



Metro Nashville:

**Total Solid Waste Management
Planning and Implementation**

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Total Solid Waste Management Planning and Implementation

▶ Metro Government of Nashville

- City & County Merged in 1963
- 570,000 Population
- 40 Council Members
- Elected Mayor
- State Capitol
- "Music City USA"
- Major Tourist and University Town
- Growing High Tech & Financial Base
- AA+ Bond Rating



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▶ Waste Management Analysis

Background

- Mayor Purcell came to office with plans to implement a series of performance audits
- Major changes in Nashville's WTE Plant was not on the agenda but the Mayor was committed to a full review of all other aspects of the Solid Waste Program
- The previous Administration had recently completed a \$30 million upgrade of Nashville Thermal to address air pollution issues
- Nashville's downtown riverfront was a very under utilized asset with its potential seriously hampered as the site of the City's primary waste disposal facility



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Disposal of MSW and District Energy

- Waste To Energy Plant (aka Thermal)
- Located on the Cumberland River in Down Town Nashville
- One of the Oldest WTE Plants In U.S.
- Thermal owned Distribution Lines
- Provided Heating and Cooling to 39 Customers: State and Metro Offices and Facilities, Private Office Buildings

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The First Sign Of A Problem

First day on the job in September 1999, Former Mayor Bill Purcell received a request from Thermal Management for \$1 million in additional unbudgeted funding and it was clear that much more would be needed.





Mayor Purcell

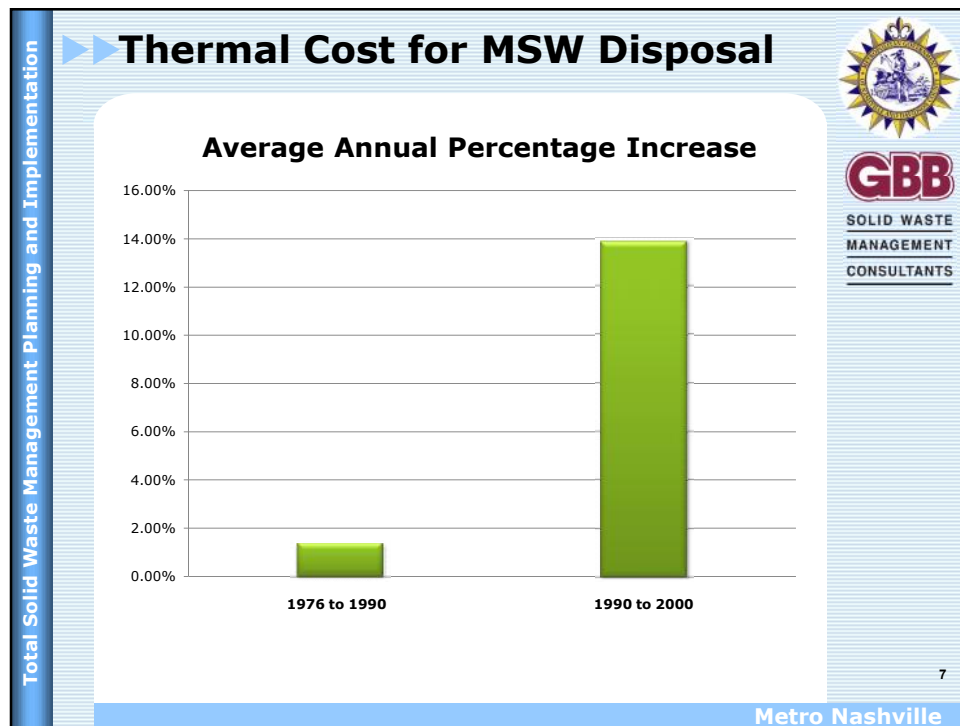


Nashville Thermal Transfer Plant

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Consultant Team

An Expert Team was Assembled

- Gershman, Brickner & Bratton, Inc.
- HDR Engineering, Inc.
- PricewaterhouseCoopers
- Gresham Smith & Partners
- Norman Hall & Associates
- Kattner/FVB District Energy Inc.
- Boulton, Cummings, Connors & Berry, PLC
- Hawkins Delafield & Wood, P.C.

