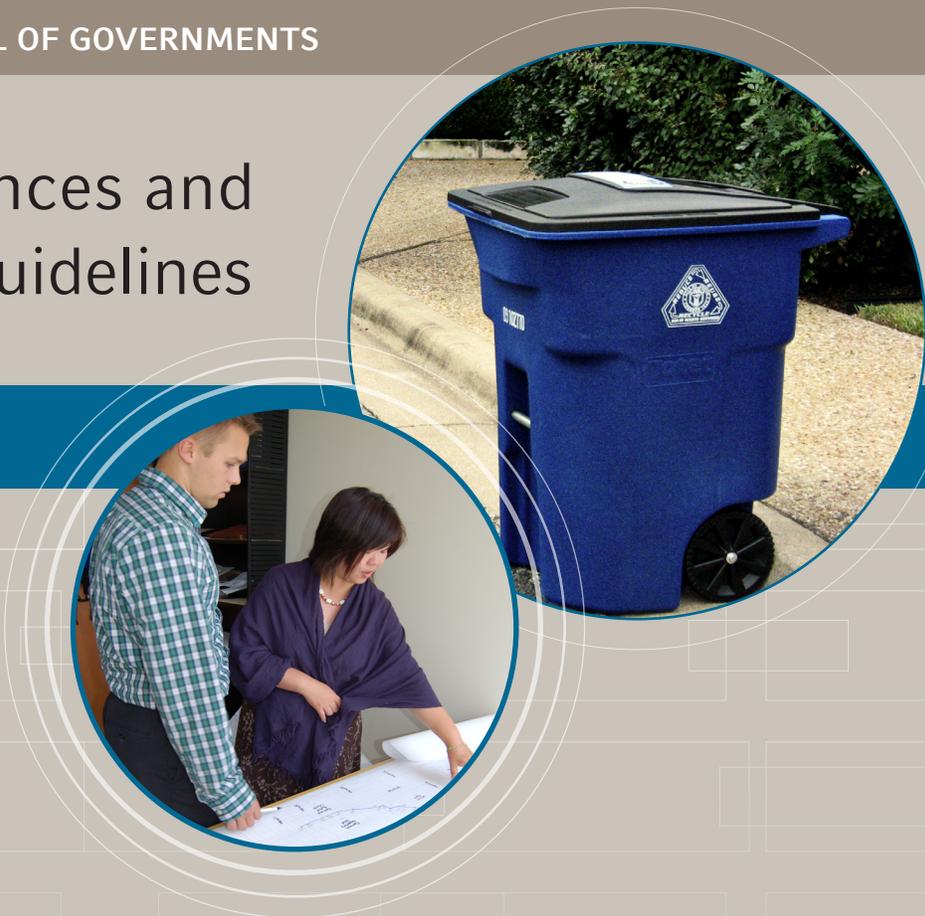




PREPARED FOR:
NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

Recycling Ordinances and Building Design Guidelines

FINAL Report | August 2009



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Recycling Ordinances and Building Design Guidelines

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This report has been prepared for the use of the client for the specific purposes identified in the report. The conclusions, observations and recommendations contained herein attributed to R. W. Beck, Inc. (R. W. Beck) constitute the opinions of R. W. Beck. To the extent that statements, information and opinions provided by the client or others have been used in the preparation of this report, R. W. Beck has relied upon the same to be accurate, and for which no assurances are intended and no representations or warranties are made. R. W. Beck makes no certification and gives no assurances except as explicitly set forth in this report.

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1.1 Project Background and Purpose

In September 2008, the North Central Texas Council of Governments (NCTCOG) retained R. W. Beck, Inc. (R. W. Beck) to develop the Recycling Ordinances and Building Design Guidelines (Guidelines). The purpose of these Guidelines is to provide a resource to local governments in North Central Texas on recycling ordinances that can be implemented to enhance recycling efforts. In addition, these Guidelines can be a resource to local governments, real estate developers, and builders in the region for recycling infrastructure that should be built into the physical design of buildings to accommodate recycling programs.

NCTCOG received a solid waste management grant from the Texas Commission on Environmental Quality (TCEQ) to develop these Guidelines. The concept for these Guidelines was developed by the Time to Recycle Subcommittee (TTR) of the Resource Conservation Committee (RCC). The TTR identified the need to provide a resource for recycling ordinances and building design guidelines to local governments and private companies in North Central Texas.

1.2 Methodology and Report Organization

R. W. Beck utilized its internal database of communities to identify recycling ordinances that are currently in place in local governments across the United States. In addition, R. W. Beck utilized other sources to identify recycling ordinances, including:

- Environmental Protection Agency (EPA);
- California Integrated Waste Management Board (CIWMB);
- Solid Waste Association of North America (SWANA); and
- Web-based search engines.

For each type of ordinance presented in this report, R. W. Beck provided case examples of communities that utilize that type of ordinance. The case examples were selected in order to illustrate the different implementation and enforcement options that may be used for each type of ordinance. The case examples listed in this report are not intended to represent an exhaustive list of communities that utilize recycling ordinances.

This report is organized into seven chapters, including the Introduction. The organization is summarized below.

- Section 1 – Introduction

- Section 2 – Single-Family Residential Recycling Ordinances
- Section 3 – Multi-Family Residential Recycling Ordinances
- Section 4 – Commercial Recycling Ordinances
- Section 5 – Construction and Demolition Recycling Ordinances
- Section 6 – Recycling Infrastructure and Building Design Ordinances
- Section 7 – Infrastructure and Building Design Guidelines for Recycling Programs

Sections 2 through 6 describe recycling ordinances that are currently in place in other communities. For each type of ordinance, R. W. Beck provides the following:

- Description of the ordinance;
- Options for implementation;
- Potential enforcement mechanisms;
- Case examples; and
- Sample ordinance language.

1.3 Sample Ordinance Language

R. W. Beck consulted with legal counsel in the development of the sample ordinance language that is included in the Guidelines. The sample language is meant to be used by local governments as a reference and starting point for developing local ordinances. **The sample language included in the Guidelines is not intended to be used as a substitute for legal counsel in ordinance development. NCTCOG and R. W. Beck strongly recommend that users of the Guidelines consult with City Attorneys and/or outside legal counsel in utilizing the language provided in this document. The information in the Guidelines does not constitute legal advice, recommendations, counsel, or guidance.**

For each ordinance described in this document, R. W. Beck provides an understanding of potential penalties for non-compliance. Local governments may reserve the right to pursue legal action against parties that violate any portion of the municipal code, including the solid waste and recycling portion. Most local governments do not pursue legal action against violators of solid waste and recycling ordinances and choose instead to apply other penalties. For this reason, R. W. Beck has excluded legal action from all ordinance language included in this document.

1.4 Recommended Use of the Guidelines

The information included within this document is intended to serve as general guidelines for communities that wish to implement ordinances that either encourage or mandate recycling. As such, R. W. Beck recommends the following with regard to the use of this document.

- **Evaluate whether ordinances require general or specific language.** In some cases, it may be more advantageous to a local government to have broad and general ordinance language as opposed to specific language. Broad language authorizes a local government to establish a program but leaves the specific aspects of the program to be developed at a policy or program level. In developing recycling ordinances, local governments should consult with City Attorneys or other legal counsel to determine whether broad or specific language is appropriate.
- **Utilize recycling ordinances as one part of an overall recycling program.** Recycling ordinances must be implemented within the context of a comprehensive recycling program in order to maximize their effectiveness. Local governments must consider the impact of a recycling ordinance on the overall solid waste and recycling system within the community.
- **Utilize sample language as a starting point for ordinance development.** The sample ordinance language provided in this document may be utilized as a starting point for a local government that is developing a recycling ordinance. Depending on the design of a local government's ordinance, certain provisions provided by R. W. Beck may not be necessary. In other cases, the language provided may need to be adjusted.

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Section 2

Single-Family Residential Recycling Ordinances

2.1 Introduction

This section lists options for ordinances that encourage or require recycling for single-family households. For the purposes of this analysis, single-family refers to households that receive individual refuse and recycling service. In many communities, buildings with four or fewer dwelling units are considered to be single-family homes.¹

This section provides a description of ordinances that can be developed by local governments as a part of an ongoing single-family recycling program. R. W. Beck has listed these ordinances in order of increasing regulation. In other words, ordinances that encourage recycling are included before ordinances that mandate recycling.

2.2 Automatic Enrollment

2.2.1 Overview

Automatic enrollment ordinances require that all single-family households be enrolled in the community's recycling program. All households incur the fees associated with the recycling program and receive a collection container regardless of whether they set-out materials for collection. Automatic enrollment ordinances encourage recycling since all households are automatically enrolled in – and pay for – recycling service.

Implementation

In order to develop an automatic enrollment ordinance, a local government must determine many aspects of the recycling program, including the following:

- Materials collected;
- Collection frequency; and
- Container and set out procedures.

Enforcement

There are typically no enforcement activities associated with automatic enrollment recycling ordinances.

¹ The definition of single-family can vary from community to community.

2.2.2 Case Examples

Most communities in North Central Texas implement recycling on an automatic enrollment basis. For example, in the **City of Heath, Texas**, all residents are issued a 64-gallon cart for collection of recyclables. All residents incur the cost associated with the recycling program.

In addition, R. W. Beck identified the following communities in North Central Texas that utilize automatic enrollment for single-family residents: Allen, Anna, Arlington, Azle, Bedford, Benbrook, Burleson, Carrollton, Cedar Hill, Colleyville, Coppell, Copper Canyon, Corinth, Crowley, Dallas, Denton, DeSoto, Duncanville, Euless, Farmers Branch, Flower Mound, Forney, Fort Worth, Frisco, Garland, Grand Prairie, Grapevine, Greenville, Haltom City, Heath, Highland Park, Highland Village, Hudson Oaks, Hurst, Irving, Keller, Lakeside, Lancaster, Lewisville, Little Elm, Mansfield, McKinney, Melissa, Mesquite, Midlothian, Murphy, Newark, North Richland Hills, Oak Point, Pantego, Plano, Prosper, Red Oak, Richardson, Rockwall, Rowlett, Royse City, Saginaw, Southlake, Terrell, The Colony, Trophy Club, University Park, Waxahachie, Weatherford, Westlake, Willow Park and Wylie.

2.2.3 Ordinance Development

Key Issues

Automatic enrollment ordinances for recycling are typically similar to a community's residential refuse ordinance. Like a refuse collection ordinance, it must include all of the primary elements of the program, including:

- Materials collected;
- Collection frequency and hours of operation; and
- Container and set out procedures.

Basic Language

Below is the basic language to establish an automatic enrollment ordinance for single-family recycling.

Frequency for residential solid waste and recycling services. Unless prevented by weather conditions, labor disputes, or other circumstances beyond its control, the City shall collect solid waste [insert frequency] and recyclable materials [insert frequency] from each residential customer at the designated point of collection as defined in Section [insert section number for description of residential solid waste and recycling services] of the Code.

Additional Provisions

An automatic enrollment ordinance for residential recycling will also require additional ordinance provisions, as shown below.

Residential solid waste fee. Each residential customer shall pay a monthly residential solid waste and recycling fee for residential solid waste recycling services as defined in Section [insert section number for description of residential solid waste and recycling services] of the Code. The monthly residential solid waste and recycling fee shall be set by City council resolution to be effective beginning on [insert date and year], and as revised thereafter.

Duty to provide carts. City shall provide each residential customer one (1) [insert cart size] gallon serial-numbered solid waste cart and one (1) [insert cart size] gallon serial-numbered recycling cart.

Preparation of solid waste and recyclable materials. Residential customers shall prepare solid waste, as defined in Section [insert definition section] of the Code, and recyclable materials, as defined in Section [insert definition section] of the Code, in accordance with the requirements established by [insert appropriate City staff] for the City. Residential customers shall place solid waste in assigned solid waste cart. Residential customers shall place recyclable materials in an assigned recycling cart. Residential customers shall not fill solid waste carts or recycling carts as to prohibit the secure closure of the cart lid or weigh more than _____ () pounds for a 30-gallon cart, _____ () for a 60-gallon cart, and _____ () for a 90-gallon cart. Residential customers shall not place solid waste or recyclables materials in containers other than their assigned cart. Residential customers shall not place solid waste or recyclables outside of their assigned cart. City shall not collect solid waste or recyclables not prepared in accordance with the Code.

2.3 Recycling Credits/Rebates

2.3.1 Overview

Recycling credits or rebates create a direct financial incentive for residents to participate in recycling. Communities that enact this type of ordinance typically charge each household a monthly fee for providing residential collection services. Households who enroll in recycling are given a credit, or rebate, of a predetermined amount on their monthly bill that reduces the total cost for residential collection service. It is important to note that prior to implementing such an ordinance, a community should conduct a thorough financial analysis to determine the amount of the rebate to be rewarded.

Implementation

One key aspect of a recycling credit or rebate ordinance is determining how residents are eligible for the rebate. There are several options to define eligibility, including the following:

- **Enrollment:** Communities can offer a refuse rebate to households that enroll in the recycling program.

- **Participation:** Residents are required to set out materials for recycling a certain number of times per month or per quarter, depending on frequency of collection and container size.

Enforcement

Ensuring Compliance

Enforcement mechanisms for a rebate/credit program depend largely on the eligibility requirements established by the local government, as discussed above. In some programs, enforcement may be conducted by the recycling collection staff. However, for some programs, especially fully-automated recycling programs, designated enforcement personnel may be required to enforce the recycling rebate ordinance.

Penalties for Non-Compliance

Local governments may choose to revoke the recycling rebate for a variety of reasons. First, local governments may revoke the recycling rebate, and remove the resident from the recycling program, for improper participation. Improper participation can include setting out contaminated materials or failure to comply with set out procedures. In addition, local governments may revoke the recycling rebate for lack of participation. In this case, since the goal of the ordinance is to encourage recycling, the local government may allow a resident to regain the opportunity to receive a rebate after a specified waiting period.

2.3.2 Case Examples

R. W. Beck identified the following communities that have recycling rebate ordinances.

- **Minneapolis, Minnesota:** Each household is charged a monthly solid waste base fee of \$23.00. In addition to the base fee, each household is charged a disposal fee that is related to the size of refuse cart used. For example, a large cart is \$4.00 per month as opposed to \$2.00 for a smaller cart. All households are given a recycling credit of \$7.00 on their monthly solid waste bill. In other words, their total bill is reduced by \$7.00 for participation in recycling. Minneapolis has a curbside-sort recycling system in which residents are required to sort their recyclables by commodity. If a certain household has documented and repeated non-compliance with set out procedures, the City removes the recycling bins from the household and revokes the recycling credit. The resident has the option to re-enter the program after three months for a fee of \$21.00.
- **Toledo, Ohio:** Each household is charged a monthly solid waste fee of \$7.00. The City offers a discount of \$5.00 to the monthly disposal bill by having households sign a recycling pledge. By signing a recycling pledge, the household agrees to participate in the City's recycling program at least once per month. The Director of Public Service establishes the regulations governing how recycling pledges are made and enforced. Once signed by the household, pledges are enforced by monitoring and unannounced audits by solid waste foreman and City

officials. Those households found in violation of the pledged agreement forfeit their right to the \$5.00 monthly discount. Due to the small amount of City staff available to perform such monitoring and random checks, the ordinance is not strictly enforced. However, during the interview with R. W. Beck, the City stated that it was moving forward with an automated collection system that would also include technology to monitor each household's set-out.

2.3.3 Ordinance Development

Key Issues

There are several key issues that must be addressed by a local government that wants to implement a recycling credit or rebate ordinance, including the following:

- Amount of rebate;
- Eligibility requirements to receive the rebate;
- Enforcement actions; and
- Personnel responsible for enforcement.

The details regarding implementation and enforcement of a recycling rebate are critical to a successful ordinance. However, R. W. Beck would typically recommend that the ordinance language be written in broad terms in order to allow the local government flexibility to make adjustments to the program as needed. R. W. Beck has employed this approach in developing the sample language shown below.

Basic Language

Shown below is sample ordinance language for a recycling rebate or credit ordinance.

Residential solid waste fee and recycling credit. Each residential solid waste customer shall pay a monthly residential solid waste fee for residential solid waste recycling services as defined in Section [insert section number for description of residential solid waste and recycling services] of the code. Residential solid waste customers who register a recycling pledge with the Department of [insert relevant City department] for the City, pursuant to Section [insert section number for registration of recycling pledge] of the code, shall qualify for a monthly residential recycling credit. The monthly residential solid waste fee and the monthly residential recycling credit shall be set by City council resolution to be effective beginning on [insert date and year], and as revised thereafter.

Additional Provisions

In addition to the basic language regarding the creation of the recycling rebate or credit, the program will require that the following additional ordinance provisions be included within the code.

Registration of recycling pledge. The Director of [insert relevant City department] for the City may establish regulations governing how recycling pledges are made and registered.

Penalties for breach of recycling pledge. The Director of [insert relevant City department] for the City may establish regulations governing how recycling pledges are enforced. The Director of [insert relevant City department] is also authorized to establish a penalty, including a fine, for those residential solid waste customers who breach the recycling pledge.

2.4 Variable Refuse Rates

2.4.1 Overview

Under a variable rate structure, also referred to as pay-as-you-throw (PAYT), residential garbage collection fees are based on the amount of garbage that is set out by the customer. A variable rate structure is intended to create a financial incentive for households to participate in recycling because, through participation, residents can produce less waste and lower their residential garbage bill.

Implementation

There are several ways that a PAYT program can be implemented. The following summarizes the most common options for PAYT implementation:

- **Carts:** Households are given the option of various sized (30-, 60- or 90-gallon are typical) or multiple rolling carts for refuse collection. In this scenario, the monthly cost of service would increase with container size or the number of containers. In some communities, waste set out outside of the cart is not collected. This reinforces the message that recycling is a key program focus and helps increase collection efficiency by allowing drivers to remain in their vehicles. In other communities, overflow waste is collected if it is in specially marked bags or tagged with city-provided tags. Cities often will charge a one-time fee for residents that want to increase their cart size while allow residents to change to a smaller cart for no charge.
- **Bags:** Households are required to purchase specially marked trash bags directly from the city or private hauler. Typically, the purchase price of the bags reflects the per-bag cost of collection and disposal. Any non-program bags set out by a resident would not be collected.
- **Tags:** Households are required to place specially marked adhesive tags on containers or bags for collection. Similar to the trash bag option, households would purchase the tags directly from the city or private hauler. Households can be required to provide their own containers or trash bags; however any container or bag set-out without a tag would not be collected.

Some communities will also provide disposal alternatives such as allowing residents to take waste to drop-off sites or landfills.

Enforcement

Ensuring Compliance

Refuse drivers are typically tasked with identifying non-compliant set outs in communities with variable refuse rates. However, communities must determine how “extra garbage” is going to be defined and managed. Some cities define “extra” or “outside-of-cart” refuse as any bags that are visible to the driver. If the lid of the container is not completely closed, the resident is considered to have an outside-of-cart set out. Figure 2-1 below provides an illustration of an acceptable and an unacceptable set out under this scenario. Other cities will have a more lenient policy, and allow containers that can be collected without spilling material to be collected. This policy can lead to drivers having to interpret amounts that can be collected.



Figure 2-1: Example of acceptable set out (left), an open-lid set out (middle), and overflowing or spilling set-out (right)

Penalties for Non-Compliance

Cities must determine what measures will be taken in the event that residents do not comply with the ordinance (e.g., refuse that is set out outside of the cart). Typical enforcement mechanisms include:

- **Non-collection:** Either the entire set out or the extra garbage is not collected by the driver.
- **Extra refuse fees:** The resident is charged a fee (typically per-bag) for extra refuse that is set out.

2.4.2 Case Examples

R. W. Beck identified the following cities with PAYT refuse rates. These examples illustrate the flexibility of design and implementation that PAYT provides.

- **Fort Worth, Texas:** Residents have the option of selecting a 32-, 64- or 96-gallon container for garbage collection. Any refuse that does not fit within the container must be bagged in a City pay bag for collection.² Households purchase City pay bags from the City. City pay bags are \$3.00 per bag and must be purchased in quantities of five. Households that place trash outside of their cart in non City pay bags or containers are charged a \$10.00 administration fee and \$65.00 per five cubic yards of materials. Households who set out garbage carts with bags inhibiting the lid to fully close are charged \$10.00 per bag. The City provides residents with one 64-gallon cart for recycling. The violation bag tag is also assessed against households who set-out improperly sorted recyclable materials.
- **Portland, Oregon:** The City of Portland offers residents with variable sized carts for collection. To encourage recycling, the City offers residents a 20-gallon “mini-can” service priced below the cost of collection to the hauler. All other sizes, 32-, 60-, and 90-gallon containers, include a disincentive premium to discourage high volumes of disposal. Only properly prepared waste is collected, any other waste is not collected and a notification is issued to the household. Portland requires all haulers to provide residents 60-gallon containers for weekly recycling collection.
- **Dover, New Hampshire:** Dover has a “bag and tag” program for single-family residents. Residents place refuse in specially marked bags sold by the City for collection. Any bulky items or bundles set-out for collection must have specially marked tags or it will not be collected. Residents are provided with bins for recycling.

In addition, R. W. Beck identified the following communities in North Central Texas that utilize PAYT refuse rates for single-family residents: Denton, Fairview, Flower Mound, Garland, Heath, Little Elm, McKinney, Melissa, Plano, Rowlett, and Watauga.

2.4.3 Ordinance Development

Key Issues

There are many key issues that must be included in a variable rate refuse ordinance, including the following:

- Identification of the container that will be used for collection;
- Set out policies and procedures for refuse; and
- Enforcement mechanism for non compliance.

² Households utilizing two 96-gallon containers are permitted to place two 30-gallon bags next to carts for each collection, but only after both carts have been filled. Bags are not required to be City pay bags.

In addition, for a cart based program, it is important to establish a rate structure with increasing rates that correspond to increasing cart size. Typical variable rate ordinances include rates for multiple container sizes.

Basic Language

Shown below is sample ordinance language to establish a variable refuse rate ordinance. The following sample language is based on 30-, 60-, and 90-gallon carts, but can be customized to a variety of sizes.

Residential solid waste and recycling fee. Each residential customer shall pay a monthly residential solid waste and recycling fee as defined in [insert section number for fee structure] of the code for residential solid waste and recycling services as defined in Section [insert section number for description of residential solid waste and recycling services] of the code. The monthly residential solid waste and recycling fee shall be set by City Council resolution to be effective beginning on [insert date and year], and as revised thereafter.

Residential solid waste and recycling fee structure. City shall charge each residential customer the following costs for residential solid waste and recycling collection services:

1. Collection, Disposal, and Processing
 - a. Solid Waste Cart
 - 30 gallon cart - \$__.__ per month
 - 60 gallon cart - \$__.__ per month
 - 90 gallon cart - \$__.__ per month
 - b. Additional Solid Waste Cart
 - 30 gallon cart - \$__.__ per month for each extra cart
 - 60 gallon cart - \$__.__ per month for each extra cart
 - 90 gallon cart - \$__.__ per month for each extra cart
 - c. Additional Solid Waste City Bag
 - 32 gallon bag - \$__.__ per Solid Waste City Bag
 - d. Recycling Cart- No charge
2. Other Charges
 - a. Account set up charge- \$__.__ per occurrence
 - b. Exchange of solid waste cart for:
 - Greater capacity cart - \$__.__ per occurrence
 - Lesser capacity cart - No charge

Additional Provisions

In addition to the specific ordinance provision regarding the refuse fees, a variable rate ordinance will require adjustments to other portions of the solid waste and recycling code, as shown below.

