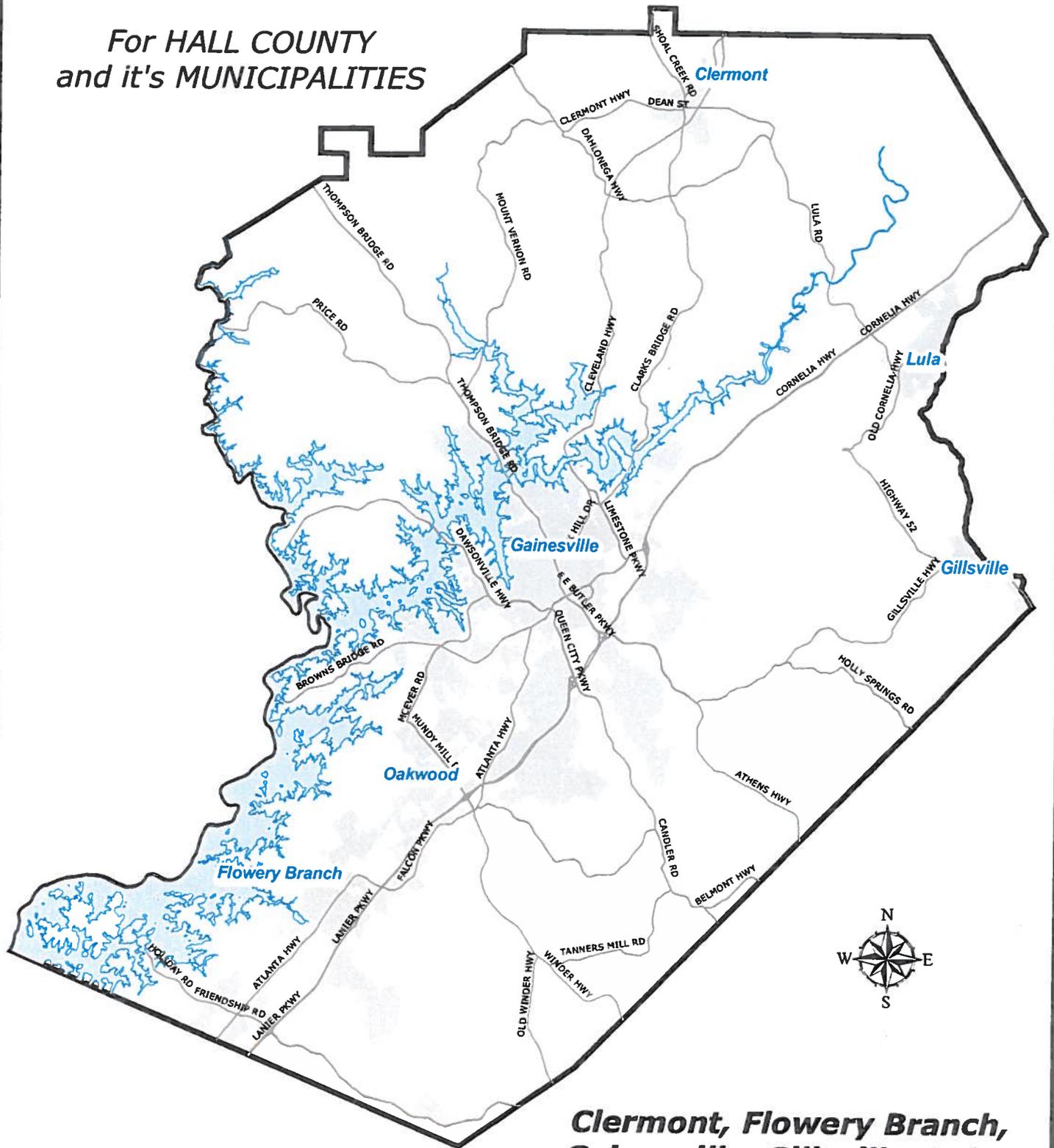


2004 COMPREHENSIVE SOLID WASTE MANAGEMENT PLAN

For HALL COUNTY
and it's MUNICIPALITIES



**Clermont, Flowery Branch,
Gainesville, Gillsville, Lula,
Oakwood, & Hall County**

**Hall County
Comprehensive Solid Waste Management Plan**

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EXECUTIVE SUMMARY

The Comprehensive Solid Waste Management Plan for Hall County and its Municipalities is a result of the planning requirements established by the Georgia Comprehensive Solid Waste Management Act. This Act requires that two goals be met by the plan:

1. Achievement of a 25% per capita reduction in solid waste disposed of by 1996, based on the amount disposed of in FY 1992; and
2. Assurance of adequate solid waste handling capability and capacity for the subsequent 10-year period.

The plan includes the following elements:

1. Waste Disposal Stream Analysis
2. Waste Reduction
3. Collection
4. Disposal
5. Land Limitations
6. Education and Public Involvement
7. Litter Reduction and Beautification (not required by DCA)
8. Implementation Schedule

Waste Disposal Stream Analysis

Source, composition and generation is dealt with in this element. An analysis of available data found the following breakdown of all Hall County generated waste disposed at in-county and out of county landfills by source for 2002.

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Waste Sources Delivered to Hall County Landfill

	November 13-25, 1991	October 20-25, 2003
Commercial	56.8%	16.6%
Industrial	28.5%	21.6%
Residential	14.7%	52.6%
Construction/Demolition	N/A	9.2%

Total Hall County Waste Generation

The sum of all waste generated and disposed within the county, as well as all waste generated within the county and exported to out of county disposal facilities gives the total waste generation from Hall County as 246,853 tons in 2002.

Disposition of Hall County Generated Waste 2002

Hall County Candler Road Landfill	67,528 tons	26%
RTS Landfill	88,000 tons	33%
Crystal Creek Landfill	15,600 tons*	6%
Exported	91,325 tons	35%
Total	262,453	

* estimated at 1,000 cu. yds./week and 600 lbs./cu. yd.

Assuming that virtually all of the waste exported from Hall County is commercial and industrial, except for the documented 1,065 tons known to be exported by cities (residential), would result in the breakdown shown below. It is interesting to note that the overall contribution of residential waste to the total is still roughly 15% (see Table 1). The vast majority of waste generated in Hall County is still from other than residential sources.

Waste Generated By Source 2002

Commercial/Industrial	47%
Residential	15%
Construction/Demolition	38%

KEY RECOMMENDATIONS

Waste Reduction

EnviroShare Program

This successful local program should be continued and expanded, in conjunction with the Greater Hall Chamber of Commerce. The materials exchange component should continue to include materials matching via e-mail and the Internet through the www.enviroshare.org web site to those non-profit groups and agencies doing “public works” in Hall County. This could provide them with needed non-financial resources to benefit the community while diverting waste from disposal. Ways to facilitate materials exchange with the general populace should also be explored.

Cooperative marketing of recyclables should be pursued to assist businesses.

Education and Enforcement

Citizens need to be educated regarding efforts that may be implemented in the household to reduce waste generation. This educational program should be conducted by Resource Recovery. The county should support the continuance of state funding, through the State’s Solid Waste Trust Fund for education and enforcement in regards to solid waste management. When the funding mechanism sunsets in 2005, the County should lobby, through ACCG (Association County Commissioners of Georgia) for renewal.

Drop and Swaps

Drop and swaps are one-day events that can be offered for the purpose of reusing items such as paints and furniture. Such programs have been successful in other areas. The same could also be done with household hazardous wastes on a more limited basis.

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Drop Off Recycling

The current drop off recycling program at compactor sites should be continued and expanded. Additional recycling opportunities should be provided as warranted/available. The additional materials that should be considered include personal computers, due to their anticipated increase in the waste stream and their heavy metals content.

Recycling and Composting Bins Distribution

Home composting units could be distributed at reduced cost to residents of the planning area. Possible state funding should be pursued via grants. Additionally, waste pallets should be made available for use in making home composting bins. Educational efforts promoting home composting should be part of the educational outreach program.

Study Curbside Recycling-County

Curbside recycling would be included in the recommended collection system analysis.

Drop Off Collection Frequency Changes

To better serve residents, a goal of changing collection frequency of recycling roll offs from collection as determined by a set schedule to collection on an as needed basis should be pursued.

Curbside Recycling-Cities

Curbside recycling should be practiced in any municipality that offers curbside refuse collection, with the possible exception of Gillsville, which could do well with a drop off program.

Commercial/Industrial Recycling

A focused effort to show businesses that waste reduction can save them money must be launched. This should be continued via the EnviroShare program and with possible assistance from the Chamber's Environmental Management Committee and others.

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Recycling Center

An evaluation of the Chestnut St. facility should be conducted as to adequacy of the facility to accommodate additional growth during the planning period. This evaluation could also include the ability to process up to 50 tons per day of commingled recyclables.

Collection

Municipalities

Municipalities offering solid waste collection should require curbside collection.

Recycling should mimic solid waste collection by also being collected at the curbside.

Residents would be required to separate recyclables from solid waste and place both at the curb for collection. Collection of refuse and recyclables would be once per week.

Municipalities should continue to handle residential waste collection or contract for service with qualifying private contractors. Privatization of commercial and industrial wastes collection should be encouraged.

Yard trimmings should be collected separately at the curb for separate management.

County

The existing transfer station system should be evaluated. It is recommended that the Solid Waste Plan Implementation Committee (PIC) be given the task of looking into the many issues, serving as a conduit for public input and developing recommendations, which may include identification of further information needs and options for further study. This committee could possibly recommend the hiring of a consulting firm to undertake a thorough study.

Disposal

Hall County's current landfill, Candler Road Landfill, is projected to have in excess of 30 years capacity remaining. This is more than adequate to ensure the required ten year disposal capacity. Measures should be continue to be undertaken, such as waste reduction

Executive Summary

and alternative daily cover to extend its useful life still further. Alternative daily cover practices can have the equivalent impact of as much as a 10.5% waste reduction.

Land Limitation

In regard to plan consistency of solid waste handling facilities, the following are recommended:

1. Financial assurance provisions should be investigated and developed more fully than possible here, to include specific minimums for various types of solid waste handling facilities.
2. The need for local ordinances to back these key plan consistency provisions should be investigated as well as a determination as to whether each municipality must adopt similar ordinances.

Education and Public Involvement

Educational efforts will work through the combined use of available resources consisting of organizations, media, facilities, and special promotions and programs.

The Chamber of Commerce should conduct workshops for local businesses to provide them information regarding how they can implement waste reduction efforts.

A speakers bureau, consisting of representatives from Resource Recovery, county and city sanitation departments, Keep Hall Beautiful and others, should be formed to make educational presentations to professional, business, church organizations, and others.

Hispanic Community Needs

Due to the county's considerable Hispanic population, consideration needs to be given to this segment of the population and the communications difficulty resulting from the language barrier and cultural differences. There appears to be a need for more and perhaps, personalized, one on one, communication.

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The effort would involve many groups and agencies, such as, but not limited to, local Hispanic organizations, Keep Hall Beautiful, Hall County Department of Public Works, Gainesville Department of Public Works and the citizens in the neighborhoods themselves. The goals of the sweep program would be an improved quality of life in the particular neighborhoods and the planning region and a lessened concern of potential code violations.

Solid Waste Management in Times of Disasters

Weather-related or man-made disasters may result in quantities of wastes requiring special operations. The severity and manner of a disaster will dictate how the planning region will react with respect to solid waste management functions. A localized, less severe event that might generate debris, which could be dealt with by the affected local government on it's own. However, a more severe or widespread event dictates activation of a county-wide response.

Hall County and all the municipalities in the county have adopted a "Local Government Resolution for Emergency Management", which places coordinated emergency management functions with Hall County, as the lead, through the Emergency Management Agency Director.

In responding to disasters, public safety is always job one. After this, operations will proceed with consideration given to reduction measures, collection and disposal. As when dealing with past disasters to hit the planning area, a system of staging areas would be utilized to amass debris until further arrangements could be made.

Contingency plans are in place to handle collection and disposal in times when back up operations are needed.

Implementation Schedule

Costs for collection should continue to be funded by self-supporting enterprise funds. Enterprise funding of solid waste management should be developed for those without

Executive Summary

them. Expenses must be covered by revenues generated by users of the system. Variable rates, where users pay according to the amount of waste generated, should be implemented.

A special local option sales tax (SPLOST) should be considered to provide the funding needed for constructing and equipping new facilities necessary to carry out this plan. Thereafter, operation and maintenance should be funded through a specific enterprise fund.

There should be no direct charges assessed residents for participation in waste reduction activities such as recycling, and drop and swaps. In some cases, such as household hazardous waste collection programs, which are quite costly, user fees could be considered to offset costs.

WASTE DISPOSAL STREAM ANALYSIS

It is very important to have a good picture of waste quantity and composition. It is this knowledge that provides the foundation upon which the solid waste plan is built. In the next few pages, we will show the relationship of waste composition as determined by the residential, commercial, and industrial sectors, and the volumes created by each.

Sources and Quantities

There are three facilities in Hall County where solid wastes are disposed. Any complete analysis of the planning area's waste stream must take into account wastes disposed at these facilities. These facilities are the Hall County Candler Road Landfill, Reliable Tire Service Landfill and Crystal Creek Landfill.

To determine the source of the solid waste entering Hall County's Candler Road Landfill, Hall County personnel conducted a waste assessment of the solid waste entering the landfill. Drivers were interviewed upon entering the landfill to determine the source of waste according to residential, commercial, industrial and construction/demolition debris categories. Definitions were established for each category, and scalehouse personnel were provided a clear understanding of each category in order to explain these, as necessary, to the drivers and obtain the best possible data. In the event of mixed loads, drivers were asked to estimate the percentage from each source. Forms were prepared for recording information in the field. The results of this waste assessment, as well as a similar one conducted in 1991 for the area's first solid waste management planning effort are shown below:

In-County Wastes

Table 1 --Waste Sources Delivered to Hall County Landfill

	November 13-25, 1991	October 20-25, 2003
Commercial	56.8%	16.6%
Industrial	28.5%	21.6%
Residential	14.7%	52.6%
Construction/Demolition	N/A	9.2%

Waste Disposal Stream Analysis

It should be noted that construction and demolition (C & D) waste was not a required source to survey when the area's original comprehensive solid waste management plan was prepared.

There are several factors for the changing waste distribution from the sources surveyed:

1. Other in-county disposal facilities have come on-line after the original plan was written, diverting wastes to other in-county facilities.
2. Other out-of-county disposal facilities have opened, since the original plan was written, thus providing competing disposal options for both public and private sector waste haulers. Waste exports have increased.
3. Gainesville privatized collection of commercial/industrial waste in 1994. At that time, commercial/industrial waste was estimated at nearly 17,000 tons per year. Private haulers may choose to export waste out of county.

Table 2 --Waste Quantities Disposed in Hall County in Calendar 2002

Hall County Candler Road Landfill	67,528 tons	39.5%
RTS Landfill	88,000 tons	51.4%
Crystal Creek Landfill	15,600 tons	9.1%
Total Tons Disposed	171,128 tons	

Comparing the 67,528 tons of waste delivered to the Hall County Candler Road Landfill in 2002 from Table 2 with the 25,441 tons delivered to all compactor sites in 2002 (see Collection Element, Table 18) yields 36.7 percent of all waste delivered to the landfill originating from the compactor sites. Or put another way, using the figure from Table 1 of 52.6% of waste delivered to the County Landfill being from residential sources, it can be seen that a total of 35,520 tons of residential waste was delivered in 2002. Of this total, waste generated from the County's compactor sites was responsible for 71.6% of all residential waste delivered to the County's landfill in 2002.

Imported Wastes

Hall County does not knowingly allow imported waste to be disposed at the county landfill. However, the two private landfills may accept out of county waste. The Reliable Tire Supply (RTS) Landfill accepted waste originating from 13 North Georgia counties in 2002. Total waste

Waste Disposal Stream Analysis

accepted in 2002 was 152,893 tons. Waste imported from outside Hall County amounted to 64,893 tons. Data on imported waste accepted at Crystal Creek Landfill are unavailable.

Exported Wastes

There is also a considerable amount of Hall County's waste that is disposed in facilities outside Hall County. This includes residential waste from Clermont, Flowery Branch and Gillsville. In 2002, this amounted to 1,065 tons. Cost (tip fees) appears to be the chief reason for this. Location also plays a part in that these cities are located on or near the boundaries of Hall County, making the choice of using nearby out of county facilities a preferred option. However, the vast majority of exported waste is most likely commercial, industrial, and construction/demolition wastes, which are heavily controlled by the private sector.

The amount of waste received at the County's landfill has declined due, hopefully, to reduction efforts but more likely due to economic reasons. This fact was evident when the last tip fee increase took effect on October 1, 1993. Monthly totals from September to October showed a decrease of over 1,000 tons! This massive decrease from one month to the next certainly was not due solely to waste reduction activities. Likely, what has happened is private waste haulers are choosing to use other, lower cost facilities. Also, there are now more facilities to choose from than there were in the early 1990's (see Table 3).

Waste Disposal Stream Analysis

Table 3 --Hall County Waste Exports in Calendar 2002

	Facility Name	Facility Type Description	Dominion	Source Of Waste	Tonnage Reported
BANKS	CHAMBERS R & B LANDFILL SITE #2	Municipal Solid Waste Landfill	Private Commercial	Hall Co	430.16
BARROW	REPUBLIC WASTE-OAK GROVE MSWLF SR324	Municipal Solid Waste Landfill	Private Commercial	Hall Co	12,943.88
BARROW	REPUBLIC WASTE-OAK GROVE MSWLF SR324	Municipal Solid Waste Landfill	Private Commercial	Gainesville	25.01
BARROW	REPUBLIC WASTE-OAK GROVE MSWLF SR324	Municipal Solid Waste Landfill	Private Commercial	Flowery Branch	158.17
CHEROKEE	CHEROKEE CO-PINE BLUFF LANDFILL, INC.	Municipal Solid Waste Landfill	Private Commercial	Hall Co	62.43
DEKALB	PHILLIPS-SCALES RD C&D (L)	Construction and Demolition Landfill	Private Commercial	Hall Co	218.51
DEKALB	WMI-LIVE OAK #2 (SL)	Municipal Solid Waste Landfill	Private Commercial	Flowery Branch	51.79
DEKALB	WMI-LIVE OAK #2 (SL)	Municipal Solid Waste Landfill	Private Commercial	Gainesville	2.65
DEKALB	APAC/GA-DONZI LN PH 5A (L)	Construction and Demolition Landfill	Private Commercial	Hall Co	12.65
DEKALB	BFI-EAST DEKALB LANDFILL	Construction and Demolition Landfill	Private Commercial	Hall Co	5.18
DEKALB	BFI-HICKORY RIDGE (MSWL)	Municipal Solid Waste Landfill	Private Commercial	Hall Co	7.16
FORSYTH	EAGLE POINT LANDFILL	Municipal Solid Waste Landfill	Private Commercial	Gainesville	11.48
FORSYTH	EAGLE POINT LANDFILL	Municipal Solid Waste Landfill	Private Commercial	Hall Co	4,191.60
FULTON	CHADWICK RD LANDFILL, INC.	Construction and Demolition Landfill	Private Commercial	Hall Co	59.10
FULTON	CHAMBERS-BOLTON RD (SL)	Municipal Solid Waste Landfill	Private Commercial	Hall Co	10.59
GWINNETT	BFI-RICHLAND CREEK RD (SL)	Municipal Solid Waste Landfill	Private Commercial	Hall Co	73,127.57
OGLETHORPE	OLGETHORPE CO-US 78 C/D LANDFILL	Construction and Demolition Landfill	PUBLIC	Hall Co	7.32
					91,325.25

Source: Georgia Environmental Protection Division

To the 91,325.25 tons of exported waste must be added the 1,065 tons exported by cities in Hall County for a total of 92,390 tons (rounded off) of exported waste in 2002.

Due to this waste exportation, it is likely that the current 5.54 lbs./capita/day generation rate is artificially low. The per capita waste generation rate from the base year of 1992 is likely more accurate. At that point in time, there were simply no other disposal alternatives. The county's

Waste Disposal Stream Analysis

landfill was the only option. Thus, the per capita generation rate of 6.41 lbs/capita/day is likely more accurate.

This exportation, plus the waste diverted to RTS Landfill, helps to explain the large reduction in tons from which the County landfill has not recovered that occurred with the last tip fee increase.

Total Hall County Waste Generation

To arrive at the total waste generated by Hall County, one must take the sum of all waste generated and disposed within the county, as well as all waste generated within the county and exported to out of county disposal facilities. This total waste generation amounted to 262,453 tons in 2002 (Table 4).

Table 4 --Disposition of Hall County Generated Waste 2002

Hall County Candler Road Landfill	67,528 tons	26%
RTS Landfill	88,000 tons	33%
Crystal Creek Landfill	15,600 tons*	6%
Exported	91,325 tons	35%
Total	262,453	

* estimated at 1,000 cu. yds./week and 600 lbs./cu. yd.

Assuming that virtually all of the waste exported from Hall County is commercial and industrial, except for the documented 1,065 tons known to be exported by cities (residential), would result in the breakdown shown in Table 5. It is interesting to note that the overall contribution of residential waste to the total is still roughly 15% (see Table 1). The vast majority of waste generated in Hall County is still from other than residential sources.

Table 5-- Waste Generated By Source 2002

Commercial/Industrial	26%
Residential	40%
Construction/Demolition	34%

Waste Disposal Stream Analysis

Classifying Waste Sources:

Residential - Waste generated by households whether single or multiple households (duplexes up to apartment complexes).

Commercial - Waste generated by retail businesses such as restaurants, stores, shopping malls. Schools, as well as government offices, should be categorized here.

Industrial - Waste generated from manufacturers or processors. This sector makes things that are sold by retailers. Examples: Wrigley's, Glidden Co., Peachtree Windows and Doors, ConAgra, Cargill, etc.

C and D (construction and demolition debris) - Waste generated as a result of new construction, remodeling, or demolition of existing structures. This is more of a waste type than a source, as it could be from individuals doing home remodeling (residential) just as easily as a commercial demolition job (commercial).

WASTE FLUCTUATIONS

Seasonal Composition

As shown in Table 6, waste composition (especially residential) can and does vary seasonally. For example, there is a higher percentage of glass in the waste stream in the summer months, undoubtedly tied to higher beverage consumption during the warmer weather. Also, in the winter, there is a greater percentage of tin cans that could be consistent with less availability of fresh, local produce.

Quantity

The planning region does not experience any noteworthy seasonality with respect to waste quantities. The only exceptions to this would be greater production of waste following the Christmas holiday and disasters. This, however, is not peculiar to Hall County. Seasonal public events and festivals do not have an appreciable effect on waste quantities.