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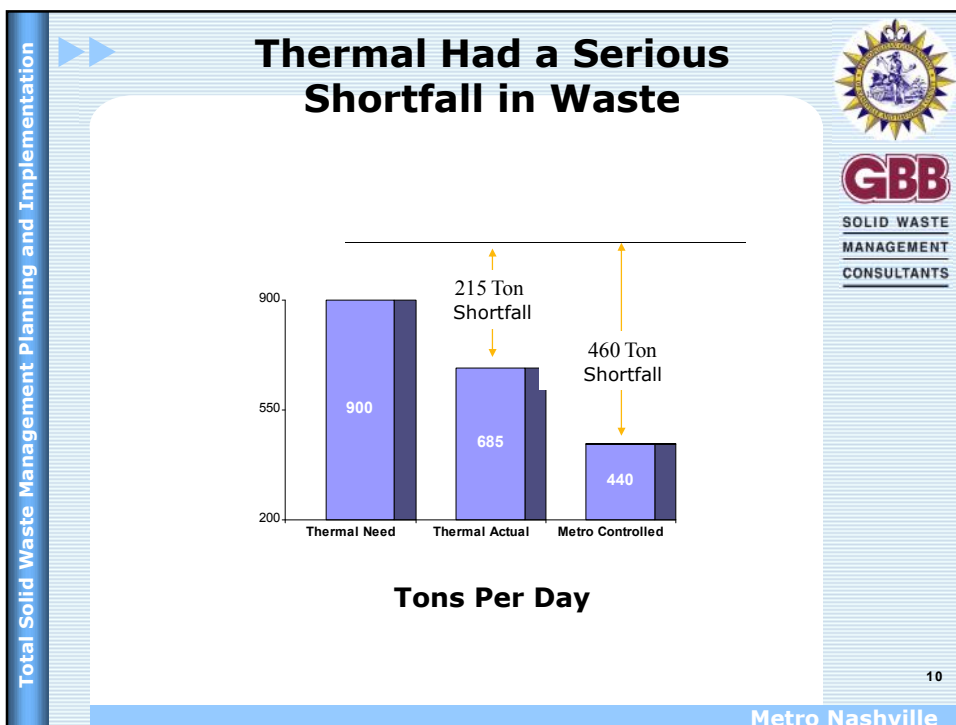

Thermal was Inefficient

Burn Efficiency

- WTE Industry Average: 93 %
- Thermal:
 - 1990 to 1997 Averaged 85%
 - 1998 Averaged 78.5%
 - 1999 Averaged 66%
 - 2000 Averaged 75%
 - 2001 Averaged 63%

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▶ What Was Wrong with Thermal?

- Aged Plant Was **Failing**
- Costs Were **Out of Control**
- Cost of Disposal Exceeded \$15 million
(\$89 per ton)



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▶ Options Evaluated to Increase Waste to Thermal

- Reduce or eliminate tipping fee for non-Metro waste
- Expansion of Urban Services District
- Adopt a Waste Generator Fee (Garbage Tax)
- Contract with Private Haulers to Deliver Waste to Thermal
- Encourage Thermal Energy Customers to Deliver Waste to Thermal
- Mandate Metro Collection of all Commercial Waste
- Accept Out-of-County Waste



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Options to Increase Waste to Thermal



Reduce or Eliminate Thermal Tipping Fee

- Thermal Fee was Already Below Average
- In 1998 the Fee was Cut by Almost 50%
- Waste Deliveries Continued to Decline
- Reduces Metro Revenue Significantly



Conclusion:
No Reason To Believe This Strategy Would Succeed.

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Options to Increase Waste to Thermal



Expansion of Urban Services District

- Requires a 25% Tax Increase for Over 100,000
- Additional Metro Services Required
- 85% of GSD Residential Waste Already Goes to Thermal



Conclusion:
Not Financially Feasible and Will Not Result in Significant Additional Waste to Thermal.

