

May 2006



Recycle 202 Workshop: Management of Drop-Off Recycling Programs & Facilities



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Workshop Purpose

- Provide an overview of drop-off recycling
- Discuss key factors in developing a successful drop-off program



Factors for Successful Program Development and Expansion

- Drop-off Location
- Staffing
- Collection
- Minimizing Contamination
- Storage
- Processing
- Transportation
- Sales and Marketing
- Recyclables Included in Program
- Strategies for Increasing Diversion



Drop-off Location



Facility Placement

- Site facility in highly populated area
- Drop-off station should be easy to access
 - Position facility near major roads
- Distance critical to success
 - Reduced distance to drop-off site yields more recyclables



Reducing Distance to Drop-offs Increases Diversion

| | Square Miles per Drop-off Site | Drop-off Tonnage per City Square Mile |
|--------------|--------------------------------|---------------------------------------|
| Austin, TX | 126 | 6.7 |
| St. Paul, MN | 8 | 15.3 |
| Dallas, TX | 1 | 38.1 |



Staffing



Drop-off Staffing

- Unstaffed operations more common than staffed
- Unstaffed sites generally:
 - Operate 24/7
 - Have higher incidence of contamination than staffed sites
 - Require greater levels of public education to reduce contamination



Drop-off Staffing

- Drop-off center should be staffed by at least one employee
 - Appropriate staffing level dependent on facility size
 - Hours of operation may be reduced to decrease labor costs
 - Public or private sector may operate site
- Knowledgeable staff reduces contamination
 - Last line of defense from contaminants in recyclable stream



Days/Hours of Operation at Sample Staffed Sites

| | Hours | Days of Operation |
|-------------------|-----------------|-------------------|
| Portland, OR | 8 AM to 5 PM | Mon-Sat |
| San Francisco, CA | 9 AM to 5 PM | Mon-Fri |
| Seattle, WA | 8 AM to 5:30 PM | Sat-Sun |





Collection Options

| Collection Method | Description |
|-------------------|--|
| Source-separated | Each material is collected in its own container |
| Dual-stream | Materials are split between two groups (i.e. glass and all others) |
| Single-stream | All materials are collected together |



Pros and Cons of Source Separated Collection

| Pros | Con |
|----------------------------|---|
| Reduces contamination | More resident time at drop-off site is required |
| Minimizes processing costs | |



Minimizing Contamination



Container Design

- Containers should be designed to prevent the acceptance of refuse or other contaminants
 - *Example:* “Cardboard Only” container may have a thin slot in which to fit cardboard



Recyclables Collected May Affect Contamination Level

- The collection of one material may contaminate another if commingled
 - *Example:* Glass shards contaminate fibers, damaging processing equipment



Public Perception Affects Contamination

- The collection of one material may increase the amount of similar contaminants in recyclables
 - *Example:* Collection of plastic bottles may increase likelihood of plastic bag contaminants in recyclable stream
- Clear and consistent public education messaging critical to minimize contamination





Container Requirements

- Loose fibers must remain dry at all times
 - Must be kept in weather-proof containers such as covered roll-offs
- Metals, glass and plastic may be stored in any type of container



Storage Space Requirements

- Facility should have enough space to store a trailer load of each recyclable material collected





Processing Decision

- Mills may prefer baled recyclables
 - City may process materials or sell unprocessed materials to an intermediary
- Processing decision dependent on cost/benefit analysis
 - Processing facilitates direct haul to mills, thereby maximizing revenues
 - However, processing causes City to incur additional equipment and staffing costs
 - Talk to buyers of materials before deciding whether to bale