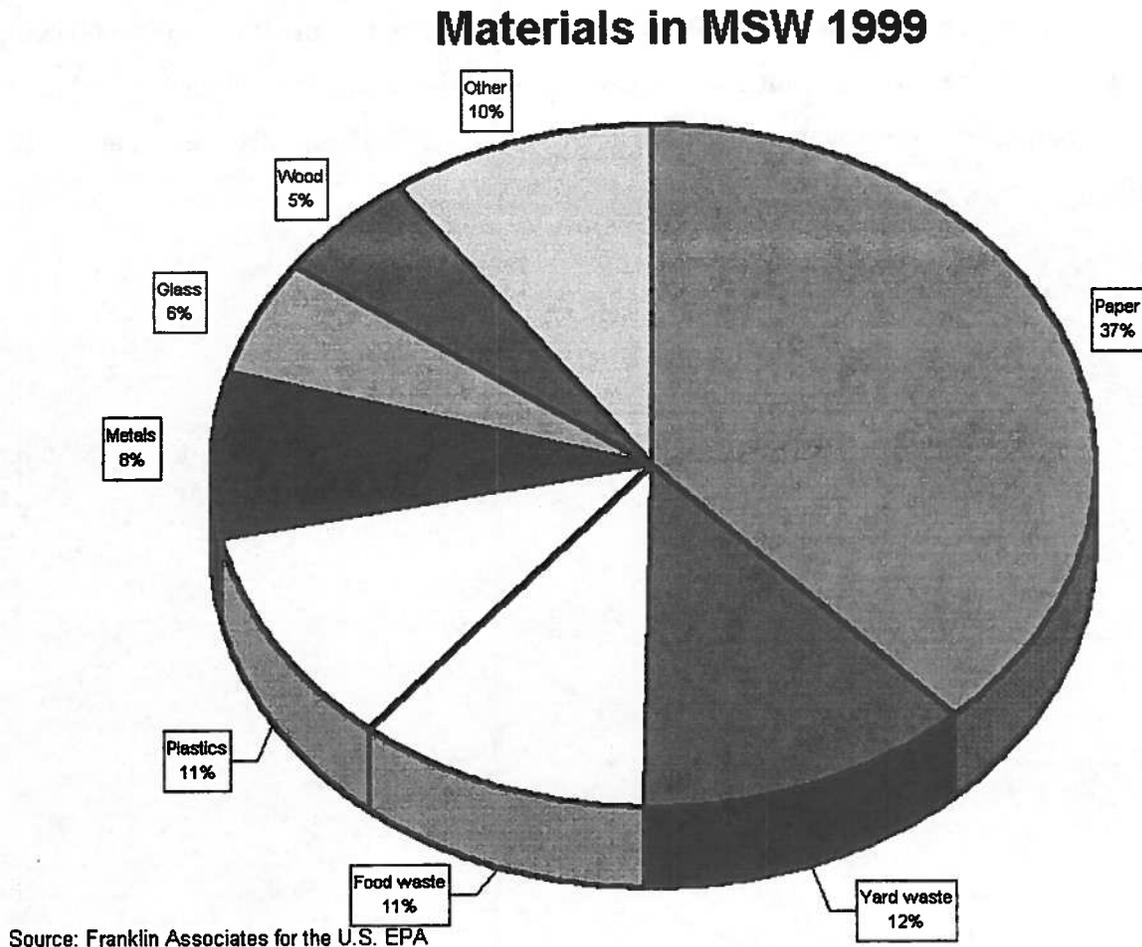
Waste Disposal Stream Analysis

Disasters, however, have had an appreciable, but temporary, impact on waste quantities. This was shown in the case of the county's last major ice storm in spring of 2000. This storm event produced an estimated 12,700 cubic yards of processed wood mulch.

Trees and vegetation from the March 20, 1998 tornado amounted to an estimated 99,600 cubic yards that was burned with air-curtain destructors. Demolition waste from homes and other buildings damaged or destroyed in the storm amounted to 1,318.48 tons disposed of at R.T.S. Landfill.

COMPOSITION

Figure 1—Waste Composition



RESIDENTIAL WASTE STREAM ANALYSIS

Background

During 1994 and 1995, the Hall County Resource Recovery Division completed an analysis of the county's residential waste stream and residents' recycling practices. The results of the composition portion of the study are reported here. Please see "Waste Reduction Element" for the study results pertaining to recycling.

Waste Disposal Stream Analysis

The waste stream characterization that was done for the 1993 plan pointed out some suspect numbers, especially in regard to yard waste. The county survey estimated yard waste at 2.9 percent; whereas, the national average was 17.2 percent. For this reason, as well as to provide information as to the composition of the Hall County residential waste remaining after recycling, a detailed waste assessment was recommended. The assessment was completed in 1995.

Methodology

An attempt was made to include waste from compactor sites in different areas of the county. During each seasonal sort, a total of four compactor sites were sampled at an approximate sample size of 250 pounds each, as recommended in the literature. Bags were picked at random from waste immediately upon being dumped at the landfill working face. Waste was sampled seasonally in the fall (November 17, 21 and December 8, 1994), winter (January 23, 24, 25, and 26, 1995) and summer (August 1, 3 and 4, 1995). The periods immediately following Thanksgiving and Christmas were avoided to reduce the influence of seasonal waste associated with these holidays. The sampling periods were chosen to be indicative of a typical fall, winter and summer waste stream. Samples were weighed on truck scales at the recycling center to assure an approximate 250-pound sample existed before being sorted.

Bags were placed two at a time on a 4' x 8' sheet of plywood on sawhorses for de-bagging and sorting. The contents of each bag, including the bag itself, were separated into the 19 categories shown in Table 6 and weighed. Scales used included a platform scale with one pound graduations and a postal scale with one-ounce graduations. The postal scale was used for the lighter weight materials that might not register accurately on the larger scale.

Findings

Residential Waste Composition

Table 6 --Hall County Seasonal Waste Composition

<u>MATERIAL</u>	FALL 1994 PERCENT COMPOSITION	WINTER 1995 PERCENT COMPOSITION	SUMMER 1995 PERCENT COMPOSITION
GLASS (CLEAR,BROWN, GREEN)	7.9	7.5	10.1
HDPE #2 NATURAL	0.6	0.7	0.6
HDPE #2 COLORED	0.7	0.7	0.4
PETE #1 MIXED	1.9	1.4	1.6
MAGAZINES	3.6	4.4	3
NEWSPAPER	5.4	4.9	4.7
CORRUGATED CARDBOARD	2.2	1.8	2.2
ALUMINUM BEVERAGE CANS	1.9	1.7	1.6
TIN CANS	3.5	5.1	2.8
OTHER VARIOUS MIXED PLASTIC	10.9	7.8	11
BOX BOARD	4.6	5.2	5.2
YARD WASTE	1	0.9	0.3
RECYCLABLE MIXED PAPER	2	3	2.8
NON RECYCLABLE MIXED PAPER	14.2	15.3	10.1
NON RECYCLABLE GLASS	0.7	0.6	1
ORGANICS	14.7	25	21.1
TEXTILES	6.8	2.4	10
OTHER MIXED METALS	1.1	0.7	1
ALL OTHER MATERIAL	16.3	10.9	10.6
TOTALS	100	100	100

Source: Hall County Resource Recovery Division. "Hall County Recycling Participation Survey and Residential Waste Stream Analysis" (1995, September)

Waste Disposal Stream Analysis

Business Waste Composition

Hall County has not undertaken any studies of waste composition from business sources. Therefore, a search of the literature was conducted for available information.

Commercial Waste Composition

Table 7--Commercial Waste Composition

Landfilled Waste Composition for the Commercial Sector (Weight Percent) –Alameda County, CA

<u>Category</u>	<u>Percent</u>
Paper	31.3
Plastic	13.9
Glass	2.3
Metals	5.5
Yard Waste	4.2
Other Organics	35.2
Other Waste	7.6

Source: 2000 Solid Waste Characterization Study for Alameda County, California--R.W. Beck, Inc

Industrial Waste Composition

Industrial waste loads are frequently homogeneous, containing a single waste product from a manufacturing process. This makes determining waste composition problematic, since wastes are more industry specific. Research in this area was performed by the California Integrated Waste Management Board.

The data were collected by sorting garbage samples from individual businesses in Southern California. Only waste disposed in dumpsters was sorted, so that material recycled at the businesses that were sampled is not included in this data. It is assumed that businesses of a certain type (say construction) dispose similar wastes, regardless of location or size of the business. This average data may not reflect the composition at a particular business or in a particular area. However, it does provide a good starting point.

Waste Disposal Stream Analysis

Some waste compositions from industries representative of Hall County were extracted from the study to show what these types of businesses are likely to dispose.

Table 8 --Industrial Waste Composition for Selected Business Types

<u>Business Type</u>	<u>Largest Waste Types and (Percent by Weight)</u>
Construction	Lumber (16.2%), Composite Construction and Demolition (11.3%), Composite Organic (6.5%), Corrugated Cardboard (5.6%)
Food Manufacturing	Food (22.4%), Composite Paper (18.6%), Film Plastic (12.5%), Lumber (6.5%)
Manufact. - Indust. Machinery	Other Ferrous (10.6%), Corrugated Cardboard (9.5%), Lumber (8.7%), Composite Paper (8.1%)
Manufact. - Transportation Equip.	Lumber (14.7%), Composite Paper (12.4%), Corrugated Cardboard (10%), Other Misc. Paper (5.3%)

Source: California Integrated Waste Management Board, Statewide Waste Characterization Study: Results and Final Report

Construction/Demolition Wastes

The estimated national per capita generation rate of building-related C&D debris in 1996 was 2.8 pounds per person per day. This compares favorably with Hall County's known 5.54 lbs. per person per day generation rate and the 51.4 % of the county's waste disposed at RTS Landfill.

Composition of C&D Debris from Buildings

The composition of C&D debris is highly variable and depends critically on the type of activity where sampling is done. Whereas wood is typically the largest component of waste material generated at construction and renovation sites, concrete is commonly the largest component of building demolition debris.

Waste Disposal Stream Analysis

Table 9 --Typical Composition of C&D Wastes from Urban Areas

<u>Material Description</u>	<u>% of Total Volume</u>
Wood Materials	
Construction Lumber	25.0
Pallets	2.0
Trees & Stumps	5.0
Paper Products	
Cardboard	17.0
Rolled Paper	0.2
Other Misc. Paper	0.6
Concrete Products	
Concrete Block	1.0
Poured Concrete Sections	1.0
Plaster	0.3
Brick	0.2
Plastic Products	
Plastic Pails	1.0
Plastic Pipe	0.2
Polyethylene Sheet & Styrofoam	0.8
Metal Products	
Ferrous Metals	5.0
Non Ferrous Metals	2.0
Roofing Materials	
Shingles	3.0
Built-up Roofing	5.0
Roofing Insulation	5.0
Earth Material	
Soil	2.0
Miscellaneous Materials	
Drywall	15.0
Broken Glass/Windows	0.1
Doors and Frames	0.1
Insulation	4.0
Paint Containers (empty)	0.8
Ceiling /Floor Tile	0.8
Carpet Remnants	2.0
Ceramic Tile	0.1
Plumbing Fixtures	<0.1
Electrical Fixtures	<0.1
Unacceptable Materials Separated for Proper Disposal	
Batteries	<0.1
White Goods	0.1
Tires	0.2
Furniture	0.2
Household Garbage	0.2
Total Volume	100%

Source: Kimmins Recycling Corp. (Tampa, FL) as reported in "Waste Age", January 1992

WASTE PROJECTIONS

Quantity Projections

Tables 10 through 16 use current scale data, population figures, and per capita waste generation to project waste quantities into the future. For simplicity, per capita waste generation is assumed to remain constant throughout the planning period.

City of Clermont

**Table 10 --Projections for Waste to be Generated by
The City of Clermont**

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	658	1.40	168(2)
2003	693	1.40	177
2004	729	1.40	186
2005	764	1.40	195
2006	800	1.40	204
2007	835	1.40	213
2008	871	1.40	222
2009	906	1.40	231
2010	942	1.40	241
2011	977	1.40	249
2012	1013	1.40	259
2013	1048	1.40	268

(1) For comparison, baseline 1992 per capita waste generation was 0.79 lbs.

(2) Actual; Includes only residential component collected by city

Sources: Native Intelligence and Woods and Poole

City of Flowery Branch

**Table 11 --Projections for Waste to be Generated by
The City of Flowery Branch**

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	1,944	2.34	830(2)
2003	2,377	2.34	1,015
2004	2,810	2.34	1,200
2005	3,244	2.34	1,385
2006	3,900	2.34	1,665
2007	4,556	2.34	1,946
2008	5,212	2.34	2,226
2009	5,868	2.34	2,506
2010	6,526	2.34	2,787
2011	7,244	2.34	3,094
2012	7,962	2.34	3,400
2013	8,680	2.34	3,707

(1) For comparison, baseline 1992 per capita waste generation was 2.13 lbs.

(2) Actual; Includes only residential component collected by city

Sources: Native Intelligence and Woods and Poole

City of Gainesville

**Table 12 --Projections for Residential Waste to be Generated by
The City of Gainesville**

YEAR	POPULATION SERVED	WASTE LBS. PER CAP./DAY(1)	TONS PROJECTED
2002	28,090	1.50	7,690(2)
2003	29,662	1.50	8,120
2004	30,731	1.50	8,427
2005	31,842	1.50	8,732
2006	32,797	1.50	8,994
2007	33,781	1.50	9,264
2008	34,794	1.50	9,541
2009	35,986	1.50	9,868
2010	37,188	1.50	10,198
2011	38,061	1.50	10,437
2012	38,935	1.50	10,677
2013	39,808	1.50	10,916

(1) For comparison, baseline 1992 per capita waste generation was 1.69 lbs.

(2) Actual; Includes only residential component collected by city

Source: Hall County Future Land Use Plan 2004

City of Gillsville

**Table 13 --Projections for Waste to be Generated by
The City of Gillsville**

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	198	1.85	67(2)
2003	200	1.85	68
2004	202	1.85	68
2005	204	1.85	69
2006	206	1.85	70
2007	208	1.85	70
2008	210	1.85	71
2009	212	1.85	72
2010	214	1.85	72
2011	216	1.85	73
2012	218	1.85	74
2013	220	1.85	74

(1) For comparison, baseline 1992 per capita waste generation was 0.79 lbs.

(2) Actual; Includes only residential component collected by city

City of Lula

**Table 14 --Projections for Waste to be Generated by
The City of Lula**

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	1,543	1.34	378(2)
2003	1,635	1.34	401
2004	1,727	1.34	422
2005	1,819	1.34	445
2006	1,911	1.34	467
2007	2003	1.34	490
2008	2095	1.34	512
2009	2187	1.34	535
2010	2,279	1.34	557
2011	2,371	1.34	580
2012	2,463	1.34	602
2013	2,555	1,34	625

(1) For comparison, baseline 1992 per capita waste generation was 1.57 lbs.

(2) Actual; Includes only residential component collected by city

City of Oakwood

**Table 15 --Projections for Waste to be Generated by
The City of Oakwood**

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	2,908	0.75	397(2)
2003	3,042	0.73	415
2004	3,176	0.73	423
2005	3,310	0.73	441
2006	3,444	0.73	459
2007	3,578	0.73	477
2008	3,712	0.73	495
2009	3,846	0.73	512
2010	3,980	0.73	530
2011	4,114	0.73	548
2012	4,248	0.73	566
2013	4,382	0.73	584

(1) For comparison, baseline 1992 per capita waste generation was 0.97 lbs. May be artificially low due to local trend that some housing developments are opting to use private service providers.

(2) Actual; Includes only residential component collected by city

Hall County
Table 16 --Hall County Waste Projections

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	153,919	9.34	262,453(2)
2003	162,372	9.34	276,867
2004	169,966	9.34	289,815
2005	176,765	9.34	301,409
2006	183,835	9.34	313,464
2007	191,189	9.34	326,003
2008	198,836	9.34	339,043
2009	206,790	9.34	352,605
2010	215,061	9.34	366,708
2011	224,307	9.34	382,474
2012	233,553	9.34	398,240
2013	242,799	9.34	414,006

(1) For comparison, baseline 1992 per capita waste generation was 6.41 lbs.

(2) Actual; Includes all waste disposed of in disposal sites located within Hall County as well as all reported waste exports.

COMPOSITION PROJECTIONS

It is inevitable that waste composition will change with the passage of time. This has been seen with the emergence of plastics in the waste stream. Also, in the past ten years, the amount of colored HDPE plastic has increased with an increasing number of milk containers converting from natural HDPE. This change has resulted in the need to alter the labeling of the county's collection containers to allow more space for colored HDPE.

While not an exact science, it may be possible to develop an idea of future waste composition. With knowledge of economic trends, as to the employment mix and types of wastes produced by a given business, it may be possible to forecast changes in waste composition. Trends in consumer goods and purchasing choices will influence residential waste composition. This factor is perhaps more difficult to predict.

Waste Disposal Stream Analysis

During the 1990's, approximately 20,000 jobs were added to the county's work force. Almost two-thirds of these were in the three sectors of retail trade, government and services. Most of the remainder were in wholesale trade and manufacturing. Modest gains occurred in finance, insurance, real estate, transportation, utilities, communications and construction.

As of 2001, Hall County's employment mix was 35.4 percent in goods producing industries, 51.6 percent in service producing industries, 12.8 percent in total government and 0.2 percent unclassified industry. The shift toward white-collar jobs is expected to continue for the planning area.

Overwhelmingly leading the manufacturing segment is food manufacturing, which comprises over 40 percent of this segment. Second in this segment is machinery manufacturing with 2.5 percent, followed by transportation equipment at 2.1 percent.

The service-producing segment is lead by retail trade at 10.8 percent and health care and social services at 10.1 percent. Accommodation and food services weigh in at 6.6 percent.

The Five Largest Employers in Hall County are:

- Conagra Poultry Co.
- Fieldale Farm Corp.
- Kubota Manufacturing
- Mar-Jac Poultry
- Northeast Georgia Medical Center

Table 17 is reflective of the residential growth occurring in the planning area. Agriculture showed the greatest losses in all areas—average employment, percent employed and proportional change. Residential growth has resulted in a decline in available agricultural lands and has, undoubtedly, caused compatibility issues with common agricultural practices, such as spreading of broiler litter, which can lead to odor complaints from nearby residents. Numbers employed by this sector will likely continue to decline as will generation of agricultural production wastes. Chief among these would be those related to the area's poultry industry such as manures, litter and poultry mortality. As the poultry growing areas are pushed out farther from the county,

Waste Disposal Stream Analysis

demolition wastes might result from chicken houses being replaced by residential growth. The area's limited dairy farming may face similar pressures and resulting waste change impacts.

Increases in all categories for construction also testifies to the growth the area continues to experience. Increases in construction and demolition wastes can be expected. It is interesting to note that, as shown previously, disposal of C and D wastes at the RTS Landfill now comprises the majority (56%) of all solid wastes disposed of in Hall County.

The economic trend explained in the text and verified by recent employment information contained in Table 17 points toward continued increases in the areas of services, finance, insurance, real estate, and public administration (government). Manufacturing is likely to remain the largest employment area. The following chart lists the types of services available in Hall County and their potential waste products.

<u>Industry</u>	<u>Potential Examples</u>	<u>Waste Products</u>
Services	Hotels, other lodging; Business Services; Health Services; Educational Services; Social Services; etc.	food, medical, office paper, cardboard, food service plastics, bedding
Finance/Insurance/Real Estate	Banks, Insurance, Real Estate	office paper, computer paper, cardboard
Public Administration	Federal, State, Local Governments	office paper, computer paper, cardboard

Because a relatively small amount of the total waste is due to residential influences, most of the influence on future waste composition will be from commercial and industrial sectors. As shown above, waste composition over the next ten years will be influenced primarily by increases in cardboard, office paper, computer paper and food wastes.

Waste Disposal Stream Analysis

Table 17 --Changes in Employment Mix-Hall County

<u>Employment Classification</u>	<u>1991 Ave. Employment</u>	<u>Percent</u>	<u>2001 Ave. Employment</u>	<u>Percent</u>	<u>Proportional Change (%)</u>
Agriculture	1,001	2.3	677	1.1	-54.4
Mining	6	<0.1	79	0.1	+887
Construction	1,873	4.3	3,264	5.1	+17.4
Manufacturing	13,334	30.9	18,688	29.2	-5.6
Service Producing	23,748	55.1	33,086	51.6	-6.2
Government	3,120	7.2	8,174	12.8	+76.4
TOTALS	43,082	99.9*	63,968	99.9*	+48.5

*Rounding error

Waste Disposal Stream Analysis

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WASTE REDUCTION ELEMENT

SOURCE REDUCTION AND REUSE

Both source reduction and reuse are waste management techniques for the non-production or unmaking of waste. In other words, waste reduction of this type can be defined as the reduction, avoidance or elimination of the generation of solid wastes. Since source reduction and reuse both result in the prevention of waste in the first place, the amount of waste which must composted, recycled, landfilled, etc. is reduced. Hence, waste reduction of this type is given the highest priority in solid waste management plans, because it reduces the demand placed on the management system. The downside is that it is the most difficult strategy to implement. Regulations may be needed to promote source reduction. The regulations can take the form of:

- ◆ Declaration of policy;
- ◆ Incentive regulations (tax credits, exemptions, positive labeling);
- ◆ Disincentive regulations (bans, taxes, deposits, product specifications).

Different strategies can be incorporated into a plan to promote source reduction and reuse. Strategies used by communities for source reduction and reuse follow.

Material Bans

Material bans may take two forms--outright bans on production or disposal bans. By far, the disposal ban is the easier to implement and more feasible on a local level. Beyond supporting sensible legislative efforts on a state or national level, the focus of this planning effort should be on disposal bans. When dealing with outright material bans, care must be taken that the alternative material, which must be substituted for the original, is not ultimately worse than the material it replaced.

Disposal bans, accomplish nothing unless there is an alternative to disposal provided. This alternative may be in recycling, composting or reuse alternative. It should be noted that disposal bans cannot be looked at as source reduction if they only result in the redirection of material from disposal to another segment of the waste management

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system, such as recycling, without any waste reduction previous to entering this process. While it is certainly desirable for additional material to enter the recycling process, it cannot be considered source reduction as explained previously. Disposal bans can, however, result in some amount of actual source reduction if the alternative provided carries with it some detrimental attribute(s), e.g., either a direct or indirect cost, which provides some incentive to reduce waste.

