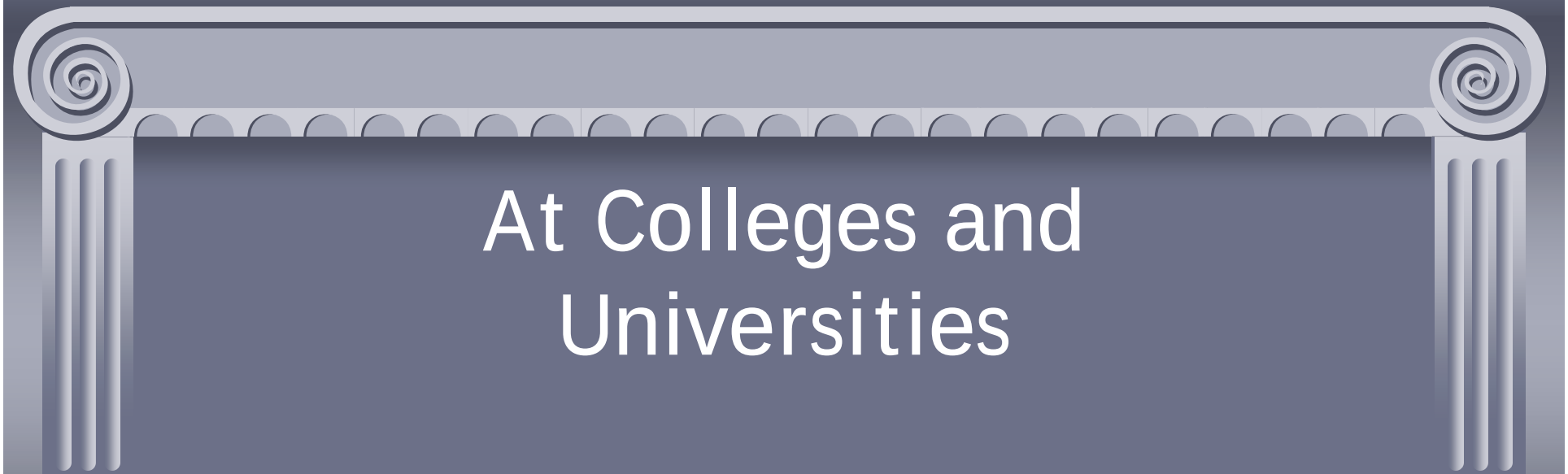
Collection and Processing of Recyclables



At Colleges and Universities

Julie C. Muir
Peninsula Sanitary Service, Inc.
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.

Stanford Recycling

- Organics Program
  - Yard Waste
  - Wood Waste
  - Grasscycling
  - Turning Woody Brush into Mulch
  - Turning Logs into Wood Chips
  - Food Waste

Stanford Recycling

- Construction and Demolition Debris
- Scrap Metal
- Scrap Electronics including cell phones and consumer electronic devices
- Batteries
- Toner Cartridges