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Options to Increase Waste to Thermal



Waste Generator Fee (Garbage Tax)

- Taxes All Businesses and Citizens
- Eliminates Thermal Tipping Fee
- Will Not Assure Significantly More Waste to Thermal
- Could Result in Double Charging for Disposal
- High Administrative Cost



Conclusion:
**Inequitable, Controversial and
Will Not Assure Significantly
More Waste to Thermal.**

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Options to Increase Waste to Thermal



Contracts With Private Haulers

- Increases Thermal Cost
- Marginal Success With Prior Efforts
- Major Haulers Have Powerful Economic Incentives to Use Their Own Landfills



Conclusion:
**Increased Costs
With Little Likelihood of Success.**

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Options to Increase Waste to Thermal



Encourage Thermal Energy Customers to Deliver Waste to Thermal

- Volume Is Relatively Small
- Unlikely to Be a Dependable Source of Waste



Conclusion:
Not a Meaningful or Dependable Solution.

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Options to Increase Waste to Thermal



Mandate Metro Collection of All Commercial Waste

- Disrupts Over 10,000 Private Contracts
- Highly Disruptive to Business Operations
- Increased Cost
- Years of Litigation Will Result
- Major Expansion of Government



Conclusion:
Not Feasible

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Options to Increase Waste to Thermal



Accept Out of County Waste

- Violates Long-standing Council Policy
- Downtown Becomes Regional Waste Disposal Center
- "Specialty" Waste and Tires
- Increased Environmental Concerns



Conclusion:
**Poor Economic and Environmental Policy
but Could Increase Thermal Waste.**

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Options to Increase Waste to Thermal



General Conclusions

- All Available Solutions Were Either Insufficient or Created More Problems Than They Solved.
- There Was No Responsible Way to Assure Sufficient Waste for Thermal to Justify the Large Amounts of Additional Taxpayer Money needed by Thermal.

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▶ Long-Term Waste Management Options and Costs

30 Year Cost (NPV)

- Keep Thermal With 900 Tons Per Day and \$15 Million Retrofit - **\$479 Million**
- Keep Thermal With 685 Tons Per Day and \$15 Million Retrofit - **\$596.5 Million**
- Keep Thermal With 548 Tons Per Day (After Recycling) - **\$688.9 Million**
- Close Thermal/recycle and Private Landfill (Out of County) - **\$435 Million**

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▶ District Energy System

Because virtually all of the Government and a substantial portion of the private sector located in downtown Nashville was dependent on Thermal for heating and cooling, the energy producing element of Thermal had to be replaced. This resulted in the birth of Nashville's new District Energy System.



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▶ District Energy System - Goals

- Private Sector/Metro Partnership
- Maintain or Reduce Current Rates for Heating and Cooling
- Guaranteed Costs of Construction / Operation
- Environmentally Sound
- Long Term Contract With Quality Operator



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▶ Winning Proposal

Constellation Energy Projects and Services (Baltimore, MD)
\$12 Billion in Assets

- R.C. Mathews Contractor
- Travis Electric
- Nashville Machine Company
- Smith Seckman Reid (design)
- Everton Oglesby Askew (architect)
- E. Roberts Alley & Associates (environmental)
- Structural Affiliates (structural)



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Winning Proposal

- No Cost to Taxpayer (other than the heating and cooling cost for public buildings)
- Lower Heating/Cooling Rates
- 15 Year Contract (w/ option to extend to 30 years)
- Capital Costs \$47.2 million - Revenue Bonds
- Letter of Credit Guarantee
- Parent Corporation Guarantee

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Winning Proposal



Cost to Energy Customers

Total Annual Costs Thermal	\$15,500,000*
Total Annual Costs of New DES	\$13,800,000
Savings	\$1,700,000
Cost Reduction	11%

* based on 2004 projections

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DISTRICT ENERGY SYSTEM

Award Winning District Heating/Cooling Project









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Green Demolition of Nashville Thermal

- Site cleanup (UST's and Asbestos removal)
- Plant Equipment Sold via Internet Auction
- Demolition and materials reuse/recycling
- Site restoration w/cover soil and grass
- % Recycled/Reused Materials = **98.5%**



WTE Equipment Auction

Fans
Pumps
Boilers
Soot Blowers
Ram Extractors
and MORE!!!