Unit Pricing

Structuring waste disposal charges so that generators pay according to the amount of waste generated can encourage source reduction and recycling. Most refuse haulers charge a flat rate, sometimes specifying a maximum number of bags or containers per stop, which will be collected for that flat fee, thus providing little direct economic incentive for reduction. There are numerous schemes for variable user fees possible for collection, which include:

1. Charging by the number and/or size(s) of containers used
2. Charging by frequency of collection
3. Charging per bag of garbage collected using standard bags, allowing customers to alter the number of bags as needed
4. Charging customers on a weight basis

Variable garbage collection fees have administrative costs and also may encourage people to illegally dispose of waste. In areas that have instituted variable rates, these fears have been largely unrealized. What has happened is citizens will attempt to “shop around” in order to find the cheapest legal alternative, and they may be willing to go some distance to do so. Where an increase of illegal dumping has been noticed is in white goods and other similar large items that may carry a relatively high user fee.

Landfill Surcharges

Landfill surcharges have been used by a number of states and local governments. Such surcharges don't encourage waste reduction by individuals as long as waste collectors charge flat fees. Landfill surcharges do, however, provide waste reduction incentives to

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commercial and industrial customers because they generally pay on a volume related basis, such as size of collection container or frequency of service. Revenues collected from disposal surcharges may be used to fund waste reduction education, recycling programs, household hazardous waste collections and other desirable waste management alternatives.

Product Disposal Charges

Product disposal charges may be a charge by weight, unit, composition, value or a combination. A product disposal charge is a tax assessed on product or packaging producers at the time of manufacture, or on the consumer at time of purchase. Unlike product deposits, these charges are not refundable. Instead, they would internalize the product's eventual disposal costs. A popular example of this is product disposal charges on tires.

Since disposal costs vary greatly by both geography and product type, it is nearly impossible to assess a tax to cover the true cost of disposal in all situations.

Administration of actual disposal costs of specific products in specific locations would be impossible. Factors to consider in determining product disposal charges include the disposal costs of the product, volume of waste generated in the product manufacture, difficulty of disposal of the product or manufacturing by-products, and environmental impact of the product or manufacturing by-product disposal. Such charges should allow flexibility for exemptions or prorating for secondary material (recycled) usage in product manufacture.

In theory, product disposal charges are an ideal method of internalizing the costs of social responsibility since it is the manufacturers and product consumers that pay in advance for the eventual disposal and environmental costs a product will create when its useful life is over. Disposal charges should encourage desirable waste management in two ways. First, economics would dictate that volume, difficulty of disposal, or hazardousness of a product be reduced in order to reduce product disposal charges and so reduce production

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costs. Second, the money collected from product disposal charges could be used to correct or reduce the undesirable impacts of product disposal.

In reality, however, there are problems in assessing such charges effectively. Methods to assess charges differ. One method is to levy the charge on virgin feedstock for metal, paper, plastic, rubber, glass, etc. at the point of product manufacture. Another is to levy it as an excise tax on wholesale or retail finished products. The latter is more realistic for implementation on a local government level. Although, as has been noted previously and from experience in states having container deposits, people will “shop around” in order to avoid such charges by purchasing goods elsewhere. For this reason, such waste reduction measures are more effective if instituted on a larger geographical basis.

Charges may be placed on both durable and nondurable products or a disposal charge only on non-durables and deposits on durables. It is difficult sometimes to determine appropriate disposal charges on durables because of the delay between manufacture and disposal. Deposits on durable goods would encourage recycling while disposal charges would not.

There are several ways to estimate disposal costs, including a per unit basis, a weight basis, and a product value basis. In order to be effective, taxing on a per-unit basis would need to establish different rates by product categories, material composition, and product sizes. Taxing by weight of a product is another way of assessing a disposal charge. There are several problems with a weight-based tax:

1. It encourages the substitution of lighter but potentially more environmentally dangerous feedstock during manufacture,
2. Unless an exclusion existed for reusable products, such a tax would discourage reusability. Returnable glass beverage containers, for example are heavier than non-returnables and lightweight aluminum is not reusable,
3. The effect of a weight-based charge diminishes as a product's price-to-weight ratio increases.

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The last problem could be addressed by using a product value (cost) in the equation for determining a product disposal tax rate. Such a value-based tax would encourage both a reduction in the materials used to manufacture products and their substitution by less expensive materials. It would discourage the use of expensive materials such as metal/plastic laminates, which are difficult to recycle. Another effect would be reduction in expensive excess packaging, which is used solely for marketing. Exemptions should be allowed for secondary material content and reusability.

Economic analyses and modeling was done in the mid 1980's to analyze the recycling and waste reduction effects on paper packaging and containers of product disposal charges, recycling subsidies, variable waste disposal fees and litter taxes. Materials included in the model were steel, glass, aluminum, paper, and plastics. For the product disposal charge analysis, the model applied the charge at the bulk materials production stage. Of the four policies analyzed, the model indicated the product disposal charge was consistently best and recycling subsidies the worst.

Product Stewardship

A relatively new concept that has arisen in the U.S. is product stewardship. Product stewardship is primarily industry driven with encouragement from the environmental community. It can involve proactive concepts such as what has become known as "design for the environment".

The design for the environment concept incorporates into product development environmental attributes such as reduction of environmentally sensitive materials, decreases in equipment energy consumption, extension of product life span and utilization of parts that can be reused, resold or recycled.

Some examples of this might include (computer):

- Modular, upgradeable design - parts can be removed without use of special tools - allowing easy repair and upgrades, thus lengthening the useful life of the computer.
- Designed for ease of assembly and disassembly - most parts snap together, no glue and minimal use of screws used as fasteners.

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- Large plastic parts are marked to aid recycling.
- Internal chassis made of recyclable steel.

Some manufacturers, most notably, computer manufacturers, have designed recycling and reuse programs. One such computer manufacturer, Dell, offers recycling and donation (reuse) options. Through Dell's partnership with the National Cristina Foundation, consumers can donate their systems to charity in exchange for a potential tax deduction.

The National Cristina Foundation is a non-profit organization that places used technology with local non-profit organizations and public agencies throughout the U.S. that service disabled and economically disadvantaged children and adults. Computers, which may no longer be useful for the original purchaser, may have several years of life left in them for a non-profit or public agency.

The recycling option involves shipping the equipment back to the manufacturer. Sometimes computer equipment is accepted from any manufacturer. There is often a fee associated with this service to cover shipping, recycling and processing costs.

Litter Tax

Another potential financial disincentive to promote source reduction is a litter tax. Litter taxes are normally an ad valorem excise tax placed on items judged to be a litter problem. Funds collected could be used for litter clean up, recycling promotion or other management purposes. Litter taxes tend to be revenue producing devices, although theoretically raising the prices of litter prone products could cause a shift to products less likely to become litter.

Drop and Swaps

Drop and swaps, a form waste exchange, have been used in a number of areas with some success. Such programs work on the principle that waste is a resource in the wrong place. When items can be matched to people who need them, they are reused and cease to be waste. Drop and swaps have had success such as in the collection of household paints. Leftover paint can make up in excess of 60 percent of the total volume of materials

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collected at household hazardous waste (HHW) collection events. Drop and swaps may be held on the same date as HHW collections but need to be managed independently of such events, because there is no time at a HHW event to separate usable from unusable paints. A pilot project held in 1990 in central Vermont resulted in approximately 50 percent of the paint being diverted for reuse.

Another drop and swap that has been successful is a furniture drop and swap. Such a program was conducted by the Lamoille County Solid Waste District, Vermont. Officials there found that, at times, items had "new homes" even before being off-loaded by the previous owner.

Commercial and Industrial Waste Reduction

EnviroShare

The origins of the EnviroShare program in Hall County go back to New England, specifically to Vermont. Around 1989, WasteCap was started by the Associated Industries of Vermont. The gist of the program was a business helping business approach, via a team of business volunteers, who toured requesting businesses and offered advice as to what they might do to reduce their solid waste. The strength of the program came from the fact that it operated via peer matching to offer non-threatening, non-regulatory assistance. Others liked the idea, and WasteCap has since spread to Maine, New Hampshire, Massachusetts and Wisconsin to name a few. WasteCap programs are most often operated by state industry associations on a statewide basis.

The WasteCap concept was included in Hall County's Comprehensive Solid Waste Management Plan adopted in 1993 as a recommended program. The Greater Hall Chamber of Commerce was approached with the idea. A subcommittee of the Chamber's Solid Waste Committee approved of the concept and renamed it EnviroShare. This expressed both the fundamental purpose (the environment) and the method (information and materials sharing).

In March 1994 the EnviroShare Team was formed from Hall County business people with proven experience in waste reduction. The first site visit was conducted on

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March 17, 1994, weeks before formal announcement of the program. Site visits involve a walk through by the EnviroShare team of the requesting business's facilities. Following the walk through, a brainstorming session takes place during which time waste reduction ideas are developed. These are then formulated into a written format and mailed to the requesting business within a few days of the site visit.

It was decided by the Environmental Management Committee (formerly, Solid Waste Committee) that, while members of the EnviroShare team already had a good knowledge of waste reduction practices, a certification program was still in order. Certification would be required of team members in order to be permitted to conduct site visits of requesting businesses.

EnviroShare seeks to:

- Improve our environment by helping each other reduce solid waste.
- Establish a library of best practices for waste reduction (waste prevention and recycling).
- Provide information on services/consultants for special needs beyond what the EnviroShare team can provide.
- Provide sources for recycling markets.
- Assist with waste audits.
- Provide information on personnel with specific expertise for volunteer assistance.
- Encourage networking and information exchange.
- Facilitate materials exchange.
- Be a clearinghouse of information.

Materials Exchange

There are several regional materials exchanges operating throughout the U.S. According to the most recent information provided by Material Exchanges on the Web Homepage, hosted by the U.S. EPA, there are over 50 material exchanges being operated in North America. Of these, the vast majority is operated on a statewide or regional (multi-state) basis. Most are non-profit and are operated by governments, universities, chambers of commerce, and non-profit groups. A few are sub-state, regional operations and some are operated at the county level. Hall County's program is one of these.

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Hall County operates a materials exchange under its EnviroShare program. This was also a recommendation of our original solid waste management plan. The basis of materials exchange is what is trash to one is treasure to another. Often it's simply a matter of matching those that want to get rid of something with those that need it. In the process, both landfill space and money are saved because no money had to be paid in landfill disposal.

At first, the normal paper-based method of conducting a materials exchange via filling out of listing forms for wanted or available listings was attempted. On a county scale, this proved to be unworkable. The weakness of paper-based listings is that they can become antiquated very quickly. Assembled into a quarterly catalog of listings, as was standard practice, the listings can become outdated virtually the instant they are put to paper. Materials' status may change quickly, negating the accuracy of printed listings.

Materials exchange is now facilitated via the EnviroShare List and other resources.

Sample Categories for listings:

- Paper
- Plastic & Rubber
- Glass
- Metal & Metal Sludges
- Wood
- Miscellaneous

EnviroShare List

A listserv (list) is an electronic mailing list that sends e-mail to all persons on the list via an email message to a single address. The basic purpose of the EnviroShare List is to provide an instant, electronic format to continue information sharing. Relevant topics include environmental, health and safety issues.

Sample Areas:

1. Training Opportunities- share information on upcoming workshops/training/certification opportunities.
2. Tips- share information you've got on environmental management.

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3. Inquiries- send an inquiry to the list. Perhaps someone out there has the answer.
4. Regulations- share information on upcoming regulations of interest.
5. Materials Exchange- got a material, need a material? Post it to the list. Maybe someone on the list can use it or knows of someone who can.

EnviroShare X-change

Continuing on with the success of the EnviroShare List, the concept was expanded and named EnviroShare X-change. EnviroShare X-change consists of email lists arranged in a web fashion to promote solid waste reduction via reuse and materials matching in Hall County. In addition to the potential for waste reduction, such a network also has implications for information exchange.

Each list in this web is organized around the following sectors in Hall County:

1. EnviroShare List (business and industry);
2. Non-Profit List (nonprofits); and
3. Schools List (city/county, private, pre-school, colleges).

Community Benefits

This program allows materials and needs to match themselves. As materials become available for reuse, they can be matched directly to those sectors doing "public works" or through them to those in need, helping to make Hall County a better place to live, while keeping beneficial materials out of the landfill. The EnviroShare X-change was chosen as Hall County's way of operating a materials exchange, to turn liabilities into assets for community benefit.

Recommendations

The materials exchange component should continue to include materials matching via EnviroShare X-change and possibly via the Internet through the www.enviroshare.org web site to those non-profit groups and agencies doing "public works" in Hall County. This could provide them with needed non-financial resources to benefit the community while diverting waste from disposal. Ways to facilitate materials exchange with the general populace should also be explored.

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Recycling

Recycling is the process by which waste materials are collected, processed and manufactured into useful products to be used again. As much as 80 percent of the waste stream, exclusive of problem wastes, could technically be recovered from the mixed solid waste stream by recycling and composting. However, household and business participation, the capture rate of the individual materials, and storage, collection, processing and transportation costs affect the actual rate of recycling.

Drop-off Recycling

Drop off recycling is simply the collection of recyclables by having residents drop them off at a collection site. The collection sites may be staffed or not. Materials collected at drop off recycling centers are limited only by imagination and the ability to market the materials.

Buy Back Centers

A buy back center is essentially the same as a drop off center, but with two differences: 1) They are always staffed; and 2) Residents receive payment for the materials they deliver. There are no known privately owned buy back centers operating in Hall County. There are other recyclers operating in Hall County as buy back centers, if one considers scrap metal dealers in this category. Information about these recyclers can be found in the Appendix in Table B-2.

Curbside Recycling

Curbside recycling is the collection of recyclables at the actual curbside. The system may use one or several bins for separation of materials in the home and placement at the curb. Materials that have been collected in curbside programs include, but are not limited to, glass, aluminum cans, tin cans, newspaper, plastics, used motor oil, used corrugated containers, box board, and household batteries.

Curbside pickup can be either source separated or commingled. Source separation involves having the generators place recyclable materials into, most frequently, a single bin. Bins are collected and then the materials separated into various compartments on

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board the collection vehicle while still at the curb. Commingled involves the collection of recyclables without separation at the curb. Separation is left to take place later at the processing center.

Source Separated at the Curb or Commingled

“Source Separation” is the separation of materials to be recycled from waste at the point at which waste is generated, be it a household or a commercial/industrial entity. Since waste is generated wherever human activity occurs, opportunities for source separation coincide as well. Commonly, source separation has been thought of as an activity relegated to the single family household. Now, however, that mind-set is changing to include source separation in multifamily apartments, institutions (schools, banks, government offices) and businesses.

Disadvantages to source separation are that it may require the use of special vehicles or modification of existing vehicles to keep the materials separate. This adds to the expense of the program. In the case of residential curbside collection, residents are required to separate newspapers, glass, beverage cans, milk jugs, etc. prior to setting them out at the curb. Collection of source separated recyclables most often results in an “overlay” of a separate collection system for recyclables overlaid over the existing trash collection system. This results in the financing, staffing and management of two complete systems.

Advantages to source separation are the materials collected are generally cleaner, may command a higher price, are easier to market, and are more likely to retain market share should supply ever exceed demand. As more recycling programs come on line and supply exceeds the end users needs for secondary materials, those programs producing the highest quality materials will be more likely to retain their market. For example, paper mills are basically machines that need a certain amount of paper fiber per day to operate. Once mills have more material than they need, they can then be selective as to what paper they choose to accept. It would be natural to accept only the best paper, all other factors being equal.

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Recovered materials are often treated in the following ways:

- 1) Single Stream- collected commingled (all recyclables collected from the curb in one container) and kept that way in the recycling truck;
- 2) Dual Stream- set out by the generator in two commingled but separate streams and collected as two streams, with one for containers and one for paper; and
- 3) Source Separated- set out by generator commingled and hand separated at the curb into compartments on the truck for each material.

Programs that collect and transport commingled recyclables enjoy lower collection costs due to less time required per stop but have higher processing costs. The advantages to a system which hand separates at the curb are reduced processing costs and reduced possibility of revenues from paper sorts downgraded by markets due to glass shards and plastic fibers contaminating paper. The downside is in higher collection costs due to more time required per stop. Source separation programs requiring citizens to separate materials into specific bins in the home average 30-60% participation, while programs with curbside collection of commingled recyclables average 50-80% participation, on average, for mature programs.

Single Stream

Single stream (also known as “fully commingled”) recycling refers to a system in which all paper fibers and containers are mixed together in a collection truck, instead of being sorted into separate commodities (newspaper, cardboard, plastic, glass, etc.) by the resident and handled separately throughout the collection process. In single stream, both the collection and processing systems must be designed to handle this fully commingled mixture of recyclables.

What are the potential advantages to single stream?

Potential advantages of single stream may include:

- Reduced sorting effort by residents may mean more recyclables are placed at the curb and more residents may participate in recycling;
- Reduced collection costs because single-compartment trucks are cheaper to purchase and operate, collection can be automated, and collection routes can be serviced more efficiently;

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- Greater fleet flexibility, which allows single compartment vehicles to be used, for refuse or recycling, providing greater fleet flexibility and reducing the number of reserve vehicles needed. (To avoid confusing customers, use a large sign/banner to distinguish when a refuse truck is being used for recycling);
- Participation and volume per household may increase and worker injuries may decrease because the switch to single stream is often accompanied by a switch from bins to cart-based collection;
- Changing to single stream may provide an opportunity to update the collection and processing system and to add new materials to the list of recyclables accepted; and
- More paper grades may be collected, including junk mail, telephone books and mixed residential paper.

What are the potential disadvantages to single stream?

Potential disadvantages of single stream recycling may include:

- Initial capital cost for:
 - new carts,
 - different collection vehicles,
 - upgrading of processing facility, and
- Processing costs may increase compared to multiple stream systems;
- Possible reduced commodity prices due to contamination of paper;
- Increased “downcycling” of paper, i.e., use of high quality fibers for low-end uses like boxboard due to presence of contaminants;
- Possible increase in residual rates after processing (due chiefly to increased breakage of glass); and
- Potential for diminished public confidence if more recyclables are destined for landfill disposal due to contamination or unmarketability.

Single stream may produce a higher rate of residuals, or those materials damaged or contaminated to the point that they are no longer recyclable, because the compaction of the commingled recyclables during collection or transport can break glass and mix different colors of glass fragments together. Broken glass may also get mixed in with paper. Mixed broken glass is generally not marketable for applications involving melting to produce new glass products, although a few new markets are emerging for this relatively low-value material.

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Other Considerations

Single stream recycling trades partial sorting by residents for more intensive sorting at a processing center. The benefits (compared to source separation) are largely in the collection process, while the incremental costs are largely connected to processing. This can create pressure to maximize cost savings at the collection end and minimize the additional sorting costs at the materials recovery facility (MRF). If this pressure is met by capital expenditures such as automated pickup and investment in modern sorting equipment, single stream may increase the overall effectiveness of the recycling program. However, if corners are cut – e.g., by poor processing – single stream may harm recycling.

Single stream may be very suitable for some communities and not at all suitable for others. Factors to consider include hauler and MRF arrangements, markets for processed commodities, current participation rates and volumes, community characteristics (permanent vs. seasonal residents, potential of automated collection, etc.) and a host of other community-specific considerations.

The capital costs of the latest sorting machinery, needed to do the job right, require relatively high throughputs (volume of materials) at the MRF – higher than most communities can generate on their own. This may mean that the community's recyclables may have to travel much greater distances to be processed by a larger MRF in order for market quality specifications to be maintained.

Dual Stream Recycling

Dual stream recycling is a system in which all paper fibers and containers are separated and collected as two separate categories of materials. One of the primary concerns of single stream recycling has been the contamination caused by broken pieces of glass that may become embedded (under compaction) or mixed in with paper. The collected materials are commonly processed as a separate container (glass, plastic, aluminum, steel) and paper stream (newspaper, residential mixed paper, magazines, corrugated cardboard). Two collection containers would be provided to households: one for papers and one for containers.

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Dual stream recycling may be thought of as a semi-commingled system. The materials are collected and processed commingled but in two separate streams.

Single Stream Versus Dual Stream

The economics of collecting recyclables as a single stream versus two streams (papers and containers separated) is compelling. A list of cost advantages is as follows:

- 1) Uses the same equipment that collects trash, i.e., one interchangeable fleet to buy and maintain.
- 2) Sets the stage for automation of collection which reduces time and eliminates injuries.
- 3) The truck returns when it is full, not when one compartment is full.
- 4) Compacting single stream material in garbage truck equipment allows for a heavier load before returning, i.e., fewer trips.
- 5) Residents carry one container to the curb. Participation rates increase.
- 6) Single stream processing equipment allows for more paper grades to be collected (OCC, mixed paper, telephone books, junk mail and all other residential paper).

The American Forest & Paper Association released the results of a study conducted by Jaakko Pöyry Consulting and Skumatz Economic Research Associates that looked at the impact single stream collection programs had on recycling operations compared to a dual stream collection program.

Among the study's findings were:

- Overall systemwide expenses increased an average of \$3 per ton for paper collected in single stream programs, which includes costs for collection, processing at materials recovery facilities (MRF) and mill utilization.
- Curbside collection costs are approximately \$15 per ton lower for single stream programs.
- Mills incurred increased operating and maintenance costs of approximately \$8 per ton when using recovered paper from single-stream programs.
- Sorting costs at MRFs averaged \$10 per ton more for single-stream recycling programs.

The Recovered Fiber Executive Committee of the American Forest & Paper Association (AFPA) funded a study that compared the contamination of single stream news (ONP) and residential mixed paper (RMP) with dual stream collection. They analyzed paper samples obtained from 60 U.S. curbside recycling programs. The final report was issued in October 2002. The overall conclusion was that single stream ONP contained 3.3% prohibitives vs. 2.0% for dual stream. However, of this, glass and fines were 0.5% for

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single stream ONP vs. 0.6% for dual stream ONP. The same study also concluded that single stream RMP had 1.8% prohibitives vs. 1.1% for dual stream RMP. However, of this, glass and fines were 0.4% for single stream RMP vs. 0.2% for dual stream RMP. In spite of all the publicity, these contamination level differences have not been significant enough to curtail sales of single stream OPN or RMP. Furthermore, as time goes by, the virgin mills that are bothered by glass and other contaminants will put in cleaning systems that are currently available and have been used for many years by recycled mills. This should eliminate the contamination issue.

