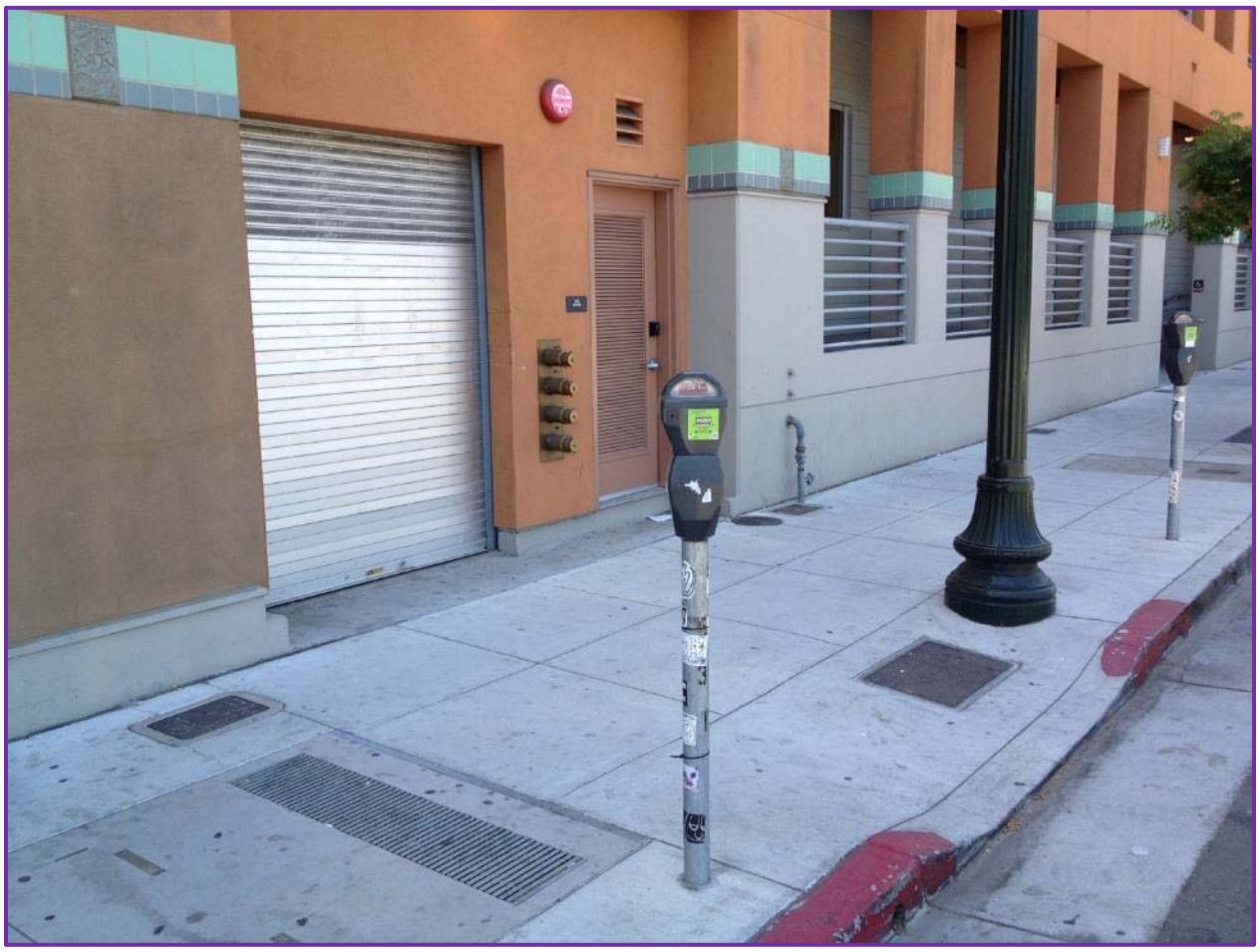


Figure 12. Well-designed trash room access with curb cut and red zone.

Another option for new buildings being designed with interior parking garages and garbage rooms is to increase the ceiling height and space so that hauler collection vehicles can enter the building, service the containers, turn around and exit. Check with the hauler for vehicle specifications such as the ceiling height needed for FEL-type containers and vehicles. The additional ceiling height needed may work well in tandem with designs for stacked residential vehicle parking systems that are becoming more common in urban MFD construction. Keys, electronic codes and/or remote control fobs/cards could be provided to hauler staff as needed to access gated/secured buildings.

Full containers can be heavy and hard to move, especially on slopes, so containers can be brought to the staging area using equipment such as towing systems and “bin movers.”

The Discard Collection Plan discussed above can also cover the subjects of storing, staging and servicing of bulky and special items for each MFD in partnership with the hauler. This can involve the use of flatbed trucks and roll-off containers and associated vehicles. If indoor

collection of these items is planned it needs to be thought through carefully with vehicle height, maneuvering and space requirements.

Chute Systems

Problem: What is the most effective, convenient and non-litter-generating way for disposed materials to be transported to collection containers in an MFD?

Figure 13. Chute room with one garbage chute door and no recycling or composting options

Considerations: Chute systems that allow for the gravity-based transportation of disposed materials through a multi-floor MFD are an attractive and convenient design option. They have been used for disposal of garbage, ashes and used linens for over 120 years in residential buildings in larger cities around the nation and in the last 20-30 years for recyclables as well. However, chutes have operational, financial and design challenges:

- They can be a maintenance challenge to keep clean and operational
- Bulky or rigid materials, such as small furniture and cardboard boxes, can jam the chute
- Multiple chutes can be a design challenge for inexperienced architects
- They can take up valuable real estate on each floor of the building
- They cost more up front in the design and construction phase, but are usually cheaper in the long run than other labor intensive options
- Educating and motivating residents to prevent contamination can be difficult
- Multiple chute systems are still relatively new, so many people are not familiar with how they work

Requiring multiple chutes or no chutes at all can be considered a mandatory design condition of approval by the permitting jurisdiction so that when disposal chutes are proposed by the applicant's design team, they are well aware of the requirement to provide multiple chutes and do not base their design on a single chute for garbage alone. Developers may be reluctant to include the space for multiple dedicated chutes if it's not mandatory. The 1st chute is typically for garbage, the 2nd chute is dedicated to recyclables and a 3rd chute is sometimes provided for compostables. While compostables collection through a chute can have maintenance and other challenges, even if a chute is not going to be used immediately for compostables collection, having the option to use it in the future is important since post-construction addition of a 3rd chute is not practical. Zero waste goals may not be attainable without this kind of infrastructure available in MFDs.

Design guidance:

- If chutes are going to be provided, consider requiring three, or a minimum of two, separate, dedicated and equally convenient chutes - one for each material to be collected: garbage, recyclables and compostables.
- The chutes should be a minimum of 24 inches in diameter and cylindrical to minimize jamming of material.
- If possible, the chutes should be completely vertical all the way from top to bottom to reduce cleaning and maintenance.
- Provide separation space between each chute from the top floor to the bottom: Consider requiring that the design have a minimum of 12 inches of separation on each side of each chute as they pass through each floor of the building and at the bottom of the system to ensure that the chutes can remain in a 90 degree vertical position at the base where containers of various sizes and shapes need separation under each chute. Therefore the opening (chamber) on each floor for a row of three side by side chutes will need to be approximately 10 feet in length and a require a chute room of at least 10 feet by 8 feet.
- The chamber for the chutes needs to be centered in the wall of chute room so that the collection containers can fit underneath the chutes.
- Chutes need to have fire suppression equipment such as sprinklers and a set of automatic chute trap doors to cut off oxygen flow to burning materials in the chute.
- Trap doors at the bottom of the chute can be used so that material does not fall on the floor when the collection container is out for service.
- A 2nd set of containers can be used under the chute on service days if the 1st set of containers is out by the street for extended periods for collection. However, some haulers charge monthly for the use of each container even if they are only being used for this temporary purpose and not being filled for service. Another solution is for the property owner to purchase a 2nd set of containers for this purpose that belong to the property.
- Proper signage: color-code and label each chute door with appropriate signage for residents to distinguish between the different streams of material for each chute. Provide information on what can and cannot be disposed through that chute door.

