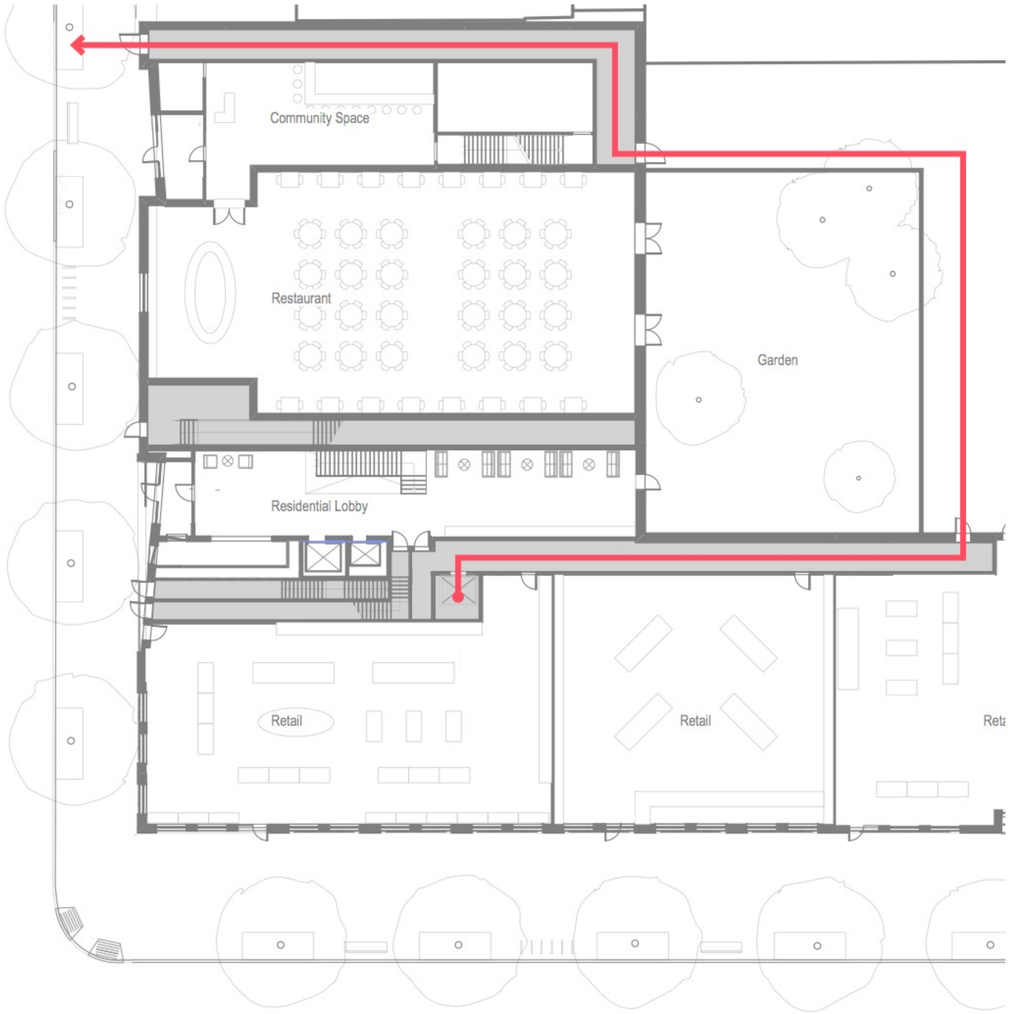
Zero Waste Design Guidelines

Design Strategies and Case Studies for a Zero Waste City

AIA New York
CENTER FOR ARCHITECTURE
Kiss + Cathcart, Architects
foodprint group
CLOSEDLOOPS
With support from The ROCKEFELLER FOUNDATION

Designing buildings for circular resource flows

Where does organic waste fit in?


Community Space
Restaurant
Garden
Residential Lobby
Retail
Retail

The Zero Waste Design Guidelines are a resource for architects, developers, building managers and urban designers

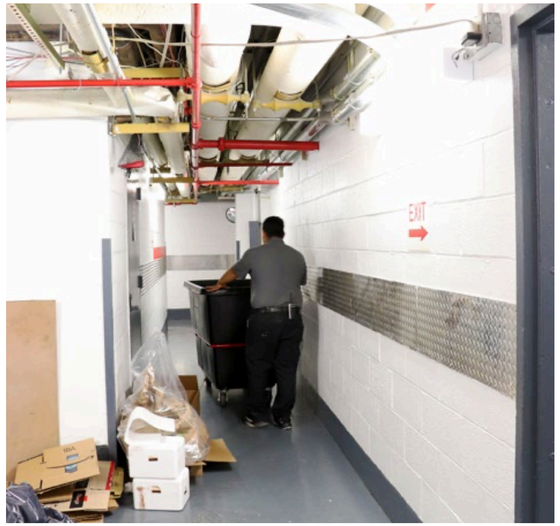
They include best practice design strategies to address the crucial role that design of the built environment plays in achieving zero waste goals, including:

- Global and NYC Context
- Strategies for Building Design
- Strategies for Construction & Demolition (Circular Building Materials)
- Strategies for Collection & Urban Design
- Case Studies
- NYC Policy & Implementation Recommendations

Best Practice Strategies for Operational Waste

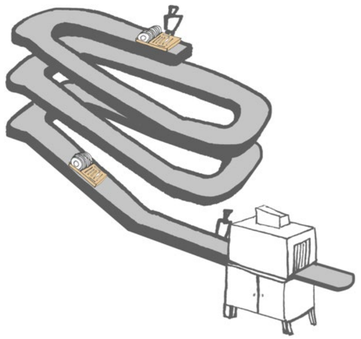
- Waste reduction strategies
- Waste diversion strategies