Case Study: Eureka Recycling

In May 2002 Eureka Recycling, in partnership with the city of Saint Paul and the Minnesota Office of Environmental Assistance (MOEA), completed a 14-month study that took a close look at five different ways to pick up recycling at the curb. The study examined how sorting method, container size and frequency of pickup affect the success of the recycling program as measured by environmental results, cost, convenience and resident satisfaction.

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Table 18 -- Comparison of Program Elements of Tested Scenarios

	A. Source Separated w/ Education		B. Two-Stream Commingled		C. Two-Stream Commingled		D. Two-Stream Commingled		D. Two-Stream Commingled & Organics		E. Single-Stream	
Collection Schedule	Bi-Weekly		Bi-Weekly		Bi-Weekly		Weekly		Weekly		Bi-Weekly	
Recycling Containers	18 Gallon Bins		18 Gallon Bins		35 Gallon Carts		18 Gallon Bins		35 Gallon Carts		64 Gallon Carts	
% Increase in Tons Collected	6.20%		7.30%		32.80%		26.10%		91.60%		20.80%	
City-Wide Materials Collected	16,300 Ton/Yr		16,453		20,394		19,361		29,410		18,519	
% Material Loss During Processing**	A 1%	B 1.6%	A 6.4%	B 10.9%	A 6.4%	B 11.6%	A 6.4%	B 10.8%	A 7.5%	B 11%	A 14.2%	B 27.2%
Net Program Material Recycled*	16,317	16,039	15,400	14,660	19,089	18,028	18,122	17,270	27,204	26,175	15,889	13,482
Net Overall % Increase in Tons Recycled	5.1%	4.5%	0%	-4.5%	24.4%	17.5%	18.1%	12.5%	77.2%	70.5%	3.5%	-12.2%
Collection Cost/Tons	\$60		\$50		\$65		\$59		\$80		\$51	
Processing Cost/Tons	\$35		\$50		\$50		\$50		\$50 (Rec) \$30 (Org)		\$60	
Processing Revenue/Ton	\$50		\$43		\$44		\$43		\$43 \$20		\$33	
Net Costs/Ton	\$45		\$57		\$71		\$66		\$88		\$78	
Customer Satisfaction**	N/A		80%		83%		76%		75%		87%	
Willing to Pay for Change	N/A		73%		63%		61%		54%		65%	

* Column "A" under "Material Loss During Processing" is the residual rate calculated without including mixed glass. Column "B" is the residual rate when including mixed glass as not being recycled. Eureka Recycling does not consider the use of mixed glass as an aggregate material or daily landfill cover as a recycled material. These residual rates are then applied to the total materials collected to calculate "Net Program Material Recycled"

** Percentage preference of the study method that group tested to the current source-separated program.

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Based on the results of this study, Eureka Recycling recommended four main changes to improve the recycling program in Saint Paul. These conclusions are specific to Saint Paul, but may be valid in other communities as well.

The study investigated three indicators:

1. **Environmental Impacts:** Consider which collection method allows residents to recycle the most materials while having the least amount of materials that have to be thrown out? (Contaminated and damaged materials have to be thrown out.) Consider the recycling collection method that gets the most recycled with the least pollution.
2. **Cost:** Consider how much the different methods cost and how the cost of each impacts the residents' choice.
3. **Convenience/Satisfaction:** Consider why, how and what do people want to recycle and what would make them recycle more.

Five collection methods were developed and tested:

1. **Scenario A:** Source-separated collection system. Residents sorted the materials at the curb into separate categories. Collection occurred bi-weekly.
2. **Scenario B:** Two-stream collection using two 18-gallon blue bins. Residents sorted materials into two categories or streams: papers (including newspaper, cardboard, paper and mail) and containers (a mix of cans, glass and plastic bottles.) Collection occurred bi-weekly.
3. **Scenario C:** Two-stream collection, same as above, but using 35-gallon rolling carts to collect and set out their materials. Collection occurred bi-weekly.
4. **Scenario D:** Two-stream collection with 18-gallon blue bins and the collection of household organics (including food scraps and non-recyclable papers like pizza boxes and paper plates) in a 35-gallon rolling cart. In this neighborhood, recycling and household organics were collected every week.
5. **Scenario E:** Single-stream collection system using one large 60-gallon rolling cart to collect recyclables. Residents did not sort by stream. Materials were mixed together-cans, glass, plastic bottles and papers-and the entire separation took place at a recycling facility. Collection occurred bi-weekly.

Recommended Changes to Saint Paul's Recycling Program for 2004:

- Implement a "two-stream" sorting system, in which all paper is collected together in one category and all containers in another category.
- Start picking up #1 and #2 plastic bottles at the curb.
- Provide weekly collection in 18-gallon recycling bins.
- Work toward adding organics collection to the curbside program.

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Multi-Family Unit Recycling

Multi-family units are basically apartment complexes. There are a number of multi-family residential areas in the planning area. Most of these occur in the larger municipalities such as Gainesville and Oakwood. The challenge in recycling in these situations is in dealing with a transient population that may feel less connection to the solid waste management system than the general population. This transient nature provides a challenge to education efforts.

For the most part, collection service is provided through landlords contracting with a private hauler or hauling refuse themselves to the county landfill. This serves to separate generators from the system and their interaction with it.

Another limitation in dealing with multi-family units is that there may be physical limitations in storage of recyclables in the household and on the property. Smaller household containers can help get around space problems in the home. However, the other problem of space limitations remains outside the residence. In larger complexes, it is not practical for everyone to place a container at curbside. A central storage location may be better and may also reduce the possibility of containers being stolen.

Mandatory vs. Voluntary Recycling

In general, mandatory recycling programs enjoy a higher participation rate than those that are voluntary. The Institute for Local Self Reliance, in its 1990 study of 16 mandatory programs found an average participation rate of 90 percent and among 6 voluntary programs 54 percent. The same study also found some voluntary programs, with higher participation rates than some mandatory ones. This indicates that mandatory alone is not always enough. Other literature sources provide a participation range of 50 to 98 percent for mandatory programs.

Most mandatory programs have ordinances that have as penalty provisions non-pickup of refuse containing recyclables and/or fines. A good number of ordinances also have enforcement provisions for waste haulers, such as fines and loss of disposal privileges.

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Many mandatory programs are mandatory in name only, that is, the knowledge that a program is mandatory (at least early on) is incentive enough, without enforcement. Enforcement, in fact, can be troublesome. For example, the non-pickup of refuse penalty is easier to enforce in programs where municipal refuse collection exists, more difficult where refuse collection is contracted, and most difficult where collection is private, free enterprise. The reason is simple-- the extent of detachment of enforcers (government) to enforcement (haulers). The same principle follows through to fining, which requires that haulers record and report violations to the entity having management authority. No matter what enforcement mechanisms are in place, if a municipality is sincere in its wishes to fully enforce a mandatory ordinance, it should probably plan on some direct policing.

Other Factors Affecting Participation Rates

There are many factors which affect curbside recycling participation rates, such as demographics, community spirit, volume based or weight based disposal fees, provision of containers, convenience, program maturity, frequency of collection, and method of calculating the participation rate.

Generally, curbside programs which have achieved the highest material recovery rates are those where:

- collection of recyclables occurs once a week and coincides with regular refuse pick up;
- material separation and preparation are made as convenient as possible for the householder; and
- the program is properly advertised and promoted on a regular, ongoing basis.

Mixed Waste Processing

Mixed waste processing systems process raw untreated MSW to yield recyclables. The main advantage to this system is the ease of implementation. It avoids the classic problem of any new program requiring citizen participation, i.e., resistance to change. Since no

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change is required, on the part of householders, there is no need for an expensive education program. There are no separate collection schedules to remember and no need to learn how to prepare recyclables. There are no separate containers to buy or store. To the residents, everything is status quo, even after the program has been implemented. Another advantage is that the same collection schedules, routes and equipment can be used.

However, such a program also avoids a classic problem of our modern society—wastefulness. It does nothing to teach people about conservation or wise use of natural resources. There is no incentive to change from destructive to constructive habits, no incentive to reduce waste, and no incentive to buy recyclable packaging.

Because there is no source separation, contamination is more of a problem. Some materials may be contaminated to the point where they cannot be recycled, e.g., soiled or wet newspaper, partially full peanut butter jars, etc. For this reason, these systems are often coupled with composting operations in order to divert these normally recyclable materials from disposal.

Processing costs are high because the total, unsorted waste stream must be processed. It is very labor and equipment intensive. Facilities may have to be three to four times larger than facilities handling only recyclables. Environmental impacts of such a facility would also be greater as all trucks must be routed to the facility resulting in traffic impacts. Also, potential problems with noise, odors and vector control would have to be addressed.

Due to the unsorted nature of the incoming refuse, contamination of the compostable fraction is also more likely. Items such as household hazardous waste, used motor oil, household batteries, and others may cause contamination of the compost if methods are not put in place to address their removal up front. The contamination potential would be further exacerbated by shredding or grinding of the compostable fraction, a common practice to assist decomposition, in advance of the composting process.

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Processing Systems

Regardless of the collection system employed, some processing will be required to make materials marketable. Processing basically accomplishes two purposes--contaminant removal, and densification.

Contaminant removal takes the form of further separation of materials (separation of dissimilar materials and separation from contaminants) and/or some sort of cleansing. Densification may be accomplished through compaction (baling), breaking/crushing (glass) or granulation (plastics). Processing is necessary to improve the economics of transport to market and to present the materials in a form whereby they may be utilized in a manufacturing process. Some materials may require additional processing by the end user.

Materials for recycling will require between one and three processing steps prior to reuse. Processing may occur in the household, at an intermediate processing facility, or broker, and prior to use in a manufacturing process. Each one of these steps requires energy and materials and generates some waste, with its attendant environmental impacts.

Recycling In Hall County

As recommended in the 1993 Comprehensive Solid Waste Management Plan, Gainesville, Oakwood, Flowery Branch, and Clermont have implemented curbside recycling programs. These all use the source separated approach.

Clermont

Clermont operates a once per week voluntary curbside recycling program utilizing municipal staff and a compartmentalized trailer. Rigid bins (one per household) and a curbside sort are used. Sorted recyclables are delivered to the Hall County Recycling Center.

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Clermont reported 8.67 tons of recyclables collected in 2003. A total of 177 tons of waste was estimated disposed in 2003. This yields an approximate 4.7 % of the waste being diverted via the city's curbside recycling program.

Flowery Branch

Flowery Branch operates a once per week voluntary curbside recycling program utilizing a contracted recycler and 18 gallon curbside bins. Recyclables are collected once per week using a curbside sort.

Table 19 -- 2003 Recycling Tons for Flowery Branch

<u>Month</u>	<u>Tons</u>
January	1.15
February	1.08
March	1.23
April	1.13
May	1.05
June	1.2
July	1.05
August	1.05
September	1.2
October	1.2
November	1.2
December	1.5
Total	14.04

A total of 1,015 tons of waste was estimated disposed in 2003. This yields an approximate 1.4% of the waste diverted via the city's curbside recycling program.

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Gainesville

Gainesville operates a voluntary curbside recycling program utilizing a contracted recycler and rigid curbside bins. Recyclables are collected once per week using a curbside sort.

Table 20 -- 2003 Recycling Tons for Gainesville

<u>Month</u>	<u>Tons</u>
January	53
February	49
March	53
April	57
May	65
June	53
July	51
August	49
September	58
October	58
November	57
December	63
Total	666

A total of 8,120 tons of waste was estimated to be disposed in 2003. Therefore, an estimated 8.2 % of the waste bound for the county landfill was diverted via the city's curbside recycling program.

The City should be able to consistently attain 20 percent diversion by increasing the participation rate and adding to the list of acceptable materials. There are concerns, however, regarding waste reduction progress among the Hispanic population that may stem from cultural differences and inadequate communication efforts.

Current (2004) costs for the City's recycling program are \$3.30/household/month as per the BFI contract.

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Gillsville

Gillsville does not offer a recycling program. Residents may use the county's compactor sites.

Lula

Lula does not offer a recycling program. Its residents may use the county compactor sites if they wish.

Oakwood

Oakwood operates a once per week mandatory curbside recycling program utilizing municipal staff and a compartmentalized trailer. Rigid bins (one per household) and a curbside sort are used. Sorted recyclables are delivered to the Hall County Recycling Center.

The total recycling for the City of Oakwood for 2003 was 17.65 tons. A total of 415 tons of waste was estimated disposed in 2003. This yields an approximate 4.1% of the waste bound for the county landfill being diverted via the city's curbside recycling program.

Hall County

Currently Hall County is collecting recyclables in custom-designed roll off containers or trailers located at all the compactor sites and the County Government/Education Building (see Table B-2 in the Appendix for locations). The custom-designed roll off containers have separate bins for each category of recyclable material. Trailers are used for collection of corrugated cardboard at all compactor sites and county office buildings. They are also used at the County Government/Education Building for collection of containers. Recyclables are transported to an intermediate processing center (IPC) located at 1008 Chestnut Street, in Gainesville. At the IPC, the recyclables are processed and placed on transfer trailers (provided by recyclers) for shipment. The newspaper is collected at all the sites located in Appendix Table B-1 by SP Recycling Corporation.

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White goods (appliances, etc.) are collected and stored at the county landfill and eventually recycled by a private contractor on a monthly basis.

As previously noted, there are other recyclers operating in Hall County that deal mostly with scrap metals. Information about these recyclers can be found in the Appendix in Table B-2.

Processing/Recovery Centers

Hall County operates an intermediate processing center (IPC) at 1008 Chestnut Street in Gainesville. An IPC essentially processes source separated recyclables. The facility is located in an industrial area less than one half mile from I-985, which is nearly ideal from an operational and transportation standpoint.

The facility accepts glass, aluminum cans, aluminum foils, steel cans, corrugated cardboard, newspaper, office paper, computer paper, mixed paper, junk mail, magazines, bound books, HDPE and PETE plastics, used motor oil, grease (used cooking oil), and portable rechargeable batteries. The Resource Recovery Division manages the Hall County Recycling Center with labor provided by a county inmate work detail from the Hall County Correctional Institution. Materials are hand-sorted.

Materials are accepted on a voluntary basis. No fees are paid for receipt of materials. The bulk of the materials come from the county's recyclables collection areas located at compactor sites throughout the county. Some materials are also brought in by the public, businesses, certain cities within Hall County, and some surrounding local governments. All materials are processed on site, except newspaper, which is collected by SP Recycling Corp. for processing at their Lawrenceville location and used motor oil, which is pumped aboard a tanker truck from each collection tank location and hauled by Universal Refining of Peachtree City. An estimated 3,607 of the total 3,647 tons recycled in 2003 is estimated to be Hall County sources (excluding cities and sources outside the county) or approximately 5.1% of the total waste bound for the county landfill.

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Taken as a percentage of waste diverted from the total residential waste collected via compactor sites—on an equal footing with the analysis done elsewhere for the cities—the diversion rate stands at approximately 9.1 %.

Private processing/recovery centers consist of scrap metals dealers, which are sometimes overlooked when one thinks about recycling. Such establishments also buy scrap and surplus materials for recycling or reuse. See Table B-2 in the Appendix for scrap metal dealers.

Table 21 -- Summary of Public Recycling Programs--2003

Local Government	Program Type	Waste Tons Collected	Tons Diverted	Percent Diverted
Clermont	Public, voluntary curbside	177	8.67	4.7%
Flowery Branch	Privatized, voluntary curbside	1,015	14.04	1.4%
Gainesville	Privatized, voluntary curbside	8,120	666	8.2%
Gillsville	None	68	0	0
Hall County, compactors only (1)	Public, voluntary drop off	26,934	2,705 (est.)	9.1%
Hall County, all in-county (2)	Public, voluntary drop off	26,934	3,607 (est.)	13.4%
Lula	None	401	0	0
Oakwood	Public, mandatory curbside	415	17.65	4.1%
Totals		37,321	4,313.36	10.4%

(1) Includes only recycled tons collected from compactor sites.

(2) Includes all recycled tons accepted from sources from within Hall County, excluding that received from Hall County municipalities.

Upgrades to Hall County Recycling Center

Since the 1993 Plan, upgrades were made as planned to the Hall County Recycling Center. These included a horizontal extrusion baler, conveying equipment, custom compartmentalized recycling roll off containers, building addition, glass crusher and

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other items. The facility currently operates under capacity and has excess processing capacity remaining.

Hall County Study

During 1994 and 1995, the Hall County Resource Recovery Division completed an analysis of the county's residential waste stream and residents' recycling practices.

Due to changing market forces, Hall County has lost some recycling tonnage from commercial and industrial sources, most notably corrugated cardboard. The waste Hall County can control—residential waste from compactor sites—represents a resource for additional recyclable tonnage.

Since the majority of local governments in the county provide waste collection services for residential waste, that which is leaving the county is largely commercial and industrial waste. This means that the relative percentage of residential waste has increased from when the waste stream was surveyed in 1991 during the development of the original Comprehensive Solid Waste Management Plan. This also means that greater impact on the amount of waste disposed at the county landfill can now be obtained by focusing on the reduction of residential waste. This assertion is further bolstered by the foregoing source of waste survey.

Knowing the amount of each material being recycled from compactor sites and armed with the data developed by the waste sort, it is possible to calculate recovery rates for each material.

Good recovery rates exist for newspaper and corrugated cardboard. Over 60 percent of available newspaper and corrugated cardboard is being recovered for recycling. It is believed that recovery rates for corrugated cardboard are actually higher. Because brown kraft paper grocery bags are recyclable with corrugated cardboard, these were also weighed with corrugated cardboard. It is believed that many residents may not be aware the two materials are compatible. Grocery bags can also more easily be stuffed in a trash bag. These two factors together may account for lowered recovery rates for this material.

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It should be noted that since the completion of this study, the market share for paper grocery bags has been largely supplanted by plastic.

The data show that, at the time of the study, Hall County was attaining an approximate 28% capture rate on those recyclables then accepted for recycling at compactors (glass, HDPE, PETE, magazines, newspaper, corrugated cardboard, aluminum cans, steel cans). The recycling program is achieving approximately 14 percent diversion of materials from disposal at the compactor sites. An 80 percent capture rate on those materials currently accepted for recycling would yield a diversion rate of nearly 39 percent or more than double the current rate. Many programs that institute volume based rates experience recycling increases of 40 percent or so.

Conclusions

Due to the exportation of commercial and industrial waste by private waste haulers, the relative percentage of residential waste disposed of in Hall County has increased. Therefore, reductions in residential waste are more effective in reducing the waste stream bound for disposal in Hall County, or more specifically, bound for the Candler Road Landfill.

Instituting volume-based rates will increase recycling. The question is whether we can handle the increased pressures on our hauling system, as it currently exists. Since recyclables are handled in an uncompacted state, every recyclable item diverted from the waste stream represents an item diverted from a compacted to uncompacted state. The increase in number of pulls on roll off containers will therefore increase. We must use this knowledge in making any changes to our current system.

A random waste sort was conducted on waste taken from the Hall County compactor sites in November 1994, January 1995 and July 1995 in an attempt to determine what percentage of each material was left in the waste stream that was not being recovered at the time of the survey. Table 22 shows the results.

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TABLE 22 -- Recyclables Recovery

Type Material	Percent Composition	Amount currently recovered per year from all 10 sites in tons (estimated)	Amount disposed of per year from all 10 sites in Tons*	Percent Recovered	Revenues from items currently recovered from all sites	Total revenues that could be made if 80% of what is left in trash as sites were captured.
Glass (clear, brown, green)	8.5	325	1244	20.7	\$11,050	\$44,887
HDPE #2 Natural	0.6	35	88	28.5	\$14,000	\$42,160
HDPE #2 Colored	0.6	20	88	18.5	\$6,000	\$27,120
PETE #1 Mixed	1.6	40	234	14.6	\$20,000	\$113,600
Magazines	3.7	175	541	24.4	\$5,250	\$18,234
Newspaper	5	1173	732	61.6	\$76,245	\$114,309
Corrugated Cardboard	2.1	450	307	59.5	\$63,000	\$97,384
Aluminum Bev. Cans	1.7	35	249	17.6	\$42,000	\$281,040
Tin Cans	3.8	60	556	9.7	\$1,800	\$15,144
Various Mixed	9.9	0	1448	0	\$0	\$0
Plastics						
Box board	5	0	732	0	\$0	\$0
Yard Trimmings	0.7	0	102	0	\$0	\$0
Recyclable Mixed	2.6	0	380	0	\$0	\$0
Paper						
Non Rec. Mixed	13.2	0	1931	0	\$0	\$0
Paper						
Non Recyclable	0.8	0	117	0	\$0	\$0
Glass						
Organics	20.3	0	2970	0	\$0	\$0
Textiles	6.4	0	936	0	\$0	\$0
Other Mixed	0.9	0	132	0	\$0	\$0
Metals						
All Other Materials	12.6	0	1843	0	\$0	\$0
TOTALS	100	2313	14630		\$239,345	\$753,878

* FY 1995

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Problem Wastes

Special Management Items

White Goods

Hall County provides a collection area at its landfill for the separate collection and recycling of white goods. Chlorofluorocarbons (CFC's) are evacuated and collected from appliances by a certified recycler. CFC's are known to be detrimental to upper level ozone and are prevented from being knowingly released into the atmosphere by federal legislation. White goods are recycled for their metals content.

Lead Acid Batteries

Lead acid batteries are prohibited from disposal in Georgia's landfills. Therefore, similar to white goods, these are accepted at a separate area at the landfill property for recycling. When found in waste delivered to the tipping floor of the receiving building, they are separated by workers and deposited at the battery recycling area. State law also requires battery retailers to accept customers used batteries for recycling at point of transfer, i.e., sale.

Tires

In 1990, Hall County implemented a ban on scrap tires entering the landfill.

Scrap tires, like all solid waste, come in a steady stream. Their waste generation is estimated at one tire per person per year. In Hall County alone that amounts to over 150,000 tires per year.

Uncovered tires pose a fire hazard and provide habitat for rodents and insects. Covered, whole tires tend to float to the surface of the landfill and recovering becomes necessary. Grinding, shredding, chopping, or slitting will solve the floating problem.

In recent years, the state of Georgia has placed an emphasis on proper management of scrap tires by cleaning up illegal tire piles and providing grant funding to local governments for local enforcement and education programs. The proper handling of scrap tires is now heavily regulated.

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However, the funds and funding mechanism for this program have been placed in jeopardy. The Georgia Legislature has failed to appropriate funds to the Solid Waste Trust Fund, choosing instead to use them to balance the State budget. In addition, the \$1.00 per tire fee assessed at point of sale is set to sunset in 2005. It is important for all local governments in Hall County to support continued funding for proper management of scrap tires in Georgia. Past experience has shown that discontinuing funding will result in a return of problems, such as illegal tire piles.