Duty to provide carts. City shall provide each residential solid waste and recycling customer one (1) [insert cart size] gallon serial-numbered solid waste cart and one (1) [insert cart size] gallon serial-numbered recycling cart. A residential solid waste and recycling customer may exchange the solid waste cart for another solid waste cart of equal or greater capacity upon payment of an exchange fee as set by City council resolution to be effective beginning on [insert date and year], and as revised thereafter. City shall not charge a residential solid waste and recycling customer an exchange fee for exchanging a solid waste cart for another solid waste cart of lesser capacity. Excluding mobility impaired residential solid waste and recycling customers as defined in Section [insert section number for definition of mobility impaired residential solid waste and recycling customers], a residential solid waste and recycling customer may exchange the recycling cart for another recycling cart of equal or lesser capacity upon payment of an exchange fee as set by City council resolution to be effective beginning on [insert date and year], and as revised thereafter. City shall not charge a residential solid waste and recycling customer an exchange fee for exchanging a recycling cart for another recycling cart of greater capacity.

Preparation of solid waste and recyclable materials. Residential solid waste and recycling customers shall prepare solid waste, as defined in Section [insert definition section] of the code, and recyclable materials, as defined in Section [insert definition section] of the code, in accordance with the requirements established by [insert appropriate City staff] for the City. Residential solid waste and recycling customers shall place solid waste in assigned solid waste cart. Residential solid waste and recycling customers shall place recyclable materials in an assigned recycling cart. Residential solid waste and recycling customers shall not fill solid waste carts or recycling carts as to prohibit the secure closure of the cart lid or weigh more than _____ (__) pounds for a 30-gallon cart, _____ (__) for a 60-gallon cart, and _____ (__) for a 90-gallon cart. Residential solid waste and recycling customers shall not place solid waste or recyclables materials in containers other than their assigned cart. Residential solid waste and recycling customers shall not place solid waste or recyclables outside of their assigned cart. City shall not collect solid waste or recyclables not prepared in accordance with the code.

Penalties for violation of code. [Insert appropriate City staff] for the City may establish regulations governing enforcement of Chapter [insert chapter number] Residential Solid Waste and Recycling of the code. [Insert appropriate City staff] is also authorized to establish and assess a penalty, including a fine, for those residential solid waste and recycling customers who

violate Chapter [insert chapter number] Residential Solid Waste and Recycling of the code.

2.5 Yard Waste Disposal Ban

2.5.1 Overview

Yard waste disposal bans are ordinances that prohibit single-family households from setting out grass clippings, leaves, or other landscaping wastes for refuse collection. Households are required to leave grass clippings on their lawns, also known as “Grasscycling”, or arrange for the composting of their yard waste materials.

Implementation

Implementing a yard waste disposal ban creates the need to determine which yard waste materials are prohibited from disposal. These materials can include any of the following:

- Grass clippings;
- Leaves;
- Weeds; and
- Small twigs.

Enforcement

Ensuring Compliance

The primary approach that local governments can adopt in order to ensure compliance with a yard waste disposal ban is inspection of the set-out containers. Solid waste inspection staff can conduct unannounced inspections of solid waste containers to determine if there are yard waste materials that have been disposed of with refuse.

Penalties for Non-Compliance

Enforcement mechanisms for a yard waste disposal ban vary with each community; however, some of the most common mechanisms are listed below:

- **Non-collection:** Residents who dispose of yard waste materials with refuse are penalized by not having their refuse collected. Typically the driver will place a sticker or tag on the container that explains why the waste was not collected and how to comply with the regulations. The waste is then collected on the next scheduled collection day, provided that the yard waste has been removed.
- **Citations:** A community may issue citations to residents who do not comply with the yard waste ban. Typically the initial citation is just a warning; however, with each consecutive offense a fee may be assessed.

2.5.2 Case Examples

R. W. Beck identified the following communities that prohibit yard waste from disposal:

- **Arlington, Texas:** Arlington implemented a yard waste disposal ban in 1993.³ The City’s program, also known as “Don’t Bag It,” encourages households to leave grass clippings on the lawn and prohibits grass disposal with refuse. Grass clippings mixed with household waste are not collected. The City educates residents on the natural benefits that grass clippings can have on their lawn and how to set up their own composting areas.
- **Arkansas and North Carolina:** These states have statewide bans on disposal of yard waste in landfills, including grass clippings, shrubbery trimmings (i.e., brush), and leaves. Cities within these states also have ordinances prohibiting disposal of yard waste with refuse to reinforce the state mandate.

2.5.3 Ordinance Development

Key Issues

There are many key issues that must be addressed by a local government that wishes to implement a yard waste disposal ban ordinance, including the following:

- Identification of materials that are prohibited from disposal; and
- Enforcement mechanisms for non-compliance.

Basic Language

Shown below is sample ordinance language to establish a yard waste disposal ban.

Disposal ban. No person shall dispose of yard waste at [insert prohibited locations] located within the City.

Additional Provisions

A yard waste disposal ban ordinance will require adjustments to other portions of the solid waste and recycling code in order to address enforcement issues, as shown below.

Penalties for violation of Code. *See Section 2.4.3 for sample language regarding penalties for violation of Code.*

³ Arlington’s disposal ban is implemented as a program and is not included within the municipal code.

2.6 Mandatory Recycling

2.6.1 Overview

Mandatory recycling ordinances require households to recycle designated materials. These ordinances make it illegal to dispose of recyclable materials with refuse. The ordinance typically will include a list of the materials that are required to be recycled.

Implementation

Implementing mandatory recycling creates the need to determine which materials are prohibited from disposal. These materials may include any of the following:⁴

- Mixed paper;
- Newspaper;
- Magazines;
- Aluminum and steel cans;
- Plastic containers #1 through #7;
- Glass bottles and jars; and
- Old corrugated cardboard (OCC).

The types of materials that are required to be recycled by ordinance vary among communities. For instance, some communities may elect to require households to recycle only a few recyclable materials, such as only newspaper and aluminum cans. However, communities may also choose to prohibit residents from disposing of any of the recyclable materials that are accepted as part of the residential recycling program.

Enforcement

Ensuring Compliance

There are two primary approaches that local governments can adopt in order to ensure compliance with mandatory recycling, described below:

- **Non-collection:** Drivers do not collect the refuse of a household unless the recycling container is also set out for collection.
- **Container inspection:** Solid waste inspection staff conducts unannounced inspections of solid waste containers to determine if there are recyclables that have been disposed with refuse.

These two approaches will ensure compliance with mandatory recycling with different levels of precision. The first approach, non-collection, will ensure that residents set out containers for recycling but will not ensure that they do not dispose of some

⁴ This list is based on materials that are typically included in many recycling programs in North Central Texas.

recyclables in the refuse. On the other hand, conducting inspections ensures that residents have not disposed of recyclables. Local governments may implement one or a combination of these approaches to ensure that residents comply with mandatory recycling ordinances.

Penalties for Non-Compliance

Enforcement mechanisms for mandatory recycling ordinances vary with each community; however, some of the most common mechanisms are listed below:

- **Non-collection:** Residents who dispose of recyclables with refuse are penalized by not having their refuse collected. Typically the driver will place a sticker or tag on the container that explains why the waste was not collected and how to comply with the program. The waste is then collected on the next scheduled collection day, provided that the recyclables have been properly separated.
- **Citations:** A community may issue citations to residents who do not comply with the recycling ordinance. Typically the initial citation is just a warning; however, with each consecutive offense a fee may be assessed.

2.6.2 Case Examples

R. W. Beck identified the following communities that have mandatory recycling ordinances.

- **Seattle, Washington:** Residents are prohibited from putting significant amounts of paper, cardboard, glass and plastic bottles and jars as well as aluminum and tin cans in their garbage containers.⁵ The ordinance also prohibits residents from disposing of yard debris with refuse. During collection, the hauler inspects each household's set-out. Residents who do not comply with the ordinance will not have their waste collected and the hauler places a tag on the container notifying the household of the violation.
- **Crockett, Texas:** Residents are required to recycle all designated recyclable materials from the waste stream, including: plastics #1 and #2, aluminum cans, tin cans, glass containers, mixed paper, OCC, and yard waste. The ordinance requires residents to use clear plastic bags for refuse and recycling set-outs so that waste collectors can identify improperly sorted materials. Those who do not comply with the ordinance will not have their waste collected, as the City prohibits the collection of improperly sorted materials.

⁵ According to the Seattle Administrative Rule SPU-DR-01-04, a "significant amount of recyclables" is defined as "more than 10 percent by volume of container, dumpster or self-haul vehicle's load based on visual inspection by a Seattle Public Utilities inspector, contractor or transfer station worker."

2.6.3 Ordinance Development

Key Issues

There are several key issues that must be addressed by a local government that wishes to implement mandatory recycling, including the following:

- Identification of materials that are prohibited from disposal;
- Enforcement mechanism to be used to ensure compliance; and
- Penalties for non-compliance.

Basic Language

Shown below is sample language that may be used by communities to implement mandatory residential recycling.

Requirement to separate solid waste and recyclable materials. Residential solid waste and recycling customers shall:

1. Solid Waste. Each residential solid waste and recycling customer shall contain all solid waste, as defined in Section [insert section] of the code, in the assigned solid waste cart. Residential solid waste and recycling customers shall not dispose of solid waste, as defined in Section [insert section] of the code, in a recycling cart.
2. Recyclable Materials. Each residential solid waste and recycling customer shall contain all recyclable materials, as defined in Section [insert definition section] of the code, in a recycling cart. Residential solid waste and recycling customers shall not dispose of recyclable materials, as defined in Section [insert section] of the code, in a solid waste cart.

Additional Provisions

A mandatory recycling ordinance will require adjustments to other portions of the solid waste and recycling code, as shown below.

Non-collection of solid waste or recyclable materials. City shall not collect solid waste or recyclable materials and residential solid waste and recycling customer shall not be entitled to a refund for City's failure to collect solid waste or recyclable materials if:

1. Improper Preparation and Placement. Residential solid waste and recycling customers shall prepare and place their assigned solid waste cart and recycling cart pursuant to Sections [insert section setting preparation and placement requirements] of the code. City shall not collect neither the solid waste cart nor the recycling cart from a residential solid waste and recycling customer if either the solid waste cart or the recycling cart is non-compliant with Chapter [insert chapter number] Residential Solid Waste and Recycling of the code.

2. Failure to Place Recycling Cart at Curb. Residential solid waste and recycling customers shall place their assigned recycling cart at the curb adjacent to the assigned solid waste cart. City shall not collect the solid waste cart from a residential solid waste and recycling customer if the assigned recycling cart is not placed adjacent to the assigned solid waste cart.

2.7 Mandatory Composting

2.7.1 Overview

Mandatory composting ordinances require households to compost designated compostable materials. These ordinances make it illegal to dispose of compostables with refuse. The ordinance typically will include a list of the materials that are required to be composted.

Implementation

Implementing mandatory composting creates the need to determine which materials are prohibited from disposal. These materials may include any of the following:

- Food scraps;
- Food soiled paper;
- Compostable plastics and cutlery;
- Yard trimmings; and
- Small pieces of clean, untreated lumber or sawdust.

The types of materials that are required to be composted by ordinance vary among communities. For instance, some communities may elect to prohibit households from composting dairy, meat or fish food scraps. However, communities may also choose to allow residents to compost any of their generated compostable materials.

Enforcement

Ensuring Compliance

There are two primary approaches that local governments can adopt in order to ensure compliance with mandatory composting, described below:

- **Non-collection:** Drivers do not collect the refuse of a household unless the composting container is also set out for collection.
- **Container inspection:** Solid waste inspection staff conducts unannounced inspections of solid waste containers to determine if there are compostables that have been disposed with refuse.

These two approaches will ensure compliance with mandatory composting with different levels of precision. The first approach, non-collection, will ensure that residents set out containers for composting but will not ensure that they do not dispose of some compostables in the refuse. On the other hand, conducting inspections ensures that residents have not disposed of compostables. Local governments may implement one or a combination of these approaches to ensure that residents comply with mandatory composting ordinances.

Penalties for Non-Compliance

Enforcement mechanisms for mandatory composting ordinances vary with each community; however, some of the most common mechanisms are listed below:

- **Non-collection:** Residents who dispose of compostables with refuse are penalized by not having their refuse collected. Typically the driver will place a sticker or tag on the container that explains why the waste was not collected and how to comply with the program. The waste is then collected on the next scheduled collection day, provided that the compostables have been properly separated.
- **Citations:** A community may issue citations to residents who do not comply with the composting ordinance. Typically the initial citation is just a warning; however, with each consecutive offense a fee may be assessed.

2.7.2 Case Examples

The **City of San Francisco, California** requires all single-family households to source separate their compostables from their refuse and place the compostable material in a separate and designated container for collection. During collection, the hauler inspects each household's set-out. Residents who do not comply with the ordinance will receive up to two notifications of the violation; however the materials will continue to be collected. Should the household continue to set-out improperly sorted material after the second warning, the household will not have their waste collected and the household will face a fine not to exceed \$100.00.

2.7.3 Ordinance Development

Key Issues

There are several key issues that must be addressed by a local government that wishes to implement mandatory composting, including the following:

- Identification of materials that are prohibited from disposal;
- Enforcement mechanism to be used to ensure compliance; and
- Penalties for non-compliance.

Basic Language

Shown below is sample language that may be used by communities to implement mandatory residential composting.

Requirement to separate compostable materials. *See Section 2.6.3 for sample language regarding requirement to separate compostable materials.*

Additional Provisions

A mandatory composting ordinance will require adjustments to other portions of the solid waste and recycling code, as shown below.

Non-collection of solid waste or recyclable materials. *See Section 2.6.3 for sample language regarding non-collection.*

Section 3

Multi-Family Residential Recycling Ordinances

3.1 Introduction

This section describes options for ordinances that encourage or require recycling for multi-family complexes. For the purposes of this analysis, multi-family complexes refer to properties that receive collective refuse and recycling service, which typically includes buildings that have five or more dwelling units within a single building.¹ Apartment complexes, condominiums or townhomes, and high-rise buildings have been included in this analysis. Examples of these types of multi-family properties are shown in Figure 3-1.

This section provides a description of ordinances that can be developed by local governments as a part of an ongoing multi-family recycling program. R. W. Beck has listed these ordinances in order of increasing regulation. In other words, ordinances that encourage recycling are included before ordinances that mandate recycling.



Figure 3-1: Examples of apartment complexes (left), condominiums or townhomes (middle), and high-rise buildings (right)

¹ The definition of multi-family can vary from community to community.

3.2 Recycling Credits or Rebates

3.2.1 Overview

Communities can provide recycling credits or rebates to multi-family complexes that participate in recycling. Offering a recycling rebate offsets the cost to provide recycling service and creates an added incentive to develop a recycling program.

Implementation

Minimum Requirements

One key aspect of a recycling credit or rebate ordinance is determining what a multi-family complex must do to be eligible for the rebate. Potential requirements include, but are not limited to, the following:

- **Program specifications:** The complex must recycle a certain number of materials or certain material types to be eligible. Communities may also include provisions regarding volume of collection containers and collection frequency.
- **Recycling plan:** Typically, this type of ordinance requires the multi-family complex to complete a recycling plan. The plan typically outlines the program that will be utilized by the multi-family complex, including collection methods, types and location of containers, materials collected, and collection frequency. A community may require that the plan be submitted and approved prior to the issuance of the rebate.

Cost Implications

Recycling rebates are typically structured as an amount per dwelling unit. The rebate received by the multi-family complex will offset the cost of recycling service.

Local governments have various options with regard to funding a rebate for multi-family complexes. The funding option that is appropriate for a community may depend on whether service is provided by the municipality or the private sector. If the service is provided by the local government, the cost to provide the rebate may be recovered from revenue received from commercial refuse rates. However, if the private sector provides service to multi-family customers, the cost could be recovered from revenue received from commercial franchise fees. It is important for local governments to establish the source of funding for recycling rebates before implementing such an ordinance. It is also important to note that prior to implementing such an ordinance, a community should conduct a thorough financial analysis to determine the amount of the rebate to be rewarded.

Enforcement

Ensuring Compliance

Enforcement mechanisms for a rebate/credit program depend largely on the eligibility requirements established by the local government. For some programs, the

community can require the multi-family complex to submit annually all documentation of recycling activities including the weight and types of material. Those unable to prove compliance through such documentation forfeit their right to receive the credit/rebate. Enforcement can also be the responsibility of the hauler for this type of ordinance. Haulers can be required to monitor the multi-family complex's recycling set-outs and report to the local government any improper activity that is in violation of the guidelines of the ordinance.

Penalties for Non-Compliance

The primary penalty for not complying with the ordinance would be revoking the rebate. In this case, since the goal of the ordinance is to encourage recycling, the local government may want to allow a multi-family complex to regain the opportunity to receive a rebate after a specified waiting period.

3.2.2 Case Examples

The **City of Chicago, Illinois** offers a rebate to multi-family complexes, which includes any complex with five or more dwelling units. The City provides a rebate to offset the total cost of refuse and recycling collection service up to \$75.00 per residential unit annually. In order to receive the rebate, the complex must establish a recycling program that includes two of the following materials: OCC; mixed paper; magazines and catalogs; newspaper; aluminum and steel cans; glass containers; plastic containers; fluorescent bulbs; or high density discharge lamps.

In addition, the recycling program must either include an additional material from the above list or develop two source reduction programs for the complex. Source reduction measures that would satisfy the requirement include, but are not limited to, the following:

- Composting of yard waste;
- Use of a mulching lawn mower;
- Installing energy efficient light bulbs or fixtures;
- Installing reusable furnace and air conditioning filters;
- Providing residents with reusable cloth or string bags; and
- Providing residents with educational materials on non-toxic or less wasteful products, such as rechargeable batteries or citrus cleaning products.

In order for the multi-family complex to receive the rebate, the complex must submit the following items to the City: a notarized statement showing the annual cost for recycling collection, the number of residential units in the complex, and a letter confirming the executed agreement with the private hauler providing waste collection. After review, City staff may approve the rebate to the complex.

3.2.3 Ordinance Development

Key Issues

There are several key issues that must be addressed by a local government that wishes to implement a recycling rebate for multi-family complexes, including the following:

- Amount of the rebate;
- Minimum requirements to receive the rebate;
- Mechanism to ensure compliance with the rebate; and
- Penalties for non-compliance.

Basic Language

Shown below is sample ordinance language for a recycling rebate or credit ordinance.

Residential solid waste fee and recycling credit. Each owner of a multi-family complex who registers a recycling plan with the Department of [insert relevant City department] for the City, pursuant to Section [insert section number for registration of recycling pledge] of the code, shall qualify for a monthly residential recycling credit. The monthly recycling credit shall be set by City council resolution to be effective beginning on [insert date and year], and as revised thereafter.

Additional Provisions

In addition to the basic language regarding the creation of the recycling rebate or credit, the program will require that the following additional ordinance provisions be included within the code.

Registration of recycling plan. The Director of [insert relevant City department] for the City may establish regulations governing how recycling plan are made and registered.

Penalties for breach of recycling pledge. The Director of [insert relevant City department] for the City may establish regulations governing how recycling plans are enforced. The Director of [insert relevant City department] is also authorized to establish a penalty, including a fine, for those owners of a multi-family complex who breach the recycling pledge.

3.3 Mandatory Hauler-Provided Recycling Service

3.3.1 Overview

Communities can require haulers to provide recycling services to multi-family complexes. This type of ordinance places the burden of compliance on haulers rather than on multi-family complexes.

There is a cost associated with providing recycling service to multi-family complexes. The cost of this service is ultimately passed on to tenants via higher rental rates. Multi-family complexes are often hesitant to procure voluntary recycling service due to the risk of having higher rental rates than competing complexes. However, mandatory recycling service, through this type of ordinance, creates a level playing field because all complexes incur the costs associated with recycling.

Implementation

Inclusion Criteria

In developing a mandatory, hauler-provided recycling ordinance, local governments must determine the complexes to which haulers are required to provide service. In many cases, local governments exclude certain complexes based on the following considerations:

- **Size:** Only complexes with over a certain number of dwelling units are required to comply with the ordinance.
- **Space:** Complexes that are determined to have insufficient space for recycling containers are excluded from the ordinance.
- **Age:** Some local governments choose to require compliance only by complexes constructed after the passing of the ordinance.

Local governments should consider the impact that a mandatory recycling ordinance will have on existing complexes. However, mandatory recycling ordinances should be written to be as inclusive as possible to ensure that complexes compete on a level playing field.

Minimum Requirements

Typically, mandatory hauler-provided recycling ordinances require haulers to perform any or all of the following activities:

- Provide recycling containers to multi-family complexes;
- Provide individual recycling containers for residents to transport recyclables from the dwelling unit to the collection containers;
- Collect recyclable materials designated by the local government with a specified level of collection frequency;
- Notify tenants in writing of the recycling program, materials collected, and the established rules of the program; and
- Submit reports to the local government regarding the amount and types of recyclable material collected as proof of compliance.

Cost Implications

In mandatory, hauler-provided recycling, some communities require haulers to provide recycling service at no additional charge to multi-family complexes. However, there is a cost associated with providing recycling service even if there is no separate fee. If

haulers are not permitted to charge a fee, the cost of recycling will most likely be reflected in the overall cost of refuse collection for the complex.

Enforcement

Ensuring Compliance

There are several methods that local governments may use to identify haulers that are not in compliance with a mandatory recycling ordinance. As discussed above, requiring haulers to submit reports as proof of compliance can serve as a primary method of ensuring compliance. However, other options for local governments are:

- Unannounced audits by city staff; and
- Apartment manager and/or tenant reporting.

Penalties for Non-Compliance

Once a hauler is determined to be not in compliance, enforcement mechanisms can include any of the following (written in order of severity):

- Written warning of the violation;
- Citation or fine that increases in amount with each consecutive offense;
- Increase in license or franchise fee; or
- Loss of hauling license or franchise.

3.3.2 Case Examples

R. W. Beck identified the following communities that require haulers to provide recycling services to multi-family complexes.

- **Dover, New Hampshire:** Haulers are required to provide recycling services to all multi-family complexes with four units or more. Haulers provide recycling containers for weekly material collection. The City relies on individual property managers and owners to ensure that waste and recyclable materials are properly collected. Those found in violation of the ordinance are subject to a fine.
- **Boulder, Colorado:** Haulers are required to provide recycling services to all multi-family complexes. The collection of recyclable materials is provided no less frequently than every other week. Containers for recycling are provided by the hauler for collection. The City of Boulder enforces this ordinance by requiring the haulers to maintain records that include the weight in tons of garbage, recyclable materials, and compostable materials that are collected from each complex. These records are to be made available for audit by the City Manager. Those found in violation of the ordinance are subject to a fine.

3.3.3 Ordinance Development

Key Issues

There are several key issues that must be addressed by a local government that wants to implement a mandatory multi-family recycling ordinance, including the following:

- Criteria for inclusion;
- Minimum requirements;
- Method for ensuring compliance; and
- Penalties for non-compliance.

Basic Language

Shown below is sample ordinance language for mandatory multi-family recycling.

Mandatory multi-family recycling collection. Each multi-family hauler shall provide a minimum of [insert frequency] recyclable materials collection, as defined in Section [insert definition section number] of the code, for [insert list of recyclable materials] to all multi-family complexes for which the multi-family hauler provides solid waste collection, as defined in Section [insert section number for description of residential solid waste and recycling services] of the code.

Additional Provisions

Mandatory multi-family recycling will require that the following additional ordinance provisions be included within the code.

No multi-family recycling collection fee. Each multi-family hauler shall provide recyclable materials collection, as defined in Section [insert definition section number] of the code, to all multi-family complexes for which the multi-family hauler provides solid waste collection, as defined in Section [insert section number for description of residential solid waste and recycling services] of the code at no additional charge beyond that agreed for solid waste collection service.

