Collection and Processing of Recyclables
At Colleges and Universities
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Stanford Recycling

Building a Sustainable Campus Community

UC Santa Cruz
June 21, 2005
Stanford Recycling

Basic Recyclables
- Collect bottles and cans, mixed paper, corrugated cardboard.
- Over 3800 recycling bins on campus
- Recycling bins are serviced once per week.
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Organics Program
- Yard Waste
- Wood Waste
- Grasscycling
- Turning Woody Brush into Mulch
- Turning Logs into Wood Chips
- Food Waste
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- Construction and Demolition Debris
- Scrap Metal
- Scrap Electronics including cell phones and consumer electronic devices
- Batteries
- Toner Cartridges
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- Reduce Waste
  - Double-side copy
  - Use Draft Paper
- Reuse
  - SUMarket
  - Material Exchange Store
- Education
  - Internship Program
Summary - 60% Diversion!

<table>
<thead>
<tr>
<th>Material</th>
<th>% of Discards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Recyclables</td>
<td>19%</td>
</tr>
<tr>
<td>Organics</td>
<td>25%</td>
</tr>
<tr>
<td>Construction</td>
<td>16%</td>
</tr>
<tr>
<td>2004 Diversion Rate</td>
<td>60%</td>
</tr>
</tbody>
</table>
Stanford University’s Diversion Rate 1994-2004
Streams of Recyclables

Why is how you collect the material important?

- How you collect will determine what type of material you will have to market and what kind of salvage revenue you will receive to support your program.
- Because recycling manufacturers are relying on a steady and consistent supply of recyclable materials generated from your recycling programs.
Streams of Recyclables

Multi-Stream
- Single categories of material
- Pros: clean sorted material, reduce labor
- Cons: requires multiple containers and generator support
- Other?
Streams of Recyclables

**Dual-Stream**

- Two streams - all bottles and cans and all paper in two separate bins
- **Pros:** relatively clean paper that can be sold as mixed paper, less collections bins
- **Cons:** Needs to be sorted in order to high grade material. Bottles and cans need to be sorted.
- **Other?**
Streams of Recyclables

Single-Stream

- All bottles and cans and paper in the same bin
- Pros: More efficient collection, less collection bins
- Cons: More contaminants collected, paper contaminated by glass and plastic residue, markets
- Other?
Streams of Recyclables

Question: Which should you pick?
Answer: It depends on your internal collection system, local markets, and local government system.

- Material Recovery Facilities
- Transfer Stations
- Dirty MRFs
Collecting Recyclables
Off Loading
Sorting At Stanford
Sorting Facility
The Start
Conveyor Belts
Inside Sorting Facility
Inside Sorting Facility
Inside Sorting Facility
The End of the Line
The End of the Line
The Extras
Why Do We Sort?

- Want flexibility in the market
- Want higher salvage revenue
  - Want California Refund Value
- Highest and best use of material
- Reduce cost on collections
- Clean up contamination
- Others?
Does It Make Sense to Sort?

- Sometimes yes, and sometimes no.
- Depends on what the market is doing.
- Depends on your local conditions.
- Bottles and cans.
Considerations

- Space
- Funding
- Material Type
- Local Markets
- Transportation
Costs to Sort

How much does it cost to sort?
- Measured in Dollars Per Ton
- Depends on how much you have to sort

Labor Costs (The Biggest Cost)

Equipment Costs (Amortized over 5 to 7 Years)

Upgrades in equipment should reduce labor costs.

Baling equipment can bring increased revenue.
## Paper

<table>
<thead>
<tr>
<th>Grade</th>
<th>Current Price</th>
<th>Average Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Paper</td>
<td>$97.00</td>
<td>$40.99</td>
</tr>
<tr>
<td>Super Mix</td>
<td>$90.00</td>
<td>$59.78</td>
</tr>
<tr>
<td>OP1</td>
<td>$95.00</td>
<td></td>
</tr>
<tr>
<td>OP2</td>
<td>$65.00</td>
<td>$54.87</td>
</tr>
<tr>
<td>White Ledger</td>
<td>$180.00</td>
<td>$160.34</td>
</tr>
</tbody>
</table>
Challenges to Sorting

- Market Fluctuation
- Keeping Productivity Up
- Updating Equipment
- Maintaining Equipment
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