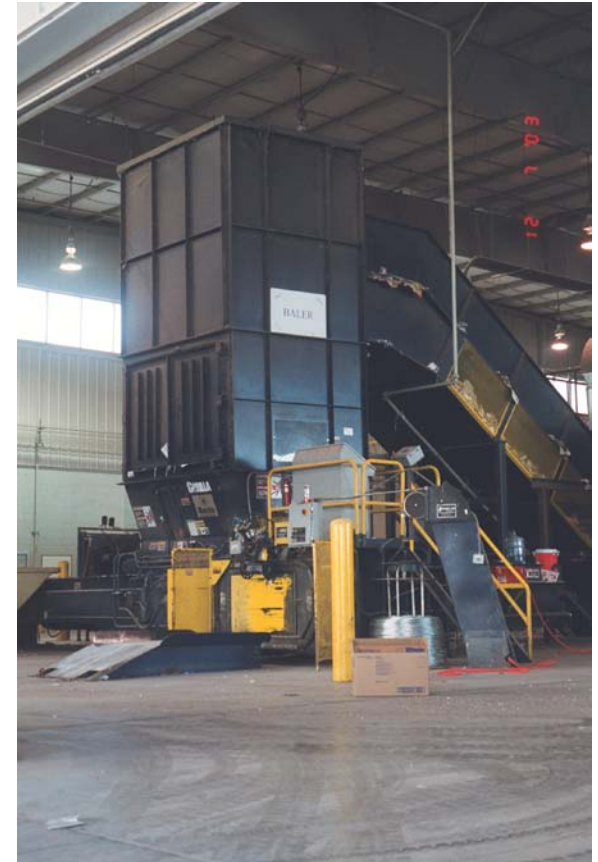
Municipal Processing

- Baling recommended for fibers, aluminum and plastics
 - Allows for more efficient storage and transportation
 - Horizontal balers are preferred to vertical balers as they tend to keep bales in original shape
 - Horizontal balers more expensive than vertical balers
- Other materials may be baled if City already has a baler



Municipal Processing

- Plastics and glass not sorted into sub-categories may be sorted to increase sales price
 - Plastics - separated between PET and HDPE
 - Glass - separated by color
- Glass may be crushed to increase density



Ideal Processing Equipment Requirements

| | Quantity | Unit Cost | Total Cost |
|------------------|----------|-----------|-----------------|
| Horizontal Baler | 1 | \$40,000 | \$40,000 |
| Conveyor | 1 | \$15,000 | \$15,000 |
| Forklift | 1 | \$30,000 | \$30,000 |
| Floor Scale | 1 | \$4,000 | \$4,000 |

Total Cost

\$89,000



Minimum Processing Staffing Requirements

- At least one additional employee would be required to support processing operations at a drop-off site
- Employee responsibilities:
 - Baling
 - Maintenance of processing equipment





Transportation



Transportation

- City may opt to haul materials to processor or to have the processor pick up materials
 - City must invest in transfer trailers if hauling materials
- Full trailer = maximum efficiency
- Glass may be significantly more costly to transport than other materials

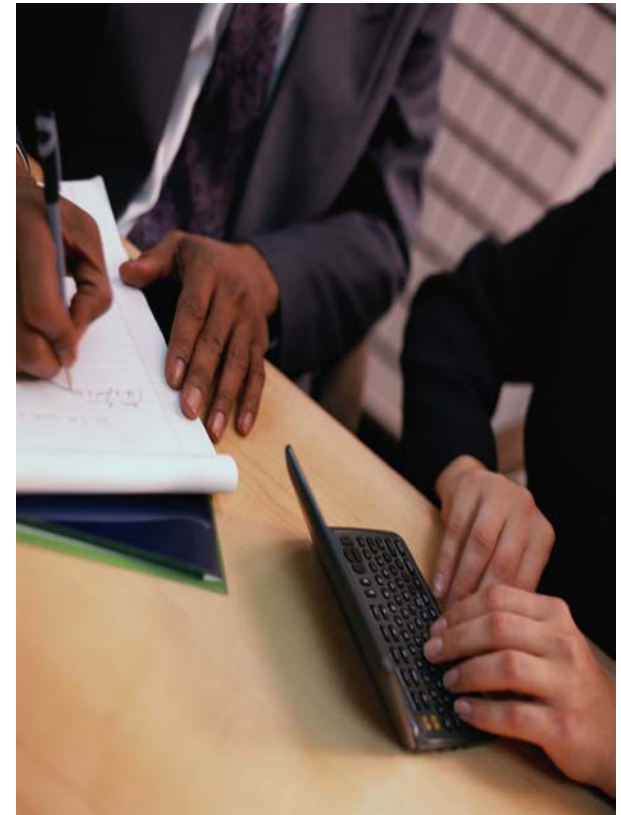


Sales and Marketing



Keys to Success in Recyclable Sales and Marketing

- Understand cost/benefit of processing in-house versus externally
- Monitor market indices to ensure City is getting best prices
- Minimize amount of contaminants in recyclables
 - Less contamination yields better materials and higher sales prices



Recyclable End Markets in H-GAC Area

| | Cardboard | Paper/ Newspaper | Glass | Metals | Plastics |
|---------------------------------|-----------|---------------------|----------|----------|----------|
| Abitibi | X | X | | | |
| Gulf Coast Recycling | X | X | | X | X |
| LaTexCo | X | | | | |
| Northwest Recycling | | | | X | |
| Strategic Materials | | | X | | |
| T. J. Burdett & Sons | | | | X | |
| Tascon | X | X | | | |
| Vista Fibers | X | X | | X | X |

Note: Data is per R. W. Beck's 2003 Regional Recycling Transfer Station Feasibility Study for the City of Huntsville, Texas.