Recycling education. Each multi-family hauler shall provide recycling education materials to all multi-family complexes for which the multi-family hauler provides solid waste collection, as defined in Section [insert section number for description of multi-family solid waste and recycling services]. At a minimum, multi-family haulers shall provide sufficient copies of a mandatory multi-family recycling collection introduction notice, developed by the multi-family hauler and approved by the [insert appropriate City staff], to be distributed by the multi-family complex to: (1) all new tenants no later than the [insert number] day after occupancy, (2) all tenants annually, and (3) all tenants no later than the [insert number] day after a change in recyclable materials collection service.

Duty to provide carts. Multi-family haulers shall provide each multi-family complex a minimum of ____ (__) [insert cart size] gallon recycling containers. For multi-family complexes that have more than ____ (_) multifamily dwelling units, the multi-family hauler shall provide the multi-family complex a minimum of ____ (__) [insert cart size] gallon recycling containers for each ____ (__) multi-family dwelling units. Regardless of the number of multifamily dwelling units, multi-family haulers shall provide each multi-family complex a sufficient number of [insert cart size] gallon recycling containers as to prevent overflow based on [insert frequency] collection.

Reporting. Each multi-family hauler shall submit a [insert frequency] report to [insert appropriate City staff]. In the report, each multi-family hauler shall identify the: (1) multi-family complexes that received recyclable materials collection from the multi-family hauler, (2) the start and end date for recyclable materials collection from the multi-family hauler for each said multi-family complex, (3) the total weight of recyclable materials collected from multi-family complexes, and (4) identification of the processor of recyclable materials collected from multi-family complexes. All such reports shall be submitted on forms provided by [insert appropriate City staff] by [insert date], for the previous [insert time period] respectively. The City reserves the right to require any additional information deemed necessary by [insert appropriate City staff], or other designee of [insert appropriate City staff].

Penalties for violation of code. [Insert appropriate City staff] for the City may establish regulations governing enforcement of Chapter [insert chapter number] Multi-family Solid Waste and Recycling of the code. [Insert appropriate City staff] is also authorized to establish and assess a penalty, including a fine, for those multi-family haulers who violate Chapter [insert chapter number] Multi-family Solid Waste and Recycling of the code.

Temporary exemptions. Multi-family haulers may submit an application for a temporary exemption for a multi-family complex to [insert appropriate City staff] on forms provided by [insert appropriate City staff]. [Insert appropriate City staff] may approve a temporary exemption where compliance would result in: (1) the multi-family complex being in compliance with the requirements of the code or other laws or (2) the multi-family complex does not have on-site space available for the separate and temporary storage of recyclable materials. If [insert appropriate City staff] approves an application for a temporary exemption, the temporary exemption is valid for a period not to exceed ____ (__) [insert timeframe] and shall be withdrawn upon the first to occur of: (1) a change in the condition that prompted the temporary exemption, (2) the expiration of the time period granted in the temporary exemption, or (3) ____ (__) [insert timeframe] from the grant of the temporary exemption. Multi-family haulers may submit a renewal application for a temporary exemption for a multi-family complex to [insert appropriate City staff] on forms provided by [insert appropriate City staff] upon withdrawal of a temporary exemption due to the expiration of the time period. After review of the temporary exemption application, initial or renewal application, [insert appropriate City staff] may:

(1) grant the temporary exemption, (2) grant a portion of the temporary exemption and deny a portion of the temporary exemption, or (3) deny the temporary exemption.

3.4 Mandatory Recycling Program Development

3.4.1 Overview

A community can enact an ordinance that requires apartment complex owners and/or managers to develop a recycling program for the multi-family complex. This type of ordinance places the burden of compliance on multi-family complexes rather than on haulers.

The cost associated with multi-family recycling programs is ultimately passed on to tenants via higher rental rates. Multi-family complexes are often hesitant to procure voluntary recycling service due to the risk of having higher rental rates than competing complexes. However, mandatory recycling service, through this type of ordinance, creates a level playing field because all complexes incur the costs associated with recycling.

Implementation

Inclusion Criteria

For mandatory recycling program development ordinance, local governments must determine which multi-family complexes will be required to comply. A discussion of this issue can be found in Section 3.3.1.

Minimum Requirements

As part of this type of ordinance, multi-family complexes are typically required to perform any or all of the following activities:

- Submit a recycling plan to the local government;
- Provide individual recycling containers for residents to transport recyclables from the dwelling unit to the centralized collection containers;
- Contract with a hauler for collection of recyclable materials;
- Notify tenants in writing of recycling program at move-in;
- Provide ongoing tenant education regarding the recycling program; and
- Submit proof of compliance to the local government, such as records detailing type and amounts of materials collected, copy of service agreement with hauler, self-hauling certificate, or receipt from recycling facility.

Ordinances will vary in terms of specificity. For example, some communities require that complexes provide a specific volume of recycling collection capacity and a certain level of collection frequency. It is important to note that when designing such

an ordinance and specifying requirements that the size of complexes be taken into consideration. A successful ordinance would require large complexes to provide enough collection capacity and level of collection frequency to meet the needs of the tenants, while not overwhelming smaller complexes with excessive collection capacity and collection frequency requirements. Section 7 of these guidelines provides a discussion of infrastructure needs for recycling programs at multi-family complexes.

Technical Assistance

If local governments mandate recycling for multi-family complexes, it is common to implement technical assistance programs to help properties meet the minimum requirements of the ordinance. As part of technical assistance programs, local government solid waste staff can assist multi-family complexes with conducting the following activities related to program development:

- Waste audits to assess the waste stream;
- Identify franchised and/or licensed haulers of recyclables;
- Develop collection infrastructure (e.g., collection areas, enclosures); and
- Develop tenant educational materials.

Enforcement

Ensuring Compliance

There are several methods that local governments can use to identify complexes that are not in compliance with a mandatory recycling ordinance. As discussed above, requiring recycling plans and other written proof of compliance can serve as a primary method of ensuring compliance. However, other options for local governments are:

- Unannounced audits by city staff; and
- Hauler and/or tenant reporting.

Penalties for Non-Compliance

Once a complex is determined to be not in compliance, enforcement mechanisms can include any of the following (written in order of severity). Based on R. W. Beck's experience, communities typically utilize less severe forms of enforcement, such as written warnings and citations.

- Written warning of the violation;
- Citation or fine that increases in amount with each consecutive offense; and
- In some extreme cases, the revocation of the certificate of occupancy.

3.4.2 Case Examples

The **City of Austin, Texas** requires all multi-family complexes with at least 100 dwelling units to institute an on-site recycling program. Property owners or management must provide collection for a minimum of four of the following

materials: mixed paper; newspaper; OCC; Kraft paper bags; aluminum; steel and tin cans; glass bottles; and plastic containers #1 and #2.

The ordinance mandates that each complex provide two 60- or 64-gallon carts, per 20 units. Materials must be collected at least once per week by the contracted hauler. The ordinance also states that complexes must provide recycling service options that enhance the convenience for tenants in order to increase participation in the program. The City reserves the right to inspect the premises to ensure compliance with the ordinance; however, the City relies primarily on tenant reporting to identify instances of non-compliance.

Each participating multi-family complex is required to complete a recycling plan form within 14 days of beginning program operations. Complexes are also required by the ordinance to file a quarterly volume report. The volume report may be completed by the private hauler.

Those found in violation are subject to citation or legal action. Legal action includes civil action that may subject the complex owner or management to fines; or, criminal action that may subject the complex owner or management to a misdemeanor punishable by fine, community service or imprisonment.²

The City also administers a Waste Reduction Assistance Program (WRAP) that is available to multi-family complexes. As part of this program, free waste assessments are performed for businesses on a voluntary basis, and City staff provides recommendations to implement a recycling program. The City has also developed “tip sheets” and other educational materials that are available to multi-family complexes to assist them in developing and implementing a recycling program.

3.4.3 Ordinance Development

Key Issues

There are several key issues that must be addressed by a local government that wants to implement a mandatory multi-family recycling program development ordinance, including the following:

- Criteria for inclusion;
- Minimum requirements of the ordinance;
- Technical assistance services to be provided by the local government;
- Method for ensuring compliance; and
- Penalties for non-compliance.

Basic Language

Shown below is sample ordinance language for mandatory multi-family recycling.

² The enforcement mechanisms listed are for information purposes only. R. W. Beck is unaware of any person or entity being incarcerated for recycling infractions.

Mandatory multi-family recycling collection. The owner of a multi-family complex shall provide a minimum of [insert frequency] on-site recyclable materials collection, as defined in Section [insert definition section number] of the code, for [insert list of recyclable materials] to said multi-family complex. The owner of a multi-family complex may provide the mandatory multi-family recycling collection personally or by contract with a recycling hauler.

Additional Provisions

In addition to other ordinance sections, a mandatory owner-provided recycling services ordinance should include additional provisions, as shown below.

Recycling education. The owner of a multi-family complex shall provide recycling education materials to all tenants. At a minimum, the owner of a multi-family complex shall provide a mandatory multi-family recycling collection introduction notice, developed by the owner of the multi-family complex and approved by the [insert appropriate City staff], to be distributed by the owner of the multi-family complex to: (1) all new tenants no later than the [insert number] day after occupancy, (2) all tenants annually, and (3) all tenants no later than the [insert number] day after a change in recyclable materials collection service.

Duty to provide carts. The owner of a multi-family complex shall provide each multi-family complex a minimum of ____ (__) [insert cart size] gallon serial-numbered recycling containers. For multi-family complexes that have more than ____ (_) multi-family dwelling units, the owner of the multi-family complex shall provide the multi-family complex a minimum of ____ (__) [insert cart size] gallon serial-numbered recycling containers for each ____ (__) multifamily dwelling units. Regardless of the number of multi-family dwelling units, owners of multi-family complexes shall provide each multi-family complex a sufficient number of [insert cart size] gallon serial-numbered recycling containers as to prevent overflow based on once a week collection.

Recycling plan. Each owner of a multi-family complex shall submit a recycling plan to [insert appropriate City staff] no later than [insert number] day after beginning operations. Each owner of a multi-family complex shall submit an amendment to the recycling plan to [insert appropriate City staff] no later than [insert number] day after change in recyclable materials collection service. In the recycling plan, each owner of a multi-family complex shall identify the: (1) location, owner's name, and owner's contact information for the multi-family complex, (2) the start date for recyclable materials collection from the multi-family complex, (3) description of the recyclable materials collection program including the location of the on-site recyclable materials collection, number and size of recyclable carts, and other pertinent information, and (4) identification of the hauler and processor of recyclable materials collected from multi-family complex. All such reports shall be submitted on forms provided by [insert appropriate City staff]. The City reserves the right to

require any additional information deemed necessary by [insert appropriate City staff], or other designee of [insert appropriate City staff].

Volume report. Each owner of a multi-family complex shall submit a [insert frequency] report to [insert appropriate City staff] on or before [insert date]. In the report, each owner of a multi-family complex shall identify the: (1) location, owner's name, and owner's contact information for the multi-family complex, (2) the start and end date for recyclable materials collection from the multi-family hauler for each said multi-family complex, (3) the total weight of recyclable materials collected from multi-family complexes, and (4) identification of the processor of recyclable materials collected from multi-family complexes. All such reports shall be submitted on forms provided by [insert appropriate City staff] by [insert date], for the previous [insert time period] respectively. The City reserves the right to require any additional information deemed necessary by [insert appropriate City staff], or other designee of [insert appropriate City staff].

Penalties for violation of code. [Insert appropriate City staff] for the City may establish regulations governing enforcement of Chapter [insert chapter number] Multi-family Solid Waste and Recycling of the code. [Insert appropriate City staff] is also authorized to establish and assess a penalty, including a fine, for those owners of multi-family complex who violate Chapter [insert chapter number] Multi-family Solid Waste and Recycling of the code.

Temporary exemptions. *See Section 3.3.3 for sample language regarding temporary exemptions.*

3.5 Mandatory Composting Program Development

3.5.1 Overview

A community can enact an ordinance that requires apartment complex owners and/or managers to develop a program for the collection of compost removal for the multi-family complex. This type of ordinance places the burden of compliance on multi-family complexes rather than on haulers.

Implementation

Inclusion Criteria

For mandatory composting program development ordinance, local governments must determine which multi-family complexes will be required to comply. A discussion of this issue can be found in Section 3.3.1.

Minimum Requirements

As part of this type of ordinance, multi-family complexes are typically required to perform any or all of the following activities:

- Provide individual composting containers for residents to transport compostables from the dwelling unit to the centralized collection containers;
- Contract with a hauler for collection of compostable materials;
- Notify tenants in writing of composting program at move-in;
- Provide ongoing tenant education regarding the composting program; and
- Submit proof of compliance to the local government, such as records detailing type and amounts of materials collected, copy of service agreement with hauler, self-hauling certificate, or receipt from composting facility.

Technical Assistance

If local governments mandate composting for multi-family complexes, it is common to implement technical assistance programs to help properties meet the minimum requirements of the ordinance. As part of technical assistance programs, local government solid waste staff can assist multi-family complexes with conducting the following activities related to program development:

- Waste audits to assess the waste stream;
- Identify franchised and/or licensed haulers of compostables;
- Develop collection infrastructure (e.g., collection areas, enclosures); and
- Develop tenant educational materials.

Enforcement

Ensuring Compliance

There are several methods that local governments can use to identify complexes that are not in compliance with a mandatory composting ordinance. As discussed above, requiring recycling plans and other written proof of compliance can serve as a primary method of ensuring compliance. However, other options for local governments are:

- Unannounced audits by city staff; and
- Hauler and/or tenant reporting.

Penalties for Non-Compliance

Once a complex is determined to be not in compliance, enforcement mechanisms can include any of the following (written in order of severity). Based on R. W. Beck's experience, communities typically utilize less severe forms of enforcement, such as written warnings and citations.

- Written warning of the violation; and

- Citation or fine that increases in amount with each consecutive offense.

3.5.2 Case Examples

The **City of San Francisco, California**³ requires all multi-family complexes to institute an on-site composting program. Property owners or management must provide collection for all compostable materials. Materials would include the following: Food soiled paper, food scraps, compostable plastics and cutlery, yard waste and clean wood or sawdust.

The ordinance mandates that each complex provide an adequate amount of color coded (green for compostables, blue for recycling and black for refuse) containers in convenient locations for tenants. The owner or management of the multi-family complex must also continually educate all tenants and employees on how to properly separate materials. Materials must be collected at least once per week by the contracted hauler. The City relies primarily on hauler reporting to identify instances of non-compliance.

Currently, no owner, management, tenant, employee or visitor of a multi-family complex in the City of San Francisco is subject to fines or penalties for violation of this ordinance. This is a relatively new ordinance and the City's Department of the Environment is to decide the specific regulations setting out the liability of such persons on July 1, 2011. However, fines may be assessed for not instituting and maintaining adequate recycling and composting programs and the hauler still maintains the right to refuse collection until the materials are properly sorted.

3.5.3 Ordinance Development

Key Issues

There are several key issues that must be addressed by a local government that wants to implement a mandatory multi-family composting program development ordinance, including the following:

- Criteria for inclusion;
- Minimum requirements of the ordinance;
- Technical assistance services to be provided by the local government;
- Method for ensuring compliance; and
- Penalties for non-compliance.

Basic Language

Shown below is sample ordinance language for mandatory multi-family composting.

³ It is important to note that this is an all inclusive ordinance that extends to every generator and hauler in the City. For the purposes of this report, the ordinance was used as an example of an ordinance that is directed towards the generator.

Mandatory multi-family composting collection. *See Section 3.4.3 for sample language regarding mandatory multi-family collection.*

Additional Provisions

In addition to other ordinance sections, a mandatory owner-provided composting services ordinance should include additional provisions, as shown below.

Recycling education. *See Section 3.4.3 for sample language regarding mandatory multi-family collection recycling education.*

Duty to provide carts. *See Section 3.4.3 for sample language regarding duty to provide carts under a mandatory multi-family collection.*

Recycling plan. *See Section 3.4.3 for sample language regarding mandatory multi-family collection recycling plan.*

Volume report. *See Section 3.4.3 for sample language regarding mandatory multi-family collection volume report.*

Penalties for violation of code. *See Section 3.4.3 for sample language regarding penalties for violation of mandatory multi-family collection.*

Temporary exemptions. *See Section 3.3.3 for sample language regarding temporary exemptions.*

3.6 Mandatory Recycling by Multi-Family Residents

3.6.1 Overview

Communities can pass a local ordinance that requires multi-family residents to participate in on-site recycling programs provided by haulers or property owners. This type of ordinance specifically mandates that multi-family residents recycle all materials designated by the program.

Implementation

Typically, this type of ordinance is combined with a mandatory recycling program, as mentioned in Sections 3.3 and 3.4. When implemented together, the ordinances act as a comprehensive multi-family recycling program.

Enforcement

Ensuring Compliance

Enforcement of an ordinance aimed at individual residents within a complex of many units can be challenging. This is largely due to the fact that most multi-family complexes utilize centralized containers versus individual containers for each unit. Therefore, strategies for identifying individuals that violate the ordinance are limited.

Most enforcement activities are targeted toward the overall complex and not individual violators of the ordinance.

One potential strategy to identify individuals that do not comply with this type of ordinance is to inspect the improperly disposed material to find information that would identify the resident (e.g., mail with name and address, magazine, etc.). This strategy is often used to identify individuals responsible for illegal dumping.

Penalties for Non-Compliance

Penalties for non-compliance for this type of ordinance can include the following:

- Written warning of the violation; and
- Citation or fine that increases in amount with each consecutive offense.

3.6.2 Case Examples

Adams County, Wisconsin requires multi-family residents to recycle designated materials. This requirement is a component to the overall multi-family recycling ordinance. The party responsible for the multi-family complex is required to provide for the collection of the materials separated from the solid waste by the tenants. Enforcement of this ordinance is the responsibility of the hauler. The hauler maintains the right to not collect material that has not been properly sorted. In addition, the hauler is required to document all occurrences of non-compliance for each complex and provide the information to the County quarterly.

3.6.3 Ordinance Development

Key Issues

There are several key issues that must be addressed by a local government that wishes to implement a mandatory recycling ordinance for multi-family residents. The most important issue that must be addressed is the implementation of a mandatory recycling ordinance as described in Sections 3.3 and 3.4. Residents must have recycling programs available in order to participate in recycling. Other key issues that must be addressed include:

- Identification of materials required for recycling;
- Determination of enforcement mechanisms; and
- Penalties for non-compliance.

Basic Language

Shown below is sample ordinance language for mandatory recycling by multi-family residents.

Recycling Required. All occupants of a multi-family unit shall separate mandatory recyclable materials, as defined in Section [insert definition section]

of the code, from solid waste, as defined in Section [insert definition section] of the code. All occupants of a multi-family unit shall deposit mandatory recyclable materials in receptacles for recyclable materials collection. All occupants of a multi-family unit shall not deposit mandatory recyclable materials in receptacle for solid waste collection.

Additional Provisions

In addition to other ordinance sections, a mandatory recycling participation ordinance should include additional provisions, as shown below.

Penalties for violation of code. [Insert appropriate City staff] for the City may establish regulations governing enforcement of Chapter [insert chapter number] Multi-family Solid Waste and Recycling of the code. [Insert appropriate City staff] is also authorized to establish and assess a penalty, including a fine, for those occupants of a multi-family units that violate Chapter [insert chapter number] Multi-family Solid Waste and Recycling of the code.

Temporary exemptions. *See Section 3.3.3 for sample language regarding temporary exemptions.*

Section 4

Commercial Recycling Ordinances

4.1 Introduction

This section provides options for ordinances that encourage or require recycling for commercial establishments. For the purposes of this study, commercial establishment generally refer to businesses including, but not limited to, office buildings, retail establishments, restaurants and food service establishments, schools, and public (e.g., governmental) facilities.

This section provides a description of ordinances that can be developed by local governments as a part of an ongoing commercial recycling program. R. W. Beck has listed these ordinances in order of increasing regulation. In other words, ordinances that encourage recycling are included before ordinances that mandate recycling.

4.2 Awards and Recognition

4.2.1 Overview

Awards and recognition programs for commercial establishments can provide incentive for businesses to recycle. These incentive programs may be combined with other regulations to accomplish a community's recycling goals. Awards and recognition programs typically provide public recognition for commercial businesses that have developed exceptional or innovative recycling programs.

Awards and recognition programs can be accounted for in a community's recycling ordinances. However, it is also possible to create an awards and recognition program that is not mentioned within a city's ordinances. For example:

- **Plano, Texas** awards local businesses with the “Environmental Star of Excellence Award” for outstanding recycling efforts. The City publicly presents these awards on an annual basis.
- **Mecklenburg County, North Carolina** developed a business recognition program as a part of their “Wipe-out Waste” campaign. Members of the program have numerous benefits including the use of the Wipe-out Waste logo and decal and free publicity at Wipe-out Waste events. Each year, the County selects businesses members of the Wipe-out Waste campaign to receive recognition awards for their efforts to increase commercial recycling.

These programs are examples of an awards and recognition programs that have been successful in encouraging commercial recycling efforts, but are not specifically accounted for within the municipal code.

Implementation

The focus of an awards and recognition program is to acknowledge efforts put forth by local businesses to increase diversion. Publicly commending recycling provides positive publicity for businesses, which encourages continued efforts.

There are many methods available for administering this type of program. Communities will commonly utilize an application or nomination process to identify commercial establishments that should be recognized.

Components of the awards and recognition program may include, but are not limited to, any of the following:

- Window decals and other promotional materials;
- Acknowledgment on the website;
- Publicity at community events; or
- Formal awards.

Enforcement

There are typically no enforcement activities associated with awards and recognition programs for commercial recycling.

4.2.2 Case Examples

Listed below are communities identified by R. W. Beck that have an ordinance for a commercial awards and recognition program.

- **Collier County, Florida:** The County has an awards and recognition program for commercial establishments that coincides with the City's mandatory commercial recycling ordinance. The County requires all commercial establishments to recycle the following materials:
 - Paper;
 - OCC;
 - Glass containers;
 - Plastic containers #1 through #7;
 - Aluminum; and
 - Ferrous metals.

The County Manager is authorized by ordinance to establish and implement the awards program, which recognizes businesses in the County who implement

exceptional or innovative recycling programs. The ordinance is written in a general manner and does not include the details of the program.

- **Sarasota County, Florida:** The Sarasota County Code of Ordinances grants the local government the authority to develop a recognition program to promote commercial recycling within the County. This ordinance is broadly written and does not include the details of the recognition program.

4.2.3 Ordinance Development

Key Issues

As mentioned previously, commercial recycling awards and recognition programs can be created without inclusion of the program in an ordinance. If a community elects to include the program in an ordinance, the key issues are:

- Determination whether the local government will be either required or permitted to develop the awards and recognition program; and
- Determination whether the ordinance will provide general or detailed definition of the awards and recognition program.

Basic Language

Shown below is sample ordinance language to establish an awards and recognition ordinance. The sample language is general in nature and does not include the specific details of the program.

Recognition program for commercial customers. [Insert appropriate City department] for the City may establish and implement a recycling recognition program to acknowledge commercial customers who implement recycling programs at their commercial property located in the City.

Additional Provisions

An awards and recognition program, written similar to the one above, will likely not require adjustments to other portions of the solid waste and recycling code. However, because each community's code is unique, R. W. Beck recommends that each community review their solid waste and recycling code to determine whether additional provisions are required to implement an awards and recognition program.

4.3 Mandatory Hauler-Provided Recycling Service

4.3.1 Overview

Local governments can require haulers to provide recycling services to commercial customers. This type of ordinance places the burden of compliance on haulers rather than individual businesses.

Implementation

Inclusion Criteria

Many communities that implement mandatory recycling choose to require compliance from all commercial generators of solid waste. However, depending on the unique circumstances in a given community, local governments may choose to grant exceptions to mandatory recycling based on any of the following factors:

- Volume of waste generated;
- Size of campus; and
- Number of employees.

It is important to note that providing exceptions to mandatory recycling can require a greater level of administration and enforcement on the part of the local government.