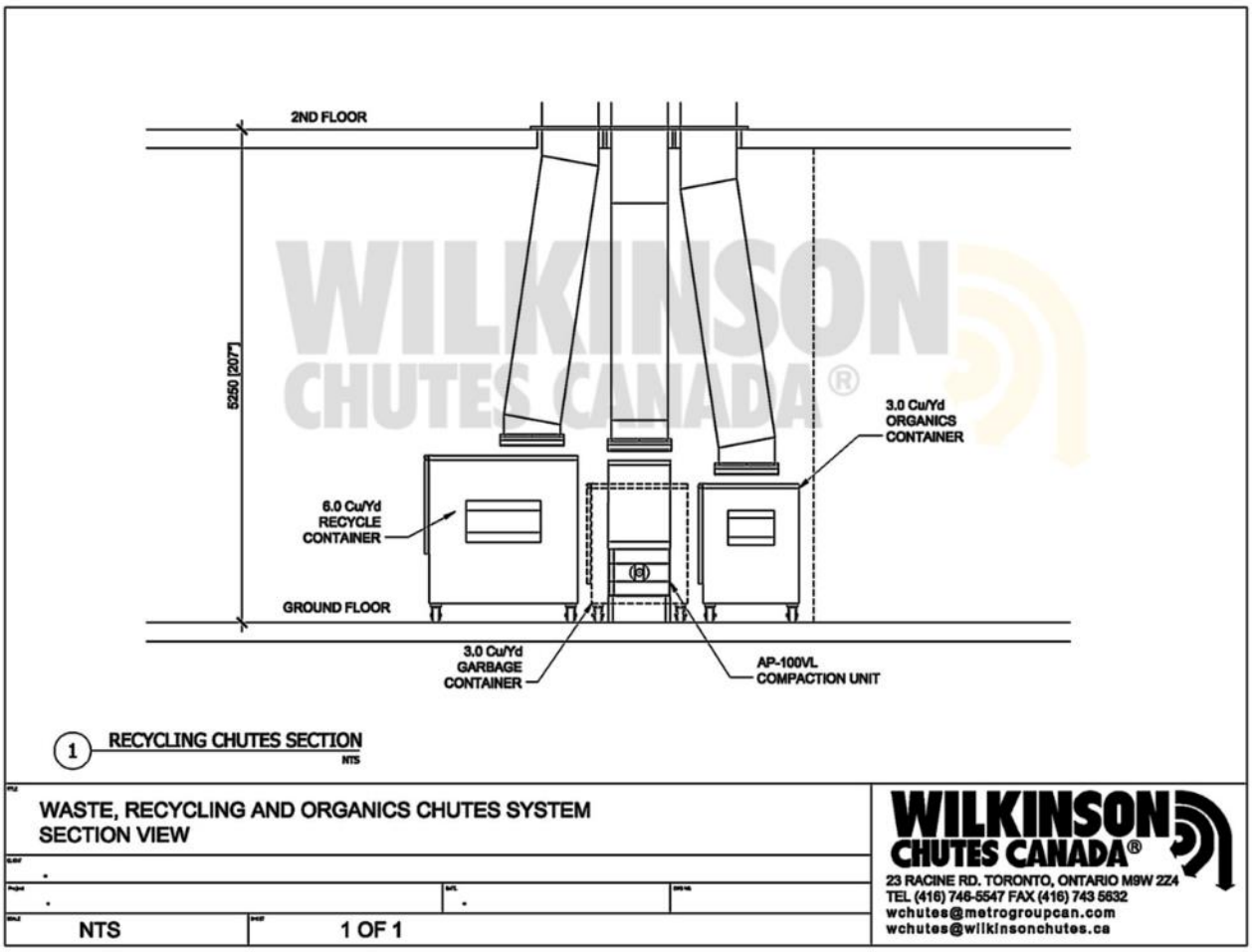


Figure 14. Dedicated three chute system (Wilkinson, 2012)

Dual Chute Systems:

In Figures 15 and 16 below are photographs of a dual chute system for garbage and recyclables collection at an MFD. The system is well designed but could have provided a bit more space under the chutes for the FEL containers to allow for easier maneuverability by the hauler crew. It can be difficult to squeeze between the containers which would allow for a push movement. Instead the hauler crew uses a pulling motion which is not ideal from a worker injury perspective. However, the enclosure does provide a short, level and smooth path to the loading location for the collection vehicle and plenty of air circulation and light through the gated entrance. The only negative factor of the gated entrance is that wind can blow litter out of the enclosure into the private street adjacent to it.

Figure 15. Chute Room with dual chutes for recycling and garbage

Figure 16. Dual chute enclosure with access gates for hauler

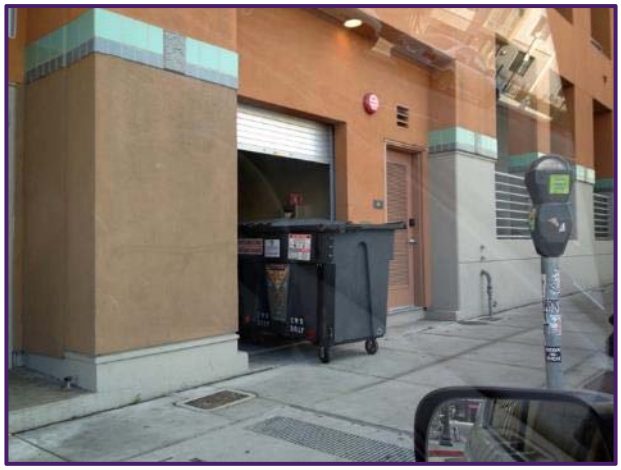


Figure 17. Access from chute room to street for hauler

Figure 18. Trash room with dual chutes

Access to the street from the chute room is crucial when you are moving large and heavy containers. These examples show chute rooms with well thought out Discard Collection Plans so that the hauler has easy access to the containers on the day of service. In Figure 17, the property maintenance staff is bringing the recycling container the short and level distance from under the chute (Figure 18) to the street for collection. An even better solution would be to give the hauler crew access to the chute room by providing them with a key or fob to open the rollup door on their own so that the bin doesn't need to be left out in the street for long periods of time that can block sidewalks and roadways.

Alternatives to Multiple Chutes:

For retrofits and other situations where multiple chutes are not possible, mechanical material separation systems at the bottom of a chute such as "Tri-sorters", "Bi-sorters" and "Carousels" have been used. There have not been many installations of these systems in the Bay Area to provide local performance data; however, they have not been proven to perform well over the long term.

Figure 19 shows a photograph of a Tri-Sorter system that was installed in San Francisco with a compactor on the left for garbage and two uncompacted metal bins for recycling and compostables on the right. Figure 20 shows the control system in the chute room that residents use to choose which material they are disposing of before they open the single chute door. The chute door is supposed to remain locked until they select the material they want to dispose. The Tri-sorter then moves a flap at the bottom of the chute to direct the materials coming down the chute to the proper container. This image was taken a year after construction at which time the chute door was not locking correctly, so residents could put any material down the chute without selecting the material type. This resulted in contamination in the metal bins and all the material being landfilled. Maintenance staff should keep a close eye on the system and call for repairs quickly if the system is not functioning properly.

Figure 19. Tri-Sorter with compactor for garbage.

Figure 20. Button controls in chute room

Figures 21 and 22 show how the design and construction of chutes for an MFD can go wrong. The design did not leave enough space in the chamber that the chutes need to pass through on each floor. The design did not take into account the space needed between each chute and the location of the chute room on the ground floor also was not located correctly under the chute chamber. These mistakes resulted in a construction quandary – either all the chutes had to be abandoned, only two chutes could be installed, or one chute with a sorting device would have to be installed. This MFD ended up using a chute sorting system. Figure 22 shows the location with a Tri-Sorter system with uncompacted FEL containers for each stream.


Figure 21. Problems during construction.


Figure 22. Final construction with Tri-Sorter.

One or No-Chute Options (instead of multiple chutes):

Here are three options that do not use multiple chutes. Each has pros and cons to consider:

- An expensive long-term operational option is to provide three containers for each of the separate streams of materials in collection rooms on each floor of the building. This usually requires maintenance staff to bring full containers down to the ground floor, typically in a freight elevator, on a regular basis which is time and labor intensive.
- A second option is to not provide any collection system on each floor and instead require residents to bring all materials to the ground floor for disposal. However, in general, the less convenient the system becomes for residents the lower the diversion rate will be as they have to do more work in separating and transporting materials a longer distance. Leaks and spillage from bags of materials transported by residents to the ground floor can also prove to be a maintenance cost especially where hallways are carpeted.
- A third option is a hybrid of these systems. A garbage chute, with recyclables containers and/or compostables containers in each chute room is also convenient for the residents.

The photos below from one retrofitted Bay Area high-rise complex show the third option:

Figure 23. Clockwise from upper left: (1) Entrance to chute room on 4th floor, (2) recyclables cart behind closed door in chute room, (3) recyclables carts being cleaned after coming down the freight elevator, (4) compostables collection carts in the parking garage next to elevator where all residents pass on the way to their cars, and (5) close-up of recyclables cart showing the small wheels that were added to the bottom of the front of the cart increase maneuverability in a small space.

Design of Garbage Rooms and Enclosures

Problem: Lack of sufficient space:

- In an enclosure or room for storing the required collection containers;
- For room to access, move around and remove specific containers on the day of service;
- For storing special and bulky items until they can be collected.

This can lead to litter generation as materials can overflow into areas outside of the intended storage room or enclosure. The design of outdoor enclosure walls and inclusion of roofing can also have litter effects. Figure 24 below shows how the lack of an enclosure and organized system can lead to litter and operational challenges:

Figure 24. Open and overflowing containers without an enclosure area.

Considerations:

One of the most common problems at MFDs is the provision of adequate storage space for disposed materials, even though California state law has required since 1993[8] that no building permit be issued for new development and expansion projects without adequate storage space for collection of garbage and recyclables. In order to prevent buildings from being constructed without adequate space and access, municipal staff could have the plans reviewed by hauler staff and can ask that calculations and diagrams be provided by the project designer on the building plans showing the following:

- The different types of containers for each stream of material;
- The arrangement of the containers within the enclosure or garbage room;
- How access to the different types of containers will be accomplished by the hauler staff;
- The path of travel from the enclosure area, garbage or chute room to the vehicle loading location;

[8] See www.calrecycle.ca.gov/publications/Documents/LocalAsst/31000012.doc

- The path of travel and turning movements of the collection vehicle through the property (collection vehicles typically need about the same space as fire engines for driving and turn movements); and
- Location and size of space for bulky and special item storage; consider how the materials will be hauled away and the location for that procedure (if a roll-off container is going to be used to take away bulky items, the ceiling height will have to accommodate the vehicle that will drop off and pick up the roll-off container. (Check with your hauler for dimensions.) RSMC's guidelines require a clear height of 50 feet inside buildings.[9]

Outdoor garbage enclosures can also be designed to minimize litter if designed with the following wall and roof features:

- Walls with no gaps at the pavement surface,
- Roofing to prevent wind and water from entering the enclosure.

