About UCSF
Problem Statement

Annual Shredding
- 2.4 millions pounds
- $250,000

Key issues
- Parnassus neighbors
- Landfill diversion
Objectives

• Examine Current State
  • Multiple Vendors

• Evaluate 3 Alternatives
  1. Outsourced consolidated contract
  2. In-house shredding
  3. Hybrid

• Decision Analysis & Recommendation
Current State: Process

**Off-site Shredding**
- Employees
- Shredding Bins
- Campus
- Shredding Vendor #1
- Vendor #1 Shredding Facility
- Shredded Paper
- Pulp / Paper Mill A
- Recycled Paper

**Mobile Shredding**
- Employees
- Shredding Bins
- Medical Center
- Shredding Vendor #2
- Shredded Paper
- Pulp / Paper Mill B
- Recycled Paper
Current State: Vendors
Current State: Demand

2.4 million pounds annually (2011)
- 99% from Medical Center
- 800 bin locations
- 3000 bins emptied per month

Demand Scenarios

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,200,000 lbs</td>
<td>2,400,000 lbs</td>
<td>3,000,000 lbs</td>
</tr>
</tbody>
</table>

Includes: Impact of Digitizing & Demographic Shifts
Option 1: Consolidated Contract
Option 2: In-House Shredding
Option 3: Hybrid

Diagram showing the flow of shredded paper from employees to shredding bins to UCSF Warehouse to Consolidated Shredding Contract Vendor to Vendor Shredding Facility to Shredded Paper to Pulp / Paper Mill to Recycled Paper.
Recommended Option

Option 2: In-House Shredding

Comparison of Options:

• Cost Analysis
• Total Quality Management
• Sustainability
• Risks
Cost Analysis: Comparison

<table>
<thead>
<tr>
<th>Demand Scenario</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status Quo</td>
<td>$(1,000,000)</td>
<td>$(2,000,000)</td>
<td>$(2,500,000)</td>
</tr>
<tr>
<td>Consolidated</td>
<td>$(750,000)</td>
<td>$(1,500,000)</td>
<td>$(1,875,000)</td>
</tr>
<tr>
<td>In-House</td>
<td>$500,838</td>
<td>$1,440,085</td>
<td>$1,624,451</td>
</tr>
<tr>
<td>Hybrid</td>
<td>$(1,010,840)</td>
<td>$(2,010,840)</td>
<td>$(2,510,840)</td>
</tr>
</tbody>
</table>

UCSF-wide revenues (costs)

<table>
<thead>
<tr>
<th>Demand Scenario</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status Quo</td>
<td>$0.10</td>
<td>$0.10</td>
<td>$0.10</td>
</tr>
<tr>
<td>Consolidated</td>
<td>$0.08</td>
<td>$0.08</td>
<td>$0.08</td>
</tr>
<tr>
<td>In-House (no recycling $)</td>
<td>$0.11</td>
<td>$0.07</td>
<td>$0.05</td>
</tr>
<tr>
<td>In-House (recycling $)</td>
<td>$0.05</td>
<td>($0.01)</td>
<td>($0.02)</td>
</tr>
<tr>
<td>Hybrid</td>
<td>$0.10</td>
<td>$0.10</td>
<td>$0.10</td>
</tr>
</tbody>
</table>

UCSF departmental costs (per pound of shredded material)
Cost Analysis: Equipment & Labor
Total Quality Management

Consolidated
UCSF must select and manage a vendor that delivers on key performance indicators.

Hybrid
UCSF must ensure all aspects of TQM for both other options. Additional communication required between warehouse and vendor.