Minimum Requirements

Mandatory recycling ordinances typically require haulers to perform any or all of the following activities:

- Provide recycling containers to commercial customers;
- Collect recyclable materials designated by the local government with a specific collection frequency;
- Notify business employees in writing of the recycling program, materials collected, and the established rules of the program; and
- Submit reports to the local government regarding the amount and types of recyclable material collected as proof of compliance.

Local governments must also determine which materials will be included in a mandatory recycling ordinance. There are generally two approaches to selecting the materials that must be included in a mandatory recycling ordinance for commercial establishments, as described below:

- **Generator-specific** mandatory recycling requires commercial establishments to recycle the materials that compose the largest portion of their waste stream.
- **Designated material** mandatory recycling requires commercial establishments to recycle a number of materials that are approved by the local government.

Cost Implications

In mandatory commercial recycling ordinances, some communities require haulers to provide recycling service at no additional charge to commercial customers. However, there is a cost associated with providing recycling service even if there is no separate fee. If haulers are not permitted to charge a fee, the cost of recycling will most likely be reflected in the overall cost of refuse collection for the business.

Enforcement

Ensuring Compliance

There are several methods that local governments can use to identify haulers that are not in compliance with a mandatory recycling ordinance. As discussed above, requiring recycling plans and other written proof of compliance can serve as a primary method of ensuring compliance. However, other options for local governments are:

- Unannounced audits by city department at commercial property; and
- Reporting of out-of-compliance haulers by commercial customers.

Penalties for Non-Compliance

Once a hauler is determined to be out-of-compliance, enforcement mechanisms typically include, but are not limited to, the following:

- Written warning of the violation;
- Citation or fine that increases in amount with each consecutive offense;
- Increase in license or franchise fee; and
- Loss of hauling license or franchise.

4.3.2 Case Example

The **City of Ann Arbor, Michigan** provides weekly recycling services to all commercial establishments within City limits at no additional charge. The commercial establishments must be contracted with the City for weekly refuse collection in order to receive the recycling services. Commercial establishments are required to separate their recyclable materials and utilize the containers provided by the City's collection service. Recyclable materials include the following:

- Steel and aluminum cans;
- Ferrous and non-ferrous metals;
- Coated beverage cartons and aseptic boxes;
- Plastic bottles #1 and #2;
- Glass and ceramics;
- Mixed paper; and
- OCC.

4.3.3 Ordinance Development

Key Issues

Communities must address the following key issues in developing a mandatory, hauler-provided recycling ordinance:

- Identification of the type of commercial establishments subject to the requirements;
- Minimum requirements of the ordinance;
- Method for ensuring compliance; and
- Enforcement mechanisms for non compliance.

Basic Language

Shown below is sample ordinance language to establish a generator-specific mandatory recycling ordinance.

Mandatory commercial recycling collection Each commercial hauler shall provide a minimum of [insert frequency] on-site recyclable materials collection, as defined in Section [insert definition section number] of the code, for the ____ (__) targeted recyclable materials that comprise the largest volume of the annual waste stream for each commercial establishment serviced by said hauler.

Shown below is sample ordinance language to establish a material-specific mandatory recycling ordinance.

Mandatory commercial recycling collection. Each commercial hauler shall provide a minimum of [insert frequency] on-site recyclable materials collection, as defined in Section [insert definition section number] of the code, for at least ____ (____) of the ____ (__) recyclable materials as defined in Section [insert definitions section] of the code.

Additional Provisions

A mandatory hauler-provided recycling ordinance will require modifications to other sections of the solid waste and recycling code, as shown below.

Duty to provide containers. Commercial haulers shall provide each commercial establishment a minimum of ____ (__) [insert size] recycling containers. Regardless of size of the commercial establishment, commercial haulers shall provide each commercial establishment a sufficient number of recycling containers to prevent overflow based on [insert frequency] collection.

Recycling education. Each commercial hauler shall provide recycling education materials to all commercial customers which the commercial hauler provides solid waste collection, as defined in Section [insert section number for description of solid waste and recycling services]. At a minimum, commercial haulers shall provide sufficient copies of a commercial recycling collection introduction notice, developed by the commercial hauler and approved by the [insert appropriate City department], to be distributed to: (1) all new customers no later than the [insert number] day after commencing service, (2) all customers annually, and (3) all customers no later than the [insert number] day after a change in recyclable materials collection service.

Reporting. Each commercial hauler shall submit a [insert frequency] report to [insert appropriate City department] on or before [insert date]. In the report, each commercial hauler shall identify the: (1) commercial establishments that received recyclable materials collection from the commercial hauler, (2) the start and end date for recyclable materials collection from the commercial hauler for each said commercial establishment, (3) the total weight of recyclable materials collected from commercial establishments, and (4) identification of the processor of recyclable materials collected from commercial establishments. All such reports shall be submitted on forms provided by [insert appropriate City department]. The City reserves the right to require any additional information deemed necessary by [insert appropriate City department], or other designee of [insert appropriate City department].

Penalties for violation of code. [Insert appropriate City department] for the City may establish regulations governing enforcement of Chapter [insert chapter number] Commercial Solid Waste and Recycling of the code. [Insert appropriate City department] is also authorized to establish and assess a penalty, including a fine, for those commercial haulers who violate Chapter [insert chapter number] Commercial Solid Waste and Recycling of the code.

Temporary exemptions. Commercial haulers may submit an application for a temporary exemption for a commercial establishment to [insert appropriate City department] on forms provided by [insert appropriate City department]. [Insert appropriate City department] may approve a temporary exemption where compliance would result in: (1) the commercial establishment being noncompliant with the requirements of the code or other laws or (2) the commercial establishment does not have on-site space available for the separate and temporary storage of recyclable materials. If [insert appropriate City department] approves an application for a temporary exemption, the temporary exemption is valid for a period not to exceed ___ (__) [insert timeframe] and shall be withdrawn upon the first to occur of: (1) a change in the condition that prompted the temporary exemption, (2) the expiration of the time period granted in the temporary exemption, or (3) ___ (__) [insert timeframe] from the grant of the temporary exemption. Commercial haulers may submit a renewal application for a temporary exemption for a commercial establishment to [insert appropriate City department] on forms provided by [insert appropriate City department] upon withdrawal of a temporary exemption due to the expiration of the time period. After review of the temporary exemption application, initial or renewal application, [insert appropriate City department] may: (1) grant the temporary exemption, (2) grant a portion of the temporary exemption and deny a portion of the temporary exemption, or (3) deny the temporary exemption.

4.4 Mandatory Recycling Program Development

4.4.1 Overview

Local governments may enact an ordinance that requires commercial establishments to develop recycling programs. This type of ordinance places the burden of compliance on commercial businesses rather than haulers.

Implementation

Inclusion Criteria

For mandatory recycling program development, local governments must determine which commercial businesses are required to comply. A discussion of this issue can be found in Section 4.3.1.

Minimum Requirements

Mandatory recycling ordinances typically require that commercial establishments perform activities including, but not limited to, the following:

- Submit a recycling plan to the local government which details the types of materials collected, frequency and method of collection and any other item that is specific to the community's recycling requirements;
- Provide containers to collect material;
- Allocate storage area for recyclable materials;
- Design an educational program that continually educates program participants about the recycling program guidelines and methods of source reduction; and
- Submit annual proof of compliance to the local government, such as records detailing type and amounts of materials collected, copy of service agreement with hauler, self-hauling certificate or receipt from recycling facility.

Local governments must also determine which materials will be included in a mandatory recycling ordinance. There are generally two approaches to selecting the materials that must be included in a mandatory recycling ordinance for commercial establishments, as described below:

- Generator-specific mandatory recycling requires commercial establishments to recycle the materials that compose the largest portion of their waste stream.
- Designated material mandatory recycling requires commercial establishments to recycle a number of materials that are approved by the local government.

Technical Assistance

If local governments mandate recycling for commercial establishments, it is common to implement technical assistance programs to help commercial businesses meet the minimum requirements of the ordinance. As part of technical assistance programs,

local government solid waste staff can assist commercial businesses with conducting the following activities related to program development:

- Waste audits to assess the waste stream;
- Identify franchised and/or licensed haulers of recyclables;
- Develop collection infrastructure (e.g., collection areas, enclosures); and
- Develop employee and/or tenant educational materials.

Enforcement

Ensuring Compliance

There are several methods that local governments may use to identify commercial businesses that are not in compliance with the ordinance. As discussed above, requiring recycling plans and other written proof of compliance can serve as a primary method of ensuring compliance. However, other options for local governments include:

- Unannounced audits by City staff; and
- Tenant and/or hauler reporting of out-of-compliance office buildings.

Penalties for Non-Compliance

Enforcement mechanisms geared toward commercial establishments typically include, but are not limited to, the following:

- Written warning of the violation;
- Citation or fine that increases in amount with each consecutive offense; and
- In some extreme cases, the revocation of the business license.

4.4.2 Case Examples

Below are examples of local governments that have implemented mandatory recycling program development ordinances.

- **Austin, Texas:** The City requires all commercial businesses and office buildings with 100 or more employees to establish an on-site recycling program. These commercial establishments must recycle at least two of the following materials:
 - Aluminum cans;
 - Tin/steel cans;
 - Glass bottles;
 - Plastic containers;
 - Newspaper;
 - OCC; and

- Mixed paper.

Recyclables must be collected twice per month. Businesses that are subject to this ordinance must provide the City with a recycling plan on the form provided by the City within the first 14 days of operations. They are also required to maintain records of the amounts and types of materials collected. These reports are required to be submitted to the City on a quarterly basis for inspection. The City is authorized to conduct unannounced inspections of the business to ensure compliance with the ordinance.

Commercial establishments found to be in violation of the ordinance are notified of the violation and are given 20 days to remedy the violation prior to the initiation of enforcement actions. Enforcement actions include citations, fines, and legal action.

- **Peoria County, Illinois:** The County requires that all commercial establishments recycle the two recyclable materials that comprise the largest portion of their waste stream. Commercial establishments with five or fewer employees are exempt from the ordinance. Collection frequency of materials depends on the service agreement between the commercial establishment and hauler.

Commercial establishments subject to this ordinance are required to keep records of the amounts and types of materials collected. These reports are required to be submitted to the County on a quarterly basis. Such reports are subject to unannounced audits by the County to ensure compliance with the ordinance.

Commercial establishments found to be in violation of the ordinance are first issued a warning of the violation. Each day after the initial notice that the violation continues counts as a separate violation. Commercial establishments are then subject to a citation or fine.

4.4.3 Ordinance Development

Key Issues

There are several key issues that must be addressed by a local government that wants to implement a mandatory commercial recycling program development ordinance, including the following:

- Identification of the type of commercial establishments subject to the requirements;
- Minimum requirements of the ordinance;
- Technical assistance services to be provided by the local government;
- Method for ensuring compliance; and
- Enforcement mechanisms for non compliance.

Basic Language

Shown below is sample ordinance language to establish a generator-specific mandatory recycling ordinance.

Mandatory commercial recycling collection. The owner of a commercial establishment shall provide a minimum of [insert frequency] on-site recyclable materials collection, as defined in Section [insert definition section number] of the code, for the ____ (__) targeted recyclable materials that comprise the largest volume of the annual waste stream for said commercial establishment. The owner of a commercial establishment may provide the mandatory commercial recycling collection personally or by contract with a recycling hauler.

Shown below is sample ordinance language to establish a material-specific mandatory recycling ordinance.

Mandatory commercial recycling collection. The owner of a commercial establishment shall provide a minimum of [insert frequency] on-site recyclable materials collection, as defined in Section [insert definition section number] of the code, for at least ____ (____) of the recyclable materials as defined in Section [insert definitions section] of the code. The owner of a commercial establishment may provide the mandatory commercial recycling collection personally or by contract with a recycling hauler.

Additional Provisions

In addition to other ordinance sections, a mandatory recycling program development ordinance should include additional provisions, as shown below.

Recycling education. The owner of a commercial establishment shall provide recycling education materials to all employees and/or tenants. At a minimum, the owner of a commercial establishment shall provide a commercial recycling collection introduction notice, developed by the owner of the commercial establishment and approved by the [insert appropriate City department], to be distributed by the owner of the commercial establishment to (i) all new employees or tenants no later than the [insert number] day after occupancy, (ii) all employees or tenants annually, and (iii) all employees or tenants no later than the [insert number] day after a change in recyclable materials collection service.

Duty to provide carts. The owner of a commercial establishment shall provide each commercial establishment a minimum of ____ (__) [insert size] recycling containers. Regardless of the size of the commercial establishment, owners of commercial establishments shall provide each commercial establishment a sufficient number of [insert size] recycling containers as to prevent overflow based on once per week collection.

Recycling plan. Each owner of a commercial establishment shall submit a recycling plan to [insert appropriate City department] no later than [insert

number] day after beginning operations. Each owner of a commercial establishment shall submit an amendment to the recycling plan to [insert appropriate City department] no later than [insert number] day after change in recyclable materials collection service. In the recycling plan, each owner of a commercial establishment shall identify the: (1) location, owner's name, and owner's contact information for the commercial establishment, (2) the start date for recyclable materials collection from the commercial establishment, (3) description of the recyclable materials collection program including the location of the on-site recyclable materials collection, number and size of recyclable containers, and other pertinent information, and (4) identification of the hauler and processor of recyclable materials collected from commercial establishment. All such reports shall be submitted on forms provided by [insert appropriate City department]. The City reserves the right to require any additional information deemed necessary by [insert appropriate City department], or other designee of [insert appropriate City department].

Volume report. Each owner of a commercial establishment shall submit a [insert frequency] report to [insert appropriate City department] on or [insert date]. In the report, each owner of a commercial establishment shall identify the: (1) location, owner's name, and owner's contact information for the commercial establishment, (2) the start and end date for recyclable materials collection from the commercial hauler for each said commercial establishment, (3) the total weight of recyclable materials collected from commercial establishment, and (4) identification of the processor of recyclable materials collected from commercial establishment. All such reports shall be submitted on forms provided by [insert appropriate City department]. The City reserves the right to require any additional information deemed necessary by [insert appropriate City department], or other designee of [insert appropriate City department].

Penalties for violation of code: [Insert appropriate City department] for the City may establish regulations governing enforcement of Chapter [insert chapter number] Commercial Solid Waste and Recycling of the code. [Insert appropriate City department] is also authorized to establish and assess a penalty, including a fine, for those owners of commercial establishments who violate Chapter [insert chapter number] Commercial Solid Waste and Recycling of the code.

Temporary exemptions. *See Section 4.3.3 for sample language regarding temporary exemptions.*

4.5 Mandatory Composting Program Development

4.5.1 Overview

Local governments may enact an ordinance that requires commercial establishments to develop programs for the collection of compostable materials. This type of ordinance places the burden of compliance on commercial businesses rather than haulers.

Implementation

Inclusion Criteria

For mandatory composting program development, local governments must determine which commercial businesses are required to comply. As previously mentioned, a discussion of this issue can be found in Section 4.3.1.

Minimum Requirements

Mandatory composting ordinances typically require that commercial establishments perform activities including, but not limited to, the following:

- Submit a composting plan to the local government which details the types of materials collected, frequency and method of collection and any other item that is specific to the community's composting requirements;
- Provide containers to collect material;
- Allocate storage area for compostable materials;
- Design an educational program that continually educates program participants about the composting program guidelines and methods of source reduction; and
- Submit annual proof of compliance to the local government, such as records detailing type and amounts of materials collected, copy of service agreement with hauler, self-hauling certificate or receipt from composting facility.

Local governments must also determine which materials will be included in a mandatory composting ordinance. Generally, the main approach is designated material mandatory composting, which requires commercial establishments to recycle a number of organic materials that are approved by the local government.

Technical Assistance

If local governments mandate composting for commercial establishments, it is common to implement technical assistance programs to help commercial businesses meet the minimum requirements of the ordinance. As part of technical assistance programs, local government solid waste staff can assist commercial businesses with conducting the following activities related to program development:

- Waste audits to assess the waste stream;
- Identify franchised and/or licensed haulers of compostables;

- Develop collection infrastructure (e.g., collection areas, enclosures); and
- Develop employee and/or tenant educational materials.

Enforcement

Ensuring Compliance

There are several methods that local governments may use to identify commercial businesses that are not in compliance with the ordinance. As discussed above, requiring composting plans and other written proof of compliance can serve as a primary method of ensuring compliance. However, other options for local governments include:

- Unannounced audits by City staff; and
- Tenant and/or hauler reporting of out-of-compliance office buildings.

Penalties for Non-Compliance

Enforcement mechanisms geared toward commercial establishments typically include, but are not limited to, the following:

- Written warning of the violation;
- Citation or fine that increases in amount with each consecutive offense; and
- In some extreme cases, the revocation of the business license.

4.5.2 Case Examples

The **City of San Francisco, California**¹ requires all commercial establishments to institute an on-site composting program. Property owners must provide collection for all compostable materials. Materials include the following: Food soiled paper, food scraps, compostable plastics and cutlery, yard waste and clean wood or sawdust.

The ordinance mandates that each commercial establishment provide an adequate amount of color coded (green for compostables, blue for recycling and black for refuse) containers in convenient locations for employees, customers and contractors. The owner or management of the establishment must also continually educate all employees on how to properly separate materials. Materials must be collected at least once per week by the contracted hauler. The City relies primarily on hauler reporting to identify instances of non-compliance.

Each commercial establishment is allotted two initial warnings for setting-out improperly sorted materials for collection. After the second warning, an establishment is subject to a fine. Fines can go up to \$1,000, but may not exceed \$100 for small generators (anyone producing up to one cubic yard of refuse per week—about six standard 32-gallon carts). Currently, multi-tenant commercial establishment's owners

¹ It is important to note that this is an all inclusive ordinance that extends to every generator and hauler in the City. For the purposes of this report, the ordinance was used as an example of an ordinance that is directed towards the generator.

or employees are not fined for improper separation. Fines may be assessed for not instituting and maintaining adequate recycling and composting programs and the hauler still maintains the right to refuse collection until the set-out materials are properly sorted.

4.5.3 Ordinance Development

Key Issues

There are several key issues that must be addressed by a local government that wants to implement a mandatory commercial composting program development ordinance, including the following:

- Identification of the type of commercial establishments subject to the requirements;
- Minimum requirements of the ordinance;
- Technical assistance services to be provided by the local government;
- Method for ensuring compliance; and
- Enforcement mechanisms for non compliance.

Basic Language

Shown below is sample ordinance language to establish a generator-specific mandatory recycling ordinance.

Mandatory commercial recycling collection. *See Section 4.4.3 for sample language regarding mandatory commercial collection.*

Additional Provisions

In addition to other ordinance sections, a mandatory recycling program development ordinance should include additional provisions, as shown below.

Recycling education. *See Section 4.4.3 for sample language regarding mandatory commercial collection recycling education.*

Duty to provide carts. *See Section 4.4.3 for sample language regarding duty to provide carts under a mandatory commercial collection.*

Recycling plan. *See Section 4.4.3 for sample language regarding mandatory commercial collection recycling plan.*

Volume report. *See Section 4.4.3 for sample language regarding mandatory commercial collection volume report.*

Penalties for violation of code. *See Section 4.4.3 for sample language regarding penalties for violation of mandatory commercial collection.*

Temporary exemptions. *See Section 4.3.3 for sample language regarding temporary exemptions.*

4.6 Disposal Ban

4.6.1 Overview

Disposal ban ordinances prohibit commercial establishments from disposing designated materials. In addition, these ordinances can prohibit disposal facilities in the community, such as landfills and transfer stations, to accept prohibited materials for disposal. These ordinances go one step beyond requiring recycling by banning specific materials from being disposed. Disposal ban ordinances are commonly enacted in conjunction with a mandatory recycling ordinance.

Implementation

Inclusion Criteria

Many communities that implement disposal bans choose to require compliance from residential, commercial or all waste generators. However, depending on the unique circumstances and specific commercial establishments in a given community, local governments may choose to grant exceptions to disposal bans applicable to commercial waste generators. Exemptions may be based on any of the following factors:

- Volume of waste generated;
- Size of campus; or
- Number of employees.

It is important to note that providing exceptions to the disposal ban can require a greater level of administration and enforcement on the part of the local government.

Minimum Requirements

A disposal ban ordinance should clearly outline the specific materials that are prohibited from disposal. Some materials that communities have elected to prohibit include the following:

- Aluminum cans;
- Metal;
- Glass;
- OCC;
- Other recyclable paper;
- Organics (e.g. food and/or yard waste);
- White goods;
- Lead batteries;
- Computers; and

- Television monitors.

When implementing a disposal ban, it is critical for local governments to fully understand the recycling options in the community for that material. Materials should only be banned from disposal in the case that there are accessible recycling options for the material.

Commercial disposal ban ordinances typically mandate that the commercial establishment perform activities including, but not limited to, the following:

- Source separate and recycle the designated material; and
- Submit proof of compliance to the local government, such as records detailing amount of the material(s) collected, copy of service agreement with hauler, self-hauling certificate or receipt from recycling facility.

Technical Assistance

Similar to implementing a mandatory recycling ordinance, local governments often provide technical assistance to commercial establishments if the community implements a disposal ban. In addition to focused efforts on commercial establishments and local haulers, a local government should include programs to assist local disposal facilities with achieving compliance with the ordinance.

Enforcement

Ensuring Compliance

To enforce a disposal ban, a local government must develop and implement enforcement mechanisms for the commercial generators, commercial haulers and the disposal facility located in the community. Like the mandatory recycling ordinance, the enforcement program may include:

- Mandatory recycling plans for all parties;
- Unannounced audits by city department at commercial establishment or disposal facility; and
- Reporting of commercial generator by commercial hauler or commercial hauler by disposal facility of out-of-compliance parties.

Penalties for Non-Compliance

In addition to the penalties identified under the mandatory recycling ordinance, local governments that implement a disposal ban often include non-compliance penalties applicable to disposal facilities. If there are privately-owned disposal facilities in the community, the local government should consider including penalties for non-compliance that will be applicable to all disposal facilities located in the community. The penalties for non-compliance with disposal bans can include the following:

- Prohibiting haulers from collecting improperly sorted materials;
- Prohibiting of disposal facilities from accepting non-compliant materials;

- Written warning of the violation;
- Citation or fine that increases in amount with each consecutive offense; and
- In extreme cases, suspension of business license of commercial generator, commercial hauler, or disposal facility until compliance is achieved.

In addition to the abovementioned enforcement mechanisms, local governments that own the sole disposal facility in the city may develop a surcharge or separate tipping fee for loads that contain the banned material. For example, an ordinance can require that the hauler pay a tipping fee that is significantly higher than the posted rate if the load contains more than a specified percent by volume of prohibited material.

4.6.2 Case Examples

R. W. Beck identified the following communities that have implemented disposal bans for OCC.

- **City of Griffin, Georgia:** The City requires all commercial establishments to separate and recycle OCC. No OCC may be disposed with refuse. Commercial establishments may either make arrangements for the collection of the material with the City or use a private hauler. Private haulers are required to report the amount of OCC recycled to the City's solid waste department at the end of every quarter and yearly total at the end of each calendar year. Commercial establishments who choose to use a private hauler or bale their own OCC must also report the amount of material recycled to the City's solid waste department at the end of every quarter and total at the end of each calendar year. Like any other violation of the solid waste chapter of the code, commercial establishments who fail to comply with the disposal ban will be tried before the local municipal court.
- **Wake County, North Carolina:** The County has an ordinance that bans the disposal of OCC and requires all haulers to pay a surcharge for improperly sorted loads that are disposed of at County facilities. Haulers are required to pay double the tipping fee if OCC constitutes ten percent or more of a load.

4.6.3 Ordinance Development

Key Issues

When implementing a disposal ban ordinance, the local government must consider a variety of key issues including the following:

- Identification of the materials to be included in the disposal ban;
- Identification of the type of facilities (e.g., MSW landfills, C&D landfills) subject to the disposal ban; and
- Enforcement mechanisms for non compliance.