Collection containers typically have lids which is used as a reason by designers not to provide a roof on the enclosure. However, in practice, lids are often left open by users and hauler drivers. Additionally, if containers leak or garbage is on the ground inside the enclosure, rain can wash away litter and pollution. A roof is an effective measure to prevent these problems. Various organizations in the Bay Area and beyond have developed guidance to assist with the design and sizing of enclosures. These are listed in Appendix 1.

Recommendation Summary for New MFD Design and Construction

It's important for cities to adequately review new MFD construction designs. Once the structure is built, it can be prohibitively expensive to modify chute systems, enlarge enclosures, install staging areas or include other strategies and designs listed above. Stand-alone garbage chutes can be removed or left in place and sealed off, but alternatives can be expensive or difficult to accomplish because of space constraints or reluctance on the part of property owner or residents to change the way materials are collected. Some cities have instituted or are considering policies to require property owners to remove single chute garbage systems if they cannot be modified to provide multiple chutes. With or without such an ordinance or requirement, it is important for municipal staff to develop partnerships with property owners, residents and haulers to work together to find mutually agreeable solutions.

- Use the SMCWPPP Model Stormwater Conditions of Approval[10]
- Consider incorporating the Conditions of Approval as described in pages 20 and 21 of the Toolkit
- Require a Discard Collection Plan for every new MFD project
- Involve the Franchised Hauler staff in the design review process and require that designs meet their needs.

Additional resources for strategies to improve the long-term performance of MFDs are listed in Appendix 1.

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[9] https://www.recology.com/recology-san-mateo-county/new-development-projects/

[10] http://www.flowstobay.org/sites/default/files/Model%20COA%20July%202016%20final.pdf

SECTION 4 Implementing Litter Management Practices

Implementation Steps

This section lays out a step-wise approach for implementing the Litter Management Practices (LMPs) in several commonly encountered situations at existing MFDs. The six steps are displayed in Figure 6 on page 11 and further described below:

Step 1 – Identifying target MFDs

Step 2 – Identifying specific litter issues

Step 3 – Choosing the appropriate LMP

Step 4 – Implementing the LMP

Step 5 – Measuring success

Step 6 – Adaptively Managing

Step 1 – Identifying Target MFDs in Your Community

Most permittees have constrained resources to address litter problems at MFDs. The first step in reducing litter at MFDs is to prioritize which properties can yield the most effective results. Here are some tips:

- Start Small:
  Target a small number of properties at first. If the process yields good results, move on to the next property or group. Build on success and learn along the way.
- Use Available Data:
  Start with whatever data or maps are available from your hauler, county, other municipal staff or other sources and then consider which of the following strategies makes the most sense for your situation. If possible obtain an up to date list of all MFDs in your jurisdiction that contains the site address, property owner name, contact information and number of units.
- Group by Location:
  If one of the strategies below yields a list with multiple properties, attempt to find several that are near each other and start with those.
    - There might be one hauler route servicing all the properties in a localized area. Working with the smallest number of drivers and routes can make adjustments faster and easier.
    - Targeting enforcement in one focused area can be easier than when problem areas are spread out over several areas.
    - Surveillance equipment or methods can be shared or might overlap in a focused area increasing effectiveness.

- Inspections are close together and take less staff time.

Below are seven strategies for identifying properties depending on what data and resources are available to municipal staff.

MFDs with Container Overages

Frequent container overages are an excellent indicator of problems at an MFD and an opportunity to correct several issues at once. Correcting the issues can have impacts on the property owner's and/or residents' garbage bill, so contact your hauler and go over the problems. Get a map or list from the hauler of MFD customers that have had repeated overages during the last twelve months. They may have ideas about which properties are problematic in ways that do not show up on data reports or maps. SMCWPPP may have generated maps for your agency with this information.

MFDs with Abandoned Waste

You may be able to work with your hauler and municipal staff from code enforcement, police, municipal maintenance, recycling and other departments to create a list or map of illegal dumping hot spots on public and/or private property in your jurisdiction to focus your efforts. SMCWPPP may have generated maps for your agency with this information.

MFD Demographics

Some properties may have challenges because of owner or resident demographics. Frequent turnover of residents, income levels, absentee landlords, cultural challenges, low levels of investment by the property owner and/or lack of on-site management can all contribute to litter problems on a property.

MFD Structure or Age

MFDs can be difficult to maintain when the systems and structures begin to age. Even new MFDs that were poorly designed or constructed can pose challenges. Obtain a list of all the MFD properties in your jurisdiction and sort them by structure type such as townhome, apartment, condominium, height, density, style and/or percent of the property dedicated to outdoor surface parking.

MFD Operations

As described in Section 2 of the Toolkit, there are different factors that can affect the operations on a given site. Look at your list of properties and if possible think about the different operational categories that each property has and see if some are similar. You may need to make some site

visits to see the properties, or use Google Street View to sort the MFDs into some initial categories.

MFDs with Low Waste Reduction Metrics

If you have a list of properties and diversion rates for each, consider targeting low diversion properties first. Sometimes these properties have low diversion rates for the same reasons that cause high litter generation.

MFDs in Trash Management Areas with Full Trash-Capture Devices

If the MRP is not requiring additional work in an area of your jurisdiction because full trash capture devices have been installed in catch basins or other locations downstream from the MFD properties, you may want to consider other problem MFDs. While visible litter can still be a blight issue in these neighborhoods, from the stormwater perspective, if the litter is being captured downstream in a device or through effective street sweeping, then the presence of litter on a street may not be the highest priority.

Step 2 - Identifying Specific MFD Litter Issues

Below are strategies for identifying which litter issues are most pressing at a particular MFD.

Communication with Affected Parties
The first step may be to communicate with property owners or managers. It is best to communicate before an on-site inspection is considered. An official letter on the jurisdiction's letterhead from a manager or mayor can be very helpful. The letter can describe the purpose of the site visit and goals of the program to inform property owners and managers of the issues and objectives of inspections.

Off-site Inspections
Before you enter a private property on a site visit, you may want to do some preliminary investigative work including the number of units that are on the property, the mailing addresses or other information before an official site inspection. (See Communication Tools in Section 4 for more details on this issue.)

On-site Inspections
Site visits can be very helpful in determining what issues are present on a property. Google Street View can reduce the time needed to survey properties, but if there are a limited number of views on a street or interior parking areas are not visible from the street, its usefulness can be reduced. Inspecting a site on the day of service before, during and after materials are collected by the hauler, or on the day before street sweeping is conducted, can often yield the best insights. If you are going to be entering the site, it is best to contact the property owner(s), HOA, or property management first and make an appointment.

Documentation

Once on-site, go to the property manager's office, if there is one, and identify yourself and gain permission to inspect the site and take photographs. Without permission from the owner or manager, any evidence that is collected, including photographs, will not be allowed in court if an issue results in legal proceedings. Use the date-time stamp function on your camera or phone-camera. This will prove useful when writing up inspection reports or using the photos as evidence. Use an inspection form and have the property owner sign the form as evidence of permission to enter the site. Give the site contact your business card and ask for theirs.

Step 3 – Selecting the Litter Management Practice

Matching LMPs with Litter Issues

Once you have identified your initial list of properties and you've categorized and characterized the sites, you can begin to match LMPs with the targeted properties. The LMPs may depend on the strategy chosen in Section 2 above. If you are targeting properties that have container overages, then your primary LMP will be to work with the hauler and the property manager/owner to come up with possible modifications to the collection container size, service frequency for each service commodity on-site. Adjustments may need to be made to the weekly volume of garbage, recyclables or compostables, if those services are offered. These adjustments will most likely affect the monthly billing rate for the property. Your hauler should be able to give you before and after billing summaries to share with the customer and consider before the changes are made. Sometimes different containers need to be delivered to the site and other containers removed which can take time to accomplish.

Identifying Constraints

Financial and physical constraints in addition to constraints on time need to be identified before they can be addressed. In order to identify constraints, gather as much information from municipal staff and the hauler. Meet with the property owner(s) and managers to hear what they perceive as the problems on the site. Finally, meet with residents to listen to their concerns and ideas for improvement before proposing any changes.

Anticipating Problems and Providing Options

There are patterns and issues that come up repeatedly at MFDs. For example, wheeled carts and bins are often left out on the curb for extended periods of time when most municipalities require them to be taken in within 24 hours after being set out. If the building has an on-site property manager, that should be taken into account. If their garbage enclosure or enclosed staging area is close to the curb, that is also a factor. If they have collection services on multiple days of the week, and are also leaving out containers beyond the time allowed, then the issue becomes a blight or nuisance. Piece together the customized approach for that MFD. There are almost always several options for each property. Some options may be more effective, more practical or less costly than others.

In the example above, there are several options that may address the problem.

- The hauler may offer an option to retrieve, service and return containers to an appropriate location on the day of service. This usually entails an additional charge, but it can solve the problem for the property.
- The hauler could combine and/or coordinate many service days for one or more streams of material into a smaller number of service days so that containers are out less frequently.
- The property could provide larger containers that can be serviced less frequently. Sometimes this option can save the property money and it also is generally more desirable for the hauler. The property owner may have been considering hiring an on-site manager or part time maintenance person. Adding the duty of bringing containers in and out on service days may encourage the hiring process.