- Planning for Waste as a Material Flow
- Volume reduction



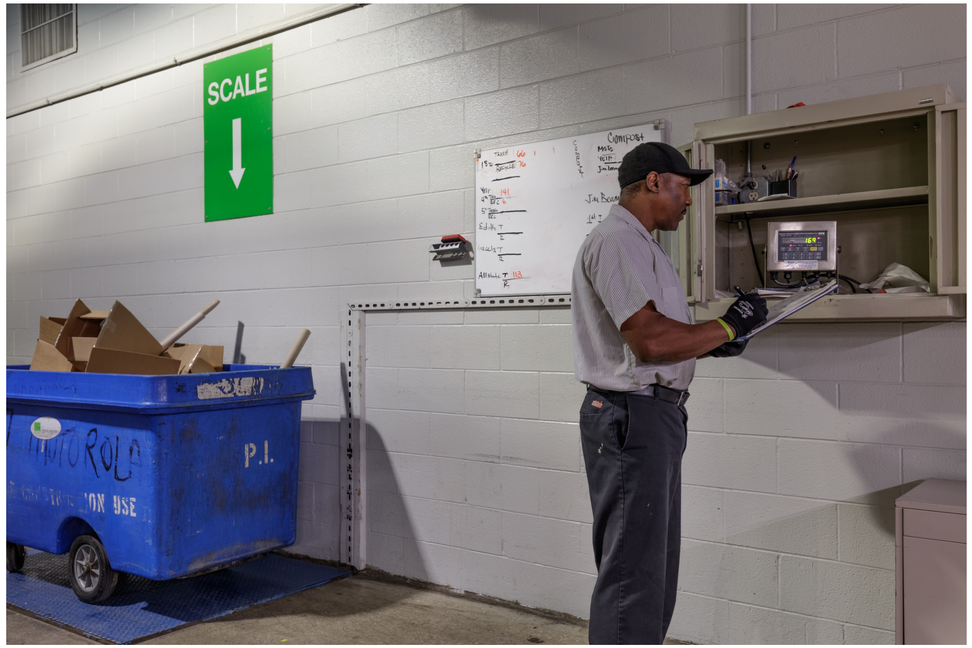
Waste Reduction Strategies

- Reduce food waste
- Reusable dishware



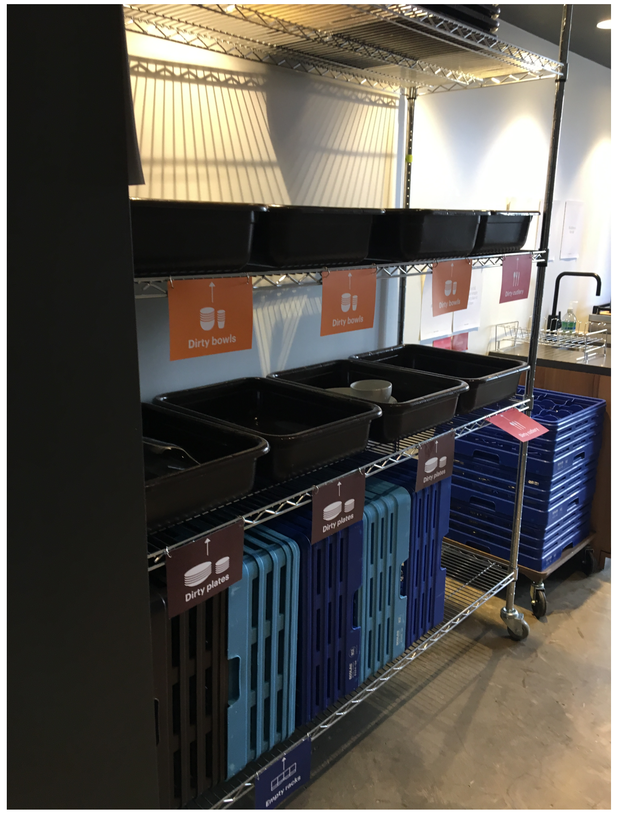
Waste Reduction Strategies

- Facilitate donation and reuse
- Incorporate financial incentives to reduce waste



Waste Diversion Strategies

- Clear visual cues and signage
- Opportunities for feedback
- Equal convenience disposal
- Design for occupancy