Basic Language

Shown below is sample ordinance language to establish a yard waste disposal ban.

Disposal ban. No person shall dispose of [insert prohibited materials] at [insert prohibited locations] located within the City.

Additional Provisions

A disposal ban will also require additional provisions within the code, as shown below.

Penalties for violation of Code. *See Section 4.4.3 for sample language regarding penalties for violation of Code.*

4.7 Mandatory Manufacturer Electronics Recycling

4.7.1 Overview

Mandatory manufacturer electronics recycling regulations are a form of mandatory recycling ordinances. These recycling regulations require manufacturers to recycle electronics manufactured by their company. Numerous states, including Texas, have implemented mandatory manufacturer electronics recycling regulations and cities, such as New York City, have done so as well.

Implementation

Inclusion Criteria

A mandatory manufacturer electronics recycling ordinance may be drafted to place the sole responsibility on the manufacturer (e.g., extended producer responsibility). As an alternative, communities have elected to assign responsibility to parties other than the manufacturer. In these instances, communities may choose to designate responsibilities for the following entities in the mandatory manufacturer electronics recycling ordinance:

- Retailers;
- Residents; and/or
- Local government.

As with the other forms of recycling ordinances, a mandatory manufacturers electronics recycling ordinance vary on whom is and is not governed by the ordinance.

Minimum Requirements

The minimum requirements vary depending on the entities that are governed by the ordinance. Following are some minimum requirements applicable to the manufacturer:

- Submit a recycling plan to the local government which details the collection, handling and recycling of electronics;
- Design an educational program to be distributed with electronics that educates consumers about the recycling program; and
- Submit annual proof of compliance to the local government, such as records detailing type and amounts of materials collected, copy of service agreement with electronics processor, and other information requested by the designated authority.

In addition to requirements for the manufacturer, the ordinance may prohibit a retailer from selling products manufactured by a company that is not compliant with the mandatory manufacturer electronics recycling program. As for residents, a mandatory manufacturer electronics recycling program may include a disposal ban on such items. Lastly, a community may choose to include requirements for the local government to designate a drop-off center for electronics. By assigning responsibilities beyond those assigned to the manufacturer, a community will have additional incentives to promote electronics recycling.

Technical Assistance

Some local governments choose to develop the electronics recycling program. Therefore, the ordinance requires a manufacturer to pay for their share of the costs of electronic recycling in the community. If the community chooses to provide the electronics recycling, the community will likely have a more active role in the collection and public education components of the electronics recycling program.

Enforcement

Ensuring Compliance

A mandatory manufacturer electronics recycling ordinance requires enforcement mechanisms to promote the success of the program. Some of the enforcement mechanisms local governments have used are:

- Unannounced audits by city department; and
- Residents or retailers reporting of out-of-compliance manufacturers.

Penalties

In addition to the penalties identified under mandatory recycling ordinance, a mandatory manufacturer electronics recycling program may include penalties for retailers who sell electronics from a manufacturer that is not in compliance with the local ordinances. Some of examples of these penalties are:

- Prohibiting retailers from selling products from manufacturers that are not in compliance with the regulations;
- Citation or fine for retailers for each offense; and
- In extreme cases, suspension of retail business license until compliance is achieved.

4.7.2 Case Examples

R. W. Beck identified the following communities that have implemented mandatory manufacturer electronics recycling regulations.

- **State of Texas:** As of September 2008, the State of Texas requires manufacturers of computer equipment who sell products within the State to develop and implement a recycling program for their products. In addition, the manufacturer is required to include information regarding the recycling program on the company's website and submit an annual recycling report to the State. Texas may impose penalties on the manufactures and the retailers of products from incompliant manufacturers.
- **New York City, New York:** New York City passed an ordinance mandating manufacturers as of July 1, 2009 to implement a recycling program for their products. The New York City ordinance includes computers, televisions, plasma screens, portable digital music players and other identified electronics. In addition, the ordinance imposes a disposal ban of the specified electronics as of July 1, 2009 for manufacturers and July 1, 2010 for residents. The City specifies reporting requirements for manufacturers and sets penalties for any person, including residents, in violation of the law.

4.7.3 Ordinance Development

Key Issues

When implementing a mandatory manufacturer electronics recycling ordinance, the local government must consider a variety of key issues including the following:

- Identification of the materials to be included in the ordinance;
- Identification of which entities will be subject to the requirements;
- Reporting requirements for manufacturers; and
- Enforcement mechanisms for non compliance.

Basic Language

Shown below is basic language for an electronics manufacturers recycling ordinance.

Mandatory electronic equipment recycling. A manufacturer of electronic equipment shall provide recycling, as defined in Section [insert definition section number] of the code, for electronic equipment that is offered for return by any person in the City and has been manufactured by such manufacturer.

Additional Provisions

An electronics manufacturer recycling ordinance also requires additional provisions to the municipal code, as shown below.

No electronic equipment recycling fee. Each manufacturer shall provide electronic equipment recycling, as defined in Section [insert definition section number] of the code, to any and all persons in the City for any and all electronic equipment that has been manufactured by such manufacturer at no charge to such person.

Labeling. A manufacturer shall not sell or otherwise distribute for sale in the City electronic equipment unless such electronic equipment has a label that identifies the manufacturer's name.

Retailer's responsibility. A retailer may not sell or offer to sell a manufacturer's electronic equipment in the City unless: (1) the electronic equipment is labeled with the manufacturer's name, (2) the City has approved a recycling plan for the manufacturer, and (3) the manufacturer is on the list of manufacturers in compliance with the mandatory electronic equipment recycling.

Disposal ban. No person shall dispose of electronic equipment as solid waste in the City.

Recycling plan. Each manufacturer shall submit a recycling plan to [insert appropriate City department] no later than [insert number] days after beginning operations. Each manufacturer shall submit an amendment to the recycling plan to [insert appropriate City department] no later than [insert number] day after change in electronics recycling program. In the recycling plan, each manufacturer shall identify the: (1) manufacturer's name, and manufacturer's contact information, (2) list of manufacturer's brand names, (3) description of the electronic equipment recycling program including the collection, transportation, and processing of electronic equipment, (4) identification of the hauler and processor of electronic equipment collected from persons in the City, and (5) annual City sales data of the manufacturer's electronic equipment for the most recent two calendar years. All such reports shall be submitted on forms provided by [insert appropriate City department]. The City reserves the right to require any additional information deemed necessary by [insert appropriate City department], or other designee of [insert appropriate City department]. For each submitted recycling plan, original or revised and resubmitted, the City shall approve or disapprove the recycling plan. If the City disapproves the original recycling plan, the manufacturer shall have ____ (__) [insert number of days] calendar days to revise and resubmit the recycling plan. If the City disapproves a revised and resubmitted recycling plan, the manufacturer shall have ____ (__) [insert number of days] calendar days to revise and resubmit the recycling plan. A manufacturer who submits a recycling plan that has been disapproved by the City more than ____ (__) [insert number of times] times shall be liable to the City for ____ (__) [insert amount] U.S. dollars per day for each day that a recycling plan is not submitted and approved by the City following the date of notification of the second disapproval.

Volume report. Each manufacturer shall submit a [insert frequency] report to [insert appropriate City department] on or before [insert date]. In the report, each manufacturer shall identify the: (1) manufacturer's name, and manufacturer's

contact information, (2) the start and end date for electronic equipment recycling reported in the volume report, (3) the total weight of electronic equipment recycled for the time period of the volume report, and (4) identification of the processor of electronic equipment recycled for the time period of the volume report. All such reports shall be submitted on forms provided by [insert appropriate City department] by [insert date], for the previous [insert time period] respectively. The City reserves the right to require any additional information deemed necessary by [insert appropriate City department], or other designee of [insert appropriate City department].

Penalties for violation of code. [Insert appropriate City department] for the City may establish regulations governing enforcement of Chapter [insert chapter number] Electronic Equipment Recycling of the code. [Insert appropriate City department] is also authorized to establish and assess a penalty, including a fine, for those persons who violate Chapter [insert chapter number] Electronic Equipment Recycling of the code.

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Section 5

Construction and Demolition Recycling Ordinances

5.1 Introduction

This section lists options for ordinances that encourage or require recycling of materials generated from construction, demolition, and renovation (C&D) projects. For purposes of this guidebook, “C&D debris” refers to materials generated from the construction, demolition, or renovation process, which typically includes the materials listed below:

- Concrete/masonry;
- Ferrous and non-ferrous metals;
- Wood;
- OCC; and
- Other materials, including soil, asphalt, drywall, roofing, carpet, ceiling tiles, and insulation.

This section provides a description of ordinances that can be developed by local governments as a part of an ongoing C&D recycling program. R. W. Beck has listed these ordinances in order of increasing regulation. In other words, ordinances that encourage recycling are included before ordinances that mandate recycling.

5.2 Fast Track Permitting

5.2.1 Overview

A local government can give developers that participate in C&D recycling preferential treatment during the permitting process. This allows a C&D project to potentially move ahead of all other C&D projects awaiting a permit. In some cases, the program provides an opportunity for the permitting staff to conduct one-on-one review of the site plans with the developer to correct any issues that may delay permitting.

Fast track permitting is typically implemented by local governments as a policy or program rather than as an ordinance. In fact, it can be advantageous for local governments to not include this type of provision in their ordinances so as to not impose unnecessary regulation on the local government. However, R. W. Beck has included this type of program within these Guidelines to provide alternatives for local governments to encourage C&D recycling.

Implementation

The primary purpose of utilizing this program is to reduce the time that a construction firm must wait during the permitting process required by the local government. The amount of time that developers wait for a permit may be up to six months depending on the workload of the permitting staff. Fast track permitting can reduce the wait time significantly. By reducing the amount of wait time associated with the permitting, the developer may begin the C&D project sooner, thus potentially reducing costs.

5.2.2 Case Example

The **City of Dallas, Texas** utilizes a program that allows construction management firms to receive building permits in a shorter amount of time if the building plans include energy efficiency mechanisms or have a waste reduction component. In addition, the City allows the developer to meet with the permit staff member to identify and correct any potential problems with the plan. This process may lead to the immediate approval of the permit in cases where the problems are minor and can be corrected during the one-on-one meetings.

5.3 Buy-Recycled (First Choice) Programs

5.3.1 Overview

Buy-recycled programs, otherwise known as first choice, aim to further develop markets for recycled C&D materials by mandating that local government agencies buy recycled-content products as their first choice in purchasing supplies. Recycled C&D materials typically must meet all existing building codes, standards, and specifications. The major advantage of a buy-recycled program is its ability to increase the market for recycled C&D material. In addition, the use of such materials can reduce the cost of city projects, reduce emissions from transport vehicles, and support the local economy.

Buy-recycled programs are typically implemented by local governments as a policy or program rather than as an ordinance. It can be advantageous for local governments to not include this type of provision in their ordinances so as to not impose unnecessary regulation on the local government. R. W. Beck has included this type of program within these Guidelines to provide alternatives for local governments to encourage C&D recycling.

Implementation

A community can develop an ordinance that requires all community-sponsored construction or development projects to give first preference to recycled C&D material. Typically, this type of ordinance requires that recycled C&D material be purchased to the greatest extent feasible prior to purchasing new materials for the project.

5.3.2 Case Example

The **City of San Francisco, California** requires all City department directors and officers calling for bids to specify recycled content materials, rather than new materials, to the maximum extent feasible in the advertisement for bids and plans for all contracts for public works or improvements. In addition, the City's Department of Public Works utilizes 100 percent recycled aggregate and sand to manufacture non-structural concrete for curbs, gutters, sidewalks and curb ramps as well as for use in making asphalt.

5.3.3 Ordinance Development

Key Issues

Before implementing a buy-recycled or first choice procurement program for C&D materials, there are many technical details that must be determined. Local governments must define the appropriate level of recycled-content material that is able to be utilized in different construction projects (e.g., roads, buildings, bridges, etc.). Because of the technical nature of construction specifications, R. W. Beck recommends that local governments establish general and broad ordinance language. This will provide the local government with flexibility to develop detailed procurement policies at a program/policy level.

Basic Language

The basic ordinance language to establish a buy-recycled ordinance is shown below.

Buy Recycled Content Materials. [Insert appropriate city staff] for the City may establish and implement a buy recycled content materials program for any or all City contracts.

Additional Provisions

No additional ordinance provisions would be required to develop a general buy-recycled procurement ordinance.

5.4 Disposal Surcharges and Fees

5.4.1 Overview

A community can provide incentive to recycle C&D material by enacting an ordinance that requires C&D collection service providers to pay a surcharge or fee for the disposal of C&D material at facilities under the community's jurisdiction. This type of ordinance is most appropriate if the community owns the landfill or transfer station where most of the waste in the jurisdiction is disposed. Implementing a surcharge or fee for C&D collection service providers establishes a clear incentive to recycle.

These surcharges or fees impose greater costs on collection service providers intending to dispose of C&D.

Implementation

Minimum Requirements

In order to implement a disposal surcharge ordinance, a community must decide what maximum percentage of a load, by weight or volume, can be comprised of C&D debris for disposal without incurring a surcharge or fee. For example, in San Diego, California, all loads that contain 20 percent or more of C&D material incur a surcharge associated with C&D disposal. This fee discourages haulers from disposing of C&D debris at the City's Miramar Landfill, incentivizing them to take the material to a mixed material recycling facility instead.

Fee Structure

Fee structures for this type of ordinance typically include the following:

- **Increased Tip Fees:** A community can double or triple the posted tip fee for loads containing C&D material.
- **Surcharges:** A community can develop a surcharge that is assessed against loads containing more than the allotted amount of C&D material. This is typically a separate charge in addition to the posted tip fee that is assessed on each load.

Enforcement

The staff of the disposal facility would be responsible for enforcing this ordinance. Staff would not need to inspect every incoming load since the majority of C&D material enters a disposal facility in a roll-off container. This would allow staff to easily differentiate between loads containing municipal solid waste and those containing C&D material.

5.4.2 Case Examples

San Diego, California implements a disposal surcharge at the Municipal Miramar Landfill for loads that contain 20 percent or more of C&D material. The City utilizes a surcharge for flat rate loads calculated by multiplying the applicable standard disposal fee for general refuse by 1.5. The surcharge for weighted loads (fee based on actual weight) is calculated by multiplying the applicable standard disposal fee for general refuse for weighed loads by 2.75.

5.4.3 Ordinance Development

Key Issues

There are several key issues that must be addressed by a local government that wishes to implement a C&D surcharge ordinance, including the following:

- Amount and structure of the surcharge; and
- Minimum requirements to comply with the ordinance.

In many communities, solid waste fees are established and adjusted on an ongoing basis through resolutions. Therefore, R. W. Beck recommends that language for a C&D surcharge ordinance be broad and general and that specific fees be established through periodic resolutions.

Basic Language

Shown below is basic language to develop a C&D surcharge ordinance.

C&D disposal surcharge. [Insert appropriate city staff] for the City may establish and implement a C&D disposal surcharge program for disposal of material containing C&D at the City municipal solid waste landfill.

Additional Provisions

There would be no additional provisions necessary for a C&D surcharge ordinance.

5.5 Franchise Fees for C&D Haulers

5.5.1 Overview

Local governments may enact ordinances that require C&D collection service providers that intend to dispose of C&D waste at landfills to pay a franchise fee. In order to encourage recycling, C&D recyclers would be exempt from this fee.

Implementation

In order to be granted a franchise by the community, haulers are typically required to submit a signed application to the community that includes the following information:

- Operations and vehicle information;
- Demonstrated hauling experience;
- Proof of insurance; and
- Reference checks.

Upon submittal of a completed and signed application, the community may grant or deny the franchise to the applicant.

Enforcement

With this type of ordinance, it is unlawful to provide any C&D collection service without obtaining the franchise. Enforcement mechanisms typically include the following mechanism listed below:

- **Penalty/Fines:** In the event that the hauler does not comply with the requirements of the ordinance, the community can assess a penalty fine. The amount of the fine is at the discretion of the community.
- **Revocation of Franchise:** Should the franchisee be found to be in violation of the agreement from which the franchise was granted, a community can revoke the hauler's franchise.

5.5.2 Case Example

Santa Rosa, California maintains a franchise fee for providers of C&D collection services of nine percent of the franchisee's gross revenues. Self-haulers and recyclers are exempt from this requirement.

5.5.3 Ordinance Development

Key Issues

When implementing a franchise fee, the City must consider the following:

- Determination of the amount of the franchise fee;
- Payment procedures for franchise fee; and
- Penalties for violation of franchise fee.

Basic Language

Shown below is sample ordinance language for franchise fees for C&D haulers.

Mandatory franchise fee. Each franchisee shall pay the City, as compensation for the rights and benefits granted by the franchise, a franchise fee in the amount of [insert the amount] percent ([insert the amount]%) of the gross revenues generated by the franchisee from services performed within the City for the prior calendar year. Gross revenues shall include all revenues from the sale or lease of containers, all revenues from collection services, all disposal fees billed, late fees, bad debt recoveries and other fees collected from customers, with no deductions except for bad debts actually written off.

Additional Provisions

A C&D franchise ordinance requires additional provisions, as shown below.

Payment of mandatory franchise fee. Franchisee shall submit payments, accompanied by statements of gross revenues as prescribed by the [insert appropriate City department], to [insert appropriate City department] by [insert date], for the previous [insert time period]. Payments postmarked after [insert date] shall be assessed [insert fee description].

Penalties for violation of Code. [Insert appropriate City department] for the City may establish regulations governing enforcement of Chapter

[insert chapter number] [insert chapter name] of the Code. [Insert appropriate City department] is also authorized to establish and assess a penalty, including a fine, for those franchisees who violate Chapter [insert chapter number] [insert chapter name] of the Code.

5.6 Green Building and LEED Ordinances

5.6.1 Overview

Local governments can develop ordinances mandating participation in Green Building (GB) or Leadership in Energy and Environmental Design (LEED) programs in order to encourage recycling. Both types of programs contain waste minimization components that encourage recycling of C&D materials.

GB is an environmentally responsible approach to land development and housing construction in an effort to conserve natural resources. Cities can develop their own unique list of criteria that must be met in order to meet the minimum requirements for the program. Traditionally, GB programs have focused on the residential sector; however, communities may develop GB programs that apply to all development.

LEED is a rating system used to determine if commercial construction or deconstruction has occurred in an environmentally friendly manner. LEED has an established rating system that allows buildings to earn points toward certification. Cities may provide incentives for commercial buildings to earn a minimum level of LEED certification.

Recycling C&D material produced by development projects is one of the measures available to comply with GB/LEED ordinances. Typically, the person or entity responsible for the C&D project is required to develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or commingled. GB/LEED points are then received for compliance and may be applied to the total rating of the C&D project.

Implementation

Inclusion Criteria

A community may designate which C&D projects are applicable to the terms and conditions of the ordinance. Typically, these C&D projects consist of community-sponsored C&D projects and commercial C&D projects. However, at the community's discretion, multi-family complexes and single-family homes may also be included in a GB/LEED ordinance. A community can define a covered C&D project based on the following:

- Square footage of the structure;

- Gross square footage of conditioned space;¹
- Type of building;
- Total project cost;
- Other classification deemed appropriate by the community.

For example, the City of Berkley, California defines a covered C&D project as any City-sponsored C&D project constructing or renovating 5,000 gross square feet or more of occupied space and has a construction estimate that exceeds \$200,000 in 2003 dollars.

Site Plans

A GB/LEED ordinance can mandate the submittal of a site plan for a C&D project prior to the issuance of a permit. The plan must establish the measures to be utilized to achieve compliance with GB/LEED standards. Such measures would include a diversion goal for C&D debris generated from the C&D project. Site plans must detail the methodology for diverting materials from the waste stream through recycling or reuse. In addition, this plan can also be required to demonstrate the amount of credits the C&D project will achieve in accordance to the GB/LEED rating system.

Performance Security/Deposits

Also referred to as a deposit, a GB/LEED ordinance can require applicants to submit a performance security to ensure compliance with the ordinance. Those found in violation of the ordinance forfeit their right to the refund of the security in its entirety, or are refunded proportionally to the level of compliance achieved by the C&D project. The amount an applicant submits as a performance security is typically relative to the gross square footage of the C&D project or a percentage of the total cost of the C&D project. Generally, there is a minimum and maximum amount required to be deposited for each C&D project. For example, the City of Livermore, California requires a \$2.00 per square foot security deposit for commercial C&D projects. A minimum security of \$10,000 is required with a maximum security of \$100,000.

Incentives

A community can encourage GB/LEED measures, such as the diversion of C&D debris from the waste stream, through sponsoring a grants program. A grants program can encourage the attainment of a higher level of GB/LEED rating than required by ordinance. For example, the City of El Paso, Texas incentivizes private sector builders to build sustainable buildings within the City. The grant awards program applies to all new construction and major remodels of commercial and mixed-use properties. Upon review and approval, grants are awarded in amounts that correspond to the level of LEED rating attained by the C&D projects. In other words, the higher level of LEED rating attained, the higher the grant award.

¹ The term “conditioned space” refers to the enclosed area in a building that is provided with a mechanical heating and cooling system.

Enforcement

Ensuring Compliance

A GB/LEED ordinance can require the GB/LEED compliance official to establish a verification plan for approved C&D projects. A verification plan lists how each GB/LEED measure, such as the diversion of C&D material, will be verified through visual inspections, documentation or other means during construction, demolition or renovation. At any point throughout the C&D project, should the compliance official find the C&D project to not be compliant with the previously submitted site plan, a stop-work order or similar command may be issued. Typically, it is up to the discretion of the compliance official if such an order is applied to a portion of the project or the entire project.

Penalties for Non-Compliance

The penalties for non-compliance with GB/LEED ordinances vary based on when the violation occurs. If the violation occurs prior to issuance of a building permit, the community may include in the ordinance the city's right to withhold the building permit until the proposed project is in compliance with the ordinance. If the violation occurs after the issuance of a building permit, the community may include in the ordinance the city's right to require the permit applicant to implement additional green building operational and maintenance measures prior to the issuance of an occupancy permit.

5.6.2 Case Examples

Below are examples of local governments that have implemented ordinances mandating participation in GB and/or LEED programs.

- **Dallas, Texas:** In 2003, the City of Dallas adopted the 2003 Bond Program as a vehicle to fund various capital improvement needs within the City. As a component to the program, all C&D projects over 10,000 square feet must be LEED Silver Certified. In 2006 the green building program policy was updated, increasing the requirement for new public works facilities under the 2006 bond program to achieve LEED Gold Certification.
- **Frisco, Texas:** The City of Frisco developed a Commercial Green Building Program that includes a recycling component. The minimum standards consist of the following:
 - 100 percent of all roof areas must comply with the specifications of the current Federal Environmental Protection Agency's Energy Star Cool Roof Program;
 - Shade trees must be planted along the front façade of non-residential and multifamily structures in accordance with the City's Landscape Ordinance to mitigate heat island effect and to create a pedestrian environment;
 - To conserve water, potable water consumption for landscape irrigation must be reduced a minimum of 50 percent over conventional developments; and

- No waste concrete or metal from a C&D project may be disposed in a landfill.

5.6.3 Ordinance Development

Key Issues

The following are key issues that must be addressed by a community that wishes to develop a GB/LEED ordinance:

- Identification of projects to be governed by the ordinance;
- Identification of project to be exempt from the ordinance;
- Development of minimum requirements of the ordinance;
- Performance deposits;
- Reporting requirements; and
- Penalties for violation of the ordinance.

Basic Language

Shown below is sample ordinance language for a GB ordinance.

Green building requirements. Each permit applicant for a covered project, as defined in Section [insert definition section] of the Code, shall comply with this chapter of the Code.

Shown below is sample ordinance language for a LEED ordinance.

LEED rating requirement. Each permit applicant for a covered project, as defined in Section [insert definition section] of the Code, shall meet [insert rating] under the LEED Rating System.