It is not typically the role of the municipal staff person to choose the solution for the MFD, but to outline the concerns and requirements of the jurisdiction and then let the property owner determine what needs to be done. This is also the role of the municipal design reviewer for new MFDs. If the property owner is resistant due to the financial impacts of a rate change in their service or other impact from modifying their operations, first try to find different options with the hauler. It's generally not a good idea to bring up non-compliance enforcement until all other options are exhausted, but if needed, reminding an owner or manager that fines and legal action could be a costly and time-consuming result of non-compliance, can be a useful way of moving the implementation forward.

Step 4 - Implementing Litter Management Actions

Successful implementation of LMPs takes concerted and sustained effort from the municipality, hauler, property owner and/or residents, especially in larger properties. Every property is different and what works in one location may not work in another.

Working with Other Affected Municipal Staff and Contractors
Using the Communications Hierarchy in Figure 4, determine which stakeholders are appropriate for the LMP that you are considering implementing. Other staff may have valuable knowledge related to the property at hand or may know of other programs and resources available to assist with implementation.

Contractors who work with the municipality can also be important parties for coordination. For example, street sweeping is an important part of litter collection in most jurisdictions and is often contracted out to a sweeping company. An effective street sweeping program allows the sweeper access to the curb and gutter area of the street, therefore if on-street motor vehicle parking is allowed on a given street during the week, then parking should be prohibited during street sweeping times. Retractable inlet screens can be installed on catch basins and inlets to keep litter on the street for sweeping. Working together with the hauler to coordinate sweeping and collection days of service can increase the effectiveness of sweeping if sweeping can take place after collection.

Working with Franchised Haulers

The effectiveness of a LMP is constrained by the situation in which it is employed. For litter control at MFDs the franchised hauler and the franchise agreement are often the biggest constraining factors. If the franchise agreement is not well designed, is not enforced, or doesn't offer the services and programs that are needed to reduce litter, then standard LMPs may be less effective and may need constant vigilance.

Understanding the issue from the perspective of the hauler is important. One common problem with modern franchise agreements is that they don't incentivize the hauler to reduce waste or litter. Rates are usually based on the size of the garbage can, cart or bin; recycling and organics collection is usually included in the cost. In the future the best option may be to separate out the cost for each service and itemize these costs on the customer's bill. As garbage levels drop, the hauler can still receive revenue from the other services. Other incentives are often inserted into franchise agreements to make up for the rate problem and these can work to a certain degree depending on the hauler and how strong the partnership is between the hauler and municipalities.

If there is no requirement in the franchise agreement to pick up litter from overflowing and overloaded containers during collection and there is no assistance from the jurisdiction to enforce overage charges on the customer, the hauler may become frustrated when that service is requested by the municipality. Building a relationship with hauler staff can be productive. If there is trust between the parties that all sides are working towards a common goal, then positive solutions can be developed.

The number one concern for hauling companies is safety. Sanitation workers, according to the US Bureau of Labor Statistics, are three times as likely to die on the job as are police officers, and fifteen times as likely as firefighters. And handling waste is one of the greatest sources of occupational injury for building maintenance staff.

Therefore haulers want to reduce risk such as in situations where a driver has to push or pull a bin in a repetitive way three hundred times per day. Automation has reduced the number of people on collection crews; there is now typically only one driver instead of two or three. The number of people per crew determines their ability to safely move containers beyond a certain size and weight and will need to be factored in when considering LMPs. The hauler management will typically have to approve any requested service change and determine new rates for service before the change can be implemented.

For problem sites, ask the hauler about the vehicle that is being used to service the MFD. The vehicle can generate litter especially when conditions are windy and the customer's containers are overloaded. Side-loading refuse collection vehicles are often the best for preventing wind-blown litter, but can only be used for wheeled cart containers. The driver empties the carts by pushing each one up to the truck and then pulling a lever to raise the cart and tip it upside down inside the hopper areas. A hopper that is shielded from the wind and is at chest-height on the side of the vehicle provides several benefits: the tipping process is less likely to generate litter, the driver can visually inspect the contents of the cart for contamination during tipping, can shake the cart inside the hopper to fully empty it, and has the ability to manually throw bags of extra materials from overloaded carts into the hopper when needed. These capabilities are limited when the

materials are tipped on the top of the truck as with a FEL type vehicle. The two types of vehicles are show in the figures below.

Figure 25. Side-loading vehicle tipping carts into hopper with good wind protection

Figure 26. FEL (Front-End-Loading) vehicles tip bins into a hopper on top of the vehicle with poor wind protection

Coordinating with a Local Waste Management Authority or Special District

In San Mateo County there are two special districts and one joint powers authority (JPA) that manage franchise agreements for solid waste collection. Additionally some municipalities have individual agreements with hauling companies. The two special districts are the Granada Sanitary District, and the Montara Sanitary District; they also manage the sewer services for their respective areas on the San Mateo County Coast. The JPA is the South Bayside Waste Management Authority (SBWMA, and also known as Rethink Waste) and is comprised of twelve public agencies that manage disposed material collection franchise agreements. The SBWMA is comprised of ten cities, the County (for certain service areas) and the Westbay Sanitary District. Special Districts and Waste Management Authorities often have access to hauler data and other information that can be valuable towards reducing litter. The SBWMA also provides outreach, oversight and coordination with the franchised hauler (Recology San Mateo County) and oversees contracts with processors for the collected recyclable and compostable materials and landfill disposal.

Using SMCWPPP Tools

SMCWPPP has developed many tools related to litter reduction for municipal staff to use related to the MFD toolkit. These include maps of illegal dumping and container overages, trash management area maps, full trash capture device maps, litter survey and assessment protocols[11] and model forms, and litter tracking guidance.

Franchise Agreement Language Practices for Litter Reduction

This document produced by SMCWPPP's Litter Work Group in 2016 contains model language and examples of existing language from franchise agreements in San Mateo County and the

[11] The Litter Assessment Protocol for Streets and Sidewalks is available at: http://eoainc.com/wp-content/uploads/2017/09/OVTA-Protctol-A-Street-and-Sidewalk-Surveys-w-Appd-v-2.0-Sept-2017.pdf and videos are at: http://eoainc.com/ovta_fc/

Bay Area related to litter reduction. Many of the examples in the document pertain directly to work with MFDs such as LMPs for reducing container overages, new types of rate structures and examples of how collection vehicle types and technologies can impact litter control.

Maps and Data from Haulers
Haulers typically maintain lists of all the customers they service including data on container overages, billing issues, changes in service, owner and manager contact information, mailing addresses for sites and owners and communications from their drivers servicing those customers. This data can be sorted for MFD properties and is usually available to municipal staff. SMCWPPP has done one example of this on behalf of the permittees with the SBWMA and produced maps displaying litter related data points.

Trash Management Area maps
Trash management area maps have important information related to MFDs and litter. If problem MFDs are located within the watershed of an existing full trash capture device, that is an important data point for prioritization. MFDs can be included as a layer in the maps to see where litter hot spots overlap with MFDs yielding targets for outreach. The maps can also provide geographical guidance on locating areas where several problematic MFDs might be considered for a campaign targeting several properties at once. Another layer that can be added to the maps are the routes of the hauler's collection vehicles to see how they overlap and can be coordinated with for any given MFD that is targeted.

Follow-up and Inspection
Once an MFD or group of MFDs are targeted and LMPs have been implemented, coordinate with the SBMWA (if applicable), the hauler's management and drivers, and other involved municipal staff to collect information on the success of the LMP. Evaluate and address problems that have occurred and provide recommended actions as part of enforcement or inspection at the property.

Enforcement
There are different types of enforcement activities that can be used to gain compliance and create successful reductions in litter at an MFD. Municipal staff have the most tools at their disposal when it comes to enforcement with Code Enforcement staff, Stormwater Program staff, Solid Waste Program staff and Planning Division staff potentially playing a role.

Code enforcement can usually be used on any section of the municipal code, but typically operates in the areas of litter abatement, illegal dumping reduction, nuisance violations, permitting compliance and vehicle controls. Stormwater, Solid Waste and Planning staff deal most often with their related section of the code, but can coordinate efforts when overlapping issues come up. The County Health Department can also be involved as they perform inspections once every four years at MFDs as part of health and safety requirements. In addition, various parts of the Franchised Hauler's operations can be involved including collection vehicle drivers and management staff such as route supervisors. In this case, the hauler can only enforce violations of customer practices or requirements that are in the franchise agreement (and any local or state laws that are related to the hauler's operations) so they sometimes have less leverage in a situation than the jurisdiction staff.

Step 5 - Measuring Success

It is important for the jurisdiction to consider what metrics are going to be used for determining progress and success during and after the MFD litter reduction effort. Setting baselines and using litter assessment protocols are an important part of that process. In order to measure the success of a litter reduction campaign, data on the past number of overages can be collected from the hauler. A statistically significant data set over a long enough time period (usually at least 12 months) is recommended for establishing the baseline depending on the frequency of overage violations and number of MFDs within the jurisdictions boundaries. In relation to the MRP, the trash management area map for each jurisdiction is the key compliance indicator. If generation levels reflected on trash management areas around problem MFDs can be lowered, that success will be reflected in the calculated litter reduction percentage that is reported to the Regional Water Board.