Nashville Thermal
Online Auction
38 Pieces
Ends April 22nd

 <http://ebid.nashville.gov>





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Green Demolition of Nashville Thermal

- Original Year 2000 Demo Estimate: \$2,400,000
- Final Project Costs:
 - UST: \$128,000
 - Asbestos Removal: \$ 86,000
 - Fencing \$13,000
 - Demolition \$ 775,000
 - Cover Dirt & Seeding \$ 96,000
 - Subtotal Cost 1,098,000
 - Equipment Sale (\$983,000)
via Internet Auction
- Actual Net Total Dismantlement Cost: \$115,000

Final Cost = 5% of Original Budget!

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Transfer and Disposal Proposal

Companies Competing:

- Waste Management
- BFI/Allied Waste
- Waste Industries
- Republic
- Waste Recovery

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Winning Proposal

BFI/Allied Waste
@ \$26.10 per ton

- 20 Year Contract
- Performance Bond
- Parent Corporation Guarantee



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Waste Disposal: Thermal vs Contract Costs

Year	Disposal Costs	Savings	Old Thermal Debt	Total Savings
2002	\$14,204,400	n/a	\$9,338,510	n/a
2003	\$14,914,620	n/a	\$9,343,814	n/a
2004	\$4,508,000	\$10,779,486	\$9,338,433	\$1,441,053
2005	\$4,620,700	\$11,048,973	\$9,341,883	\$1,707,090
2006	\$4,736,218	\$11,325,197	\$9,337,953	\$1,987,244
2007	\$4,854,623	\$11,608,327	\$9,335,828	\$2,272,499
2008	\$4,975,989	\$11,898,535	\$4,866,518	\$7,032,017
2009	\$5,100,388	\$12,195,998	\$4,867,078	\$7,328,920
2010	\$5,227,898	\$12,500,898	\$4,870,328	\$7,630,570
2011	\$5,358,595	\$12,813,421	\$4,868,138	\$7,945,283
2012	\$5,492,560	\$13,133,756	\$4,146,755	\$8,987,001
2013	\$5,629,874	\$13,462,100	\$3,341,563	\$10,120,537
2014	\$5,770,621	\$13,798,653	\$3,343,275	\$10,455,378
			Total	\$66,907,592



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Improving Solid Waste Operations

- Curbside Recycling
 - Nashville's program limited to small area of City
 - No coherent strategy
 - Inefficient and expensive
- Curbside Trash Collection
 - Program was labor intensive
 - Included a mix of public employees and private collection companies
 - Weak oversight of contracts

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Total Solid Waste Management Planning and Implementation



Improving Solid Waste Operations

Old Curbside Recycling Program

- Curbside Collection Performed On Overtime
- Materials Collected In Rear Loaders
- Over \$300 Per Ton To Collect
- \$40 Per Ton To Process
- Little To No Public Education
- Material Collected In Bins
- No Communication System In Trucks

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Improving Solid Waste Operations



Old Curbside Trash Collection Program



- Combination Contracted and Metro Collection
- Inefficient Routes
- 3 Person Crews
- Annual Truck Maintenance Cost More Than New Vehicle
- High Injured On Duty Rate
- High Amount Of Litter
- No Public Education
- No Communication System In Trucks

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Total Solid Waste Management Planning and Implementation

Improving Solid Waste Operations



What We Decided to Do

- Implement a Cart-based System
- Implement Use Of Automated & Semi-Automated Trucks
- Implement New And Efficient Routes
- Implement Environmental Education
- Implement Lower Costs

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Improving Solid Waste Operations

- Procurement for Carts
- RFP For 10 Year Contract To Provide, Warranty, and Service Containers
- Cascade, OTTO, ZARN, Rehrig Pacific, and Stringfellow/Toter Submitted Proposals
- Stringfellow/Toter Won Contract:
 - 96 gallon = \$35.39
 - Assemble/Deliver = \$2.15
 - Service Agreement = \$1.56 Annually

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Improving Solid Waste Operations

Procurement for New Trucks

- RFP Issued For Partnership
- McNeilus, Labrie, and Stringfellow/Heil submitted
- Stringfellow/Heil Won
 - 5 Year Contract
 - 5 Year Bumper to Bumper Warranty
 - Automated = \$167,000
 - Front Loader = \$141,000
 - Semi-Automated - \$113,000