Additional Provisions

A GB/LEED ordinance may also require additional ordinance provisions, as shown below. These provisions primarily refer to reporting requirements to ensure compliance with GB standards. Should a local government wish to mandate LEED standards, these provisions may be modified to refer to proof of LEED compliance.

Green building plan required. Each permit applicant for a covered project, as defined in Section [insert definition section] of the Code, shall submit a green building plan on forms provided by [insert appropriate City staff], for the previous [insert time period] respectively. All such green building plans shall be submitted on forms provided by [insert appropriate City department]. The City reserves the right to require any additional information deemed necessary by [insert appropriate City department], or other designee of [insert appropriate City department]. For each submitted green building plan, original or revised and resubmitted, the City shall approve or disapprove the green building plan.

Approval of green building plan required before issuance of building permit. City shall not issue a building permit for any covered project unless and until the green building plan is approved by [insert appropriate City staff].

Compliance with green building plan required for issuance of occupancy certificate. City shall not issue an occupancy permit for any covered project unless and until the green building plan is approved by [insert appropriate City staff].

Compliance with green building plan required after issuance of occupancy certificate. Applicant, property owner, and building tenant shall comply with the green building plan prior to and after issuance of the occupancy permit.

Penalties for violation of Code. *See Section 5.5.3 for sample language regarding penalties for violation of Code.*

5.7 Mandatory C&D Recycling

5.7.1 Overview

A mandatory C&D recycling ordinance typically requires developers to recycle or reuse C&D material generated from projects. The ordinance typically will include a list of the materials that are designated as recyclable and reusable.

Implementation

Inclusion Criteria

A community may designate which C&D projects are applicable to the terms and conditions of the ordinance by setting thresholds. Typically, these thresholds are related to the type, size and total cost of the C&D project and can be used in any combination. For example, the City of Atherton, California defines covered C&D projects as any project that has an estimated cost above \$50,000, or will generate more than 10 tons of C&D debris.

Like the other ordinances included in these Guidelines, a mandatory C&D diversion ordinance may include an exemption component. If unique circumstances make it infeasible for a C&D project to comply with the diversion requirement, the developer may apply for an exemption. Generally, the developer is required to indicate the maximum rate of diversion that is feasible for each material and the unique circumstances that make it infeasible to comply with the diversion requirement.

Minimum Requirements

Local governments must determine which materials will be required to be recycled or diverted under the ordinance. Common materials included in mandatory recycling ordinances include those listed in Section 5.1.

Waste Management Plans

Typically, before a construction or demolition permit is issued, the developer must submit a waste management plan (WMP) to the local government for approval. The purpose of the WMP is to ensure that the C&D project will be in compliance with the ordinance. The WMP typically includes:

- Estimated weight of C&D debris, by material type, to be generated;
- Maximum weight of materials that can feasibly be diverted;
- The proposed method of diversion;
- Proposed recycling facilities; and
- Estimated weight of C&D materials to be disposed.

Performance Security/Deposits

Mandatory recycling ordinances may require that developers post a cash deposit prior to receiving a permit. The deposit may be sized in an amount relative to the estimated tonnage of C&D debris to be generated, the size of the C&D project or the total cost of the C&D project. Typically, ordinances that require a cash deposit include a minimum and maximum amount that is to be deposited. Generally, the deposit is returned upon the developer submitting proof of compliance. If the project does not comply with the ordinance, a portion of the deposit is returned. The portion returned typically depends on the actual diversion achieved by the project.

Enforcement

Ensuring Compliance

Upon completion of the C&D project and prior to the final building approval for new construction, the developer can be required to submit all necessary documentation to prove compliance with the ordinance. Reporting is generally due within a specified number of days following the completion of construction. Developers are typically required to report the following information:

- Actual material volume or weight generated by the C&D project;
- Receipts from disposal and recycling facilities and/or licensed haulers and vendors that received each material; and
- Any additional information needed to demonstrate compliance.

Penalties for Non-Compliance

Typically, any deposit that is posted in accordance with an ordinance is forfeited if the responsible party does not submit this required documentation within the specified amount of time.

5.7.2 Case Examples

The following are examples of communities that have implemented mandatory recycling for C&D material.

- **Plano, Texas:** The City requires all residential and commercial C&D projects requiring a building permit to complete a C&D deposit form provided by the Building Inspections Department. The following C&D projects are exempt from this requirement:
 - Commercial C&D projects less than 3,000 square feet;
 - Residential C&D projects less than 5,000 square feet;
 - Pre-fabricated enclosures or structures;
 - Roofing projects;
 - Swimming pools, hot tubs, patios, sunrooms or other one-room residential C&D projects; and
 - C&D projects for which only mechanical, electrical, plumbing or HVAC permits are required.

No building permit is issued by the chief building inspector until the deposit form, along with the coinciding deposit, is submitted. Deposits are calculated by C&D project square footage and are capped with a maximum valuation. Upon completion of the C&D project, the developer must submit the signed C&D Deposit Refund Request Form in addition to any other necessary documentation demonstrating compliance. The responsible party of the C&D project must apply for the refund within 180 days of the date of final inspection or date of the Certification of Occupancy. Deposits are fully refundable when a 60 percent diversion goal is achieved and prorated for lower diversion percentages.

- **Imperial Beach, California:** The City requires all developers of covered C&D projects to submit a WMP prior to the issuance of a permit. Covered projects include those with a total cost of greater than or equal to \$25,000 those that involve the construction and/or demolition of 250 square feet of floor space. The WMP should demonstrate that the project will achieve a 50 percent diversion rate.

Upon completion of the C&D project, the developer is required to submit all documentation of diversion and disposal along with a completed WMP. The WMP must document that the diversion requirement for the C&D project has been met in order to receive final occupancy approval. Those found to be not compliant with the ordinance are subject to criminal and civil penalties.

- **San Mateo, California:** The City requires all developers of covered C&D projects to submit estimates of tonnage to be generated and diverted from the C&D project. Covered projects include construction of any new residential or commercial building and demolition or renovation projects that exceed \$50,000. The compliance official must approve all submitted information before a permit is

issued. The City requires a 60 percent diversion rate for all new construction or demolition projects and 50 percent for all alteration projects.

Developers must provide a cash deposit to receive a building permit. For demolition projects, the required deposit is one dollar per square foot of floor space. For new construction projects, the required deposit is three percent of the cost of the project, not to exceed \$30,000 for commercial projects and \$10,000 for residential projects. The minimum amount for any deposit is \$1,000. The deposit is returned, without interest upon proof that the C&D project has complied with the required diversion rate.

Developers must maintain documentation throughout the C&D project of material disposed, recycled or reused. This information is monitored by a compliance official intermittently throughout the C&D project to assure compliance. Upon completion of the C&D project, the developer has 60 calendar days to submit all documentation to the compliance official for final inspection. Any developer found to be not compliant or who fails to submit the required documentation forfeits their deposit.

5.7.3 Ordinance Development

Key Issues

As reflected in the case examples, mandatory C&D recycling vary from program to program. When developing a mandatory C&D recycling ordinance, a local government should consider the following key issues:

- Identification of C&D projects to be governed by the ordinance;
- Identification of C&D projects to be exempt from the ordinance;
- Reporting requirements;
- Minimum C&D recycling requirements; and
- Penalties for violation of the ordinance.

Basic Language

Shown below is sample ordinance language for mandatory C&D recycling.

C&D recycling required. Each permit applicant for a covered project, as defined in Section [insert definition section] of the Code, shall comply with this chapter of the Code.

Additional Provisions

A mandatory C&D recycling ordinance should include additional ordinance provisions, as shown below.

C&D waste management plan required. Each permit applicant for a covered project, as defined in Section [insert definition section] of the Code, shall

submit a C&D waste management plan on forms provided by [insert appropriate City staff], for the previous [insert time period] respectively. In the C&D waste management plan, each permit applicant for a covered project shall identify the (i) estimated weight and volume, by material type, to be generated, (ii) estimated weight and volume, by material type, to be generated that can feasibly be diverted, (iii) estimated weight and volume, by material type, to be diverted, (iv) designated vendor or facility that the permit applicant proposes to collect, divert, market, reuse and/or receive the C&D waste, (v) estimated weight and volume of C&D waste to be disposed, and (vi) total square footage of the covered project. All such reports shall be submitted on forms provided by [insert appropriate City department]. The City reserves the right to require any additional information deemed necessary by [insert appropriate City department], or other designee of [insert appropriate City department]. For each submitted C&D waste management plan, original or revised and resubmitted, the City shall approve or disapprove the C&D waste management plan.

C&D diversion requirement. Each permit applicant for a covered project, as defined in Section [insert definition section] of the Code, shall divert the following amount of C&D:

- (a) Demolition: [insert the amount] percent ([insert the amount]%) of total C&D tonnage
- (b) Renovation: [insert the amount] percent ([insert the amount]%) of total C&D tonnage
- (c) New Construction: [insert the amount] percent ([insert the amount]%) of total C&D tonnage

Approval of C&D waste management plan required before issuance of building permit. City shall not issue a building permit for any covered project unless and until the C&D waste management plan is approved by [insert appropriate City staff].

Deposit required before issuance of building permit. City shall not issue a building permit for any covered project unless and until a deposit is posted with the [insert appropriate City staff]. Each permit applicant for a covered project, as defined in Section [insert definition section] of the Code, shall submit a deposit equal to [insert deposit amount]. The minimum amount for a deposit shall not be less than [insert deposit amount]. City shall return the deposit, without interest, in total or in proportion, upon proof to the satisfaction of [insert appropriate City staff] that the permit applicant has complied with the C&D waste management plan and the C&D diversion requirements. If [insert appropriate City staff] that the permit applicant failed to comply with the C&D waste management plan and/or the C&D Diversion requirements, the permit applicant shall forfeit [insert description of amount] of the deposit.

Penalties for violation of Code. *See Section 5.5.3 for sample language regarding penalties for violation of Code.*

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Section 6

Recycling Infrastructure and Building Design Ordinances

6.1 Introduction

This section provides options for recycling infrastructure and building design ordinances. These ordinances either encourage or mandate that specific features be included in the physical design of buildings to accommodate recycling. Recycling infrastructure and building design ordinances may also require the provision of adequate amounts of recycling containers for the collection and storage of recyclable materials. Typically, infrastructure regulations are applied to new or major renovations of multi-family and commercial developments; however, these regulations can also apply to existing developments and single-family developments at the local government's discretion.

R. W. Beck has listed these ordinances in order of increasing regulation. In other words, ordinances that encourage recycling are included before ordinances that mandate recycling.

This Section should be reviewed in conjunction with Section 7 of this report which provides R. W. Beck's professional assessment of infrastructure that is needed in buildings to accommodate recycling programs.

6.2 Interior Storage Requirements

6.2.1 Overview

Local governments can enact ordinances that either require or encourage developers to include recycling space in the interior of buildings to make recycling more convenient for occupants. Examples of interior recycling storage and systems that may be recommended include the following:

- Roll-out drawers for recycling containers below the sink; and
- In multi-family high-rise buildings, the provision of space for recycling bins on each floor or recycling chutes.

Implementation

Inclusion Criteria

Local governments typically direct interior storage requirements at residential developments. Local governments must also determine which developments are

required to comply with the ordinance, whether new or existing, as discussed in Section 6.1.

Design Requirements

This type of ordinance typically encourages or requires developers to provide a minimum square footage of space for storage of recyclables. For example, the City of San Diego, California requires all individual dwelling units within a multi-family complex to be equipped with an interior refuse and recyclable material storage area of at least five cubic feet. The storage area must consist of at least 2.5 cubic feet for recyclable material and at least 2.5 cubic feet for refuse. Ordinances may also mandate or encourage developers to provide roll-out drawers for storage of recyclables.

For multi-family high-rises, interior storage requirement ordinances typically recommend that developers provide areas for recycling collection containers on each floor. These provisions are typically written in general fashion and do not include specific requirements regarding the collection areas or containers.

Enforcement

Ensuring Compliance

The primary means to enforce infrastructure and building design ordinances is through the construction permitting process. Utilizing this process, recycling infrastructure would be one of many criteria that needed to be achieved in order to receive a building permit. If a local government requires the developer to submit a recycling plan, this document could also be used to ensure compliance.

Penalties for Non-Compliance

For ordinances that provide recommendations, no enforcement activities are necessary. However, if local governments mandate interior storage requirements, then enforcement mechanisms may include the following:

- **Denial of building permit or Certificate of Occupancy:** Issuance of a building permit or certificate of occupancy for a development is typically conditioned upon the provision of the appropriate recycling areas or systems in accordance with the regulations set by the ordinance. Should the developer not comply with the ordinance, the community can withhold the building permit or certificate of occupancy for the development until the conditions of the ordinance are met.
- **Fines:** In the event that the developer does not comply with the requirements of the ordinance, the community can collect a fine.

6.2.2 Case Examples

Below are examples of local governments that have implemented ordinances that require or encourage interior storage requirements for recycling.

- **Sacramento, California:** The City encourages developers to include recycling space or systems within each individual residence of a multi-family development. The ordinance recommends providing a roll-out drawer for recycling containers below the sink with a recommended allocation of three cubic feet.
- **Ventura County, California:** The County encourages developers of multi-story buildings to provide space for recycling bins and trash disposal on each floor, in addition to a main collection area accessible for collection of materials.

6.2.3 Ordinance Development

Key Issues

There are several key issues that a local government must address when implementing interior storage requirements for recycling, including:

- The amount of space required to be allocated for recycling; and
- Whether to require or recommend that interior storage space be included in residential development.

Basic Language

Shown below is basic language to require interior storage space for recycling.

Interior storage of solid waste and recyclable materials required. Each permit applicant for a covered project, as defined in Section [insert definition section] of the Code, shall include in the covered project a minimum of ____ (__) cubic feet designed for the internal storage of solid waste and a minimum of ____ (__) cubic feet for the storage of recyclables. The City shall approve or disapprove the interior storage of solid waste and recyclable materials.

Additional Provisions

An interior storage ordinance may require additional ordinance provisions, as shown below.

Penalties for violation of Code. [Insert appropriate City department] for the City may establish regulations governing enforcement of Chapter [insert chapter number] [insert chapter name] of the Code. [Insert appropriate City department] is also authorized to establish and assess a penalty, including a fine, for those franchisees who violate Chapter [insert chapter number] [insert chapter name] of the Code.

6.3 Exterior Recycling Areas and Enclosures

6.3.1 Overview

Local governments can enact ordinances that mandate a minimum exterior storage area for recyclables and refuse based on the type of development. Typically, storage area requirements are based on dwelling units within a multiple unit residential development or gross square footage of a commercial development.

Implementation

Inclusion Criteria

A community may designate the types of developments that are required to comply with the ordinance. Typically, ordinances regarding exterior recycling areas and enclosures are intended for multi-family and commercial developments. Applicability for this type of ordinance could be based on any of the following criteria:

- Any new and/or existing structure;
- Major modification developments adding more than 30 percent to the existing floor area or a certain number of square feet;
- Any development where garbage receptacles are or will be used;
- Quantity of waste generation;
- Employer/tenant occupancy threshold; or
- Certain square footage or number of dwelling units threshold.

Design Requirements

Some local governments require that refuse and recycling containers be enclosed or screened. If this is the case, local governments typically place certain design requirements on refuse and recycling enclosures. The purpose of these design requirements is to ensure a consistent appearance of the enclosures as well as to ensure that collection containers may be efficiently collected by vehicles. Table 6-1 summarizes common design requirements for recycling and refuse enclosures. R. W. Beck provides further discussion of enclosures in Section 7 and conceptual drawings of enclosures in Appendix A.

Table 6-1
Enclosure Design Elements

Element	Requirements
Doors/gate	Locking gate; doors must open greater than 90 degrees
Screening/fencing	Screened on 3-4 sides; 6-8 feet high
Paving	Concrete pad with apron is required
Clearance	

Vertical	15-25 feet
Driveway	40-50 feet long (to accommodate 36-foot collection vehicle); 15-20 feet wide
Front-load container	6-8 inches from container to back wall, 1-2 feet from container to side walls and/or other containers
Turning areas	Adequate turning area for a 3-axle, 36 foot collection vehicle
Pedestrian gate (primarily multi-family)	Door to provide access without opening main gate

Convenience

Typically, exterior storage ordinances require the disposal of recyclable materials to be as convenient as refuse disposal. The ordinance can require the placement of recycling containers adjacent to the refuse container or within the same enclosure as the refuse container.

Site Plan

Prior to the issuance of any building permit, an ordinance can mandate the submission and approval of a site plan with a recycling statement. Typically, these site plans include the general layout and design of the development itself, along with a statement of recycling that includes, but is not limited to, the following:

- Analysis of the expected composition and amounts of solid waste and recyclables that will be generated and collected at the development;
- Location, design specification and number of recycling and refuse storage areas, receptacles and enclosures that adequately meet the volume and material requirements of the development;
- Signage that will be used to clearly identify the recycling area and receptacles and materials collected; and
- Educational outreach program that explains education of owners, tenants, and occupants.

Enforcement

See Section 6.2.1 for enforcement mechanisms that may be used for exterior storage.

6.3.2 Case Examples

The **City of Frisco, Texas** requires all multi-family developments to construct at least one triple-wide enclosure for recycling. In addition, any commercial developments meeting any one of the following criteria are required to provide at least one singlewide refuse enclosure and one singlewide recycling enclosure:

- Commercial establishments with 20 or more employees;
- A commercial establishment having in excess of 2,000 square feet of contiguous HVAC space; and
- A multi-tenant building with centralized refuse collection.

Single-wide enclosures are large enough to accommodate one dumpster, double-wide can accommodate two dumpsters, and triple-wide can accommodate three dumpsters. All enclosures must be located a minimum of 50 feet from any multi-family complex and a minimum of 100 feet from any adjacent residential district boundary lines. All enclosures must be screened from view on at least three sides, and the exterior design must comply with existing requirements of the City.

For both multi-family and commercial developments, the enclosures must be designed to provide a 15-foot inside turning radius within a 30-foot approach for the collection vehicle. The openings of the gates for enclosures must be angled no more than 30 degrees from the centerline of the solid waste collection route. There must be a minimum overhead clearance of 25 feet and a driveway access with a clearance of 14 feet.

Multi-family and commercial developments found to be in violation of this ordinance are subject to a fine and can be denied the certificate of occupancy until compliance with the ordinance is met.

6.3.3 Ordinance Development

Key Issues

The three critical issues in the development of exterior recycling areas and enclosures are:

- The type of projects covered by the ordinance;
- The information required to be provided in the exterior recycling plan; and
- The enclosure requirements.

Basic Language

Shown below is basic language to require exterior storage space for recycling.

Exterior storage of solid waste and recyclable materials required. Each permit applicant for a covered project, as defined in Section [insert definition section] of the Code, shall include in the adequate, accessible and convenient areas for collection of solid waste and recyclable materials. The exterior storage of solid waste and recyclable materials shall be adjacent to each other and screened from public view by landscaping, fencing, or other City approved structure.

Additional Provisions

To establish an exterior storage ordinance, additional provisions may be required, as shown below.

Exterior storage of recyclable materials required. Each permit applicant for a covered project, as defined in Section [insert definition section] of the Code, shall submit an exterior storage of recyclable materials plan on forms provided

by [insert appropriate City staff], for the previous [insert time period] respectively. In the exterior storage of recyclable materials plan, each permit applicant for a covered project shall identify the (i) total square footage of the covered project, (ii) the number of individual units in the covered project, (iii) a description of the proposed collection program, (iv) a description of the proposed enclosures for the solid waste and recyclable materials collection areas; and (v) designated vendor or facility that the permit applicant proposes to collect, divert, market, reuse and/or receive the recyclable materials. All such reports shall be submitted on forms provided by [insert appropriate City department]. The City reserves the right to require any additional information deemed necessary by [insert appropriate City department], or other designee of [insert appropriate City department]. For each submitted exterior storage of recyclable materials management plan, original or revised and resubmitted, the City shall approve or disapprove the exterior storage of recyclable materials plan.

Approval of exterior storage of recyclable materials plan required before issuance of building permit. City shall not issue a building permit for any covered project unless and until the exterior storage of recyclable materials is approved by [insert appropriate City staff].

Compliance with exterior storage of recyclable materials plan required for issuance of occupancy certificate. City shall not issue an occupancy permit for any covered project unless [insert appropriate City staff] determines the permit applicant is in compliance with the exterior storage of recyclable materials plan.

Penalties for violation of Code. [Insert appropriate City department] for the City may establish regulations governing enforcement of Chapter [insert chapter number] [insert chapter name] of the Code. [Insert appropriate City department] is also authorized to establish and assess a penalty, including a fine, for those who violate Chapter [insert chapter number] [insert chapter name] of the Code.

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Section 7

Infrastructure and Building Design Guidelines for Recycling Programs

7.1 Introduction

In this section, R. W. Beck describes the physical elements that can be included in buildings and facilities in order to accommodate recycling programs. These building design guidelines may be used by local governments as the basis for developing ordinances or green building programs. In addition, these guidelines may be used by developers who wish to incorporate infrastructure for recycling into a development project. Conceptual drawings of certain recycling infrastructure can be found in Appendix A.

For this analysis, R. W. Beck's approach was to identify the ideal infrastructure that could be implemented to accommodate recycling programs. In many cases, programs may be implemented without these specific infrastructure elements. R. W. Beck focuses much of this analysis on the design of enclosures to house refuse and recycling containers. Many communities do not require refuse and recycling containers to be enclosed. If containers are not going to be enclosed, the specific spacing requirements included in this report may still be utilized to ensure that containers may be collected.

This Section should be reviewed in conjunction with Section 6 that provides a summary of recycling infrastructure ordinances that are currently in place in other communities.

For each building type discussed in this section, R. W. Beck estimates the quantity and composition of material that could be generated. These estimates are based on available industry data and R. W. Beck experience. Therefore, the material generation estimates quantities in this section are not precise projections of material to be generated and should only be used by local governments and developers as general guidelines.

7.2 Single-Family Residential

The following describes physical elements that need to be included in the design and construction of single-family homes to accommodate curbside recycling programs. For the purpose of this analysis, single family homes include dwelling units that

receive individual refuse and recycling service. Generally, this includes buildings that have four dwelling units or fewer.¹

7.2.1 Material Generation

Based on R. W. Beck industry experience, the quantity of recyclables generated from single-family homes can vary based on the type of program that is provided by the hauler or local government. For communities that provide collection of materials using 18- to 24-gallon, open bins, residential customers can generate between 300 to 500 pounds per household annually. Assuming a set out rate of 50 percent and weekly recyclables collection, this level of material generation results in set outs that weigh between 12 and 20 pounds. For communities that provide single-stream recyclables collection using 90-gallon rolling carts, residents can generate up to 800 pounds of material per household annually. This level of material generation results in set outs that can weigh up to 30 pounds, using the same assumptions described above.

The types of materials generated by single-family homes also depend on the type of program that is provided and the capabilities of the processing facility. Listed below are the materials that are typically included in residential curbside recycling programs in North Central Texas.

- Aluminum and steel cans
- Plastic containers #1 through #7
- Newspaper
- OCC
- Mixed paper

If the program and processing facility permits, glass bottles may also be included in recycling programs in North Central Texas.

7.2.2 In-Home Collection

Most local governments provide recycling collection containers to residents for material set out at curbside. However, this section describes infrastructure that can be included in the interior of single-family dwelling units to facilitate separation of recyclable material from refuse.

Space Requirements

Some communities, including the City of Palo Alto and the County of Sacramento, California, have required specific space allocations for interior storage of recyclables. Many communities in California recommend (or require) two to three cubic feet of

¹ The definition of single-family may vary based on the specific community.

space for interior recyclables collection for single-family households.² Two to three cubic feet of space can typically be located inside of a lower-level kitchen cabinet.