Example Metrics that can be used:

- Number of container overages before, during and after LMP implementation
- Results of street litter assessments before, during and after LMP implementation
- Diversion percentage before and after LMP implementation
- Amount of litter in full Trash Capture Devices (TCDs) before, during and after LMP implementation

Step 6 – Adaptively Managing

Once the first effort has been completed, take stock of the results, lessons learned, metrics used in the project and the overall effort to results ratio. Consider if changes are needed to improve the project, or if another approach altogether is needed to make the program more cost-or-labor-effective. If the project is providing results and no changes are needed, then use the prioritization process to find new target MFDs or use the next property or group of properties on the list from the initial process. Consider what types of target properties were generated from the initial prioritization process and if the criteria need to be adjusted in the sorting procedure.

Depending on how many MFDs are located within the jurisdiction consider how much impact the first round of the effort generated and how many cycles or years of effort will be needed to get to the last of the properties on the list that are deemed to be of enough value to act upon. Consider the 80/20 rule that contends that the first 80% of an effort may yield the most effective portion of the success while attempting to achieve success at the last 20% of a target sector may yield declining results with a disproportionately increased level of effort. This can also be reflected in an MFD campaign by the number of total units within the jurisdiction where a few large properties can contain most of those units.

SECTION 5 Litter Management Practices

Table 2: Litter Management Practices organized by type.

Educational and Informational
1. Identifying a Communication Hierarchy 2. Communication Strategies with Residents, Owners and Managers 3. Site-specific Outreach and Community Based Social Marketing 4. Coordinating and Sharing Information with the Hauler 5. Jurisdiction-wide Education 6. Measuring Success
Structural
7. Garbage Enclosure Modifications 8. Selecting Container Types – Both In-unit and Shared
Financial
9. Identifying and Resolving Billing Issues with Haulers 10. Diversion-based Franchise Agreement Rate Structures
Operational
11. Partnering with Other Municipal Staff and Stakeholders 12. Right Size – Right Service 13. Service Day Collection Logistics 14. Ensuring Good Housekeeping Practices 15. Minimum Service Requirements 16. Move-in and Move-out Procedures 17. Managing Bulky Items, Special Items, Universal Waste, Medicine, Sharps, Paint, Freon and Household Hazardous Waste 18. Abandoned Waste Prevention and Reduction 19. Individual Cart Set-out Procedures
Legal
20. Coordination of Enforcement Efforts 21. Examples of Updated Municipal Code Sections Related to Litter

Educational and Informational LMPs

1. Identifying a Communication Hierarchy

Implementation Process: Develop a communications hierarchy for the litter reduction effort. The hierarchy demonstrates who is leading the effort, who the stakeholders are, how they fit into the project, and what their role is, advising or leading. Figure 4 on page 8 displays some typical participants and possible additional stakeholders for an MFD litter reduction project. Crucial information, data and assistance in resolving litter problems, implementing LMPs and ultimately achieving success can be dependent on the involvement of the players in the hierarchy.

2. Communication Strategies with Residents, Owners and Managers

Implementation Process: Devise one or more communication strategies for the litter reduction effort. Depending on your budget for expenses and labor, decide what communication tools the strategy will utilize such as direct mail to residents, managers and owners, phone calls, on and off site meetings, tail gate trainings with hauler staff, internal meetings with relevant municipal and County staff, on-site community based social marketing efforts, surveys to residents and/or owners, on-site posters and/or signage, letters on official City letterhead to owners/residents, and direct emails to residents and/or owners. All of these communication tools can be effective to varying degrees.

One challenge with MFDs can be obtaining mailing addresses for each unit for direct mail outreach. Many address databases, such as one from the County assessor's office or one from the hauler, may only have one site address and one mailing address for each property, usually the property owner and/or manager.

If the property owner or manager is unable to provide individual unit numbers, here are some tips for acquiring them. Get whatever address information you can from the hauler, the County and other staff. If you can get hauler information, ask for the day(s) of service and types, numbers and commodities of collection services that are provided to the property. Checking the information from the hauler, if the property has multiple wheeled carts for service, check the number of containers – it might equal the number of units on the property since smaller properties often will provide one garbage cart for each unit. Check the days that the property has garbage service and make a site visit on that day to confirm the number of wheeled carts. Sometimes each unit will write their unit number of the lid or side of the cart. Make a site visit - but you don't need to meet with property owners, residents or managers necessarily. Save time by just dropping by and not going on the property. You can often see from the sidewalk, the number of meters for different utilities such as natural gas, water, electricity, or communication systems such as phone, but also the number of mail boxes. The number of gas meters or mail boxes will usually be the same as the number of units. Once you have the unit numbers/addresses you can directly mail each tenant information as part of an outreach campaign.

Using email to communicate with residents can be effective, but obtaining email addresses for each resident can be difficult. Some municipalities may have email lists of residents who have

signed up on their city website for agency e-newsletters or other communications. Check also for email addresses from other partners on your communication hierarchy such as the franchised hauler and other municipal staff such as planning, housing, solid waste etc.

Condominium and townhome owners can sometimes be more easily communicated with as they have Homeowners Associations (HOAs) and boards of trustees who have meetings and their own communication networks. Property managers may have methods for communicating with residents that can be harnessed.

When issues come up that involve the franchised hauler, it's good to begin first with management. There is usually a staff person from the hauler assigned to each jurisdiction who has regular meetings to go over any issues with the franchise agreement. This person can be very helpful getting information on an MFD customer such as collection services, billing issues, contact names and telephone numbers, number of units etc. Once you have checked with management about a service issue, ask them to get input from drivers that service the customer as they may also have experience with the property and can provide additional information on issues that have come up such as overflowing containers or other problems.

Waste management authorities and special districts can also be a source of information and assistance for reducing litter at MFDs. The SBWMA has data on customers within their service area and does outreach and campaigns of their own in partnership with Recology of San Mateo County (Recology). The SBWMA also oversees the franchise agreement with Recology and can act as an intermediary with the hauler if any issues come up regarding the franchise agreement and what responsibilities or services are covered. For efforts at MFDs, the SBWMA may be able to provide resources such as brochures on recycling and bulky item collection that can be related to litter reduction. Special districts such as a Sanitary Sewer district often provide collection services to their area, or they contract with a franchised hauler to provide those services. Reach out to them in a similar way to the waste management authority.

Additional Resources:
Databases of MFD addresses from the hauler, waste authority, county or local municipality.

3. Site-specific Outreach and Community Based Social Marketing

Implementation Process: Community Based Social Marketing (CBSM) and similar research have shown that social norms can be useful in influencing behavior. When people see their peers using behaviors they perceive as accepted and "normal" they begin to model those behaviors as well. This practice of "norming" was used in a comparison with outreach efforts by in a pilot project in Livermore at three MFDs in 2014. The project compared results from norming (accomplished by paying a resident to perform regular daily pickups of litter) at one MFD with an "outreach" approach at a second site and a third "control" site. The outreach approach used printed materials, signage, newsletter articles and pledge posters to encourage litter reduction, the norming site was kept litter free, to test if it would result in less litter generated. The outreach site was the most successful of the three in short term and long term litter reduction. The pledge posters were among the most effective outreach measures. See

Appendix 2 for more details on the project and links to a website where example and customizable outreach materials can be downloaded and used for MFD sites in your jurisdiction. Below are some excerpts from the lessons learned summary:

1. "At the norming site, regular litter pickup has not been continued beyond the pilot phase. A few weeks after the pilot ended, the resident volunteer reported the amount of litter to be close to pre-pilot levels."
2. "Before conducting outreach, place as many garbage cans, butt cans and other litter-preventing receptacles on the property - especially in areas where high levels of litter are observed, e.g., near walkways, parking lots, etc. Not surprisingly, convenience and availability of garbage cans increase the likeliness of participation in a litter prevention program."
3. "During the pilots, buy-in and hands-on support from property managers proved a key to success. We therefore recommend choosing sites for replication that have a property manager who is onsite at least partially and is interested in collaborating on litter prevention. Frequent check-ins throughout the campaign ensure that any negative developments are quickly noticed and corrected…"
4. "HOAs appear to be particularly well suited for replication of the project, as their boards meet regularly (by law at least every 3 months, but often more frequently). They also tend to have their own communication channels such as regular newsletters, email groups and websites to connect with residents - all vehicles that can be leveraged for litter prevention outreach."
5. "In our work with the "outreach" pilot site, it proved very advantageous to connect and collaborate with one resident who felt strongly about litter prevention and was also fairly connected with other residents. These allies can help support the campaign by sharing observations, influencing fellow residents and modeling (i.e. norming) the desired behavior. When pledges are used, they can also "seed" the pledge poster with their signature."

Additional Resources:
https://www.cleanwaterprogram.org/index.php/multi-family-litter-prevention.html

4. Coordinating and Sharing Information with the Hauler

Implementation Process: A franchise agreement typically spells out what data the hauler is required to collect, process and report to the municipality. When needed, municipal staff can be the conduit for this information with MFD owners, managers and residents. Hauler staff can work together with municipal staff to present the information to the customers and offer options for litter problems and/or service issues. Franchise agreements can have requirements to collect data on litter such as overages, on-site litter and materials that block driver access to containers, under-subscribed services, contamination, bulky items collection issues, poor housekeeping practices by management and abandoned waste problems.

Additional resources:
See the Operational LMPs below.

5. Jurisdiction-wide Education

Implementation Process: If there are several MFDs that have problems within a jurisdiction, then a city-wide approach may be effective and needed. Adopt a block, adopt-a-drain, shoreline cleanups, creek cleanups, green business programs are all examples that have been used to reduce litter jurisdiction wide. Other examples include foodware ordinances and single-use plastic shopping bag bans that can be combined with outreach efforts.