Hall County has developed educational materials with state grant monies detailing the options for management of scrap tires in Hall County. Residents are urged to let their tire retailer handle their used tires. The second option is to take them to the tire recycling area at Hall County landfill. The county contracts with a tire recycler for proper handling.

Used Motor Oil

The 1993 plan recommended collecting and recycling the estimated 98,625 gallons of DIY (do it yourself) used oil in 1992 and the projected 120,322 gallons of used oil by 2002. The method chosen was the placement of used oil collection containers at each compactor site and the recycling center on Chestnut Street. As of 2004, there are total of 14 collection sites maintained by Hall County. Amounts collected ranged from 10,850 gallons in 1994 to 45,810 gallons in 2003 for an increase of 422 percent since the program's inception. The volume collected continues to grow each year.

Should Hall County move forward with conversion to curbside collection in selected areas, the county should monitor any adverse impacts on volume of used oil collected. Should the volume of used oil collected be adversely affected, the county should investigate alternatives to recover the lost volume, including but not limited to, curbside collection, new drop off locations in affected areas and private sector efforts. Curbside recycling should be included in the recommended collection system analysis.

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Alabama's longstanding and successful, Project R.O.S.E. (Recycled Oil Saves Energy), provides several examples of metropolitan areas collecting used oil at the curb with regular garbage pickup. These communities include Tuscaloosa, Huntsville, Athens, and Decatur. Residents place used oil in a clear leak proof container, then leave it alongside garbage containers at the curb. City sanitation workers transfer the used oil to a holding tank at city facilities where it is picked up for recycling. Garbage trucks are typically retrofitted with storage racks for this collection option.

According to a 1989 brochure from EPA, some other communities that were collecting oil at the curb at the time include:

- Five cities in California
- Minnesota Metropolitan area
- Haddonfield, NJ
- Mount Olive, NJ
- Hamburg, NY
- Cary, NC
- Over 100 communities in Oregon
- Columbia, MO

Regular or periodic curbside collection is certainly an option.

Household Hazardous Waste

Hall County has developed a brochure on the topic of how to manage common household chemicals such as paint, anti-freeze, gasoline, used motor oil and batteries. In keeping with the national standard, paint appears to be the most common item in this category among Hall County residents.

Both Gainesville and Hall County Solid Waste Divisions have noted that paints can be a problem. Cans sometimes break in packer trucks or compactor containers, and may leak out of moving trucks onto the public's vehicles. Both indicate paint is not a big enough concern to justify the cost of doing something else, however.

A collection program to handle paint and related products (stains, paint thinner, varnish, etc.) had been investigated by the Hall County Resource Recovery Division and the

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Environmental Management Committee of the Greater Hall Chamber of Commerce. It was determined that the cost for one single day event could be on the order of \$30,000. A workable funding mechanism could not be found to host a conventional collection event. See Disposal Element for additional discussion of handling of paints under “Special Management Items”.

For now, the County provides recommendations for proper management of household hazardous waste from a publication by the Pollution Prevention Assistance Division entitled “Guide to Best Management Practices for Household Hazardous Waste and Radon”.

Electronics

Electronics products have gained some attention in recent years both due to the growth of the personal computer and ancillary equipment market, and the rate at which the technology becomes antiquated and the search for the next significant source of heavy metals in the waste stream. Now that lead acid batteries have been banned from landfills and enjoy a very high recycling rate and mercury use has been highly reduced in alkaline batteries and fluorescent tubes, the focus has changed to electronics as the next major source of heavy metals. Lead, mercury, cadmium and chromium comprise some of the metals of concern found in electronics.

In the United States alone, 20 million or more PCs became obsolete each year, meaning more than 315 million computers will have been disposed by 2004. Computers, TVs and other electronic equipment account for 220 million tons of waste each year in the U.S., of which more than 10% goes straight to landfills (a percentage quickly climbing). As much as 80% of the PCs and other e-waste collected for recycling in the U.S. happens to end up in Asia — where it may be unsafely disposed.

Along with Athens/Clarke and Rome/Floyd Counties, Hall County held a one-day collection event on November 17, 2001 for recycling of PC's, televisions and VCR's. The three jurisdictions were each granted \$10,000 by the Georgia Department of Community Affairs for the event as part of a pilot project to obtain experience in this new

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area of recycling. Hall County had a total of 121 participants bring in an estimated 13,900 pounds of electronics for recycling at its one-day event. Based on the estimated population of 139,000 at that time, the generation rate was 0.1 pounds per person. Virtually all of the \$10,000 was spent on advertising, operating supplies and contractor's fees required for the event. This information could be used as a rough guide for future events.

Some states have enacted legislation banning disposal of certain electronics waste such as computer monitors. Other states, such as Georgia, have established ad hoc committees to investigate the issues and make management and/or legislative recommendations based on their findings.

The National Electronics Product Stewardship Initiative (NEPSI) is a group coordinating an agreement among governments, manufacturers and environmentalists on a nationwide electronic-waste recycling program. Perhaps the biggest issue so far is how to pay for a national recycling program. In March 2002, the group agreed in principle on the concept of a "front-end" fee on PC users, i.e., an extra amount to finance its so-called "end-of-life" costs. Some feel the upfront fee will be less a deterrent to recycling and safe disposal than the current back-end charges (by most recyclers and manufacturers), which may act as a disincentive.

While they don't disagree, representatives of the manufacturers are sensitive about the amount of such a fee. Even adding \$25 to \$30 to the price tag of PC or other electronic device could hurt sales or be unevenly applied by different importers, big-name brands or other manufacturers. In the meantime, manufacturers may act to make a bigger contribution by designing new products with lesser amounts of lead, mercury and other toxic materials.

It is unclear how electronics will be managed in Georgia, as this is a developing and changing issue both nationally and locally. It is enough at this point to monitor

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developments and be open to the possibility of and opportunities for separating selected electronics materials for recovery via reuse and recycling.

Organics and Yard Trimmings Management

Composting is the natural decomposition of organic material by microbial activity under aerobic conditions. It occurs naturally and unaided all the time in our natural world. It can also be made to occur under controlled conditions as a means of waste reduction to produce a usable product, in the form of a soil additive. The end product is a humus material, which increases moisture retention in sandy soils and porosity in clay soils. This material may have valuable agronomic uses. Studies have shown that compost may keep plants free from root rot and other fungal diseases. Compost helps promote plant root development, thus increasing a plant's resistance to drought and wind stress. Waste products in the composting process are heat, water and carbon dioxide. Volume reduction ranges from 40 to 75 percent of original volume.

Factors affecting the compost decomposition rate are the carbon/nitrogen ratio, moisture content, oxygen, and internal temperature. Carbon provides energy for the microorganisms and is released into the atmosphere in the form of carbon dioxide. A beginning carbon/nitrogen ratio of 25:1 to 30:1 is recommended. Table 23 illustrates average carbon/nitrogen ratios for selected materials.

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Table 23 --Carbon/Nitrogen Ratios Of Common Composting Materials

Food waste	15:1	Leaves	60:1
Wood	700:1	Fruit waste	35:1
Sawdust	500:1	Rotted manure	20:1
Straw	80:1	Cornstalks	60:1
Grass clippings	19:1	Alfalfa hay	12:1
Broiler litter	11:1	Hen manure	6:1
Pullet litter	18:1		

References: Hall County Cooperative Extension Service, 1990
University of Georgia, Cooperative Extension Service, 1991

Moisture is needed by microorganisms for growth. An easy test for moisture content is to grasp a sample of the composting material. It should have the feel of a damp sponge, and when squeezed no free moisture should be wrung out. Excessive moisture can lower temperatures and oxygen levels, resulting in odor problems.

Adequate oxygen penetration into the decomposing mass is needed to maintain aerobic biological conditions and hasten decomposition. Oxygenation is used to increase microbial activity and thus raise temperatures.

Internal temperature of the composting material affects the rate of decomposition and destruction of pathogens and weed seeds. Temperatures should range from 130° F to 150° F for best results. Most weed seeds are inactive at 150° F to 160° F, and at these temperatures pathogens and fly larvae are almost completely destroyed.

Home Composting

Home composting can be a key component of waste reduction. Many areas, notably Seattle and several local governments in Georgia, have made home composting units

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(bins and other enclosures) available to residents in a coordinated effort. Many vendors of such units are more than willing to assist in this regard.

Home composting may also be done without the use of commercially made bins. In fact, it can be done with no bin at all. However, a bin does help to maintain a neater appearance, maintain a higher pile to generate higher internal temperatures and keep out unwanted animals.

Preprocessing

Many times, preprocessing of wastes in advance of composting is desirable. One of the most common preprocessing methods is to chip wastes. A chipper may be used to chip woody wastes such as small tree limbs and brush.

A tub grinder may be used to grind organic wastes such as brush, leaves, grass, pallets, construction waste wood, and tree limbs. Tub grinders consist of a rotating tub into which materials to be processed are loaded. Beneath the rotating tub is a high-speed hammermill. Tub grinders may be useful in further size reducing pre-chipped wastes or can handle a variety of unprocessed wastes.

A drawback to tub grinders is the tendency for the hammers to require frequent replacing or resurfacing. This may be expensive in materials, labor and lost grinding time. Materials such as leaves tend to cause rapid wear due to the relatively large amounts of grit they contain. Tub grinders are also prone to damage by metal contaminants that may be found in the waste.

High torque shredder/grinders may also be used to process yard wastes. Some grinders use slowly rotating augers. These need to be resurfaced or replaced less frequently than hammers in tub grinders. However, particle size may not be as uniform or small as that produced by tub grinders.

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The main goal of preprocessing is to reduce the size of the material being composted. Size reducing the material has the benefit of increasing the surface area for microbes to inhabit, thus increasing their populations and hastening the composting process. Preprocessing can also serve to mix materials. Mixing is also beneficial in creating uniformly favorable conditions throughout the composting mass.

Preprocessing may also be an end in itself if the material is to be used for mulching. Medium and fine textured mulches are less likely to be blown by wind, becoming seated on the landscape better than course materials. Mulches help conserve moisture, insulate plants against temperature extremes and help control weeds. They also decompose and add nutrients to the soil.

Markets

Marketing of compost should be considered up front when planning a project. Local government should have some involvement in marketing, even under a full-service contract. A year should be allowed to develop a marketing program. Give-away programs may help move compost, but to the extent possible, compost should be sold. If residents pay for compost, they are more likely to see it as a valued product. Markets for compost include landscaping (public and private) projects and horticultural uses. The agricultural community represents a largely untapped market for compost. Horticultural and agricultural interests are likely to have more stringent quality standards.

Like recycling, composting should not be looked upon as a money making proposition. Experts recommend that for budgeting purposes, local governments project zero dollars from the sale of compost. In Wesley Hills, MA, for example, efforts are made to sell the 4,000 to 5,000 tons of yard waste compost produced each year, but much of it goes to community projects or is donated to various groups.

Municipal Composting

As a municipal program, composting is most likely to be of the low-tech windrow approach. Front-end loaders are commonly used to turn and aerate the composting

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material. This material is most likely to be leaf and yard waste. Such waste tends to be high carbon, low moisture material. It does not tend to attract vectors or cause objectionable odors. High moisture, high nitrogen materials such as grass clippings can cause objectionable odors if allowed to clump and become anaerobic. To avoid this, the material must be preprocessed to ensure the clippings are evenly mixed with more carbonaceous materials.

Central Yard Waste Composting

Central yard waste composting is the composting of leaf and yard waste at a centralized facility. It may be publicly or privately operated. It is likely to be a "low tech" approach, commonly composted outside using windrows. It presents a low probability for odor problems; however, care must be taken to break apart grass clumps to avoid these areas becoming anaerobic. According to the Solid Waste Composting Council (SWCC), there are approximately 1,400 central yard waste composting projects currently operating in the U.S. Some have been in existence for over a decade. According to Franklin Associates, on average more than half of total yard waste may be grass clippings. No central yard waste composting is being practiced in the planning region. Yard wastes may be collected for composting either loose or in some form of container at the curb. With container collection, yard waste may be placed in paper or plastic bags or some type of rigid bin. Such a collection method offers the advantage of using existing refuse equipment for collection. A disadvantage is distribution of bags or bins to residents. Loose leaves can also be collected using special equipment such as "pincer" type buckets attached to front-end loaders or skid steer loaders. Vacuum machines can also be used.

In-Vessel Composting

In-Vessel composting implies composting indoors using specially designed enclosures. These enclosures may be of various types, such as rotating tubes or concrete stalls. This method is likely to use forced aeration along with mechanical turning. In-vessel systems offer greater control of the entire process since it is done in a closed environment free from outside environmental fluctuations such as precipitation and temperature. Such systems may also be more energy dependent, i.e., energy is required for forced aeration

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and mechanical turning. The advantage is that these systems produce a finished compost in the least amount of time. They also offer greater odor control by regulating oxygen levels, moisture levels, and by using biofilters or other “scrubbers” to remove any objectionable odors released to the environment. As of 2003, no in-vessel composting is being done in the planning region.

Municipal Solid Waste (MSW) Composting

Most facilities compost yard waste, but increasing numbers are focusing on MSW. In general, these are higher technology facilities processing mixed MSW as their feedstock. MSW composting may, of course, also be done on a home composting level.

There is considerable debate regarding source separation versus non-source separation MSW composting. Some feel that not enough research has been done to definitely say whether source separation or non-source separation has the least environmental impact and the lowest total cost. Opponents of mixed MSW composting (sometimes called “mass composting”) argue that such an approach circumvents the need for source separation and preprocessing of compostable components. Supporters of mixed MSW composting point toward the ability to compost the largest fraction of the 60 percent of the waste stream that is compostable, and that it therefore offers the greatest diversion of waste from landfills. Common arguments for and against mixed MSW composting are summarized below:

For:

1. Source separation of compostables is unnecessary.
2. Avoiding separate collections results in cost savings.
3. Environmental impacts of separate collections are avoided.
4. Mixed MSW composting plants can recover recyclables.
5. Mixed MSW composting plants can produce marketable compost.
6. The largest fraction of MSW is composted and therefore offers the greatest waste diversion.

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Against:

1. Recycling materials that can be recycled may be a higher use than composting them.
2. Our throwaway mentality will be reinforced since manufacturers and consumers might find generation of “compostable” discards acceptable.
3. Mixed MSW composting may produce an inconsistent product of questionable quality and limited marketability.
4. There is a question whether current technologies adequately remove non-compostables, recyclables, and hazardous components.
5. Source separation produces higher quality compost.
6. Mixed waste composting provides an easy solution that will weaken reduction and recycling efforts.

The usual approach with mixed MSW composting is to screen out the non-compostable fraction, such as metals and plastics, at the back end. Both supporters and opponents agree that the composting process benefits from front-end separation. Where they differ is on the degree of separation. Table 24 shows data from an unpublished paper by l’Hermitte of concentrations of seven heavy metals in composts produced in Germany from mixed MSW, from separate collection and from tree and shrub prunings and agricultural wastes.

Mixed MSW composting systems that preprocess incoming wastes by mechanical grinding or shredding should be avoided. Such systems offer the greatest risk of contamination because contaminants may be liberated into the compost. Items such as dry cell batteries and aerosol cans, if shredded, may provide an avenue of contamination. It is not clear whether the analysis presented in Table 24 represents results from a system that utilized shredding of incoming mixed MSW.

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Table 24 -- Effect of Source Separation on Heavy Metal Concentration in Composts

Feedstock	Compost (dry weight)						
	Cd	Zn	Pb	Cu	Cr	Ni	Hg
Source Separated MSW	408	133	33	36	29	nd*	1
Central Separated MSW	1570	513	274	71	45	2.4	5.5
Prunings and Agricultural Compost	80	27	22	16	21	<1	<1

Reference: l'Hermite. From "Source Separation and MSW Compost Quality" by C.G. Golueke and L. F. Diaz, 1991, BioCycle

*nondetectable

Co-composting

Co-composting is the simultaneous composting of one or more waste streams with sludge from wastewater treatment facilities or some other nitrogen rich material. The sludge provides the moisture and nutrients, while the other wastes provide the bulking agent. A 3:1 ratio of bulking agent to sludge is recommended.

When mixing different waste streams, contamination, especially from sludge is a possibility. A study for EPA by the County Sanitation Districts of Los Angeles County of 498 sludge products revealed the products free of pathogenic viruses and viable ova. The pathogenic bacteria of Salmonella and Yersenia were detected in a significant number of the sampled products. However, in the same report researchers found no evidence of anyone getting sick from using a sludge compost-based product.

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Organics or Yard Trimmings Management in Hall County

Clermont

Clermont does not provide collection of yard waste to its residents. As a result, residents must self manage. Local officials speculate that many residents burn yard trimmings in the fall. There seem to be no feelings among residents to indicate burning as a problem. Most homes are on one acre lots, as required by the Town. This may help to facilitate on-site management. Most subdivisions don't have a lot of trees to create leaves. Grass clippings are not an issue locally.

Clermont should review its local ordinances to ensure it has a requirement that yard trimmings not be placed in or mixed with municipal solid waste and should encourage home composting.

Flowery Branch

Flowery Branch provides weekly collection of yard trimmings on Monday. Mulch is produced and made available to residents.

Gainesville

Some passive composting is practiced by cities such as Gainesville that pile the leaves collected at curbside to compost on their own. Yard trimmings are chipped when possible. Both mulch and leaf compost are made available to residents free across the street from the Sanitation office on Altavista Road. Much of the wood mulch is from the streets department, as a result of right-of-way maintenance and trees across roads and storm damage. Larger limbs and tree parts that are collected by the streets department are deposited at Altavista for residents to get for firewood. What is left gets chipped by the streets department. The yard trimmings collected by sanitation are materials put out at curbside from yard maintenance and storm debris that comes down on resident's property. Gainesville participates in the annual Bring One for the Chipper program to chip Christmas trees into useful mulch.

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Gillsville

Gillsville does not provide for collection of yard trimmings. Residents self manage.

Lula

Yard trimmings are chipped by municipal staff at the curbside once per month. Mulch is made available to residents.

Oakwood

Limbs are chipped and mulch given back to residents. Oakwood has a mulch site near the community building adjacent to the city park on Allen and Railroad Streets. Mulch is made available to residents.

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Home Composting

In March of 1992, Hall County received a grant from the Department of Community Affairs (DCA) to construct a home composting demonstration site, which was located at Elachee Nature Science Center. The demonstration site has helped provide a useful resource in helping to spread the word about home composting. There is a strong association between home composting and gardening. As a result, it is likely to be much more prevalent in rural areas.

Mulching

Hall County participates in the annual Bring One for the Chipper program to chip Christmas trees into useful mulch. Hall County has chippers used in right of way clearing and maintenance. The mulch is provided free to area residents. Hall County could review the need of offering periodic grinding of yard trimmings as a service to residents and as an alternative to disposal.

Composting

Composting has been studied and promoted by the Chestatee-Chattahoochee Resource Conservation and Development Council, Inc., using funding from federal, state and local

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sources. The focus has been the evaluation and demonstration of on-farm composting of poultry litter and dead birds.

Guidelines have been developed for composting dead birds as an alternative to pit disposal. It can also provide poultry producers an alternative method of utilizing large quantities of poultry manure.

The use of poultry manure as a nutrient source can be used to enhance the composting process. It increases pH, decreases the C/N ratio and increases bulk density. Bulk density is an indicator of the degree of decomposition, as it reflects the decrease in particle size. Table 25 illustrates the results of a study conducted in Alachua County, FL. The study showed that higher temperatures were maintained for a longer time when poultry manure was added to yard waste.

Table 25 -- Properties of Co-Composted Yard Waste and Poultry Manure after Composting for 16 Weeks and Curing for 3 months

Treatment*	Bulk Density		g/cm ³
	pH	C/N	
9:1	6.7	1:28	0.25
10:0	6.4	1:41	0.21
3:1	7.2	1:24	0.34

*9:1 = 9 parts yard waste and 1 part poultry manure (volume basis typical for each)
Reference: Alachua County, Florida, 1991

The use of poultry manure can carry with it certain management problems such as flies and odors. Odor problems can be controlled by not storing poultry manure at the site and incorporating it into the yard waste as soon as it arrives. Frequent turnings of twice per week also help. The Florida study showed flies to be a problem at the 25 percent level of poultry manure; however, fly larvae were never present when 10 percent poultry manure was used.

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As called for in the County's Comprehensive Solid Waste Management Plan, in July 1997, Hall County embarked on a grant-funded project to combine waxed coated corrugated cardboard (WCC) and broiler litter into a composting project. The previous solid waste plan had identified sources of wax coated corrugated cardboard as primarily from poultry processing, the county's largest employer. Prior to beginning this project, a small pilot project was conducted. It was found that the coated cardboard and poultry waste provided a mixture feasible for composting. A work group of the Comprehensive Solid Waste Management Plan Implementation Committee was formed to oversee the planning and implementation of this project. The workgroup included representatives from the poultry industry, as well as local governments and UGA.

Leading up to the project, the work group looked into various options for dealing with wax coated corrugated cardboard boxes. Options considered included recycling, energy recovery (incineration) and composting. Composting was felt to be the best option, as it offered a measure of local control.

Once this option was decided upon, a pilot study was conducted. UGA was enlisted to conduct laboratory testing of various mixtures. WCC was shredded and mixed with poultry manure to speed the composting process.

A field study was also conducted involving the setting out of shredded WCC/poultry manure in a row about 4 feet high by 16 feet wide by 300 feet long. A contractor was hired to compost the material. The pilot proved the feasibility of producing finished compost in about 3 months. The finished compost was tested in a laboratory and found to be of very good quality.

The selected site for the full-scale project was the Allen Creek Landfill, which at that time had been closed for nearly two years. The site opened on May 10, 1999. In addition to WCC, yard trimmings were also accepted at the site and turned into useful wood mulch. Hours of operation were Monday through Saturday 8 a.m. to 4 p.m.

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A horizontally fed grinder with a 200 horsepower industrial diesel engine was purchased for use on the project. Unfortunately, due to unforeseen technical problems involving equipment and site limitations, the project was discontinued in September 1999.