Additionally, single-family homes must have space necessary to store recycling bins or carts on non-collection days. Recycling containers may be stored inside of a garage or adjacent to the building. A standard 96-gallon cart occupies approximately 26 cubic feet of space. The dimensions of a 96-gallon container are shown in Figure A-1 of Appendix A.

Built-In Recycling Centers

Built-in recycling centers, such as roll-out containers for recycling collection, can provide additional encouragement for residents to recycle. These roll-out container units typically occupy the space underneath a kitchen cabinet. Cabinet design and manufacturing firms provide a variety of models for built-in recycling centers. R. W. Beck provided a conceptual drawing of a potential design for a built-in recycling center in Figure A-2 of Appendix A. An example of a roll-out recycling drawer is shown in Figure 7-1.



Figure 7-1: Example of Built-In Recycling Center (*Source: Simplehuman*)

Built-in recycling centers are not essential for a single-family resident to participate in curbside recycling. However, these centers can facilitate more convenient separation of recyclable material from refuse. Space for recycling should be labeled clearly to encourage diversion.

7.2.3 Curbside Collection

Curbside recycling programs for single-family homes are typically accommodated without any specific design elements for collection. The most critical element for

² Source: *Recycling Space Allocation Guide*, California Integrated Waste Management Board, March 1993

curbside collection, especially for fully-automated programs utilizing carts, is to have sufficient space at curbside for access to the container.

In order to be safely collected by an automated truck, a cart must have five feet of clear space on either side when it is set out for collection. In other words, access to the container cannot be obstructed by mailboxes, cars, other collection containers, etc. Figure A-3 shows the necessary space needed for cart set out in front of a single-family home. Figure 7-2 provides examples of a set out with sufficient space on either side of the container and a set out with insufficient clear space.



Figure 7-2: Examples of Appropriate and Inappropriate Cart Set Out

7.3 Multi-Family Residential

The following describes physical elements that need to be included in the design of multi-family complexes to accommodate recycling programs. For the purpose of this analysis, multi-family complexes are defined as properties that receive group refuse and recycling service. Generally, this includes buildings that have five dwelling units or more.³

Multi-family complexes are often constructed without the proper infrastructure to implement a recycling program. The design elements described in this section are intended to make recycling feasible to implement at a multi-family complex. Furthermore, the elements included in this section are intended to make recycling and refuse collection equally easy to use by the resident in order to maximize participation and material recovery.

7.3.1 Material Generation

The types of material generated by multi-family households are similar to single-family households as described in Section 7.2.1. However, multi-family households typically generate lower quantities of material than single-family households. Based

³ The definition of multi-family may vary based on the specific community.

on R. W. Beck's experience working with municipalities in North Central Texas, multi-family households can generate between 50 and 300 pounds of recyclable material on an annual basis.⁴ One study conducted by the U.S. Environmental Protection Agency (EPA) found that multi-family households generate an average of 280 pounds annually.⁵ This is approximately 35 percent of the material generation potential of a single-family household with a 96-gallon cart.⁶

A basic rule of thumb may be used to determine the total discard capacity, including refuse and recycling, of a multi-family complex. For each resident of a multi-family complex, approximately 0.25 cubic yards (CY) of weekly discard capacity is needed.⁷ Discard capacity may be divided between refuse and recyclables based on the specific design of the recycling program.

7.3.2 In-Unit Collection

The infrastructure needed for interior collection of recyclables for multi-family dwelling units is similar to single-family homes, as discussed in Section 7.2.2. Specific elements of in-unit collection are described below.

- **Space requirements:** Approximately two to three cubic feet of space is recommended for interior collection of recyclables.
- **Built-in recycling centers:** Roll-out containers for recycling can facilitate easier separation of material.

An important issue for multi-family residents can be transporting recyclables from the unit to the central collection area. Therefore, in lieu of a built-in recycling center, apartment complexes may provide residents with small recycling bins that fit into sinks or other small spaces (two to three cubic feet). These bins typically are between six and 10 gallons and have a handle. An example of an apartment recycling bin is shown in Figure 7-3.

⁴ Source: *Multi-Family Recycling Study*, prepared by R. W. Beck for the City of Fort Worth, Texas, September 2005

⁵ Source: *Multifamily Recycling: A National Study*, U.S. EPA, November 2001

⁶ (280 lbs/800 lbs) * 100 = 35%

⁷ Source: *Multifamily Green Building Guidelines*, Alameda County Waste Management Authority



Figure 7-3: Apartment Recycling Bin with Handle (Source: Busch Systems)

7.3.3 Common Area Recycling

In addition to in-unit collection of recyclables, apartment complexes can provide recycling carts and/or bins in common areas of the complex. Areas appropriate for recycling include:

- Laundry room;
- Mail room;
- Pool area; and
- Other common areas.

7.3.4 Recycling Centers

Overview

Recycling centers are centralized collection areas where multi-family residents may bring recyclables. Recycling centers can also be the point at which the collection contractor collects containers.

Based on R. W. Beck industry experience, it is a best management practice to utilize 96-gallon carts for multi-family recyclables collection. In addition, a study conducted by the U.S. EPA showed that programs with high diversion are more likely to use 96-gallon carts for collection.⁸ Therefore, R. W. Beck conducted this infrastructure analysis with the assumption that 96-gallon carts would be utilized for collection.

Location

In designing multi-family recycling centers, it is critical that recycling containers are equally convenient or more convenient for the resident than refuse containers. In order to achieve this convenience, one approach is to co-locate refuse and recycling

⁸ Source: *Multifamily Recycling: A National Study*, U.S. EPA, November 2001

containers at the same location within the complex. This approach ensures that recycling and refuse services are equally accessible to the resident and that residents are aware that recycling service is provided.

Another consideration in designing multi-family recycling and refuse facilities is whether to centralize all containers in one area. For instance, a complex with several buildings may wish to have one refuse/recycling facility per building rather than having one central location. Complexes should take into account the configuration of the complex and resident traffic patterns when making a decision regarding centralization of disposal facilities.

Container Capacity

As previously mentioned, multi-family complexes need approximately 0.25 CY of discard capacity – which is a combination of refuse and recycling – per multi-family resident. This rule of thumb may be used as a benchmark in determining infrastructure needed for recycling programs.

To accommodate recycling programs in North Central Texas, R. W. Beck believes that it is reasonable for 25 percent of a complex's total container capacity to be allocated for recyclables. Based on this recommendation, the resulting need for refuse capacity and recycling capacity for complexes of various sizes is shown in Table 7-1. For instance, a complex with 100 residents would require total discard capacity of nine cubic yards. Based on R. W. Beck's recommendation of 25 percent recycling capacity, the complex would need six, 96-gallon carts for recycling and one, six cubic yard dumpster for refuse. This analysis is based on weekly collection of refuse and recycling.

Table 7-1
Container Capacity Needs for Multi-Family Households ¹

Residents	Units ²	Total Capacity (CY)	Recycling Capacity (CY) ³	Number of 96-gal Carts ⁴	Refuse Capacity (CY)
50	20	5	2	4	3
100	40	9	3	6	6
150	60	13	4	8	9
200	80	17	5	10	12
250	100	21	6	12	15
300	120	25	7	14	18
350	140	30	8	16	22
400	160	34	9	18	25
450	180	38	10	20	28
500	200	42	11	22	31

¹ Analysis assumes refuse and recycling is collected one time per week.

² Assumes 2.5 residents per dwelling unit.

³ This number was rounded to the nearest whole cubic yard to simplify the analysis.

⁴ 96 gallon containers represent approximately ½ cubic yard of disposal capacity.

In addition to 96-gallon containers, some complexes may choose to include a separate front-load container for cardboard (OCC) collection. Due to the transient nature of apartment residents, multi-family complexes may generate large quantities of OCC that may be difficult to contain within a cart. Therefore, when designing a recycling system for multi-family, complexes may consider using a separate container for this material.

Enclosure Design

Multi-family refuse and recycling areas may be enclosed to enhance the appearance and aesthetics of the complex. Common refuse and recycling enclosure requirements are shown in Table 6-1 in Section 6.

A sample refuse and recycling enclosure is shown in Figure A-4 of Appendix A. R. W. Beck designed this enclosure to be sufficient for 100 multi-family residents based on the analysis shown in Table 7-1.

R. W. Beck would note that, depending on the specific building code in a given community, multi-family recycling and refuse containers may not need to be enclosed. However, in the event that containers do not need to be enclosed, the same design elements regarding access to the containers, vertical clearance, and container placement would apply.

7.3.5 Recycling Chutes

Multi-family high-rise complexes with centralized refuse chutes pose a unique challenge for recycling programs. Recycling can be challenging to implement in these buildings due to the following:

- Most buildings have one chute that can accommodate refuse only;
- Space for centralized recycling areas in these buildings is limited, as most high-rises do not have large parking lots; and
- The convenience of refuse chutes can deter recycling efforts for residents.

High-rise complexes generally have two options for recycling infrastructure. The first is to install a new recycling chute or retrofit an existing chute. Recycling chutes work similarly to refuse chutes and empty into a centralized container or compactor below the complex. A conceptual diagram of a recycling chute is shown in Figure A-5 and A-6 of Appendix A.

Another option for high-rise recycling is to create a recycling area on each floor where residents may bring recyclables. It is ideal if a recycling area can be located next to the chute for refuse. Janitorial staff could empty the containers as-needed and bring material to a centralized collection container. The collection containers on each floor should be able to be safely emptied by hand. R. W. Beck would expect that the discard capacity needs for high-rises would be similar to what is shown in Table 7-1. This type of system is an option for multi-family high-rises; however, due to space constraints, it may present significant operational challenges.

7.4 Commercial

The following describes physical elements that need to be included in the design of commercial buildings to accommodate recycling programs. R. W. Beck provided discussion of recycling infrastructure needed in the following types of commercial buildings:

- Restaurants;
- Office buildings;
- Schools; and
- Retail.

Although this analysis focuses on the specific commercial entities shown above, the infrastructure requirements discussed here may be used as a general guide to develop recycling infrastructure in other types of commercial facilities.

7.4.1 Restaurants

This section describes recycling infrastructure that is needed for restaurants. For the purpose of this report, the term “restaurants” generally refers to both fast food and full service restaurants.

Material Generation

Based on prior waste generation studies conducted in other areas of the country, restaurants⁹ generate approximately 6,500 pounds of waste per employee on an annual basis.¹⁰ The following materials are the most prevalent recyclable materials in the restaurant waste stream. R. W. Beck also included an estimate of the percentage of the waste stream comprised of each material based on information from waste generation and composition studies, as referenced above.

- Paper, including OCC (30 to 50 percent)
- Food waste (40 to 60 percent)
- Containers, including glass, plastic, and metal (10 to 12 percent)

Container Capacity

As previously mentioned, restaurants generate approximately 6,500 pounds of material annually per employee. To accommodate recycling programs, restaurants need to have collection infrastructure to collect the following materials:

- Organic/food waste;
- Paper and containers; and¹¹
- Refuse.

For this analysis, R. W. Beck provided for 30 percent container capacity for paper/containers, 40 percent for organic waste, and 30 percent for refuse based on the waste characterization listed above. Based on these assumptions, Table 7-2 shows R. W. Beck’s assessment of infrastructure needed at restaurants of varying sizes.

⁹ Includes fast food and full-service restaurants.

¹⁰ Source: *Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups*, California Integrated Waste Management Board, June 2006.

¹¹ Before deciding to commingle paper with containers, R. W. Beck recommends that a restaurant conduct a specific waste stream analysis and evaluate services that are available from private haulers.

Table 7-2
Container Capacity Needs for Restaurants ¹

Employees	Weekly Capacity (Tons)	Weekly Capacity (CY) ²	Organics (CY) ³	Paper (CY) ³	Refuse (CY) ³
10	33	5	2	2	2
20	65	9	4	3	3
30	98	13	5	4	4
40	130	17	7	5	5
50	163	21	8	6	6
60	195	25	10	8	8
70	228	30	12	9	9
80	260	34	14	10	10
90	293	38	15	11	11
100	325	42	17	13	13

¹ Analysis assumes refuse and recycling are collected once per week and organics are collected twice per week.

² This number was rounded to the nearest whole cubic yard to simplify the analysis.

³ These numbers were rounded to the nearest cubic yard.

Enclosure Design

Enclosures for restaurants would be subject to the same design requirements as shown in Table 6-1.

A sample restaurant enclosure is shown in Figure A-8 of Appendix A. R. W. Beck designed this enclosure to be sufficient for a restaurant with 50 employees based on the analysis shown in Table 7-1. The enclosure includes a six CY container for refuse, a six CY container for paper and other recyclables, and a 4 CY container for food waste. R. W. Beck assumed that the food waste container would be collected twice per week. Food waste collection must typically occur more frequently than once per week due to the odor and sanitation issues associated with organic material. Food waste collection frequency can vary based on the specific material generated as well as the local climate.

7.4.2 Office Buildings

This section describes recycling infrastructure that is needed for office buildings. For the purpose of this report, the term “office buildings” generally refers to commercial buildings and excludes institutional and industrial facilities.

Material Generation

Office buildings generate one to two pounds of material daily per employee.¹² Waste composition data for office buildings is limited; however, the American Forest & Paper Association (AFPA) estimates that up to 70 percent of material generated from office buildings is recyclable paper.¹³ In addition, business waste characterizations conducted in the State of California support paper percentages at approximately 50 percent. Because of the high percentage of paper products in the waste stream, recycling programs at office buildings have traditionally focused on the recovery of paper.

Container Capacity

As previously mentioned, office buildings generate approximately one to two pounds of material daily per employee. To accommodate recycling programs, office buildings need to have collection infrastructure to paper and refuse.

For this analysis, R. W. Beck provided for 50 percent container capacity for paper and 50 percent for refuse based on available waste characterization data. Based on these assumptions, Table 7-3 shows R. W. Beck's assessment of infrastructure needed at office buildings of varying sizes.

Table 7-3
Container Capacity Needs for Office Buildings ¹

Employees	Weekly Capacity (Tons)	Weekly Capacity (CY) ²	Paper (CY) ³	Refuse (CY) ³
50	0.25	4	2	2
100	0.50	7	4	4
150	0.75	10	5	5
200	1.00	14	7	7
250	1.25	17	9	9
300	1.50	20	10	10
350	1.75	24	12	12
400	2.00	27	13	13
450	2.25	30	15	15
500	2.50	34	17	17

¹ Analysis assumes refuse and recycling are collected once per week.

² This number was rounded to the nearest whole cubic yard to simplify the analysis.

³ These numbers were rounded to the nearest cubic yard.

¹² Source: California Integrated Waste Management Board

¹³ Source: Workplace Recycling Guide, American Forest & Paper Association.

Enclosure Design

Enclosures for office buildings are typically subject to the same design requirements as typical enclosures as shown in Table 6-1.

A sample office building enclosure is shown in Figure A-7 of Appendix A. R. W. Beck designed this enclosure to be sufficient for an office building with 200 employees based on the analysis shown in Table 7-3. The enclosure includes an eight CY container for refuse and an eight CY container for recyclable paper.¹⁴ The enclosure was designed with the assumption of once per week collection.

7.4.3 Retail

This section summarizes recycling infrastructure that is needed to accommodate recycling programs in retail establishments. For the purposes of this analysis, R. W. Beck focused on retail establishments that are stand-alone or co-located at a shopping center (e.g., big box stores, other retail). R. W. Beck excluded shopping malls from this analysis due to the mixed-use nature of mall operations.

Material Generation

Retail establishments generate approximately 5,700 pounds of material annually per employee.¹⁵ Waste composition data specific to North Central Texas is not available; however, studies conducted in the State of California have found that between 60 and 70 percent of waste generated from retail operations consists of paper.¹⁶ The majority of this paper material is recyclable OCC. Because of the high percentage of OCC in the waste stream, recycling programs at retail operations have traditionally focused on the recovery of OCC.

Container Capacity

To accommodate recycling programs, retail operations need to have collection infrastructure for OCC (and potentially other paper) and refuse. For this analysis, R. W. Beck provided for 50 percent container capacity for OCC and 50 percent for refuse based on available waste characterization data. Based on these assumptions, Table 7-4 shows R. W. Beck's assessment of infrastructure needed at retail operations of varying sizes.

¹⁴ R. W. Beck recognizes that the enclosure design provides for slightly greater collection capacity than is needed based on Table 7-3. The enclosure was designed to be consistent with standard solid waste container sizes.

¹⁵ Source: *Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups*, California Integrated Waste Management Board, June 2006

¹⁶ Source: *Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups*, California Integrated Waste Management Board, June 2006

Table 7-4
Container Capacity Needs for Retail Establishments ¹

Employees	Weekly Capacity (Tons)	Weekly Capacity (CY) ²	OCC (CY) ³	Refuse (CY) ³
50	0.25	4	2	2
100	0.50	7	4	4
150	0.75	10	5	5
200	1.00	14	7	7
250	1.25	17	9	9
300	1.50	20	10	10
350	1.75	24	12	12
400	2.00	27	13	13
450	2.25	30	15	15
500	2.50	34	17	17

¹ Analysis assumes refuse and recycling are collected once per week.

² This number was rounded to the nearest whole cubic yard to simplify the analysis.

³ These numbers were rounded to the nearest cubic yard.

Enclosure Design

Enclosures for retail establishments are typically subject to the same design requirements as typical enclosures as shown in Table 6-1.

A sample retail enclosure is shown in Figure A-7 of Appendix A. R. W. Beck designed this enclosure to be sufficient for a retail establishment with approximately 200 employees based on the analysis shown in Table 7-4. The enclosure includes an eight CY container for refuse and an eight CY container for OCC. The enclosure was designed with the assumption of once per week collection.

7.4.4 Schools

This section describes recycling infrastructure that is needed to accommodate recycling programs in schools. For the purpose of this project, R. W. Beck focused on grade schools and high schools. Due to the mixed use nature of the campuses, colleges and universities have unique recycling infrastructure needs that would require more detailed analysis.

Material Generation

Schools typically generate between one and five pounds of material weekly per student. For the purposes of this report, R. W. Beck assumed that students generate five pounds of material per week.

Waste characterization data for schools in North Central Texas is limited. However, based on waste characterization data available from the U.S. EPA, the following are the most prevalent recyclable materials that can be found in a school waste stream:

- Paper and OCC (28 percent);
- Food waste (24 percent); and
- Containers, including glass, metal, and plastics (approximately seven percent).

Container Capacity

Based on the waste characterization data provided above, schools need to have collection infrastructure to collect paper, containers, food waste, and refuse. Based on available data, R. W. Beck believes it is reasonable for schools to provide 25 percent of container capacity for paper and containers, 25 percent for food waste and organics, and 50 percent for refuse. Based on these assumptions, Table 7-5 shows R. W. Beck's assessment of infrastructure needed at schools of varying sizes.

Table 7-5
Container Capacity Needs for Schools ¹

Students	Weekly Capacity (Tons)	Weekly Capacity (CY) ²	Organics (CY) ³	Paper (CY) ³	Refuse (CY) ³
100	0.50	4	1	1	2
200	1.00	7	2	2	4
300	1.50	10	3	3	5
400	2.00	14	4	4	7
500	2.50	17	4	4	9
600	3.00	20	5	5	10
700	3.50	24	6	6	12
800	4.00	27	7	7	14
900	4.50	30	8	8	15
1000	5.00	34	9	9	17

¹ Analysis assumes refuse and recycling are collected once per week and organics are collected twice per week.

² This number was rounded to the nearest whole cubic yard to simplify the analysis.

³ These numbers were rounded to the nearest cubic yard.

Enclosure Design

Enclosures for office buildings are typically subject to the same design requirements as typical enclosures as shown in Table 6-1.

Enclosures for schools can be designed very similarly to enclosures for restaurants. A sample school enclosure is shown in Figure A-8 of Appendix A. R. W. Beck designed this enclosure to be sufficient for a school with approximately 700 students based on

the analysis shown in Table 7-5. The enclosure includes a six CY container for refuse, a six CY container for paper, and a four CY container for food waste.¹⁷ The enclosure was designed with the assumption of once per week collection for paper and twice per week collection of refuse and food waste.

¹⁷ R. W. Beck recognizes that the enclosure design provides for slightly greater collection capacity for food waste than is needed based on Table 7-5. The enclosure was designed to be consistent with standard solid waste container sizes and collection frequencies for this material.