Etsy Headquarters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6.8 7
8.1
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D.9
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B.5
A.5
A
E.2
E
D.3
D
C.6
C.1
C
B.2
B
STAIR A
03A21
ELECTRIC CLOSET
03B19
VESTIBULE
03B20
AV CLOSET
03C21
COATS
03FC20
RECYCLING
03C19
FOCUS - DESIGNATED
03C16
FOCUS - DESIGNATED
03F16
OPEN OFFICE
03F19
OPEN MEETING
03J16
PHONE
03C13
MEDIUM CONF
03C15
PHONE
03C12
PHONE
03D12
COATS
03A11
CLOSET
03B11
SMALL MTG
03D10
FOCUS
03C10
STANDUP
03B10
OPEN OFFICE
03B15
WAR ROOM
03B09
SMALL MTG LOUNGE
03B07
HALL WAY
03C11
CORRIDOR
03E13
MOTHER'S ROOM
03D13
COPY
03E12
IDF
03F15
MECHANICAL ROOM
03F14
ELEC RM
03F12
03F13
STANDUP
03C09
IDF
03C07
MECHANICAL ROOM
03C05
FACILITY STOR
03D03
AV STORAGE
03F08
IT STORAGE
03F07
ELEC RM
03E04
HALL WAY
03F10
PANTRY
03G10
LIVING ROOM
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WOMEN'S
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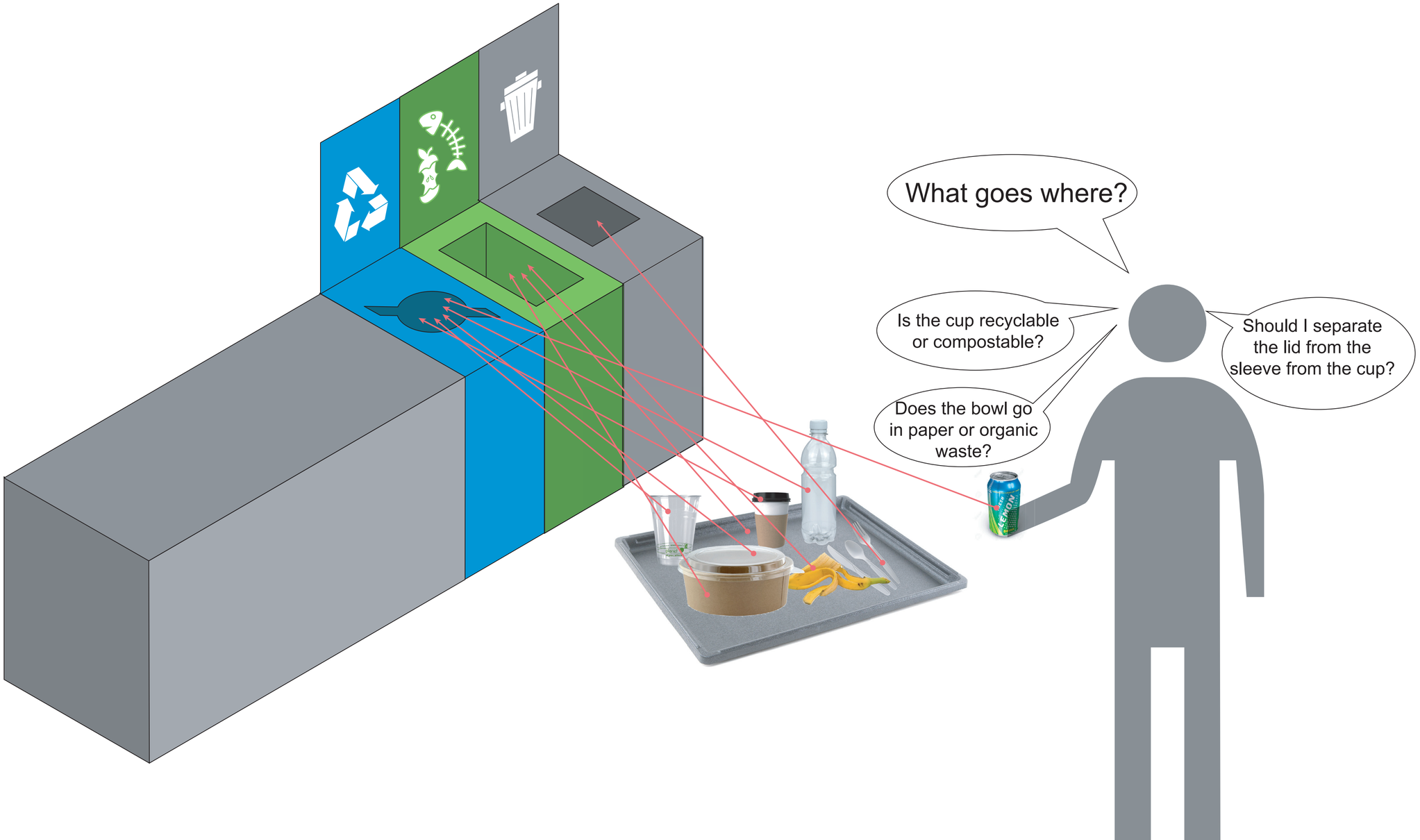
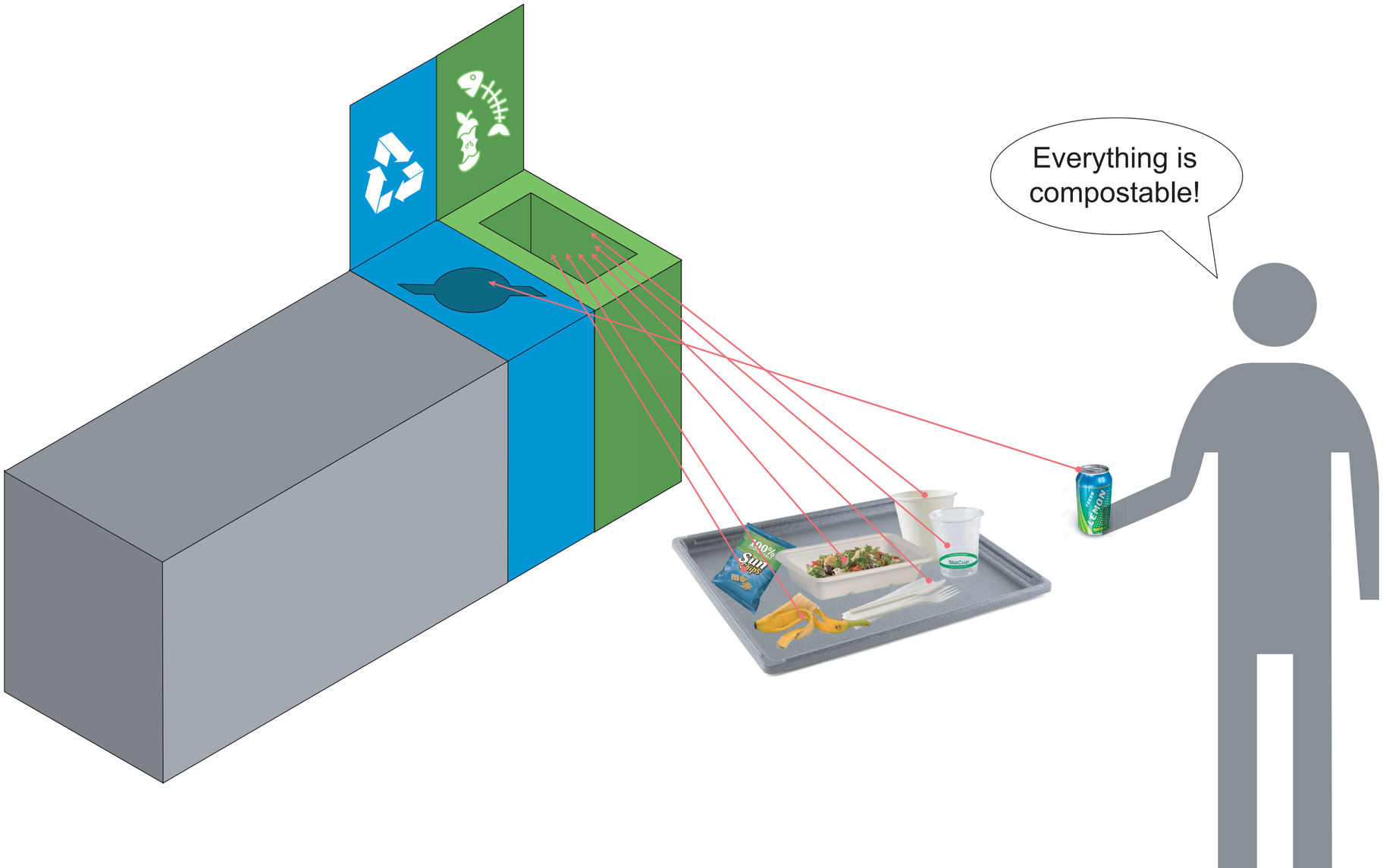
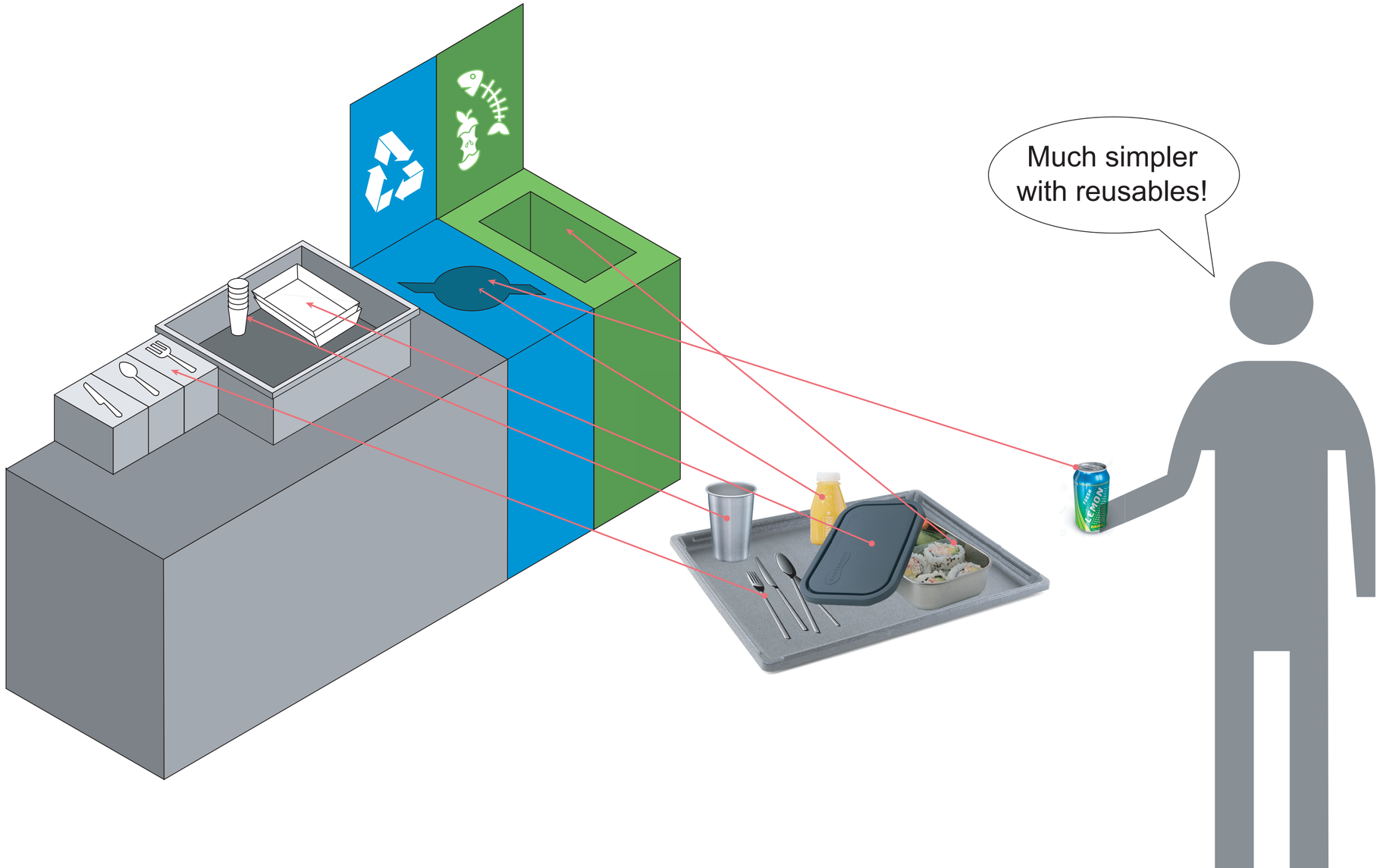
Simplifying diversion