Lessons learned:

1. A differential of five dollars is enough to provide generators of WCC (wax coated corrugated) incentive to separate and bring the material to a recovery facility.
2. People will pay \$5 per ton for wood mulch.
3. There was a good balance between wood waste coming in and mulch going out.
4. The grinder was not adequate to keep up with demand.
5. The grinding of WCC produced a lot of airborne dust (paper fibers) that clogged the radiator and air filter on the grinder.
6. The toughness of the WCC and airborne dust interacted to cause overheating of the grinder's engine unless closely monitored.
7. The roughly 3.5 acre site was not large enough for the project.
8. Applying gravel to the composting pad was a mistake, as it became incorporated into the compost with turning.

Waste Reduction in Times of Disasters

For discussion of waste reduction in times of disasters see "Solid Waste Management In Times of Disasters" within the Education and Public Involvement Element.

Needs/Goals

Adequacy of Waste Reduction Program

While the waste sources that contribute waste to the county landfill have definitely changed from the 1993 plan, going from heavily weighted to commercial/industrial (85%) to weighted towards residential (53%) in 2003, Table 5 shows that overall, the residential portion still remains at 15%. If the goal were to be reduction in the amount of waste disposed at the county landfill, in order to extend its life, one might concentrate more on residential waste reduction activities. However, if the goal were to be working toward achieving the State's reduction goal, as was the case with the 1993 plan, concentration solely on residential programs will not achieve the State's 25% per capita waste disposal reduction goal.

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State's Per Capita Waste Disposal Reduction Goal

The Commissioner of the Georgia Department of Community Affairs in 1997 asked the State Attorney General for an opinion as to whether the State's waste reduction goal, which was based on the date of July 1, 1996, was still in effect. The Attorney General's Office issued the following official opinion on July 11, 1997:

"Therefore, it is my official opinion that the essential intent of Code Subsection 12-8-21(c) is the reduction of solid waste by 25 percent. This goal remains effective in applying related requirements of the 'Georgia Comprehensive Solid Waste Management Act,' notwithstanding that the goal was originally expressed in terms of a calendar date which has passed. Jurisdictions which met the goal should continue the process of maintaining it; jurisdictions which did not meet the goal should continue the effort to reach it."

The date was ruled to be part of the goal but not the end of it. The Subsection that sets this goal is a part of the "Georgia Comprehensive Solid Waste Management Act".

The state's waste reduction goal plays a part in several requirements of the Act. These include:

1. Each city and county must have a program in its solid waste management plan for meeting the goal;
2. No permit, grant or loan may be issued for a municipal solid waste disposal facility unless the host jurisdiction and other jurisdictions which will contribute waste are actively involved in and have a strategy for meeting the goal;
3. Permits for solid waste handling and for solid waste handling facilities are similarly conditioned; and
4. Local jurisdictions and the Department of Community Affairs are required to report on progress toward meeting the goal.

Table 16 shows the current estimated per capita generation rate at 8.79 lbs/person/day. The base year 1992 per capita waste generation was an estimated 6.41. To achieve the 25% reduction from the recognized base year or a decrease to 4.8 lbs/person/day would take a total reduction of nearly 4 lbs. or a 45% reduction from the current generation rate. It is believed that the base year waste generation rate may be flawed is as much as the data on out of county waste exports was lacking or its existence unknown during

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development of the initial plan, and scales were not in place at all disposal facilities during all of the base year.

That being said, the reduction goal established by the state is a statewide goal to be measured and achieved on a statewide basis. Therefore, focusing on transferring this to a countywide basis is not what the Act requires. So long as the planning area has a meaningful reduction strategy in effect and is actively engaged in implementing it, the requirement is being met. The reduction measures outlined herein should be adequate to meet that goal.

Reduction Activity Summary

Previous to March 1992, Hall County Government contracted with private firms for recycling collection and/ or processing. In some instances, the County hauled recyclables (newspaper) to private processing facilities. This changed on March 6, 1992 when the County took on collection, processing, and marketing of all recyclables. From late July 1991 to March 6, 1992, Hall County contracted with Sonlight Recycling and Recovery for recycling services.

Other considerable reduction efforts are ongoing among area businesses and scrap metal dealers. These are, however, difficult to document since they are not government programs, and wastes they process may be imported from outside the planning area. Tables 26 through 30 summarize reduction efforts from inception to 2003.

Table 26
Hall County Recycling Statistics for
March 1989 to June 1989

Commodity	Tons Recovered	% of Total
Newspaper	204.47	100
TOTAL	204.47	100

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Table 27
Hall County Recycling Statistics for FY 1990
(July 1989 to June 1990)

Commodity	Tons Recovered	% of Total
Aluminum	4.65	0.5
Glass	4.98	0.5
Misc. Paper	5.57	0.5
Newspaper	800.09	80.1
Scrap Metal	184.06	18.4
TOTAL	999.35	100.0

Diversion Rate= 999.35 Recyclable Tons / 153,598.86 Total Waste Tons X 100 = 0.65%

Table 28
Hall County Recycling Statistics for FY 1991
(July 1990 to June 1991)

Commodity	Tons Recovered	% of Total
Aluminum	9.63	0.6
Glass	73.01	4.7
Misc. Paper	6.00*	0.4
Newspaper	1116.93	71.7
Scrap Metal	351.96	22.6
TOTAL	1557.53	100.0

Diversion Rate = 1557.53 Recyclable Tons / 117,451.70 Total Waste Tons X 100 = 1.3%

*Estimated

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Table 29
Hall County Recycling Statistics for FY 1992
(July 1991 to June 1992)

Commodity	Tons Recovered	% of Total
Aluminum	25.00*	0.8
Corrugated Cardboard	42.63	1.4
Glass	305.00*	10.2
Misc. Paper	10.00*	0.3
Newspaper	1,209.80	40.4
Plastics	50.00*	1.7
Scrap Metals	354.05	11.8
Waste Tires	1,000.00	33.4
TOTAL	2,996.48	100.0

Diversion Rate = $2,996.48 \text{ Recyclable Tons} / 116,272.73 \text{ Total Waste Tons} \times 100 = 2.6\%$

*Includes some estimated weights due to incomplete record keeping during transition from contracted, privately provided service to publicly provided service.

Table 48 shows an apparent disparity in growth rates between the increase in waste tons and recyclable tons collected from Hall County compactor sites. Assuming the rate of recycling among county residents were to remain more or less constant, the rates of growth should track more consistently. However, the data show this not to be the case. There must be factors at play that create this phenomenon.

As explained in the Collection Element, the rate of overall recycling at compactors has lagged behind the growth in waste disposal. The impact of a full compactor is negligible to the waste disposal customer. However, the same cannot be said about the impact a full recycling bin has on a customer who has made the extra effort to recycle. The impact is one of definite negative reinforcement. The result of such negative reinforcement may be the cessation of recycling in the affected household. By comparison, even if the compactor is full, the customer disposing of waste is instructed to leave the trash bag(s)

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on the ground near the compactor unit. Since the customer was able to achieve the desired end result of getting rid of their trash, there is no negative reinforcement and, consequently, no impact on their future use of the compactor sites for waste disposal. Further reinforcement of this view is provided by comparing growth in tons of trash and growth in ton of recyclables (see Table 30).

Recommendation

The constraints that are currently placed on the collection of recycling roll offs by adhering to a set collection schedule has a tendency to act as an arbitrary limit on growth. If Hall County desires to increase its recycling rate and offer improved customer service to residents participating in recycling, collection frequency of recycling roll offs should be increased by changing from collection as determined by a set schedule to collection on an as needed basis.

Table 30 --Comparison Of Waste Tons And Recyclable Tons From Compactor Sites

Year	Waste Tons	Recycling Tons(1)	OCC	Total Recyclables
1995	14,914	2,238	524	2,762
1996	15,930	2,316	565	2,881
1997	18,837	2,405	627	3,032
1998	19,762	2,459	687	3,146
1999	20,942	2,49	754	3,251
2000	23,161	2,640	782	3,422
2001	24,730	2,461	1,403	3,863
2002	25,720	2,453	1,238	3,692
2003	27,145	2,468	1,179	3,647

(1) Excludes corrugated cardboard

Corrugated cardboard was excluded from Table 30 to isolate the comparison to those recyclables collected in roll off containers with waste collection.

Targeted Reduction Activities

In order to be effective at reducing the overall waste generation rate, as discussed previously, it will still be important to promote and assist with waste reduction in the

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commercial/industrial sectors, as well as construction and demolition wastes, which are likely due, in large measure, to commercial activity (construction and demolition contractors). While it is true that many in the business community, especially manufacturers, have made great strides in reducing their waste output, the data in Table 5 show there is apparently much work in this area left to do. Even though waste reduction strategies should target these areas, reduction that can be realized in the residential sector should not be ignored, especially if they can be obtained relatively quickly and easily. Residential waste reduction will result in life extension to the county landfill, which is now weighted toward residential waste.

Needs/Goals Summary

Possible strategies for obtaining increased waste reduction in the targeted commercial and industrial sectors could include:

1. Greater presence of EnviroShare program
2. Cooperative marketing of recyclable materials, within EnviroShare program.
3. Partnering with others offering reduction assistance to the target sectors.
P2AD, GA Tech, UGA, others.
4. Increased education on advantages of waste reduction on improved competitiveness.
5. Increased aggressiveness in waste reduction targeted to businesses. This could take the form of collection of corrugated cardboard, and possibly other materials, provided by Resource Recovery Division. Rome/Floyd and Athens/Clarke have done this. Service could be provided to those businesses that are not currently being serviced by private sector recyclers, so as not to be seen as competing with the private sector. Former County Commissions have established such a policy. It is not known whether the County Commission still holds to this policy. Many businesses are not recycling key, easily recycled materials such as corrugated cardboard, perhaps due to their being too small to recycle via the private sector or due to lack of storage space to

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store material for a week or more at a time. A public sector effort might be able fill a need.

Possible strategies for obtaining increased reduction of residential waste for Hall County and its municipalities could include:

1. **Increased education.** There are concerns regarding waste reduction progress due to cultural differences and communications challenges when addressing the Hispanic community. This is especially the case for Gainesville, which has a large Hispanic population.
2. **Providing residents with recycling and/or composting bins**
3. **PAYT/curbside recycling.** PAYT and curbside recycling should be included in the recommended collection system analysis.
4. **Increased aggressiveness in waste reduction targeting residents.**
This could be done by offering to buy (commonly referred to as “buy back”) certain materials that are accepted at the Hall County Recycling Center. This has been done by Rome Floyd and Gwinnett County. Buy back could be limited to materials that are not already being sought by private recyclers in Hall, in order to avoid competing with the private sector, if that were a concern.
5. **Increase collection frequency of recycling roll offs by changing from collection as determined by a set schedule to collection on an as needed basis.**

Additional Needs/Goals

1. **Drop and swaps** are one-day events that can be offered for the purpose of reusing items such as paints and furniture. Such programs have been successful in other areas. The same could also be done with household hazardous wastes on a more limited basis. Drop and Swaps could be advertised via local media resources (see Education Element) and conducted

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one Saturday in the spring and one in the fall by Resource Recovery and Keep Hall Beautiful. Based on response, the program could be offered more often.

2. Require private haulers to offer recycling service to their customers. Explore options for enforcing this requirement, such as through business licensing. Meet with private haulers as issues affecting them arise. Private haulers could be required to offer recycling service to their customers. An ordinance requiring that haulers comply must be passed by the County and all municipalities. The ordinance could be enforced by requiring compliance in order to receive a business license.
3. Continue and expand the drop off programs at county compactor sites. Add opportunities for recycling of other materials as feasible.
4. Provide used oil collection in municipalities for use by residents. Drop off areas should be located such that municipal personnel can supervise the facility. The alternative of requiring businesses who sell motor oil to participate with local governments in the program seems to compliment the activities of other types of businesses in working toward the goal of reuse, reduce or recycle. Businesses need to be involved to the point of having a significant role and commitment to the program. Experience has shown in many cases that the business leaders will accept the responsibility for protecting the environment and in many cases can provide meaningful input to local governments in developing programs. A public/private partnership for DIY used oil recycling should be considered as the alternative that should be implemented by Hall County municipalities.

Each municipality offering solid waste collection would provide a location for DIY used oil to be collected. The location for a collection container and the container, including maintenance around the site and quality control, would be provided by the municipality. Hall County would provide collection containers at the 13 compactor sites located throughout the county for

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residents in the unincorporated areas and offer to include all municipal collection containers in a contract with a used oil recycler. Municipalities would participate in the cost/revenues of the county contract with a used oil hauler.

A committee of retail business managers who sell motor oil would be appointed by elected officials to develop a program for offering recycling opportunities to include incentives and an educational program.

5. Review the need of upgrades to Hall County Recycling Center at 1008 Chestnut Street to accommodate additional volume. The services of a design firm familiar with layout of facilities for sorting commingled recyclables should be enlisted in the design of sorting lines or other improvements.
6. Explore the feasibility of alternatives to wax coated corrugated cardboard that contributes toward waste reduction. As part of the EnviroShare program, packaging alternatives to coated corrugated cardboard would be explored.
7. Encourage home composting via implementation of home composting bin distribution program and utilization of the regional demonstration site at Elachee Nature Science Center. Low cost or free home composting bins are available in the form of surplus and discarded pallets. Hall County and municipalities would be encouraged to distribute bins.
8. Hall County should review the need of offering periodic grinding of yard trimmings as a service to residents and as an alternative to disposal. Research via surveys and other methods could be pursued to determine if sufficient need and interest exists.
9. Examine requiring building codes for including recycling considerations into new building design. New buildings (office buildings, apartment complexes,

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etc) could be required to include design considerations for recycling. Considerations would include adequate areas for storage of recyclables. Ordinances should be passed by the county and all municipalities to include these requirements in building codes for applicable buildings.

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COLLECTION ELEMENT

The collection and hauling of waste in Hall County ranges from the County and municipalities to private firms and private individuals self-hauling their solid waste to the County landfill, other landfills or compactor sites. Additionally, there is a wide variety of vehicles utilized for collection of solid wastes. A description of solid waste collection vehicles can be found in Appendix C.

INVENTORY AND ASSESSMENT

Unit Pricing

Unit pricing, pay as you throw (PAYT) or variable rate pricing, is a system under which residents pay for waste management services per unit of waste collected rather than through a fixed fee. It treats waste services like any other utility where charges are determined by rate of usage.

Unit pricing is nothing new. It's a familiar concept for businesses. For years, many companies have been paying for waste removal services based on the size of their dumpsters and/or frequency of collections.

Potential Benefits of PAYT

Communities that have adopted PAYT programs have reported a number of benefits, ranging from reduction in waste generation to greater public awareness of environmental issues.

Waste Reduction

Unit pricing can help substantially reduce the amount of waste disposed of in a community. Some communities with unit pricing programs report that unit pricing helped their municipality achieve reductions of 25 to 45 percent in the amount of waste shipped to disposal facilities.

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Reduced Waste Disposal Costs

When the amount of waste is reduced, communities often find their overall solid waste management costs have declined as well. A portion of the revenues previously spent on waste disposal, however, may need to be dedicated to recycling, composting, or other diversion activities.

Increased Waste Prevention

To take advantage of the potential savings that unit pricing offers, residents typically modify their traditional purchasing and consumption patterns to reduce the amount of waste they generate. These behavioral changes have beneficial environmental effects beyond reduced waste generation, often including reduced energy usage, pollution reduction and resource conservation.

Increased Participation in Composting and Recycling Programs

Under unit pricing, new or existing recycling and yard waste composting programs become opportunities for residents to divert waste for which they would otherwise pay. Experience has shown that these programs are the perfect complement for unit pricing. Analysis of existing unit pricing systems shows that composting and recycling programs divert 8 to 13 percent more waste by weight when used in conjunction with a unit pricing program.

Support of the Waste Management Hierarchy

By creating an incentive to reduce as much waste as possible using source reduction and to recycle and/or compost the waste that cannot be prevented, unit pricing supports the hierarchy of waste management techniques defined by EPA.

More Equitable Waste Management Fee Structure

Traditional waste management fees, in effect, require residents who generate a small amount of waste to subsidize the greater generation rates of their neighbors. Under unit pricing, waste removal charges are based on the level of service the municipality provides to collect and dispose of the waste, similar to the way residents are charged for phone service or electricity. Because the customer is charged only for the level of service

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required, residents have more control over the amount of money they pay for waste management.

Increased Understanding of Environmental Issues in General

Through unit pricing, communities have the opportunity to explain the hidden costs of waste management. Traditional waste management systems often obscure the actual economic and environmental costs associated with waste generation and disposal. Once individuals understand their impact on the environment, they can choose to take steps to minimize it.

POTENTIAL BARRIERS TO PAYT

While there are clearly benefits associated with unit pricing programs, there also are potential barriers. Communities considering unit pricing should be aware of the costs and possible community relation implications associated with the following issues.

Illegal Dumping

Some residents have strong reservations about unit pricing, believing it will encourage illegal dumping or burning of waste in their area. Communities can counter this fear with an effective public education program. Since most communities with unit pricing programs have reported that illegal dumping proved to be less of a concern than anticipated, providing residents with this information can help allay their concerns over illegal dumping.

Inadequate Reduction Options

PAYT works best in communities where there exists adequate waste reduction infrastructure and opportunities. One should be coupled with the other. Failure to do this may result in an increase in illegal dumping or other unintended consequences such as increased burning or unauthorized use of commercial waste containers. Adequate waste reduction opportunities can help circumvent such abuses and allow generators to exercise

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control of their waste collection expenses, assuming there is no or little charge for reduction options.

Recovering Expenses

Since unit pricing offers a variable rate to residents, the potential exists for uneven cash flow that could make it harder to operate a unit pricing program. To address this, communities must be sure to set prices at the appropriate level to ensure that, on average, sufficient funds are raised to pay for waste collection, complementary programs, and special services.

Administrative Costs

Effectively establishing rates, billing residents, and collecting payments under a unit pricing program will likely increase a waste management agency's administrative costs. Communities need to set waste collection prices at a level that can cover these costs.

Perception of Increased Costs to Residents

While a unit pricing program offers residents greater control over the cost of collecting their waste, it could initially be seen as a rate increase. An effective public outreach campaign that clearly demonstrates the current costs of waste management and the potential reductions offered by unit pricing will help to address this perception.

Multi-family Housing

Extending direct waste reduction incentives to residents of multi-family housing can present a challenge. Since waste generated by these residents typically is combined in a central location to await collection, identifying the amounts of waste generated by individual residents in order to charge accordingly can be difficult. Communities must experiment with rate structures and collection systems to encourage residents of multi-family housing to reduce waste.

Building Public Consensus

Perhaps the greatest barrier to realizing a unit pricing program is overcoming resistance to change, both among citizens and elected officials. Informing residents about the

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environmental and economic costs of current waste generation patterns can help overcome this resistance and build support for unit pricing.

Careful planning and design of a unit pricing program to meet specific community needs is the best solution to these potential difficulties. In particular, an effective public education program designed to communicate the need for unit pricing and address the potential concerns of residents will help meet these challenges.

TYPES OF COMMUNITIES THAT CAN BENEFIT FROM UNIT PRICING

Unit pricing programs work best when tailored to local needs. All types of communities can design unit pricing programs that will help achieve the goals of reducing waste generation and easing waste management difficulties. Large, medium-sized, and small communities in every region of the country have realized these benefits. Local officials indicate that unit pricing programs also work well whether solid waste services are carried out by municipal or by private haulers. As a result, unit pricing has grown significantly over the last few years. In the 1980s, only a handful of communities in the United States operated unit pricing programs. As of January 1994, over 1,800 programs are scheduled to be in operation. In addition, laws in many states currently mandate or encourage unit pricing programs. Georgia encourages such programs.

Winning community support for unit pricing often hinges on explaining how the program can achieve certain critical objectives. Discussions at EPA's Unit Pricing Roundtable revealed that residents tended to support unit pricing if the program achieved the waste management principles about which they cared the most. Residents often develop a sense of civic pride in programs that meet these objectives. Roundtable panelists strongly recommended that solid waste officials devote a significant amount of attention to communicating basic principles.

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Georgia's Experience

Reported use of PAYT in Georgia fell from 47 in 2000 to 42 in 2001, but some of these reported programs may not fit the true definition of a PAYT system. There are 28 communities in Georgia with financial incentive PAYT programs. These programs have many different designs. Most counties operate PAYT systems at convenience centers while most cities integrate their program into a curbside or backdoor collection system. In some programs, residents are charged based on the volume of waste they dispose, while in others, residents are charged based on the weight of the waste they dispose.

Some PAYT programs operate on a subscription basis, where residents pay a flat fee to dispose a predetermined amount of waste and are assessed an additional fee if they dispose of more waste. Others operate on a variable basis, where residents purchase bags for a fee that covers the collection, disposal, and the costs of the bags used to manage the waste.

As different as the PAYT programs are, they provide some common lessons, especially when it comes to how the public responds to the programs. Almost all communities report that public education can make or break a program. Many communities also claim that despite their initial concerns, illegal disposal did not significantly increase when a PAYT program was implemented, especially if ordinances were in place and enforced to minimize illegal dumping. Finally, the way in which solid waste management costs were covered before the PAYT program began can strongly influence public reaction to the program; whether it is seen as an added tax or a way to gain control over individual disposal costs.

Equity

The program should be structured so that people who generate more waste pay more, while residents who prevent waste, recycle, and compost are charged less.

Waste Reduction

The program must significantly reduce the community's generation of waste, increase the rate of recycling, and, therefore, reduce the amount of waste requiring disposal.

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Reductions in Waste Management Costs

By helping to alter household waste generation patterns, the program should help reduce the cost of collecting and disposing of the community's solid waste.

Community Improvement

The program should contribute to improvements in the quality of life in the community, such as resource conservation and land preservation.

EDUCATION AND PUBLIC INVOLVEMENT

In addition to deciding what information needs to be communicated, solid waste officials also should consider how best to reach residents in the community. Specifics need to be communicated. An unspecified change in waste management services scheduled to occur at some future date is not likely to capture a community's attention. Following are some activities that represent some of the ways in which officials can explain the benefits of unit pricing.

Public Meetings

Interactive public meetings offer solid waste officials the opportunity to present the case for unit pricing. Such meetings also give citizens the sense that their concerns are being heard and addressed in the final program design.

Briefing Papers for Elected Officials

As both shapers and followers of public opinion, elected officials tend to be at the center of public policy debates. Because well-informed leadership can raise issues in such a way as to attract residents' interest, solid waste officials might want to provide elected officials with brief summaries of the issues associated with solid waste management and the likely benefits of a unit pricing program.

Press Releases

Press coverage of a change in the way that a community pays for its solid waste collection services is inevitable. Keeping key radio, television, and newspaper outlets well informed of the reasoning behind the move to unit pricing can make the press a

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valuable participant in the decision-making process and prepare the community for an upcoming change.