Step 1: Determine what measures, campaigns and outreach efforts have previously been done in your jurisdictions.
Step 2: Find out what direction elected officials have given to management regarding litter and blight around the jurisdiction. There may be sub-areas within a municipality that all agree need work.
Step 3: Reach out to the SBWMA (if you are a member agency), SMCWPPP and your hauler to find out what resources are available for a community outreach effort.

Additional resources:
City of Belmont – Adopt-a-Drain Program
http://www.belmont.gov/city-hall/public-works/environmental/adopt-a-storm-drain
City of San Mateo – "Team Up to Clean Up" and Adopt-a-Drain Programs:
http://www.cityofsanmateo.org/3009/Team-Up-to-Clean-Up
https://www.cityofsanmateo.org/3715/Adopt-A-Drain
City of South San Francisco – Adopt-a-Storm-Drain Program:
http://www.ssf.net/services/adopt-a-storm-drain
County of San Mateo – Adopt-a-Block Program
http://www.smcsustainability.org/hazardous-waste-illegal-dumping-litter/#adopt
City/County of San Francisco – Adopt-a-Drain Program:
https://adoptadrain.sfwater.org/

6. Measuring Success

Implementation Process: This LMP applies to all the other LMPs. When outreach efforts begin, if possible, the team should define what success means for the project and how it will be measured. Metrics for measuring progress can vary depending on the project, but some useful ones for litter may be:

- Reduction in volume or item-count of litter collected at trash capture devices downstream from the targeted MFD
- Reduction in litter surveyed in trash assessments in the targeted MFD's TMA
- Reduction in collection container overages at targeted MFD
- Reduction in contamination of collected materials at targeted MFD
- Increase in diversion at targeted MFD
- Increase in good housekeeping practices on-site at targeted MFD by management
- Reduction in resident, management or owner complaints to hauler and/or city

Additional resources:
The Litter Assessment Protocol for Streets and Sidewalks is at:

http://eoainc.com/wp-content/uploads/2017/09/OVTA-Protctol-A-Street-and-Sidewalk-Surveys-w-Appd-v-2.0-Sept-2017.pdf

Structural LMPs

Larger MFDs (20 units or more) typically either have chutes or they require residents to bring their materials to an outdoor garbage enclosure or an internal garbage room for centralized storage and collection from the hauler. Buildings with a garbage chute also usually require the residents to bring their recyclable and compostable materials by hand to the garbage room (see section 2 for more details on chutes). MFDs with under 20 units (and townhome MFDs) often have individual garbage carts for each unit and shared carts for recyclables and compostables. There may be outdoor garbage enclosures, indoor garbage rooms or individual garages for each of these types of MFD.

7. Garbage Enclosure Modifications

Implementation Process: Garbage enclosures are typically the most important aspect of the on-site storage and collection system. Enclosures are where most of the litter is generated and either captured or released to the environment, and structural issues can make the difference. Old style garbage enclosures are often no more than a fence and a gate surrounding the collection containers.

Newer enclosures usually have a roof, solid walls, lockable gates, hose-bibs with a water connection, sanitary sewer drains and sometimes fire suppression equipment such as sprinklers. Walls that extend all the way down to the pavement are important for litter control. Sometimes enclosures are designed with gaps at the bottom of the fence to allow for easier cleaning and to make the bottom of the enclosure visible to management to discourage people from sleeping in the enclosure, but that allows litter to blow out. A roof also prevents water and wind from mobilizing litter. Storm drains outside enclosures can have trash capture devices installed.

Getting a property owner to modify an existing enclosure can be difficult. If the property owner needs a building permit for other work on-site or some other permit is needed, the jurisdiction can sometimes use the municipal code or other regulatory mechanisms to require upgrades to enclosures at the same time. Sometimes property owners will voluntarily upgrade enclosures if a litter problem is identified on-site. Some agencies such as StopWaste in Alameda County, have in the past provided grants to property owners that were used to upgrade enclosures to allow for additional diversion and reduce litter. The municipality may be able to use their stormwater ordinance to require upgrades at MFDs if the trash enclosure and on-site operations are causing or contributing to an illicit discharge as defined by the ordinance.

Additional Resources:
See Sections 2 and 3 above and Appendix 1.

8. Selecting Container Types – Both In-unit and Shared

Implementation Process: Property owners and management can take advantage of events that trigger a review of collection containers – both for the MFD as a whole and for each dwelling unit. Triggering events can include: new construction, Right Size - Right Service (RS2) campaigns, audits, new management and other municipal outreach efforts. Selection of the containers for the whole building should be considered in consultation with the hauler, the municipal staff and property representatives in order to fully understand implications of the container choice on diversion, monthly cost, operations, and convenience for residents and receive buy-in from the customer. Containers for each dwelling unit can sometimes be provided by the hauler, waste management authority or municipality and sometimes with grant funds from state agencies or private companies. In-unit containers can be rigid containers or flexible bags. These containers should be washable, re-usable, convenient to use and be designed to fit in small spaces such as under countertops or in closets. Compactors can generate litter when the removable section is emptied by the collection vehicle or when it is set out for service. A flap on the container and on the compactor section can leak litter especially when overloaded or on windy service days if the compactor is outside or if the container is set outside for service. The flap on the side of the compactor container shown in the image to the left may be leaking litter into the street. This is a small compactor container – probably for a garbage chute inside the MFD.

Figure 27. Compactor container that may be leaking litter.

Additional resources:
See Appendix 1.

Financial LMPs

9. Identifying and Resolving Billing Issues with Haulers

Implementation Process: Some issues at MFDs can trigger a customer rate review, a route audit, or review of the rates in the franchise agreement. Having the correct rates for services provided informs the customer and the hauler of issues for RS2 efforts to maximize efficiency and other issues that can lead to litter reduction. For example:

- If a customer has been charged incorrectly, the account history can be checked to see how far back in history the billing mistake began and a credit or charge due can be calculated. Customers care more about litter when they are being charged correctly.
- In some more urban jurisdictions with development causing changing land uses, a mistake can occur when a property is redeveloped from commercial to residential. It is common for franchise agreements to have different rates and services for residential

accounts compared with commercial accounts, which can lead to billing complications. If the hauler's finance department is unaware that a property has changed from commercial to residential, they will not know to begin charging under the residential rate structure.

- Other issues with billing can occur when complicated service changes are made and the results are not clearly communicated to the hauler's finance department.

A route audit is usually included in the franchise agreement as a regular practice (every year or two). Billing audits can also be included as an option for a particular customer. If the jurisdiction or the customer requests audits that exceed the provisions of the franchise agreement, sometimes the hauler has the option to request payment for the additional work involved.

Step 1: When litter issues in a neighborhood or at a particular property have gained the attention of municipal staff, a route audit can be useful for confirming that the rate customers are paying matches the service levels that the hauler's database has them subscribed to. Route audits can also measure driver performance and compliance with the franchise agreement and contamination levels at an MFD.

Step 2: After the route audit is complete, the results can be shared with municipal staff for discussion and suggested changes.

Step 3: The agreed-upon changes, if any, can be shared with the MFD property owner, management and/or HOA for feedback and/or acceptance.

Step 4: The changes recommended by the route audit can be implemented into training, signage, operational and/or structural changes.

10. Diversion-based Franchise Agreement Rate Structures

Implementation Process: Most franchise agreement rate structures are based on the level of monthly garbage service that the property subscribes to. State and local regulations may require service minimums. Newer state and regional regulations are beginning to require minimum recyclables and/or compostables collection services for MFDs to reduce waste to landfills and meet state environmental goals. San Francisco and their franchised hauler, Recology, have developed a new rate structure that is not solely based on the refuse service, but instead has a base rate for all services and a variable rate based on waste reduction. Here are some steps to use when considering a move to a diversion-based rate structure:

Step 1: Review the current franchise agreement rate structure.

Step 2: Gather example rate structures from jurisdictions that have already implemented some or all of the steps here. The City of San Francisco is the most prominent local example.

Step 2: Discuss these new rate structure concepts with elected officials, municipal staff, haulers, waste authorities and others to get consensus when agreement negotiations are being initiated.

Additional Resources:
City and County of San Francisco and Recology Inc. Collection Service Rates:
https://www.recology.com/recology-san-francisco/rates/
http://sfpublicworks.org/refuserates

Operational LMPs

11. Partnering with Other Municipal Staff and Stakeholders

Implementation Process: Elected officials and municipal staff from varying departments may have involvement with MFDs, but with different objectives or purposes. Stormwater program staff may be interested in reducing litter and illicit discharges, while waste reduction program staff will likely be more involved in increasing recycling and composting activities. Code Enforcement staff may not typically deal with litter or waste reduction issues, but may instead be working on reducing blight or noise disturbances. Police and firefighters typically deal with life, health, safety and property crimes. Councilmembers and mayors often respond to concerns of residents, but are not always aware of environmental compliance issues. Sharing of resources and information can improve the effectiveness of all the programs mentioned above. MFD garbage enclosure improvements can provide an excellent example of a municipality acting as a partnership.

Example scenario:

> An MFD has a garbage enclosure next to one of its residential buildings. After cleaning some flammable chemicals, a maintenance employee wrongly disposes of the rags in a recycling container. An hour later a resident rushing to work mistakenly tosses a still smoldering cigarette butt into the same recycling container lighting the rags and starting a large fire with the newspapers in the bin. The poorly designed and constructed garbage enclosure with no roof or fire suppression equipment is built into the exterior wall of the one story structure with windows and a flammable overhanging roof above it. Luckily the fire department responds quickly to a smoke alarm within the building and prevents extensive damage.