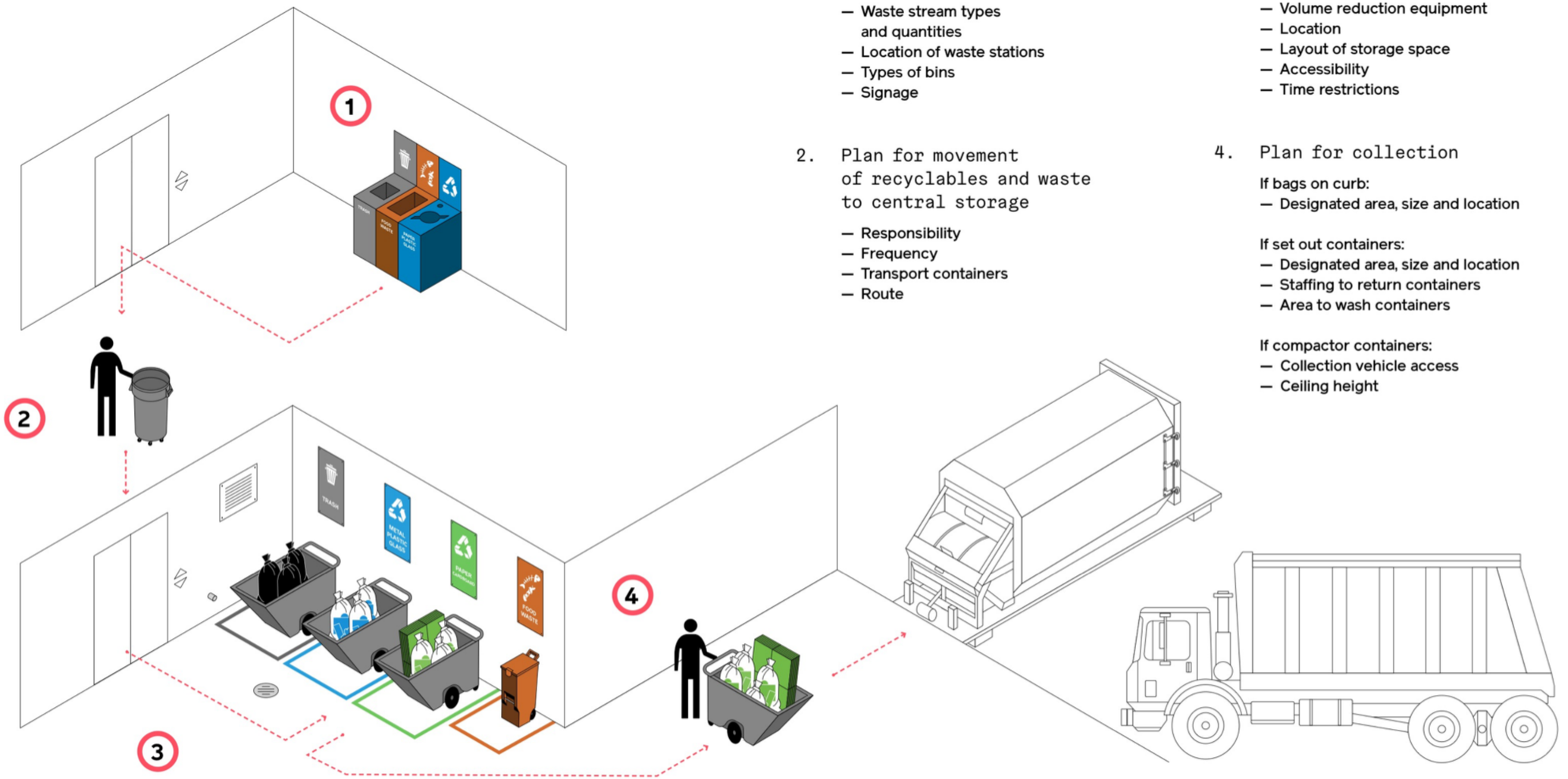
All compostables



All reusables



Planning for Waste as a Material Flow



1. Plan for tenant disposal and separation
   - Waste stream types and quantities
   - Location of waste stations
   - Types of bins
   - Signage

2. Plan for movement of recyclables and waste to central storage
   - Responsibility
   - Frequency
   - Transport containers
   - Route

3. Plan for waste storage
   - Calculate area required
   - Volume reduction equipment
   - Location
   - Layout of storage space
   - Accessibility
   - Time restrictions

4. Plan for collection

   If bags on curb:
   - Designated area, size and location

   If set out containers:
   - Designated area, size and location
   - Staffing to return containers
   - Area to wash containers

   If compactor containers:
   - Collection vehicle access
   - Ceiling height

Calculate waste volumes

zerowastedesign.org

Waste Calculator

Use this calculator to figure out the volume of waste that your building will generate. See how reducing waste generation, increasing waste diversion and using volume reduction equipment can reduce storage requirements.

1. Is your building commercial or residential?

COMMERCIAL | RESIDENTIAL

2. Basic Building Information

This calculator works for the listed occupancies below.
Enter information for all that apply.

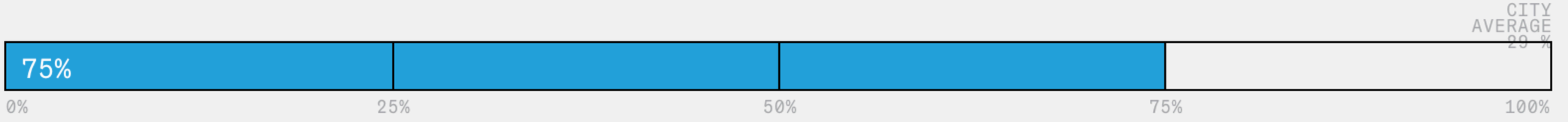
Food Service:	Hotels:	Retail—Grocery:	Retail—Non-Food:	Office:
# Employees	# Employees	# Employees	# Employees	# Employees
50				1000

3. Waste Generation +

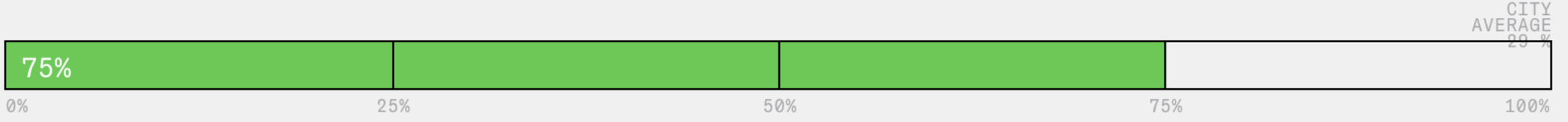
4. Capture Rate Per Material Stream −

Average capture rates per stream are shown below.
Adjust the sliders to reflect waste diversion strategies and goals.