Town of Clermont

Solid Waste Collection

The Town of Clermont offers uniform solid waste services to all its residents. Collection is done from 250 residences once per week on Mondays. The Town provides no commercial or business service. A Town ordinance requires that waste be contained in plastic or paper bags and placed in cans or carts and placed at curbside. Exceptions are made for occupants of premises who request special consideration due to age or disability. In cases of holidays recognized by the Town occurring on Mondays, waste is collected the next day. The Town requires any person, firm or corporation collecting and transporting waste over the streets of the Town for monetary consideration to first obtain written permission from the Town of Clermont to do so. Only bagged MSW is collected by the Town. Town officials speculate that very few residents haul their own bagged refuse to the County's compactor sites.

According to Town officials, waste collection averages 5,000 – 6,000 lbs. per week. The amount has increased notably in the last two years, roughly doubling due to additional subdivision areas being annexed into the Town. Waste collection charges are currently \$5 per month or \$60 annually. Charges are billed and collected quarterly (in advance).

Waste items **not** accepted include:

- Yard trimmings
- Leaves
- Sticks
- Paint or solvent cans

The Town does not collect commercial waste nor does it collect outside the Town limits. The vast majority of commercial waste is collected by Waste Management.

Collection

Recyclable and Yard Trimmings Collection

As with waste collection, if growth continues at the current rate, recycling collection also would likely go to two days per week. Recycling pick up is the same day as garbage collection. The Town provides blue boxes to residents and collection on Mondays. Recyclables are collected by municipal employees using a specially designed trailer towed by a pick up truck. Collected recyclables are delivered to the Hall County Recycling Center.

Set out requirements:

- Items must be placed in containers at curbside by 8:00 a.m.
- The Town of Clermont provides recycling containers

Items collected include:

- Newspapers
- Aluminum cans/foils
- Tin cans
- Plastic bottles – PETE #1, HDPE #2
- Glass
 - Clear
 - Green
 - Blue
 - Brown

Clermont does not offer collection of yard trimmings. Residents must self-manage. Town officials suspect most residents burn yard trimmings in the fall. Grass clippings are not an issue. There have not been notable complaints on burning. It should be noted that permits are required from Hall County Fire Services any time burning is done. No permits are issued during a burn ban. There have been no expressed feelings among residents to indicate burning as a problem. Most homes are on one-acre lots, as now required by the Town. Most subdivisions don't have a lot of trees to create leaves. Therefore, at present, this helps to reduce service demands for yard trimmings.

Other Collections

A lack of personnel and manpower prevents Clermont from collecting large items such as furniture and white goods. Such items must be hauled by residents or by a private hauler

Collection

to the County Landfill. City residents may also take advantage of the county's furniture and appliance pick up.

Solid waste collection costs are currently funded from the City's General Fund.

Adequacy of Collection Program

Clermont's collection program seems adequate for the planning period. The notable exception would be collection of bulky items. However, city residents may avail themselves of this service provided through the County each spring.

Needs/Goals

Table 10 shows that from 2002 to 2013, Clermont's annual waste tonnage is projected to increase by 100 tons or approximately 60%.

In the next 10 years, if growth continues, Clermont may have to go to 2-days/week waste collection, servicing half the town each day. Added cost to the City would be in taking existing staff off other duties and added O & M on their collection vehicle. As long as the equipment is up to the task, the feeling is the Town should keep collection services in house.

The 250 stops being served as of 2003 are projected by Town officials to increase an additional 100 to 150 stops in the next ten years. The population is expected to, keeping pace with projected increase in waste, increase by nearly 60% in ten years. The official population is 658 (2002). There have been 25 annexations in last two years. Continued annexations will certainly be a major factor in this anticipated growth. Privatizing waste collection might be an option for Clermont to consider. The need for yard trimmings collection should be investigated.

City of Flowery Branch Solid Waste Collection

Collection

The City of Flowery Branch provides once weekly waste collection services each Monday to all city residents. No service is provided outside of City limits. Waste must be placed at the curb in closed garbage bags placed inside the provided hinged-lid trash container by 6:00 a.m. Loose waste is not picked up under any circumstances.

Collection of bagged residential waste and recyclables has been privatized in Flowery Branch since 1997. Residents provide their own bags. Cost is \$11/mo. for residential collection. The hauler actually charges the city \$8/mo. The extra \$3 helps to offset the cost of yard waste collection, which is handled in-house. Due to the need to re-bid collection services, the contractor could change from year to year. Flowery Branch has employed four different contractors thus far. The current contractor (2003) is Red Oak Sanitation.

Waste items not accepted in regular collection include:

- Corrugated cardboard
- Bulky items
- Paint
- Tires
- Construction materials

Commercial waste is collected by private contractors via individual subscription.

Recyclable and Yard Trimmings Collection

Recycling collection is provided through the city's private contractor once weekly on Monday, the same day as waste collection. Recyclable materials must be placed in 18 gallon bins and set at the curb adjacent to the trash receptacle no later than 6:00 a.m.

Items accepted include:

- Clear plastic – PETE #1
- Newspapers
- Magazines
- All glass containers
- Cardboard (must be broken down flat)
- Aluminum and tin cans

Items not accepted include petroleum products.

Collection

Yard trimmings collection is done by city workers once weekly on Monday.

Yard trimmings must be placed at curbside no later than 6:00 a.m. Leaves or grass clippings must be placed in clear bags or bags marked as yard waste. Yard waste must not exceed 20 gallons per bag. Brush and/or limbs must not exceed 4 feet in length and 6 inches in diameter. No household trash should be placed in yard waste bags.

The city still collects yard trimmings in-house using a chipper and dump truck. Mulch is made available to residents at the wastewater treatment plant. The city also uses it internally. Dump trucks are customized to allow mulch to be blown in back. Also residents can call and make an appointment to accept mulch from the city. The only requirement is that it be scheduled in advance.

Other Collections

Since 2000, the contractor has also collected bulky wastes (white goods, furniture, etc.) and C&D (up to 4 cubic yards). If the bulky wastes are less than 4 cubic yards, it is included in the \$11/mo. cost. An additional charge for removal of bulky waste in excess of 4 cubic yards is a minimum charge of \$25.00 and must be paid prior to placement at the curb. Bulky items are collected every second Tuesday of each month. Items must be set out at the curb by 6:00 a.m. and no sooner than 2 days prior to pickup

Construction debris is not accepted. These services are provided by private vendors via individual subscription.

Adequacy of Collection Program

Needs/Goals

Table 11 shows that from 2002 to 2013 Flowery Branch's annual waste tonnage is projected to increase from 830 to 3,707 or approximately 447%. This may offer improved economies and bargaining power. Additional demands this might place upon the city would be limited due to solid waste services being provided under contract with private service provider. Increased demands on city resources might come in the form of

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additional customer service related calls and perhaps additional billings, if not already outsourced.

City of Gainesville

Solid Waste Collection

The City of Gainesville provides waste collection services directly utilizing a fleet consisting of rear loaders, scooters with 3 cu. yd. capacity (provide better capability for back-yard collection) and flatbed dump trucks for collecting bulky items and yard waste at the curb. Additionally, vacuum-type leaf machines and chippers are utilized to collect and process leaves and limbs. Both the vacuum leaf machines and chipper are attached to flatbed trucks to which an enclosed body is attached. The City of Gainesville provides backdoor (more specifically, back yard) solid waste collection for single-family units, duplex units, triplex units, and quadraplex units. Backdoor collection entails city collection crews collecting wastes from locations such as backdoors, garages, carports, and recognized locations on the resident's lot. All collection locations are required to be at ground level. Backdoor pick-up is acknowledged to have negatives, but it has become an accustomed service that is a source of pride for the city. It has, however, contributed to increased exposure to worker injury and collection inefficiencies.

The City requires waste to be in plastic bags and stored in rust proof, moisture-proof containers equipped with handles and tight fitting covers. The containers must have a maximum capacity of 35 gallons and be maintained in a sanitary condition free from odor. Residents must provide their own bags, cans or carts.

Residential collection fees, as of 2003, are \$13 + \$3.35 surcharge for landfill tip fees + \$3.30 for recycling for a total monthly charge of \$19.65. This includes up to 1 cu. yd. /wk. total waste collection. There are some indications that these fees may increase in order to more closely reflect the actual cost. Backdoor service is provided twice per week for each customer with collection days varying by route.

Gainesville no longer provides commercial collection to businesses, apartment complexes and industrial accounts. As recommended in the previous plan, Gainesville ceased

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servicing commercial container accounts in 1995. When commercial waste service ceased, there were approximately 800 to 900 accounts. Gainesville implemented a non-exclusive franchise on March 21, 1995. Private haulers were given the total commercial and industrial sector within the city. However, the non-exclusive franchise was implemented as a means to retain some control over this sector. This non-exclusive franchise allows an approved hauler to operate within the city according to its ability to gain market share under open competition within the commercial/industrial sector.

The non-exclusive franchise has the following features:

- Haulers must be deemed consistent with the prevailing Comprehensive Solid Waste Management Plan.
- Haulers pay the city a franchise fee of \$35 per quarter and 5 percent of gross income to operate in the city.

Recyclable and Yard Trimmings Collection

As was recommended in the 1993 Comprehensive Solid Waste Management Plan, Gainesville provides once per week curbside recyclables collection via a private contractor. Items must be placed at curbside in recycle containers supplied by the contractor.

Items accepted include:

- Newspapers
- Aluminum cans/foil
- Steel cans
- Glass (clear and brown only)
- Soda bottles PETE #1
- Colored plastics HDPE#2
- Plastic milk jugs HDPE#2
- Junk mail
- Magazines
- Catalogs
- Phone books
- Office paper

The City provides all customers with curbside leaf collection. This is on a seasonal basis beginning around November and ending around the first of February. Leaves are not

Collection

landfilled, but are stockpiled on City property. They are allowed to decompose on their own.

Other Collections

Flatbed truck service is provided at the curbside only, except perhaps in the case of the elderly or infirm. Flat-bed trucks collect yard waste and bulky items (furniture, etc.). Such mixed loads are taken to the County landfill or to RTS Landfill. To keep things separate would require more trips or more vehicles traveling the same route to avoid calls from residents that only some of their things were picked up.

The only limitations on these items is a City ordinance requiring items hauled by flat-bed truck be less than five feet in length and less than 50 pounds. White goods are also collected and sold to a local scrap metal dealer. Gainesville charges \$18 for each Freon containing appliance and \$12 each for other appliances. Residents are required to call for pick up of these, but many times they do not call. Whenever the collection crews see materials that are out on the curb, they make a note of these cases and report it to the Sanitation Superintendent. There have been cases where residents have been billed for their removal, but they can claim they never authorized the pick up and are not going to pay the bill. Consequently, as a matter of course, these are often referred to Code Enforcement as a pre-emptive measure. This charge is included on water bills. All billing is done through the water department.

Illegal dumping is very sporadic and not much of a problem. When discovered, it is forwarded to Code Enforcement.

Waste items **not** picked up by Gainesville include:

- Tires
- Acids
- Explosive materials
- Pallets
- Batteries
- Liquids
- Paint and paint thinners
- Building materials
- Dangerous or corrosive materials of any kind

Collection

Adequacy of Collection Program

Needs/Goals

The City feels municipal service of residences should continue and not be privatized. The feeling is that illegal dumping would likely increase with privatization as would an adverse impact on aesthetics from increased “trashiness”. There are concerns regarding some problems on waste collection that are possibly due to cultural differences in the Hispanic community. More effective communication methods may be helpful. It is difficult to enforce trash container requirements among all community sectors.

Table 12 shows that from 2002 to 2013 Gainesville’s annual waste tonnage is projected to increase from 7,703 to 10,916 or approximately 42%. Gainesville seems to have adequate collection capabilities for the near future. The most severe test comes from the demands placed on staff and machines to maintain the current level of service. If the need and will to make changes were to come about, the city would always have the option of increasing collection efficiency through going to once per week backdoor or mandatory curbside on a twice per week or once per week basis. While perhaps having the perception of lessening the level of service, it would allow the city to free up existing resources to continue doing the job, likely with no to little manpower or funding increases. This could offer an important option and would provide a possible course of action to maintain an acceptable level of service in times of fiscal constraint.

As to curbside recyclables collection, the current contractual arrangement seems to be working fine from the standpoint of the mechanics of collection being adequate. The weakness might be in the education and program reinforcement (see Education and Public Involvement).

The City feels it would be helpful to have a coordinating committee or group composed of sanitation, streets department, water department (billing) and private contractor (curbside recycling). This group could meet once per quarter to go over solid waste

Collection

coordinating issues. The purpose would be to review and define responsibilities and protocol. The expected result would be communication and coordination improvements.

City of Gillsville

Solid Waste Collection

The City of Gillsville has no collection equipment or staff. Instead, collection services are provided by a private contractor. Cooks Sanitation provides residential waste collection once per week on Monday. The City pays \$12/mo./per stop (2003). Waste is collected at any reasonable location near driveways; however, back door collection is provided as established by the needs of individual residents. Waste must be bagged, and there is a five bag limit (any size). Residents must provide their own bags, cans or carts. Only household garbage is accepted. Although Gillsville is split between Hall and Banks Counties, all city residents receive the same level of service. A small number of businesses subscribe for services from various waste management companies.

There is limited illegal dumping. One isolated street has some problems on the Banks County side. There are no formal plans to address this. Hall County provides code enforcement services.

Recyclable and Yard Trimmings Collection

Recyclables collection is not provided. Recycling has been discussed, but it would not be easy to put in place. Residents self-manage their yard trimmings. It is either burned or mulched.

Recycling may be offered to commercial establishments, but local officials are not aware of any being done.

Other Collections

Gillsville does not, itself, provide other collections. Bulky items are collected annually during Hall County's Appliance and Furniture Pick Up. See "Hall County" section for more information.

Collection

Adequacy of Collection Program

Needs/Goals

Table 13 shows that from 2002 to 2013, Gillsville may anticipate an annual waste tonnage increase from 67 to 74 tons or approximately 10%. Gillsville's privately provided waste collection service should be adequate during the planning period.

Gillsville is really not large enough to make curbside recyclables collection feasible, with the possible exception of perhaps co-collection. A drop off based program would be a plausible alternative, given the small, compact size of the community and few main travel thoroughfares. A site could be located that would be convenient to the frequent travel routes of most or all city residents.

City of Lula

Solid Waste Collection

The City of Lula offers municipal solid waste collection once per week on Friday. Waste must be bagged. At this time there is no limit on size or number of bags. All residents have the same level of service. Residents are billed \$5/month with their water bill. All waste is hauled to the Hall County Candler Road Landfill. Two rear loaders are used. One is of six cubic yards capacity; the other is believed to be 12 cubic yards. Because high growth is predicted, the City may go to two days per week services.

Lula services a few small businesses once per week. More than once per week collection is not provided. Larger businesses are serviced by private haulers. There is no licensing of private haulers. Lula will not likely get into licensing or franchising in next 10 years, as there is not believed to be enough revenues to cover administrative cost.

Lula may be getting out of commercial waste collection altogether, depending on commercial growth that is expected to take place along Route 365.

Waste items **not** accepted include:

- Motor oil
- Hazardous waste
- Bagged yard waste

Collection

Recyclable and Yard Trimmings Collection

Recyclables collection is not provided; however, the city may start doing so. Until then, residents can use the nearby Lula compactor.

Lula does not provide leaf collection, and no bagged yard waste is accepted. However, curbside collection of limbs up to 12 inches in diameter is provided once per month. The goal is to collect every two weeks. A flatbed dump truck is used to collect yard trimmings. The woody yard trimmings are chipped into mulch. The mulch is made available to all residents at no charge. The City will also direct haul mulch to residents at no charge. It is also used internally on City properties.

Illegal dumping has not been an issue.

Other Collections

Lula does not provide other collections. Bulky items are collected annually during Hall County's Appliance and Furniture Pick Up. See "Hall County" section for more information.

Adequacy of Collection Program

Needs/Goals

Table 14 shows that from 2002 to 2013 an annual waste tonnage increase from 378 to 625 tons or approximately 65% is estimated. Growth is coming. Lula may have to go to twice weekly services. On Mondays collection crews may cover half the city and on Tuesdays, the other. The city plans to remain in the collection business for the planning period.

City of Oakwood

Solid Waste Collection

The City of Oakwood provides residential collection of municipal solid waste to 610 households as of 2002. Waste is picked up once weekly on Mondays or the following day in the event of inclement weather or holiday. Curbside service is mandatory with the exception of the handicapped, infirm and elderly. Waste must be placed in closed plastic

Collection

bags and placed in a suitable, covered container at the curbside no later than 8 a.m. Residents must provide their own bags, cans or carts. All residents have the same level of service. Private haulers service apartment complexes and private gated communities. Private haulers also service some new housing developments. The City of Oakwood does not collect from businesses.

Illegal dumping has been a problem in the more secluded, undeveloped areas of the Oakwood Industrial Park. Oakwood police do patrol the area and have caught some perpetrators. There is only one way in and out of the property.

There is no separate charge for waste collection or recycling. It is included in the general fund.

Waste items **NOT** picked up include:

- Tires
- Acids
- Explosive materials
- Building materials
- Dangerous or corrosive materials of any kind

Recyclable and Yard Trimmings Collection

Oakwood offers mandatory curbside recycling once a week on Tuesday.

Set out requirements:

- Items must be placed at curbside no later than 8 a.m.
- The City provides containers to property owners.
- Renting residents pay a \$15 deposit for recycle containers

Items **NOT** accepted include:

- Corrugated cardboard

Items accepted include:

- Newspapers
- Glass
- Magazines
- Aluminum Cans/Foil
- Tin (steel) cans
- Plastic Bottles – PETE (#1) and HDPE (#2)

Collection

Oakwood does not provide leaf collection. Limbs no larger than 6" in diameter and not less than 3' in length are collected once monthly on the last Friday. Oakwood allows limbs to be placed curbside no more than 2 days prior to pickup, and residents must remove all limbs not collected within 24 hours. Oakwood also has mulch available from yard trimmings. Residents must load and self-haul. The city does not collect grass clippings, shrubbery trimmings, pine needles and the like. Rather, the city urges these items be composted.

Other Collections

Oakwood does not provide other collections. Bulky items are collected annually during Hall County's Appliance and Furniture Pick Up. See "Hall County" section for more information.

Adequacy of Collection Program

Needs/Goals

Table 15 shows that from 2002 to 2013 an annual waste tonnage increase from 397 to 584 tons or approximately 47 % is estimated. Oakwood is benefited by the trend in housing developments employing private waste haulers. The result is decreased demands on Oakwood's resources than would otherwise occur. Oakwood should look at franchising as a way to ensure a measure of control and quality of services provided by the private firms offering collection services to residential, commercial and industrial sectors in the city.

Oakwood should investigate the possibility of converting waste management functions into an enterprise fund. Any franchise fees should go into this dedicated fund.

Hall County

Solid Waste Collection

Hall County provides collection of solid waste from a system of 13 staffed convenience centers (compactor sites) located throughout the County. These sites, depending on

Collection

topography, require between 1.5 to 2 acres. As the name implies, each site has a stationary compactor to compact waste into an enclosed roll off container. The compactor sites are serviced by trucks from the County's Solid Waste Division. Waste is delivered to the County's Candler Road Landfill.

In August 1987 East Crescent became the first site in Hall County's conversion from a collection system based on roadside green boxes to its current compactor site system. At the time this conversion began, the compactor site system was viewed as a temporary solution. This "temporary solution" has been in place since that time, with the last site having opened in 2000.

Formerly, the compactor sites were open seven days per week from 6 a.m. to 9 p.m. They are now open Monday-Saturday 7:00 a.m. - 9:00 p.m. and Sunday 8:00 a.m. - 7:00 p.m. They are only closed Christmas day. As required by county ordinance, only bagged refuse is accepted at the compactor sites. Waste that cannot be bagged must be taken to landfill.

Private contractors provide collection service via open competition throughout Hall County and in municipalities, mainly with respect to commercial/industrial waste. Private haulers provide residential, commercial and industrial waste collection. There is also a number of businesses that self-haul wastes. These businesses tend to be contractors, e.g., roofing contractors or owners of rental properties, although poultry processors also self-haul. A chart listing the private contractors and their services is in the Appendix as Table C-1 Hauler Survey of Services Offered. Hall County provides collection to an unknown number of households. The results of the Hall County Solid Waste Management Public Opinion Survey, which was conducted in 1991, indicate that a substantial number of residents living in the unincorporated area do not use the compactor sites. This suspicion is raised by the 28.3 percent reporting that they used "dumpsters" for disposal. It is presumed that "dumpsters" could be understood to mean one of two things: either dumpsters located at the McEver Road drop off area, which were in service at the time of this 1991 survey, or dumpsters at place of employment. Of residents of unincorporated

Collection

areas, 52.5 percent responded they used compactor sites while 47.5 percent was the total of all other methods.

This considerable percentage apparently choosing not use compactor sites raises a question about what collection option residents use. Currently, possible options include private waste haulers, place of employment or even illegal dumping. It is difficult to imagine illegal dumping as an option of regularity, given Hall's enforcement efforts and lessening attractiveness of this option as population increases. It is difficult to try to estimate how many use place of employment as an option. In the source of waste survey that was done for the Waste Disposal Stream Analysis, quantities from this option would have been reported with commercial and industrial waste sources. That leaves collection via private waste haulers operating in unincorporated areas as the remaining obvious option.

How many users of the Hall County Compactor sites are there? This may be estimated by using the 1.7 lbs./person/day generation rate (see table 18 projections for waste to be collected at Hall county compactor sites).

Based on the 23,162 tons collected at compactors in 2000 and an estimated per capita generation rate of 1.7 lbs/day gives: $(23,162 \times 2000) \div 365 \div 1.7 = 74,656$ (estimated) users or approximately 27,650 households (2.7 persons/household). This method predicts a usage rate among residents of unincorporated Hall of approximately 70% (see Table 18). This amounts to an increase from 16,381 households in 1991 to 27,650 households in 2000 or an increase of 59%. Census figures for 1990 indicate 2.5 persons per household. This has grown to 2.7 as estimated by 2000 census.

With the possible exception of Clermont and Gillsville--the two least populous cities--the per capita generation rates have remained rather consistent with the passage of time. Also, looking at the per capita generation rates experienced by the cities in Hall, shows an average of 1.84 (including Oakwood's 0.73 lbs./capita) and 1.65, which excludes Oakwood's somewhat skewed number due to some housing developments being off

Collection

limits to Oakwood's collection crew. This seems to provide verification of 1.7 lbs. per capita generation rate used in these calculations. The cites can be looked to as reliable gauges of per capita generation rates because of their having more of a "captive" audience with respect to known numbers of users (generators).