In-House
UCSF must implement and manage quality control:
- HIPAA requirements
- service delivery
- internal survey
- employee empowerment
Sustainability: Current State

- 20,400 Trees
- 456,000 Gallons of Oil
- 8,400,000 gallons of water
- 3,600 cubic yard of landfill
- 4,800,000 kW of energy
Sustainability: Consolidated

CINTAS

recall

Shred-it

SHRED WORKS
# Sustainability: In-House

Financial and sustainability impacts from transportation

<table>
<thead>
<tr>
<th></th>
<th>In-House</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round Trip Miles</td>
<td>24.8</td>
</tr>
<tr>
<td>Total miles per day (w/ 5 trucks)</td>
<td>124</td>
</tr>
<tr>
<td>Miles per Year (250 days)</td>
<td>31,000</td>
</tr>
<tr>
<td># of gallons of diesel (at 5.3MPG)*</td>
<td>5850</td>
</tr>
<tr>
<td>Total annual spend on gas at $4.40/diesel**</td>
<td>$15,500</td>
</tr>
<tr>
<td>CO2 (Metric Tons)</td>
<td>3.432</td>
</tr>
</tbody>
</table>
### Sustainability: Comparison

LCA-based environmental impacts from transportation

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Unit</th>
<th>In-House</th>
<th>Hybrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone depletion</td>
<td>kg CFC-11 eq</td>
<td>1.30E-07</td>
<td>4.24E-07</td>
</tr>
<tr>
<td>Global warming</td>
<td>kg CO2 eq</td>
<td>3432.96</td>
<td>11137.99</td>
</tr>
<tr>
<td>Smog</td>
<td>kg O3 eq</td>
<td>561.29</td>
<td>1821.07</td>
</tr>
<tr>
<td>Acidification</td>
<td>mol H+ eq</td>
<td>1141.87</td>
<td>3704.71</td>
</tr>
<tr>
<td>Eutrophication</td>
<td>kg N eq</td>
<td>1.142</td>
<td>3.71</td>
</tr>
<tr>
<td>Carcinogenics</td>
<td>CTUh</td>
<td>4.70E-05</td>
<td>0.00015</td>
</tr>
<tr>
<td>Non carcinogenics</td>
<td>CTUh</td>
<td>0.00045</td>
<td>0.0015</td>
</tr>
<tr>
<td>Respiratory effects</td>
<td>kg PM10 eq</td>
<td>1.259</td>
<td>4.09</td>
</tr>
<tr>
<td>Ecotoxicity</td>
<td>CTUe</td>
<td>8699.84</td>
<td>28226.0047</td>
</tr>
</tbody>
</table>

- Modeled in SimaPro 7 with TRACI 2.0 impact categories
- Assumes a diesel combination truck driven 31,000 miles/year (124 miles day * 250 days/year) on 1250 trips with 0.871 metric tons (2.4 million lbs / 1250 trips) of paper per load.
Sustainability Recommendations

4 EL Projects?
Green Fleet Leasing
Risks: Comparison

UCSF will have less insight and less control over:
- amount of paper / sustainability metrics
- noise/air pollution from truck routes
- no direct control over sustainability performance

Consolidated
- Lowest Risk
Risks: Comparison

In-House
• High risk / High reward

UCSF will face:
• institution-wide opt-in
• large capital investment
• logistics design
• background checks on employees

• need for secure transportation
• backup for equipment failure
• limited capacity expansion
• fire risk
Risks: Comparison

Hybrid
- All risk / no reward

UCSF will face:
- institution-wide opt-in
- logistics design
- background checks on employees
- need for secure transportation and transitions
Decision Tree: Total

Medical Center Participates

0.33 Medium Shredding Demand

$ 1,181,582

Status Quo

$ (2,000,000) $ (2,000,000)

Consolidate

$ (1,500,000) $ (1,500,000)

In-House

$ 1,440,085 $ 1,440,085

Hybrid

$ (2,010,840) $ (2,010,840)

Total

$ 1,440,085

Total Cost: $ 1,440,085
Implementation Timeline: In-House

Internal Survey to Determine Interest

UCSF Hybrid Shredding

UCSF RFP

Rework routes/Prepare Warehouse

In-house Option

Procurement sign-off

Buy Equipment

Rework routes/Prepare Warehouse

Outsourced Consolidated Shredding

UCSF RFP/Procurement sign-off
Conclusion
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Recall:  • Jim Wruck

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Shred-it:  • Hong Luu
Team Learnings
Questions?