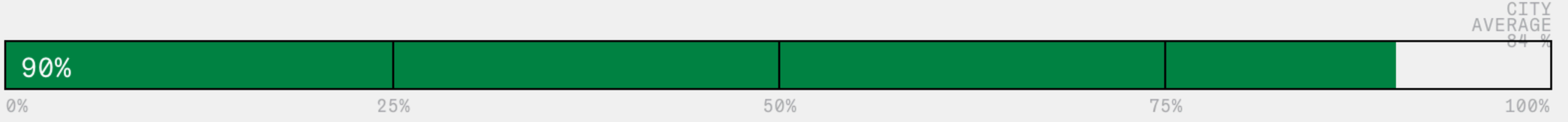
Metal, Glass and Plastic



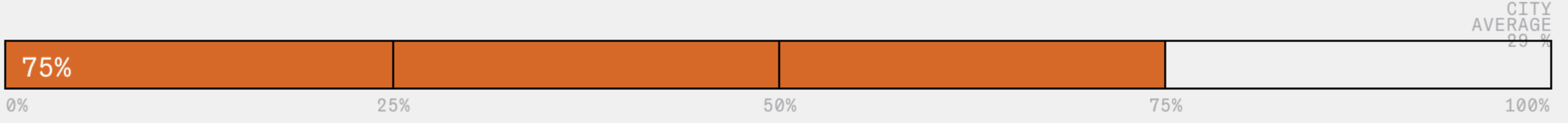
Paper



Cardboard



Organics



*For Buildings With Organics Separation

5. Volume Reduction Equipment

Recommended equipment to reduce waste volumes in your building is shown below. See Best Practice Strategy 2.21 for volume reduction equipment and 2.23 for organic pretreatment

Select the equipment you plan to provide.

These are strongly recommended:

VERTICAL TRASH COMPACTOR | METAL, GLASS & PLASTIC COMPACTOR CONTAINER | METAL & PLASTIC BALER | CARDBOARD BALER

ORGANICS PRETREATMENT TO SOLID

In addition, you might want to consider:

CARDBOARD COMPACTOR CONTAINER

Other options:

TRASH COMPACTOR CONTAINER | ORGANICS PRETREATMENT TO LIQUID | ORGANICS COMPACTOR CONTAINER

WASTE DIVERSION | REQUIRED STORAGE

Required Storage Area:

2563 SF
BASED ON SELECTED CONTAINERS

☐ SINGLE-STREAM RECYCLING

1 CUBIC YARD = 202 GALLONS
1 TON = 2000 POUNDS

Storage requirements for the number of days stated are shown below. If needed, change the container types you plan to use to recalculate your total storage area.

Refuse:

DURATION
3 DAYS

CONTAINER TYPE
7 2 CUBIC YD CONTAINER

Metal, Glass, and Plastic:

DURATION
3 DAYS

CONTAINER TYPE
103 1 CUBIC YD CONTAINER

Paper and Cardboard:

DURATION
3 DAYS

CONTAINER TYPE
43 2 CUBIC YD CONTAINER

Organics:

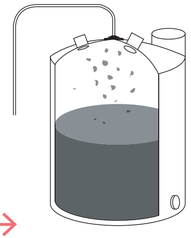
DURATION
3 DAYS

CONTAINER TYPE
22 64 GALLON BIN

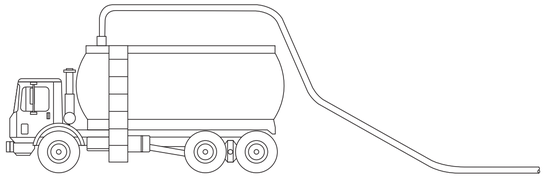
Reduce Waste Volume

- Provide balers and compactors
- Provide equipment to treat organic waste

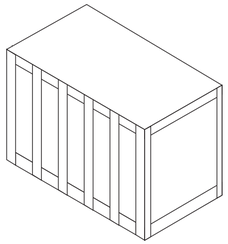
Organics equipment



Holding Tank

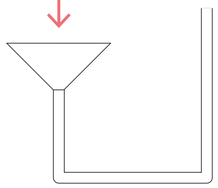


Tank Truck



Micro Anaerobic Digestion

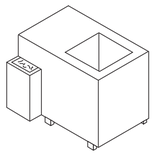
Biogas or Heat and Electricty



Grinder

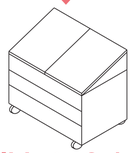
3”-4’ tubes

Organic waste slurry in pipes

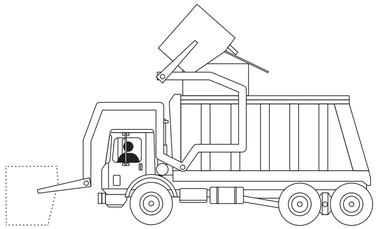


Dewaterer
(in kitchen)