Recyclables Included in Program



Recyclable Commodities Collected

- Cardboard
- Newspaper
- Office Paper
- Plastic
- Aluminum
- Tin
- Glass



Recyclable Selection



- Understand costs of collecting, processing and transporting each commodity
- Consider commodity values
 - Fibers, plastics and metals most valuable commodities
 - Glass least valuable commodity
 - Fiber may generate most revenue since it makes up large portion of recyclable stream



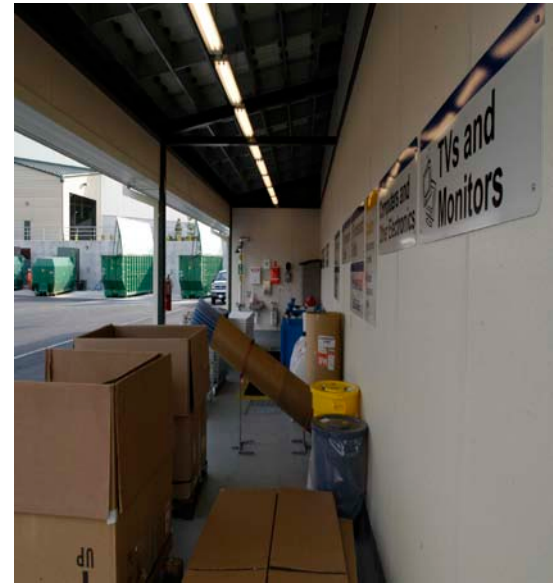
Current Commodity Prices – South Central Region

| Commodity | Price per Ton |
|----------------------------------|--------------------|
| Aluminum | \$1,500 to \$1,600 |
| Plastics | \$300 to \$800 |
| Sorted Office Paper (baled) | \$100 to \$105 |
| Old Corrugated Cardboard (baled) | \$80 to \$85 |
| Old Newspaper (baled) | \$65 to \$85 |
| Steel | \$60 to \$75 |
| Glass | \$0 to \$30 |



Environmental Issues

- Materials with negative cost/benefit may still be worth collecting
 - Household hazardous waste (HHW)
 - E-waste
- Environmental considerations must be taken into account
 - Potential for illegal dumping



Household Hazardous Waste



HHW Recycling and Reuse



- Drop-off collection may occur at permanent facilities, mobile units, or one-day events
- At drop-off site, citizens may exchange and reuse:
 - Paints
 - Solvents
 - Cleaning products
 - Pesticides
- Paints may be collected to be remanufactured and resold by producers as recycled product



Hiring a Contractor to Dispose of HHW

- Contract should specify:
 - Waste collected
 - Cost of disposal
 - Material packaging used in disposal
 - Disposal methodology
- H-GAC has standing contract with vendor to provide collection for member communities
 - Talk with H-GAC for details





Collection of E-Waste



- Collection may occur at drop-off sites or one-day events
- H-GAC area recyclers provide collection at municipal drop-off sites
 - Diligently select recycler
 - Unscrupulous “recyclers” improperly dump e-waste in foreign countries
- H-GAC has standing contract with vendor to provide collection for member communities
 - Talk with H-GAC for details



H-GAC Area E-Waste Recyclers

| | |
|------------------------------|--------------------------------|
| Alpha Laser Recharge | Recycle America |
| Altech | Rose Metal Processing |
| CCF Recycling | Scrap Computer |
| Coleman Engineering & Metals | South Post Oak Recycling |
| Commercial Metals | Surplus Buyers |
| CompuCycle | Texas Diversified Technologies |
| Eagle Electronics | Texas Metal Recyclers |
| JLA Electronics | |



Strategies to Increase Diversion



Public Education

- Higher levels of public education spending yield higher levels of diversion
- Marketing materials chosen are critical (further detail provided in Public Education Presentation)



Add New Facilities

- More drop-off sites = greater diversion
 - Locate in more highly populated areas and near major roads



Regional Partnership



- Establish regional recycling cooperative
 - Cooperative marketing of recyclables to end markets
 - Joint customer education program
- Cooperatives are particularly useful to rural communities



Interlocal Agreements

- Facilitate cooperation via sharing of facilities
 - Provide a basis for revenue and expense sharing
 - Set standards for recyclable contamination levels



Questions or Comments?

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