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Old Collection Method



- Bottomless Cans
- Worker Injuries



- More Litter
- Vector Problems



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New Collection Method



- Reduced Worker Injuries
- Reduced Labor Costs



- 10 Year Full Warranty On Carts
- 5 Year Bumper To Bumper Warranty On Trucks



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▶ Improving Solid Waste Operations

Improving Routing

- Routes Had Not Been Updated For Decades
- Utilized C2Logix/WasteBid.com's FleetRoute Software
- Established Symmetry To Household Recycling and Trash Routes
- Fewer Routes – Trucks and Crews
- Balanced Workloads – No "Easy Routes"
- Balanced Workdays – Reduced Overtime

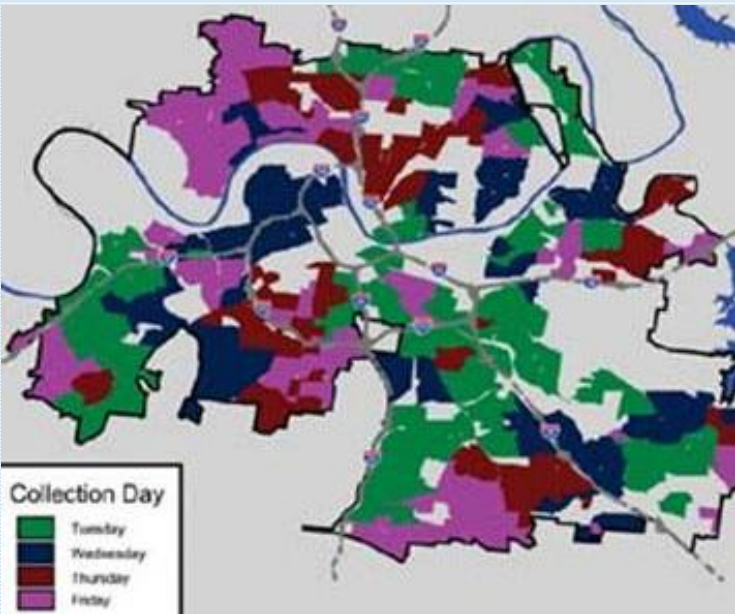
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▶ Old Collection Routes




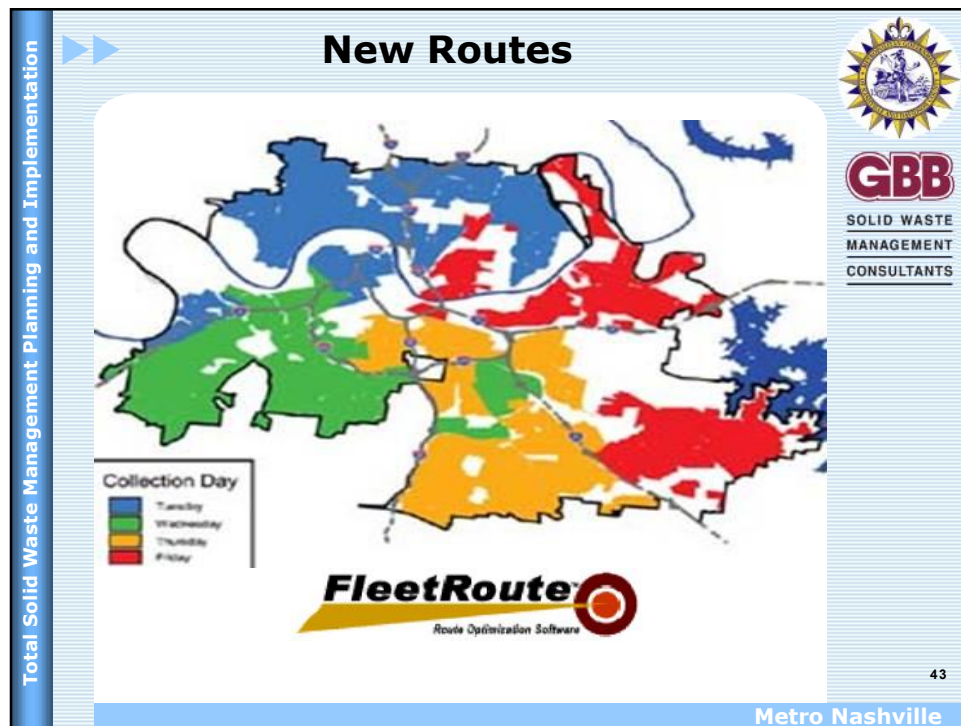
Collection Day

- Tuesday
- Wednesday
- Thursday
- Friday

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Improving Solid Waste Operations