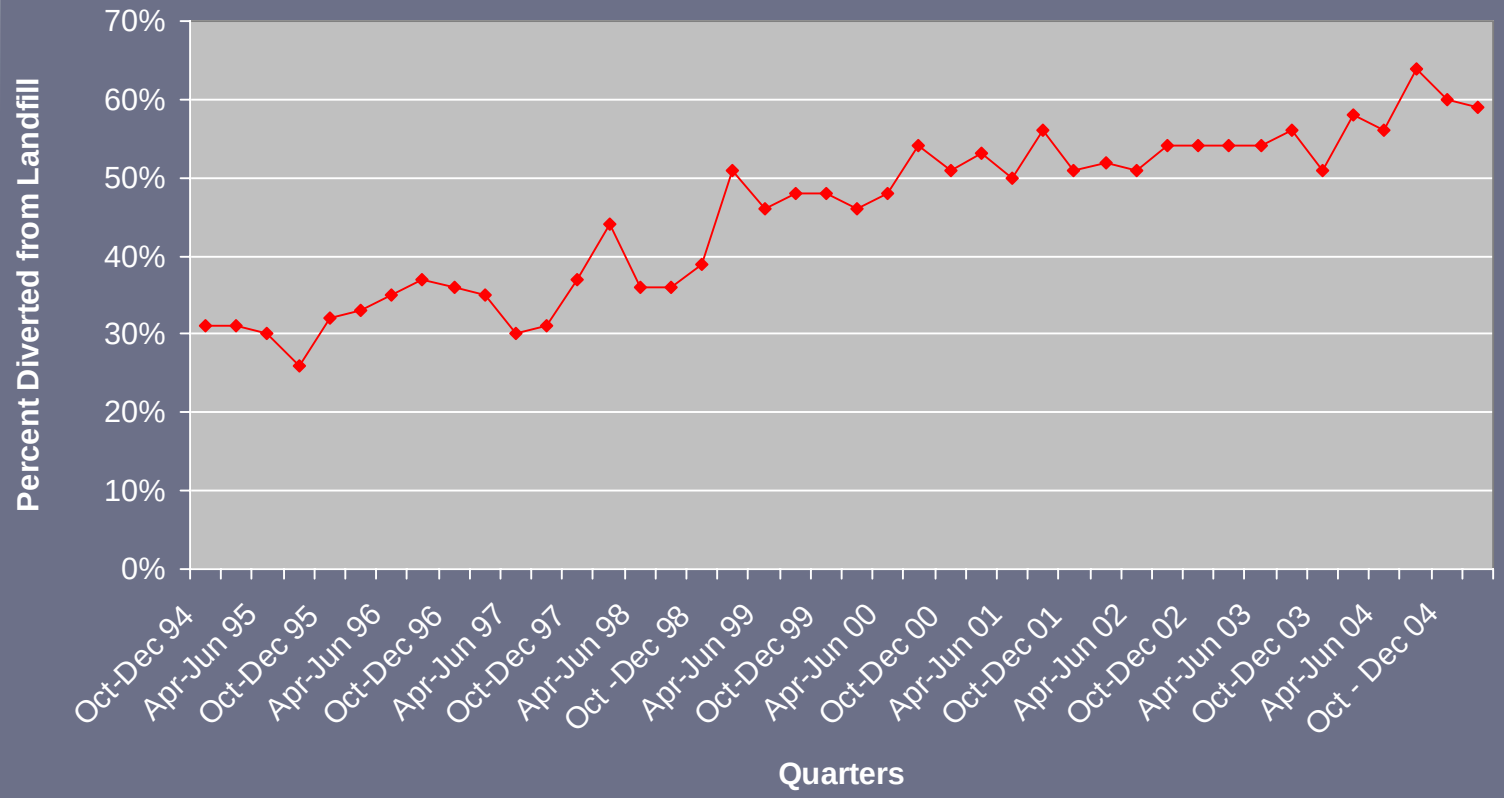
Stanford Recycling

- Reduce Waste
  - Double-side copy
  - Use Draft Paper
- Reuse
  - SUMarket
  - Material Exchange Store
- Education
  - Internship Program

Summary – 60% Diversion!

Material	% of Discards
Basic Recyclables	19%
Organics	25%
Construction	16%
2004 Diversion Rate	60%

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?

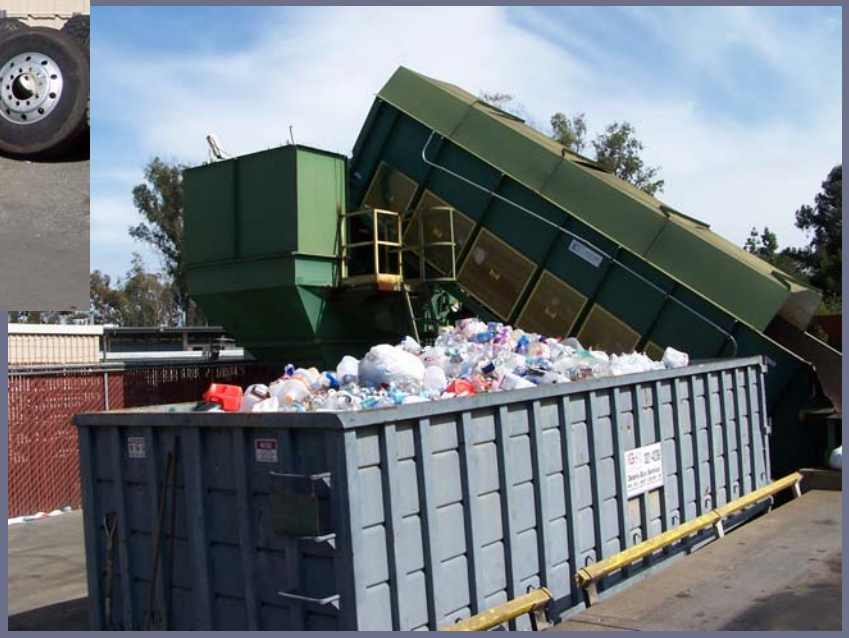
Streams of Recyclables

- 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

Grade	Current Price	Average Price
Mixed Paper	$97.00	$40.99
Super Mix	$90.00	$59.78
OP1	$95.00	
OP2	$65.00	$54.87
White Ledger	$180.00	$160.34

Challenges to Sorting

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

Julie Muir
Peninsula Sanitary Service
Stanford Recycling Center
339 Bonair Siding
Stanford, CA 94305
(650) 321-4236
juliem@pssi.stanford.edu
http://recycling.stanford.edu