Dried organic waste, lighter and less odorous



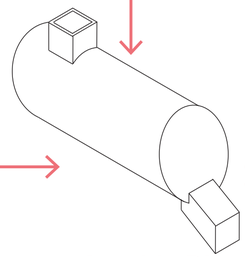
Solids to 2-4 CY Container



Front End Loader (FEL) Truck

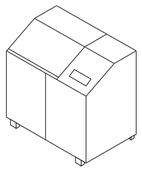
Heavy odorous organic waste

Wheeled Bin



Aerobic Digester
In-Vessel Composting

Onsite Compost Use



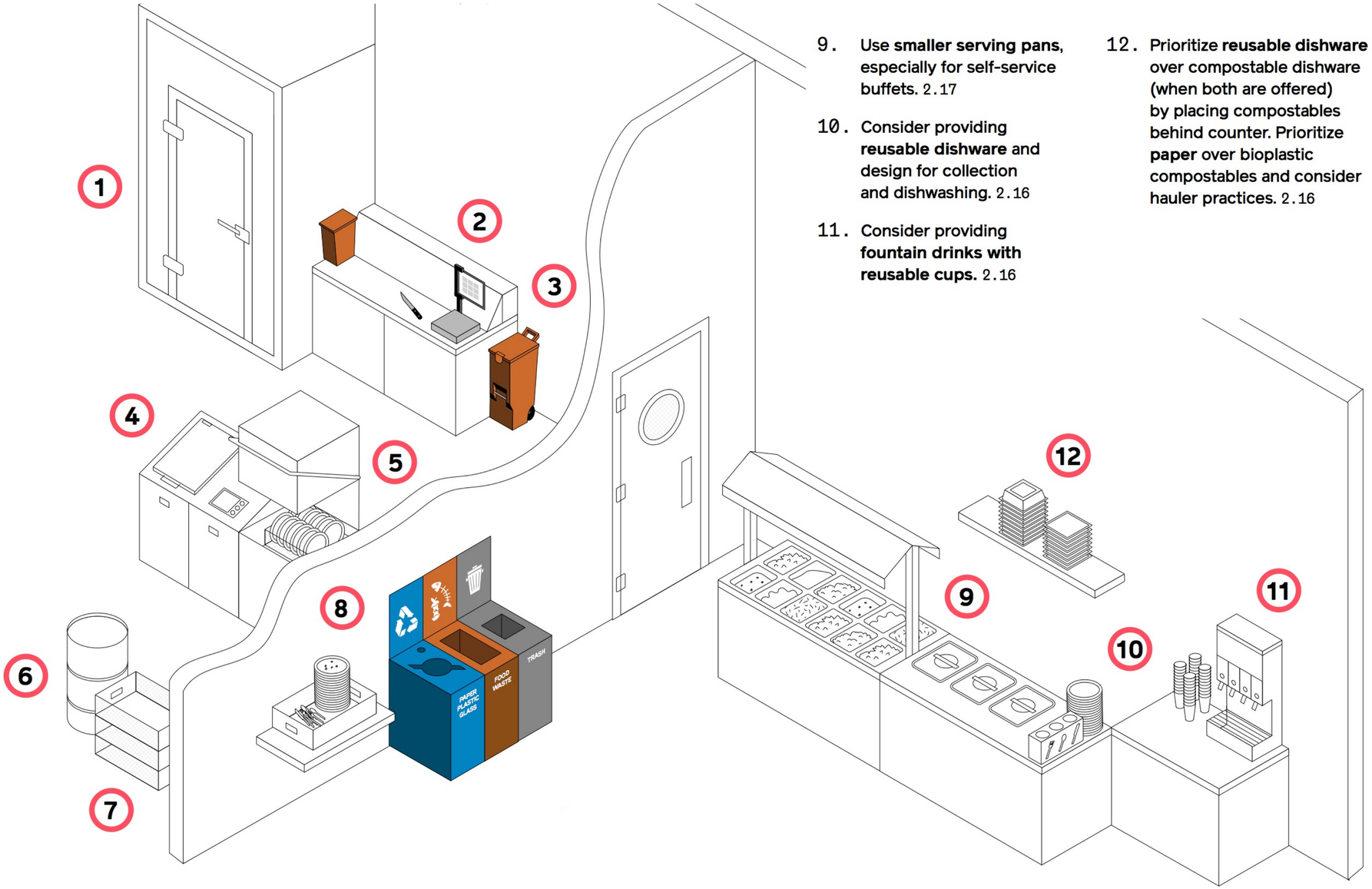
Aerobic Digester - Liquifier
(in kitchen or central)

Watery, broken-down organic waste

Liquid output to drain

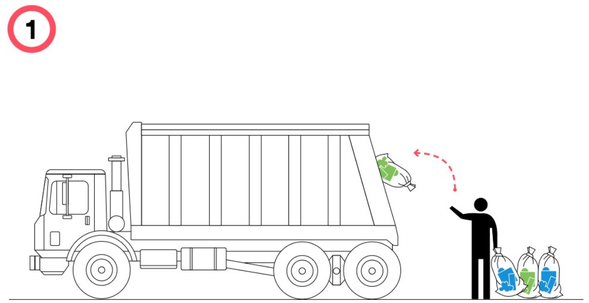
Food Service Design Strategies

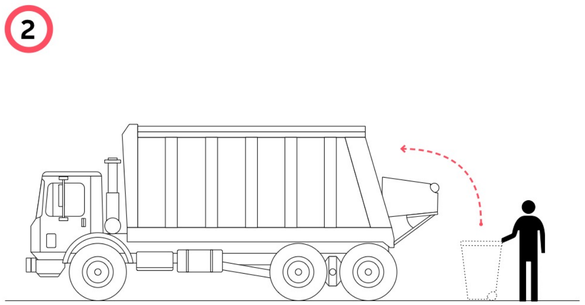
1. Refrigerator includes **storage for food donations**. Locate food donation storage for convenient collection. 2.18
2. Provide **food waste tracking system with scale**. 2.17
3. Organic waste collection in kitchen: replace refuse bins with **small organics toters**, and **countertop organics caddies**. 2.09
4. For volume reduction, consider **food waste pretreatment equipment**.
5. Provide **dishwashers** and consider path from dish room to dining area. For larger operations consider dish carousels. 2.16
6. Accommodate **cooking oil collection and storage**. 2.14
7. Delivery considerations: Where possible receive deliveries in **reusable crates** that the vendor collects. 2.06
8. Design **customer recycling stations** with clear visual cues and signage to accommodate all waste generated, including liquids. 2.10