Education

- RFP For Education Development
- McNeely, Pigott, and Fox Under Contract
- \$2.00 Per Capita On Education
- New Billboards
- Window Stickers
- E-mail / Phone Reminder
- Newspaper Columns
- Newsletter / Bulletin Inserts
- Free Media
- Public Meetings
- Targeted Neighborhoods

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Education

Billboards



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Attractive signage at our facilities



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Trucks as traveling message boards



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Awards



- 2003 Silver Anvil Award, Public Relations Society of America
- 2003 Bronze Public Education Excellence Award, Solid Waste Association of North America

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Improving Solid Waste Operations

Lowering Curbside Trash Costs

Year	Old Contracts	New Contracts	Annual Savings	Cumulative Savings
1	9,475,207	8,227,184	1,248,023	1,248,023
2	9,636,286	8,367,046	1,269,239	2,517,262
3	9,800,102	8,509,286	1,290,816	3,808,079
4	9,966,704	8,653,944	1,312,760	5,120,839
5	10,136,138	8,801,061	1,335,077	6,455,916
6	10,308,452	8,950,679	1,357,774	7,813,690
7	10,483,696	9,102,840	1,380,856	9,194,546
8	10,661,919	9,257,589	1,404,330	10,598,876
9	10,843,172	9,414,968	1,428,204	12,027,080
10	11,027,505	9,575,022	1,452,483	13,479,563

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Improving Solid Waste Operations

Recycling/Convenience Centers

- Only 2 Facilities Countywide
- Limited Hours
- Limited Customer Service
- Containers Difficult for Customers to Use

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Upgraded Recycling / Convenience Centers



- A Clean Environment
- Easy To Use

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Total Solid Waste Management Planning and Implementation

Upgraded Recycling / Convenience Centers

Friendly Customer Service
Convenient Hours





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▶ Recycling/Convenience Centers



Results



- Customers Per Year:
 - 42,000 in 2000
 - 117,000 in 2004
- Contracted roll-off hauling replaced w/Metro haulers & roll-offs packed more efficiently
- Operating cost dropped from \$991k to \$737k
- Cost per customer dropped from \$23 to \$10

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▶ Household Hazardous Waste



- The facility shut down halfway through 2000 because of ballooning costs.
- In 2000, facility was open 4 hours one Saturday a month
- Few customers used it
- Did not take electronic waste
- Operated totally by contractors

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Household Hazardous Waste

What We Did

- Developed and implemented plan
- Replaced contract labor with in-house labor
- Increased operational days and hours
- Increased competition among vendors who sell supplies
- Optimized storage
- Optimized recycling and reuse
- Educated public on alternatives to toxic material
- Improved customer service

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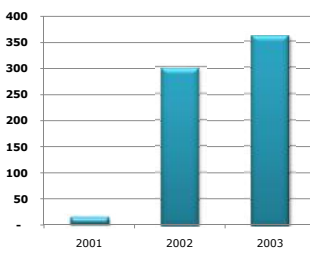
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Household Hazardous Waste

Results

- Days Of Operation Go Up
- Annual Cost Drops From \$300,000 in 2000 to \$150,000 a Year
- 1,500 Annual Customers in 2000
- 11,000 Annual Customers in Recent Years



HHW Days Open



Year	HHW Days Open
2001	~20
2002	~300
2003	~350

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Household Hazardous Waste

Award

- 2004 Bronze Excellence Award for Household Hazardous Waste Facility
- Solid Waste Association of North America



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Total Solid Waste Management Planning and Implementation

Savings from Total Plan

2007 Independent Audit Validated the Results


- Audit was conducted under the supervision of the Metro Council Audit Committee
- Audit work performed by a highly qualified and independent contractor

Audit Conclusion:

The Audit concluded that the savings "have not only materialized, but appear to be greater than were originally estimated through the current year."

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Thank You!

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