This case demonstrates both the need for proper design and construction of garbage enclosures, but also the need to train staff and educate residents. Several departments from the municipality joined together to prevent future fires by requiring the property owner to construct a new garbage enclosure with the correct design and construction. The Fire Marshal can provide appropriate requirements for the enclosure design related to roofing and fire suppression equipment. Staff from planning and building, stormwater, waste reduction and housing can share integrated design requirements and ideas. During its review, the hauler provides information on how their staff and vehicles will service the containers within the enclosure and other design criteria. The partnership improves the operation and maintenance of the new garbage enclosure; reduces litter and waste; and increases safety and the serviceability of the collection containers.

In San Mateo County, environmental health inspectors visit MFDs to ensure compliance with other municipal codes and may be a source of information regarding litter issues at these properties. Additionally, code enforcement and community housing (i.e., non-profit organizations) staff could assist in implementing an integrated approach to reducing illegal dumping by housing individuals currently living outdoors, around creeks and other public spaces. Housing developers, property managers and residents can also participate in developing LMPs on their properties and in their community outreach.

Additional Resources:
SMCWPPP Model Stormwater Conditions of Approval:
www.flowstobay.org/sites/default/files/Model%20COA%20July%202016%20final.pdf
Various:
Enclosure Design Criteria and Requirements – See Appendix 1.

12. Right Size - Right Service

Implementation Process: One of the most-utilized LMPs is called “Right Size – Right Service” or “RS2”. Collection containers should be managed in a way that reduces litter and waste while providing operational efficiency for the franchised hauler and the best value for the customer. There are several LMPs related to containers and the collection of materials both within the property and by the hauler. This LMP optimizes the operational aspects of the collection containers either through changes in the number, size and/or type of containers and/or the frequency of service. Overflowing containers are an indicator of a need for an RS2 review.

Step 1: Catalogue the containers on-site that are provided by the hauler, the days of the week that they are serviced, and the gallons of service per residential unit per week for each stream of material can be calculated. If the number of gallons of refuse per unit is less than 32 gallons and the garbage bins are regularly overflowing, then the service level for refuse should probably be increased. Another option would be to increase the recyclables and/or compostables collection service level either through increased container size or increased frequency of collection. This may increase the diversion level on paper, but it can become a more complicated calculation. Contamination levels need to be monitored carefully if sufficient refuse service is not provided or if the residents do not have convenient access to recyclables and/or compostables collection containers. One chute for refuse-only is the most common way that recyclables and compostables are given unequal footing. Assess litter generation on the surrounding streets before service changes are made to establish a baseline.

Step 2: If it is determined that a service change is needed, an analysis should be completed by the municipal staff and/or the hauler describing the other available options for service for the customer under the franchise agreement.

Questions to ask are:

- How many days of service are offered for each stream of material and under what circumstances? Some contracts only allow certain services for the highest volume customers. One example of that is Saturday and/or Sunday compostables collection service is only available for businesses or MFDs that already have a minimum of three day a week service (Monday, Wednesday and Friday, for example). Figure 28 below shows the 2nd service of the day in the evening in an older commercial area where space for containers is limited. The hauler made the service available at the request of businesses.
- What types of service containers and collection vehicles can the site accommodate?
- Are compactors a possible option?
- Should existing compactors be replaced with uncompacted bins or wheeled containers?

- Can garbage rooms, chutes, outdoor garbage enclosures or other storage locations accommodate the new containers and/or service days?
- What are the monthly rate impacts associated with the proposed change of service? Are there new or additional monthly fees for distance, keys, locks, container rental, container cleaning etc.?
- What are the logistical impacts to drivers and on-site maintenance staff with the proposed change of service? Are they acceptable?

Figure 28. Twice per day commercial collection service with a rear loading vehicle.

- Are there interim steps that will need to be taken to phase in the new service such as container changes made and dealt with by the hauler?
- Are there internal collection containers and signage that need to be installed and used on the site to increase the efficiency, access and/or reduce the contamination of materials?
- Are there training needs for haulers or on-site staff to achieve the goals of the new program?
- Can the Waste Management Authority, municipality or hauler provide containers, signage, training or other resources to the drivers or on-site staff?

Step 3: Write up a "before and after" service proposal with a comparison of rate information. Share the proposed change in service with other municipal staff shown in Figure 4 to see if they have any comments on the proposed changes. Get approval from the property owner, manager, HOA (if needed), hauler and municipal staff.

Step 4: Implement the approved service change and measure the post-change reduction in litter, if possible.

Additional Resources:
ZLI Best Management Practices for Right Size – Right Service
http://scvurppp-w2k.com/pdfs/1314/Final_BMP-Litter-Trash_Recommendations_060314.pdf

13. Service Day Collection Logistics

Implementation Process: Occasionally the main problem regarding litter generation is not related to the containers or on-site management, but is due to the way that containers are serviced by the hauler or that non-authorized personnel are accessing the containers. It could be that containers are not stored in a convenient location or the type of vehicle that the hauler is using is not the best at reducing litter impacts. Containers can be locked to prevent unwanted access by scavengers or neighbors using the containers instead of paying for their own service.

Step 1: Meet with the hauler management and driver to determine if changes can be made on their end.

Step 2: Meet with the property owner and management to determine if there are issues with the service day location for containers. If so, is the location modifiable? Can lockable containers be used such as in the figures shown to the right? Some containers have locking lids to prevent litter from blowing away when the lid is open. Other containers are locked to prevent unauthorized access - either from humans or other animals that can increase litter problems in the container area.

Figure 29. Locking lid

Step 3: Are there changes in the franchise agreement that need to be addressed, either in an immediate change to the agreement or in the future when there are negotiations for an extension or a new agreement is being considered? Immediate changes are typically negotiated with the hauler and sometimes lead to an impasse or a rate increase to pay for the impact to the hauler. Sometimes an agreeable cost-neutral solution can be found when all parties negotiate in good faith.

Figure 30. Locking lid on Front End Load (FEL) container.

Additional Resources:
Hauler Franchise Agreements
Vendor websites:
www.toter.com
www.rehrigpacific.com
www.otto-usa.com
www.con-fab.com/pitch-tops

14. Ensuring Good Housekeeping Practices

Implementation Process: As shown by the Livermore pilot study, collection of litter by maintenance staff alone may not be the most efficient long-term solution for reducing litter at MFDs. Examples of LMPs include:

- An integrated solution combining more litter containers for residents (and cigarette butt collection cans, if needed), increased litter pick-up by staff, increased signage, pledge posters for residents to sign, move-in/move-out kits with waste and litter reduction information etc. can be effective.
- Another common problem related to good housekeeping is the breaking down of cardboard boxes. As more residential cardboard is generated from on-line shopping (the so-called “Amazon effect”) whole boxes that are not flattened by residents are becoming a large problem in recyclables collection containers. The non-flattened boxes quickly take up a large amount of space in the collection container causing overflows and overages resulting in on-site litter generation. Non-recyclable packaging materials inside boxes (foam, plastic bags etc.) are also contaminants in the recycling programs when not removed and disposed of properly. Instructions with photos on how to flatten boxes can be included with outreach materials to residents.
- Haulers can assist property owners/managers with housekeeping issues by providing the right size and type of collection containers for the property, signage and container labeling. They may also be able to provide containers for indoor areas depending on the franchise agreement specifications.
- Municipal and/or Waste Management Authority staff may also have containers available for indoor areas.

Additional Resources:
See Livermore information in LMP #3 and in Appendix 2.

15. Minimum Service Requirements

Implementation Process: Some jurisdictions have minimum service levels for MFDs to avoid allowing property owners to under-subscribe to garbage service in order to lower their bills, reducing garbage service to the point where it does not reflect the actual on-site generation. When onsite garbage generation exceeds collection container capacity, increases in recyclables and compostables contamination can result as well as overflowing containers and increased litter. RSMC requires 96 gallons of solid waste service for every five units in MFDs. San Mateo County has a 32 gallon per unit minimum for solid waste. San Francisco also has a requirement for a minimum level of recycling service per unit.

Step 1: Notify the property owner that the service level has fallen below the minimum service level.
Step 2: An audit of the site including an RS2 process can be developed.
Step 3: Implement the results of the RS2 process and/or audit.

Jurisdictions that do not have minimum service levels for MFDs often rely on audits, enforcement, outreach and property owner communication to control service levels, contamination and litter.

Additional Resources:
RSMC Franchise Agreement – Article 5.02.B.2

16. Move-in and Move-out Procedures

Implementation Process: Containers often overflow when residents are moving in or out of their homes in MFDs. Wrapping and boxing materials used for shipping and transporting goods are often thrown away when residents move in and bulky item items and boxes of old food and other garbage are thrown away when residents move out. Municipal staff and haulers can work with Property Owners/Managers on the following actions:

Step 1: Consider providing a "Move-in and move-out guide" for new residents with information on recycling of boxes and other moving supplies. Brochures are available with move-in and move-out tips for reducing waste that in turn can reduce litter. RSMC and Rethink Waste have developed one example (see link below).

Step 2: Work with the hauler to order extra service for recyclables, compostables and/or refuse if at certain times of the year, such as at the end and beginning of the school year, the MFD will have overflowing containers. Ordering extra service is less expensive typically than paying for overages on or after the regular day of service.