Appendix A
Conceptual Drawings

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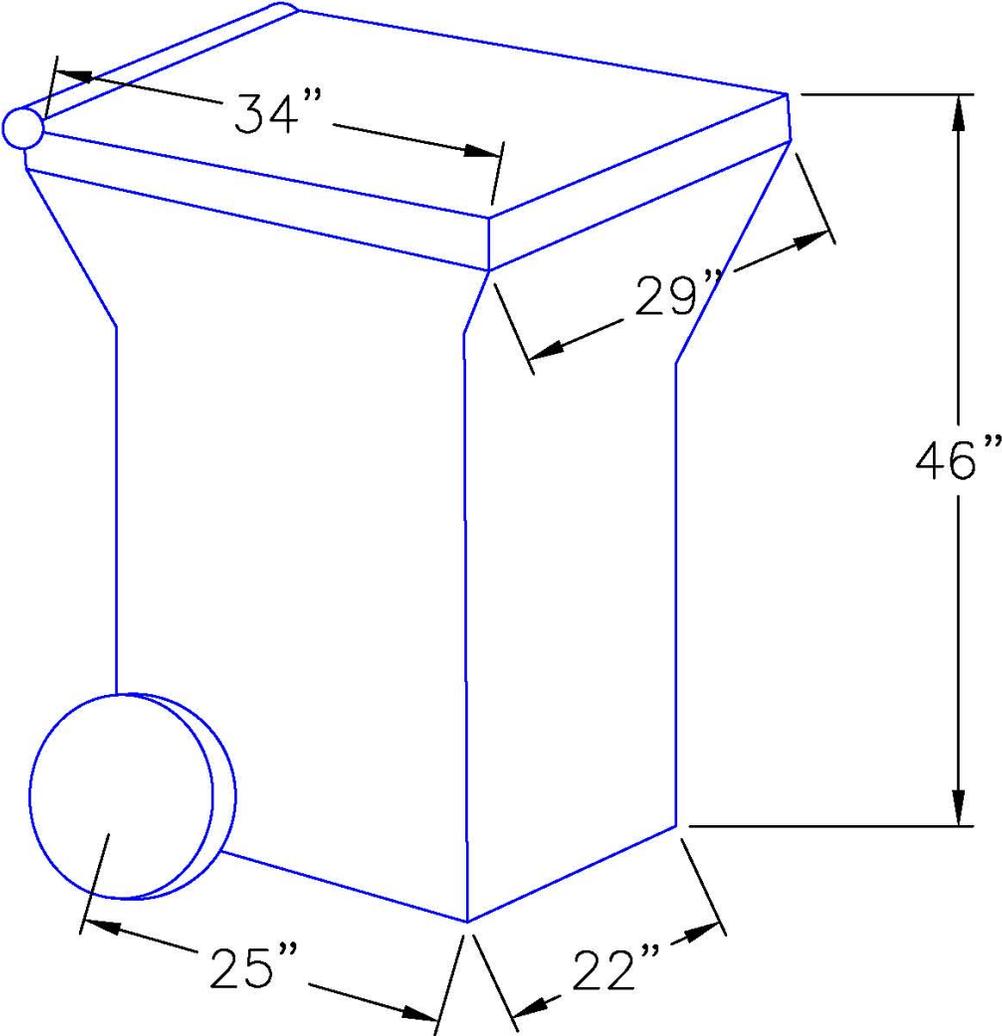


Figure A-1: Standard 96-gallon recycling cart

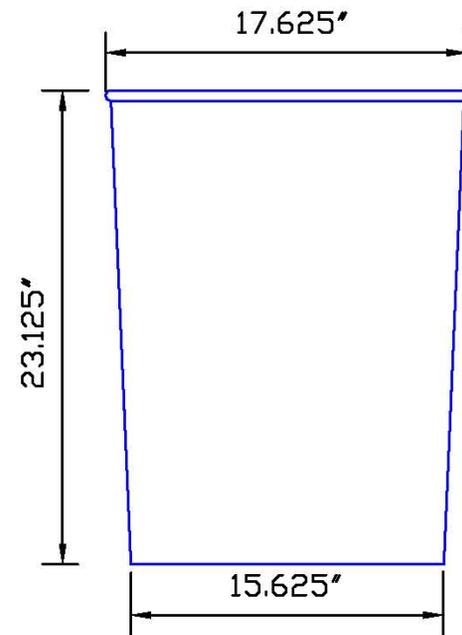
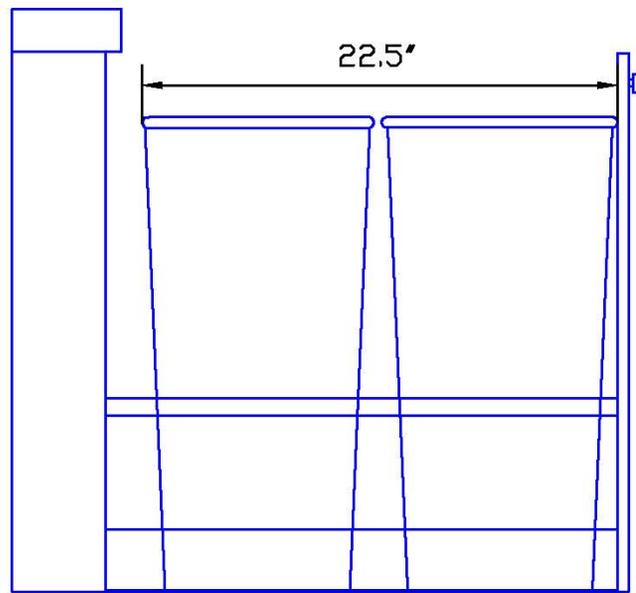


Figure A-2: Potential Design of a Built-In Recycling Center

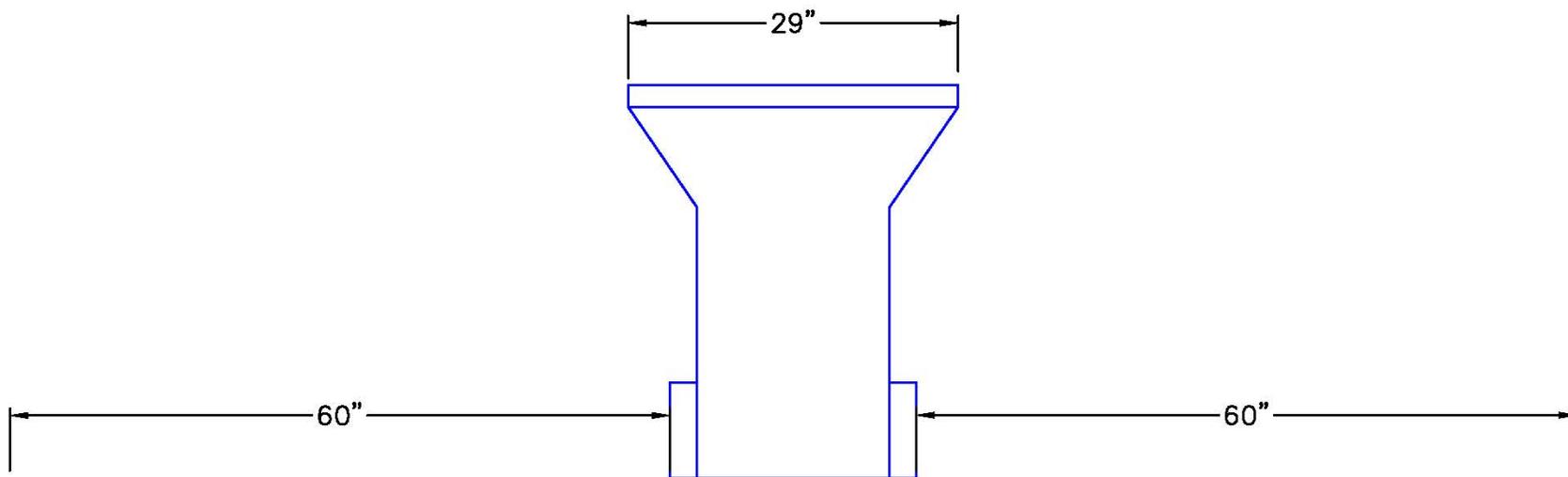


Figure A-3: Set-Out Spacing Requirements for a 96-gallon recycling cart

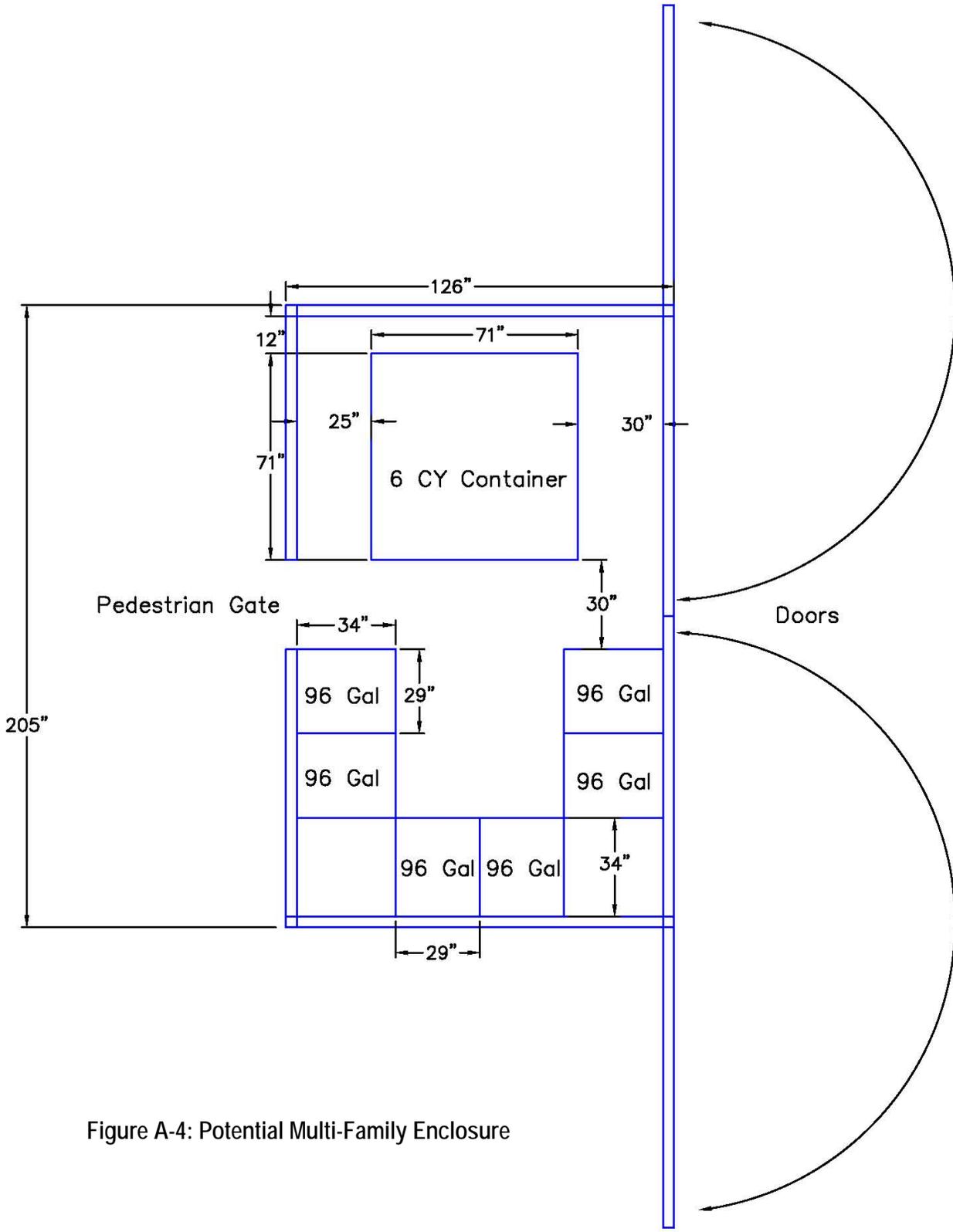


Figure A-4: Potential Multi-Family Enclosure

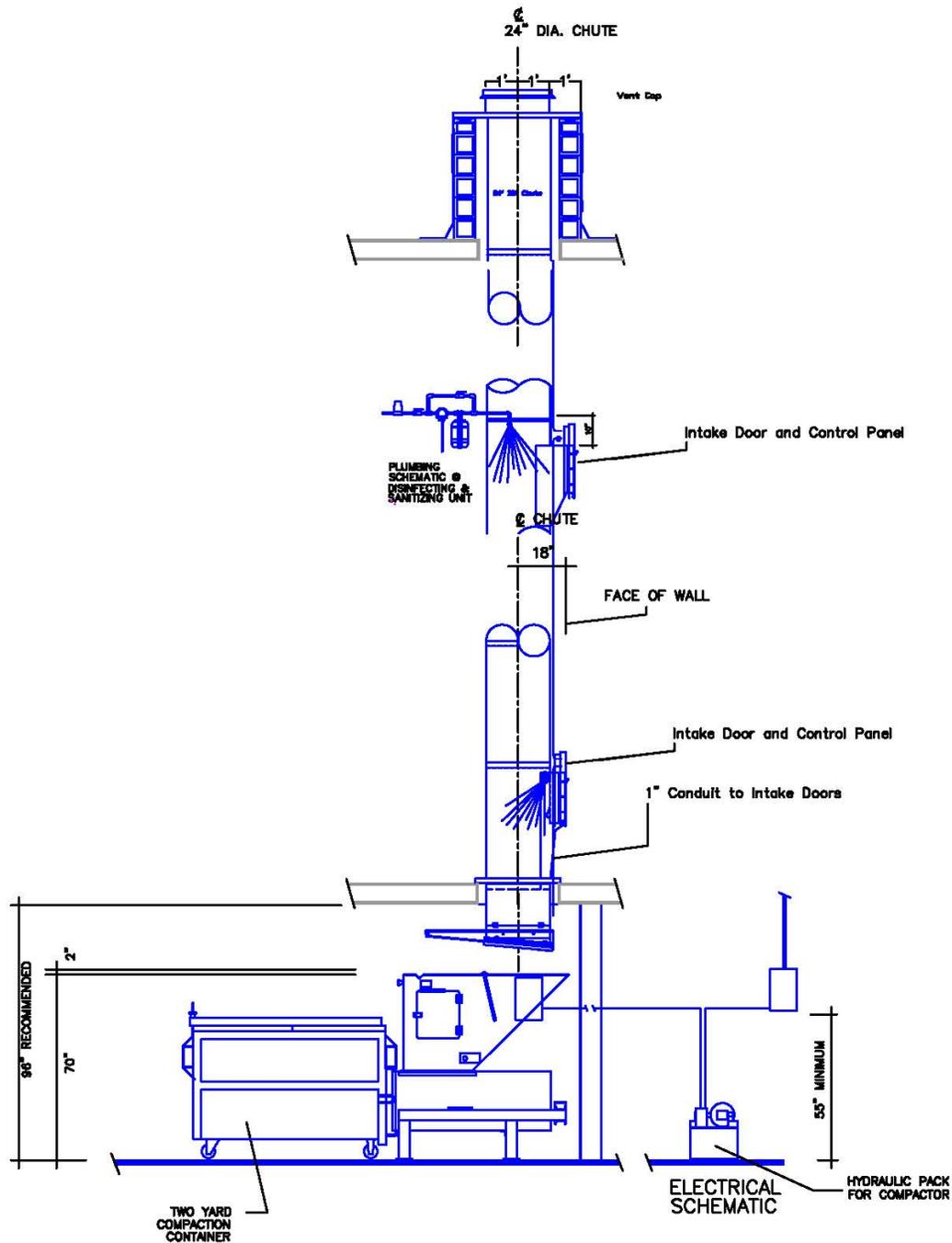


Figure A-5: Multi-Family High Rise Recycling Chute, Side View
(Adapted from Wilkinson HiRise)

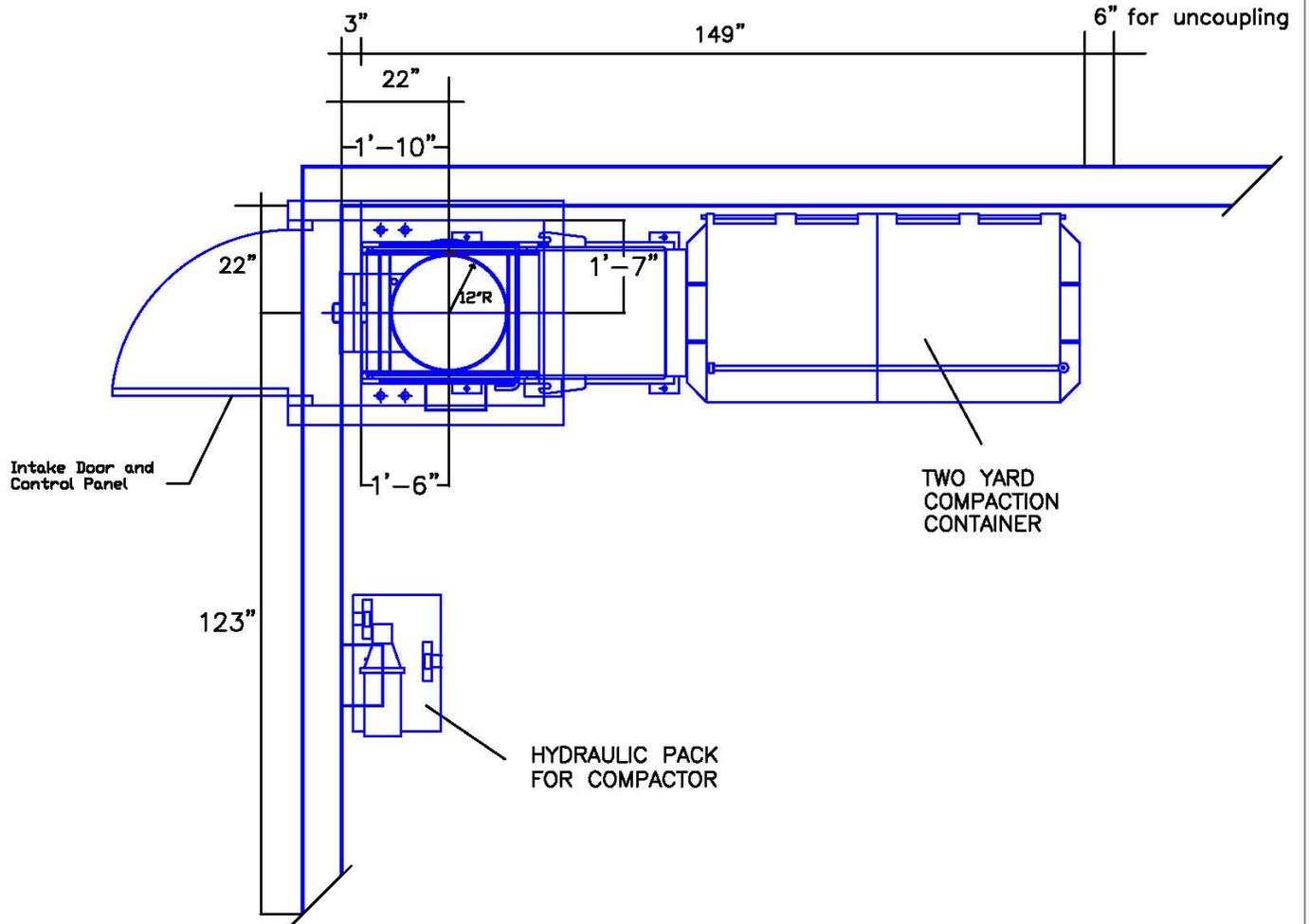


Figure A-6: Multi-Family High Rise Recycling Chute, Overhead View
 (Adapted from Wilkinson HiRise)

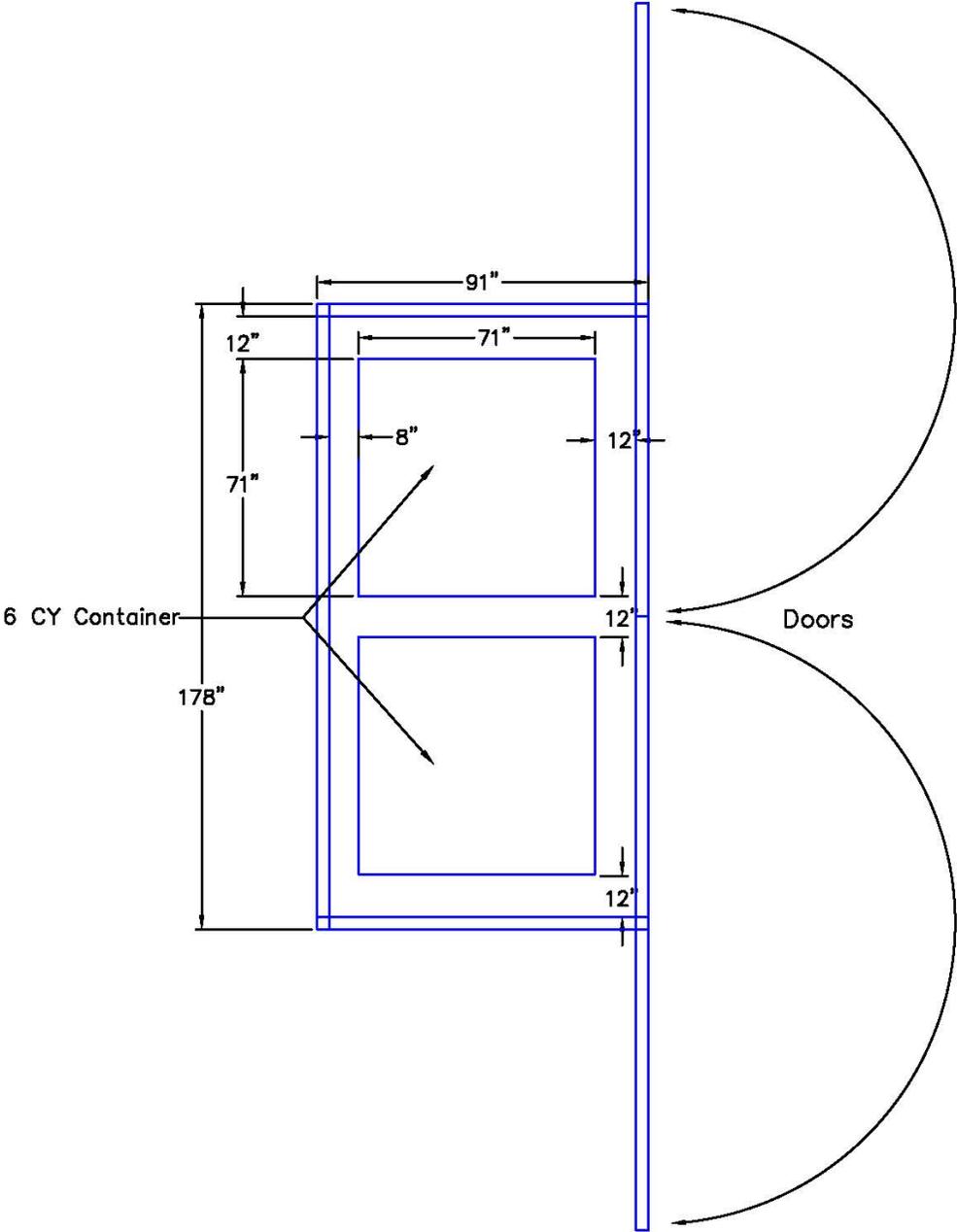


Figure A-7: Potential Commercial Enclosure for Retail and Office Buildings

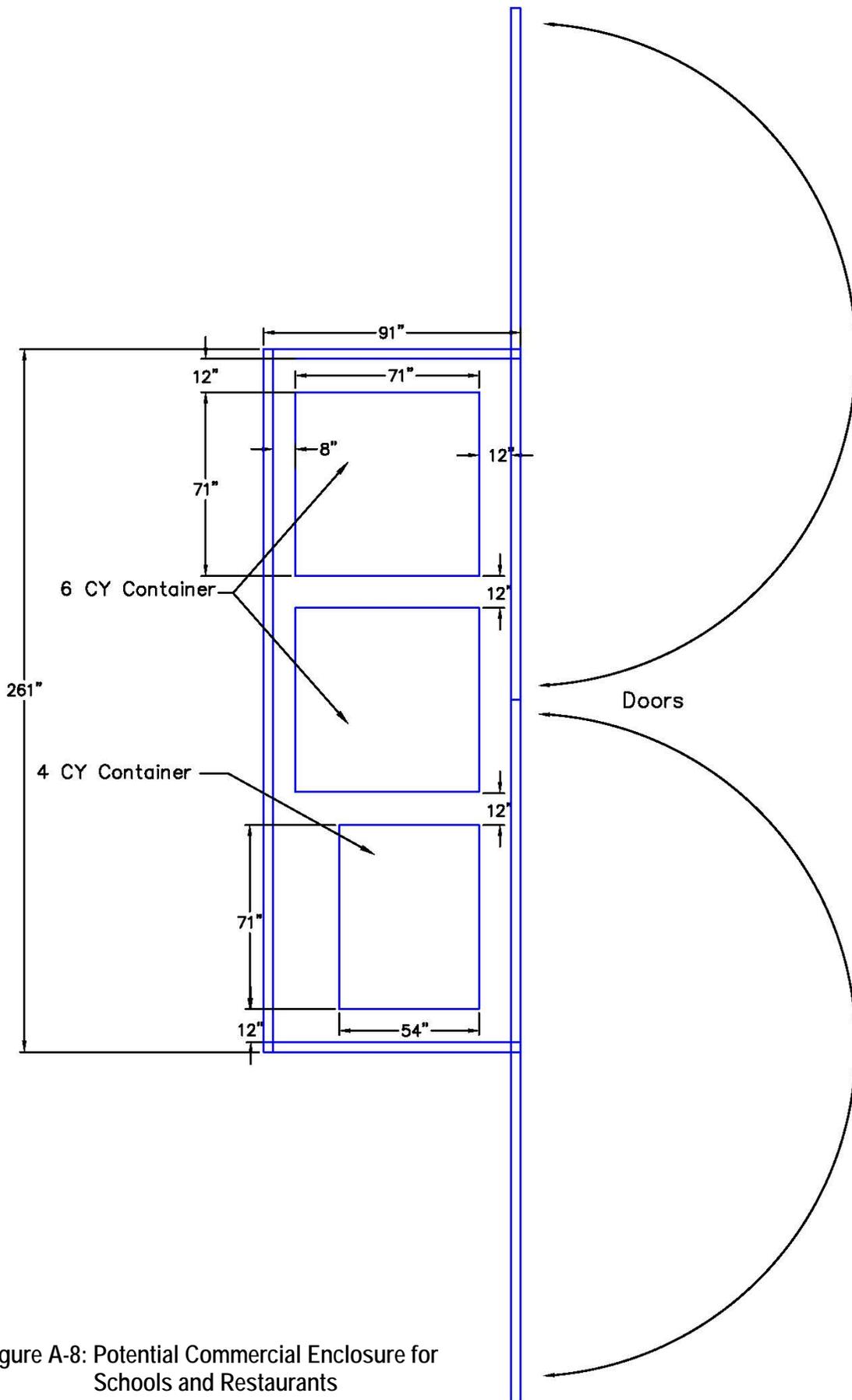


Figure A-8: Potential Commercial Enclosure for Schools and Restaurants