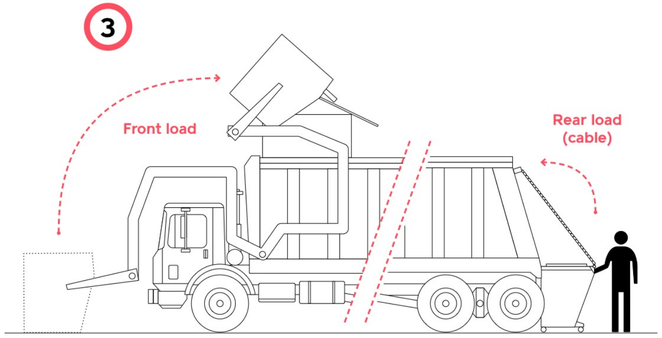


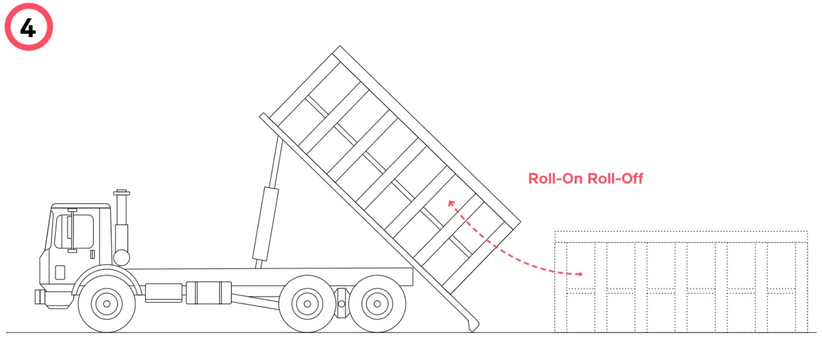
9. Use **smaller serving pans**, especially for self-service buffets. 2.17
10. Consider providing **reusable dishware** and design for collection and dishwashing. 2.16
11. Consider providing **fountain drinks with reusable cups**. 2.16
12. Prioritize **reusable dishware** over compostable dishware (when both are offered) by placing compostables behind counter. Prioritize **paper** over bioplastic compostables and consider hauler practices. 2.16

Collection & Urban Design Context



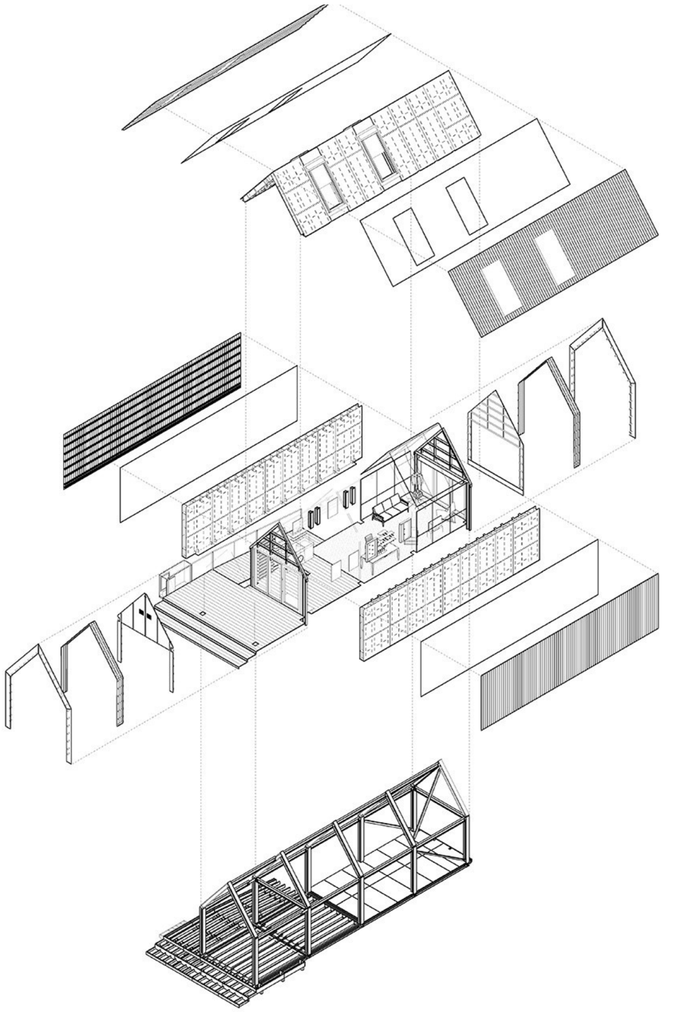






Strategies for Construction & Demolition Waste Circular Building Materials

- Design for material optimization
- Material selection
- Construction and demolition waste management onsite



Zero Waste Design Guidelines - Bay Area

Designing for Zero Waste Food Service

October 21, 2020

Christina Grace, Founder, Foodprint Group
Erin Cooke, Sustainability and Environmental Policy, San Francisco Airport
Stefan Moedritzer, Sustainability Waste Program Manager, Real Estate & Workplace Services, Google

Designing for Circular Building Materials

Nov 19,2020

James Slattery, C&D Debris Recovery, San Francisco Environment
Amanda Kaminsky, Founder, Building Product Ecosystems
Eden Brukman, Green Building Coordinator, San Francisco Environment
Frances Yang, Sustainability Specialist, Arup
Marcus Hopper, AIA, Senior Associate, Gensler

Zero Waste Multifamily Residences and Districts

Early 2021

AIA New York

AIA San Francisco

AIA Silicon Valley

Webinar recordings at AIANY.org, search videos

Next Steps

- Adapting to other cities
- Incorporating into green building standards
- Case Studies
- Pilots and Research
- Advocacy and Policies
- Consulting with cities, districts, developers

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Center for Zero Waste Design

Visit the website at

zerowastedesign.org

to read the full guidelines