Step 3: Work with the hauler on providing bulky item collection services for the MFD.

Additional Resources:
www.rethinkwaste.org/residents/multi-family-residences/property-owners-managers

17. Managing Bulky Items, Special Items, Universal Waste, Medicine, Sharps, Paint, Freon and Household Hazardous Waste

Implementation Process: Collection of Bulky Items, Special Items, Universal Waste, Medicine and Household Hazardous Waste at MFDs can be difficult and complex - the services offered by the hauler can make a difference. There are also a variety of other methods for dealing with these items besides collection at the MFD. Some stores participate in national take back programs for items such as rechargeable batteries. There are state-wide collection systems for paint and there are local take-back programs by some retailers. Some counties and/or waste management authorities operate HHW drop-off programs at fixed locations, curbside collection programs and/or drop-off collection programs through mobile collection vehicles. MFD property managers, residents and owners can arrange for these services and coordinate with the hauler, jurisdiction, county, waste management authority and businesses. See Section 2 and Appendix 4 for more details. It is important to understand the different types of materials and how they must be handled.

Bulky Items: These are typically materials that are too large to fit in a wheeled cart or bin or that may cause problems during regular collection services. Examples are couches, other large furniture, bicycles and Christmas trees. The hauler may have services to collect these materials either by appointment for a particular property individually or on a set day for a neighborhood.

Special Items: This category includes tires, mattresses, e-waste and some types of large appliances. These products cannot be landfilled and must be collected and processed. Some of the materials like mattresses, televisions, computer screens and tires have California-legislated advance recycling fees assessed at the time of purchase and therefore there are programs from the state and other organizations that collect those materials. There are also businesses that collect, process and recycle e-waste and may solicit property managers for the pickup of materials.

Universal Waste: Batteries and fluorescent lights are in this category. In San Mateo County there are local retail stores (such as Ace Hardware) that can accept these items. However, if the resident has more than just universal waste, they can use the County's HHW program.

Medicine: Residents may dispose of medicine (including pet medicine) using MED-Project's collection kiosks located at over 37 pharmacies and police stations throughout the County. www.smchealth.org/RXDisposal. Homebound residents are eligible to utilize a mail-back service by visiting www.med-project.com.

Sharps: The County has a disposal bin at Tower Road for residents to dispose of sharps waste. Over 10 additional disposal bin locations are available for residents to safely dispose of sharps in the County https://www.smchealth.org/sharps. Sharps are not accepted through the HHW program. Check www.calrecycle.ca.gov/homehazwaste/sharps/ for more options and info.

Paint: Paint containers with intact labels can be taken by residents to locations participating in California's PaintCare Program. The Property Manager/Owner may also be responsible for this material if used for a rental unit. See the resources list below.

Appliances with Freon: Freon is a potent ozone-layer-depleting chemical when released into the atmosphere, therefore appliances that may contain Freon, such as refrigerators and air-conditioners need special disposal handling. In rental units, these products often fall under the responsibility of the property owner/manager for disposal as the appliances are provided by them. Large refrigerators should be disposed of by a licensed refrigerator recycler in order to capture the Freon.

Household Hazardous Waste: Wastes from your home that are toxic, corrosive, flammable or reactive, based on their chemical properties, are considered Household Hazardous Waste (HHW). Products such as paint thinner, toilet bowl cleaner, and rat bait exhibit these hazardous characteristics. It is illegal to dispose of such dangerous wastes in the regular trash or dump them down the drain, so use the San Mateo County's HHW Program for proper disposal.

MFD property managers, residents and owners can arrange for these services and coordinate with the hauler, jurisdiction, county, waste management authority and businesses.

Additional Resources:
www.recology.com/recology-san-mateo-county/bulky-items/
www.smcsustainability.org/download/waste-reduction/Reduce-Reuse-and-Recycling-Guide-2017-Final-Web.pdf
www.smcsustainability.org/waste-reduction/reduce-reuse-recycle/

www.smchealth.org/hhw
https://earth911.com/recycling-guide/how-to-recycle-rechargeable-batteries/
www.paintcare.org/paintcare-states/california/#/everyone
www.calrecycle.ca.gov/HomeHazWaste/Info/
Or contact the Office of Sustainability 1-888-442-2666 for more information.

18. Abandoned Waste Prevention and Reduction

Implementation Process: Abandoned waste, also known as illegal dumping, is a growing problem in San Mateo County and the Bay Area. A partnership between the hauler, the community, property owners and code enforcement is needed to create change. Some haulers will take away and dispose of abandoned waste as part of a franchise agreement, but unless the source issues are addressed, the amount of illegally dumped material and associated resources needed to deal with that practice, can increase as a result. When haulers pick up the materials it affects all residents and business owners with increased garbage rates.

MFDs often contribute to the problem of abandoned waste for a variety of reasons. Insufficient bulky item collection, increased disposal costs and regulations, residents' lack of resources and income to transport unwanted materials to the proper facility can all be reasons for increased abandoning of waste. Property owners need to ensure adequate collection of these items. In addition if vermin or insects are found in dwelling units all abandoned items should be safely disposed of in order to avoid spreading of vectors to other units and tenants.

Additional Resources:
See Appendix 3
Residents in unincorporated County can use Report It! SMC to report illegal dumping. Scroll down on this website to "report illegal dumping":
http://www.smcsustainability.org/hazardous-waste-illegal-dumping-litter/

19. Individual Cart Set-out Procedures

Implementation Process: For properties that require each unit to set out their individual carts, there are recommended litter practices that are similar to single family home situations. Carts should have their lids fully closed and not be overloaded such that litter can blow out from the cart. All materials must be contained within the cart and not be placed on the ground except per hauler acceptable rules such as for pre-scheduled or pre-paid overages. Styrofoam peanuts, shredded paper and other materials than can easily escape a container and become litter should be bagged and tied shut. The HOA and/or property manager can walk the property on set out days to check that procedures are followed. Hauler drivers should clean up spills and litter per the franchise agreement requirements. In-unit containers can be provided by management to the residents. These containers and bags can help transport recyclable and compostable materials to the carts and prevent litter. The jurisdiction, hauler, waste management authority and/or County may have resources for this program.

Additional Resources:
See Appendix 3 for proper set-out guidance and resources.

Legal LMPs

20. Coordination of Enforcement Efforts

Implementation Process: A successful program to reduce the prevalence of abandoned waste can involve many stakeholders. Staff from code enforcement, police, County environmental health, solid waste, stormwater and the franchise hauler can all have a role to play. The City of San Mateo has been successful in reducing the amount of illegally dumped material and the corresponding number of pickups done by the hauler, through a targeted enforcement and multi-departmental concentrated effort.

Additional Resources:
Contact the City of San Mateo's Solid Waste and Recycling Program for more information.
www.cityofsanmateo.org/2076/Recycling-Compost-and-Garbage

21. Examples of Updated Municipal Code Sections Related to Litter

Implementation Process: The County of San Mateo has made changes to its municipal code in order to more effectively enforce violations related to occurrences of illegally dumped material in the unincorporated sections of the County.

Additional Resources:
Administrative Citation
https://library.municode.com/ca/san_mateo_county/codes/code_of_ordinances?nodeId=TIT1GEPR_CH1.40ADRE_1.40.050ADCIENOR
Illegal Dumping/Littering
https://library.municode.com/ca/san_mateo_county/codes/code_of_ordinances?nodeId=TIT3PUSAMOWE_CH3.50ILDULI_3.50.050CRPEAVILDU

APPENDICES

Appendix 1: New Development and Garbage Enclosure Guidance

www.recology.com/recology-san-mateo-county/new-development-projects/
www.stopwaste.org/resource/space-guidelines-recycling-organics-and-refuse-services
https://fremont.gov/DocumentCenter/Home/View/1528
www.zerowastedesign.org
http://www.cityofpaloalto.org/civicax/filebank/documents/59536
www.flowstobay.org/sites/default/files/Model%20COA%20July%202016%20final.pdf

Appendix 2: Outreach and Behavior Change

www.recology.com/recology-san-mateo-county/sorting-guides-signage/
Livermore MFD Litter Reduction Pilot:
www.cleanwaterprogram.org/residents/multi-family-litter-prevention/item/litter-prevention-in-multi-family-buildings.html

Sample documents:
Letters to residents, property owners, managers, drivers etc.
Posters for residents

Appendix 3: Set-out rules, Bulky & Special Item Collection & Abandoned Waste

www.recology.com/recology-san-mateo-county/bulky-items/
www.ssfscavenger.com/residential/bulky-item-collection-program/
www.republicservices.com/residents/bulk-waste
www.recology.com/recology-of-the-coast/pacifica/
www.greenwaste.com/
www.smcsustainability.org/waste-reduction/
www.cityofsanmateo.org/2174/Illegal-Dumping

Appendix 4: Franchise Agreements

Examples of LMP language for franchise agreements can be found in the following documents:
SMCWPPP:
www.flowstobay.org/sites/default/files/Franchise%20Agreement%20Litter%20Practices%20Recommendations%20-%20Jan%202016.pdf
SCVURPPP's Zero Litter Initiative:
http://scvurppp-w2k.com/pdfs/1314/Final_BMP-Litter-Trash_Recommendations_060314.pdf
http://scvurppp-w2k.com/pdfs/1516/Franchise_Agreement_Litter_Practices_Recommendations-Jan_2016.pdf

Appendix 5: State Regulations

Information on AB 341, AB 1826 and AB 2176:
www.calrecycle.ca.gov/Laws/