Recyclables and Yard Trimmings Collection

The county provides drop off collection only. Residents may drop off recyclables at any of the compactor sites, the recycling area at 711 Green Street (parking lot for the County Education Building), or the public drop off area at the Hall County Recycling Center in Gainesville. Recyclables must be separated by residents and placed into marked bins.

Recyclable items accepted include:

- Newspaper
- Glass
- Aluminum cans/foils
- Steel Cans
- Magazines
- Softbound books
- Phone books
- Hardbound books
- #1 and 2 plastic bottles (PETE, HDPE)
- Corrugated cardboard
- Used motor oil (recycling center only)
- Portable, rechargeable batteries (county recycling center at 1008 Chestnut St. or at Keep Hall Beautiful 604 Green Street, Suite 1)
- Grease (used cooking oil)

Recyclables are collected in custom-designed compartmentalized roll off containers and hauled to the Recycling Center by the Solid Waste Division. A fleet of 18' long trailers is used to collect corrugated cardboard. These trailers are serviced by the Resource Recovery Division. In addition, Resource Recovery provides collection of office and computer paper once per week from County and certain Gainesville City offices, under an informal cooperative program.

Collection

Residents must provide their own yard trimmings removal. Items may be managed on site or taken to RTS Landfill or Crystal Creek Landfill. Both are located on Monroe Drive in Gainesville.

Other Collections

White goods, bulky wastes, tires, yard wastes and other non-baggable refuse must be taken by residents to either the County Landfill or RTS Landfill. However, during the county's Furniture and Appliance Pick Up Week (formerly Operation Clean Sweep) held each spring, oversized items are collected. "Appliance and Furniture Pick Up Week" is an annual event scheduled each spring that allows county residents to arrange for collection of any large waste items, such as appliances and furniture. It is especially useful for citizens, such as seniors, the infirm, or citizens without transportation, who would otherwise not be able to haul these materials to a landfill. Interested citizens call to register indicating their address and items to be collected and submit it to the Hall County Road Maintenance Division or Gainesville Sanitation Department (if a Gainesville resident). Materials are picked up either by Hall County Road Maintenance Division or Gainesville Sanitation Department, depending on location. Also involved are the Hall County Solid Waste Division and Keep Hall Beautiful. Hall County Resource Recovery Division coordinates the program. At the County landfill property, areas have been established for depositing of white goods and other metals for recycling. Items such as furniture are disposed.

ADEQUACY OF COLLECTION PROGRAM

Table 31 shows projections for waste quantities to be collected at Hall County compactor sites over the planning period.

Table 31 -- Projections for Waste to be Collected at Hall County Compactor Sites

YEAR	POPULATION		WASTE PER CAP./DAY(3)	TONS PROJECTED
	POPULATION(1)	SERVED(2)		
2000	107,152	74,656	1.70	23,162(4)
2001	115,955	79,710	1.70	24,730(4)
2002	118,578	82,002	1.70	25,441(4)
2003	124,763	86,814	1.70	26,934(4)
2004	130,591	88,878	1.70	27,574
2005	135,582	92,275	1.70	28,628
2006	140,777	95,811	1.70	29,725
2007	146,228	99,521	1.70	30,876
2008	151,942	103,409	1.70	32,083
2009	157,785	107,386	1.70	33,317
2010	163,932	111,570	1.70	34,614
2011	171,324	116,600	1.70	36,175
2012	182,962	124,521	1.70	38,633
2013	186,106	126,661	1.70	39,297

(1) Estimated, unincorporated area

(2) Estimated actual number of users assuming 1.7 lbs./capita/day generation rate.

(3) Includes current level of reduction

(4) Actual tonnage

County Compactors Traffic Count Discrepancy

Table 32 shows an increase of 124% in tons of waste collected from 1992 to 2002.

Consulting the traffic count data from the 2003 survey and comparing it with the first count done in 1991-1992 (see Appendix B), we find an increase of only 0.2%. How can the waste quantities collected at compactor sites increase 124% but not be shown in a notable increase in traffic through the sites? Had the rate of usage increased, it should be supported by an increase in traffic count. Yet, the traffic count data do not support this.

Table 32-- Increase in Waste Collected from Compactor Sites**WASTE COLLECTED**

SITE	1992 TONS	2002 TONS	% CHANGE
EAST CRESCENT	1396	2662	91%
SARDIS	1582	2585	63%
GAINESFERRY	1039	1816	75%
MURRAYVILLE	1188	2085	76%
TADMORE	1008	2195	118%
LULA	517	1061	105%
BLACKSHEAR	2107	3109	48%
WAUKA MTN.	1154	2090	81%
CANDLER	598	1644	175%
BALUS	761 *	2330	N/A
ALLEN CREEK	BUILT 1996	366	N/A
GOULD	BUILT 1997	2201	N/A
FLOWERY BRANCH	BUILT 2000	1297	N/A
TOTALS	11350	25441	124%

*Balus was built in 1992 and represents a partial year.

There is a discrepancy between the increased rate of waste collection at the sites and rate of usage as evidenced by the traffic counts. It is difficult to believe there has been virtually no increase in number of users (as evidenced by traffic counts through the sites), given the population increase the county has experienced and the increase in waste collected from the sites. If the data are reasonably accurate, then a conclusion one could make is that the amount of waste delivered per vehicle per visit would have to increase more than two-fold. Could there have been a dramatic increase in waste generation rates? Could family sizes (persons per household) have increased dramatically? Are small businesses using the sites illegally? Are small waste haulers using the sites illegally? Are neighbors hauling neighbors' waste? These are some questions that may warrant further research.

Is it possible the traffic count data are faulty? While every attempt was made to survey the compactor sites during the same time of year, this was not possible for every site. In addition, usage rates can be affected by local weather conditions or perhaps other factors.

Collection

Further research may show that weather conditions or other factors could have impacted one or both surveys. The traffic count data could be further analyzed for reasonableness.

As discussed previously, the system of compactor sites that currently serves the County was intended to be a temporary solution. Indeed, this collection system has begun to show its limitations and weaknesses. There are several areas of concern. These include:

1. Sunday collection;
2. Monday backlog of waste from overloaded compactors at most sites that must be collected and hauled off before normal operations can resume;
3. The waste and recycling collection systems are at times overwhelmed;
4. Recycling collection is inadequate to meet the demands of a growing population;
- and
5. Roadside litter.

Sunday Operation

During the siting of the county's current landfill, an agreement was reached between Hall County and the Citizens' Facility Issues Negotiation Committee. This agreement prohibits Sunday operation of the landfill. The agreement was reached in 1995 during the local facility issues negotiation process provided by the State of Georgia in the siting and permitting of new waste handling facilities.

Since the compactor sites are fully operational on Sundays, waste collection must proceed as usual, yet the limitation of not having the landfill operational is telling. The ability to collect waste on Sundays is artificially limited to the number of empty compactor containers on hand. Once all available containers are full, the waste must be deposited (in bags) on the ground. This results in health and sanitation concerns from the standpoint of vermin and vectors being allowed access to the waste during the hours the waste sits on the ground. This situation could provide sufficient grounds for Hall County to be cited for a violation by state regulators.

Collection

Monday Backlog

Each Monday, there is a ripple effect due to Sunday's limitations. This takes the form of trash bags that must be collected off the ground before normal operations may resume.

There is a backlog at roughly half the sites, on average, and it takes approximately the first half of Monday to return to normal operations. During this time, the Solid Waste Division is unable to haul any of the recycling roll-off containers, many of which are full to overflowing from a weekend worth of use. This represents a weakness in the current system.

Overwhelmed Collection Systems

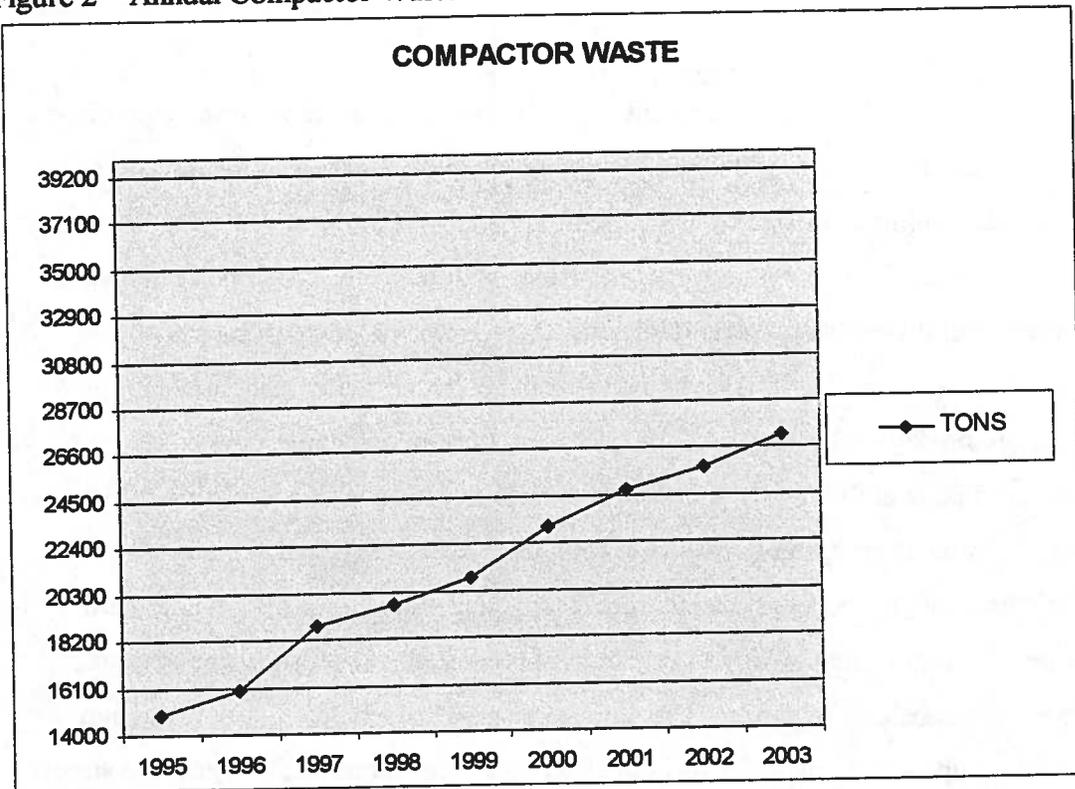
There are times when the county's current collection system is overwhelmed with respect to both waste and recyclables collection. For the most part, this begins the day after Christmas and continues for two weeks thereafter. Involved during this holiday period are the Solid Waste, Resource Recovery, and Road Maintenance Divisions. Even with the resources and manpower of three divisions, there is no way to keep pace with demand. One major cause of this is the fact that the collection sites remain open, depending on the day of the week, until 8 or 9 p.m., but the collection effort only continues until dusk at the latest. It is simply unsafe to continue the collection effort after dark. At that time of year, sunset occurs at roughly 5:30 to 5:40 p.m., leaving several hours for a backlog of waste and recyclables to develop. Recycling is especially hard hit. It is not uncommon for the collection schedule of recycling roll-offs at some sites to go one or two weeks behind schedule. The amount of waste received creates a situation where keeping up with demand for its collection takes precedence. The system is simply overwhelmed and something has to be compromised. This does little to comfort the citizens that have separated their recyclables only to find the recycling containers full, leaving them with the decision to take them back home and try again or dump them into the trash. This situation also causes much consternation among compactor site attendants as they face the brunt of residents' complaints.

Collection

Recycling Collection

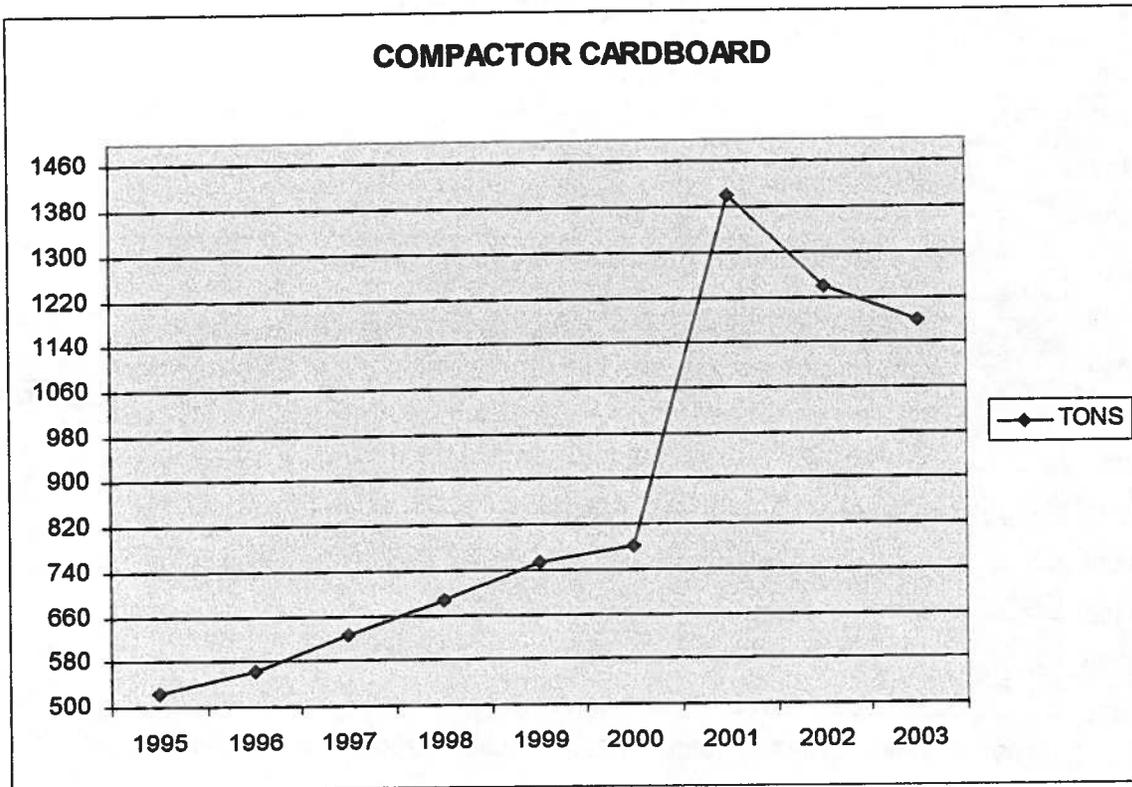
Day to day recycling collection appears inadequate to meet current needs. This is supported by calls from compactor site attendants reporting full containers and residents' complaints. Also note Figures 2-4 (below and compactor site surveys), which show a disparity between waste growth and recycling growth and between cardboard collections growth and that collected in roll-offs. Also, the results from compactor surveys (see Appendix B), although a small sampling, points to areas of concern.

Figure 2—Annual Compactor Waste Totals



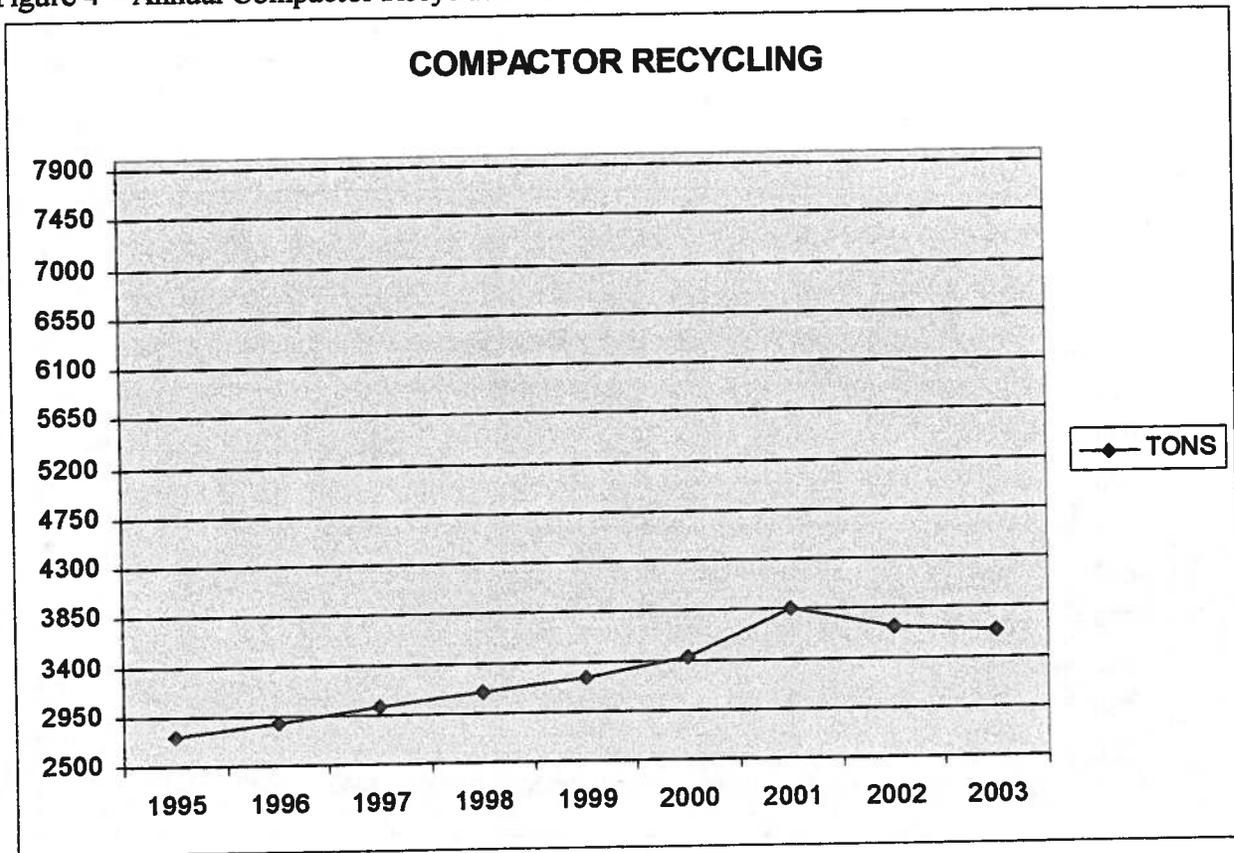
Collection

Figure 3—Annual Compactor Cardboard Totals



Collection

Figure 4—Annual Compactor Recyclables Totals



From the preceding figures, some observations can be noted. First, Figures 3 and 4, and to a much lesser extent Figure 2, show the impact of the economic downturn exacerbated by the horrific events of September 11, 2001. Second, the rate of recycling of corrugated cardboard roughly tracked with compactor waste growth to 2000, then increased rapidly for unknown reasons before decreasing as a result of the 2001 economic downturn. Third, the rate of overall recycling at compactors has lagged behind, possibly due to national or local trend, but presumably, due to lower overall rates of recycling and negative feedback provided by users encountering full recycling containers. Unlike bagged waste or corrugated cardboard, residents cannot leave miscellaneous recyclables on the ground. They can be easily dispersed by wind and foot traffic. They can also be dangerous, e.g., broken glass. Consequently, full containers have much more detrimental impact. The result of inadequate collection frequency is that the recycling rate may be kept artificially low.

Collection

Roadside Litter

With thousands of waste haulers, in the form of residents hauling their waste to the various compactor sites, there is an increased probability of bagged waste or loose waste blowing out of vehicles and winding up as roadside litter. Although State DOT regulations require loads to be secured, as does the "Official Code of Hall County Georgia", many times they may not be properly secured. The results can be seen via casual observation and is also supported by conversations with Hall County Enforcement personnel.

UNINCORPORATED HALL COUNTY

Alternatives for Hall County's Collection System

There has been some thought given the possibility of changing the current collection system employed by Hall County. Any change(s) should result in improvements to current system shortcomings, expressed previously or, logically, ought not be made.

In making any change, one should look at the various options for providing improvements over the current system and dealing with projected future system demands.

Potential Short Term Collection Changes

There are several changes that might result in improvements to the current convenience center system. Sunday operation of the sites could be discontinued or operating hours shortened. This would recognize the operational constraints and be consistent with the agreement reached with the Citizens' Facility Issues Negotiating Committee, which requires the county's landfill not be operated on Sundays, and a prior recommendation of the Hall County Solid Waste Plan Implementation Committee. The resultant Monday backlog would also be eliminated by this change, as would the possibility of environmental citations. Eliminating Sunday operations could save an estimated \$74,500 annually in regular and overtime pay.

Collection

Hall County should investigate ways to increase recyclables collections from compactor sites. Doing so would provide a level of service in keeping with public expectations. Also increased throughput would further offset processing costs and make use of unused capacity. An additional fee could be added to the existing \$50 solid waste assessment, which finances the cost of operation of the county compactor sites, to self-fund recycling. There is currently no self-funding mechanism for the recycling system, as there is for waste collection. Shortfalls are made up in county landfill tip fees.

Potential Long Term Collection Changes

For any options that might involve increased privatization in providing collection services, due consideration should be given to maintaining management controls over such a system.

Controls

Nearby Gwinnett County offers an excellent, long-term working model using the private sector to provide all collection services but with controls in place. For example, haulers must go through a process to pre-qualify before approval by the County Commissioners. This process requires:

- ◆ Insurance
- ◆ 10-year disposal capacity assurance letter from landfill they use
- ◆ Certain minimum services – once/week curbside trash
- ◆ Once/week curbside recycling (a single charge item for trash/recycling)
- ◆ Offer yard waste collection (allows additional fee)
- ◆ Special service for additional items (can charge for CFC containing appliances only, furniture, etc is free).

Gwinnett has a step-by-step progressive complaint and disciplinary mechanism in place and set forth in its local solid waste ordinance. Citizens contract with the hauler (service provider), but when they don't get the service they feel they should, citizens can lodge

Collection

complaints with the county. Unresolved complaints may lead up to a public hearing held by the county. Penalties may include fines, restraint from operating as a service provider, and civil action.

ANALYSIS OF ALTERNATIVES FOR HALL COUNTY'S COLLECTION SYSTEM

Feasibility of Curbside Collection

An analysis of collection alternatives must include feasibility of curbside collection, as this stands as a cornerstone of this issue. Indicators can be examined to determine if curbside collection is feasible. There are a number of indicators or measures that might be identified for this purpose.

Possible Measures:

1. Is curbside collection occurring in unincorporated areas of Hall County now? If so, is it limited to certain areas?
2. Is curbside collection occurring in comparable communities?

Current State Of Curbside Collection In Hall

Curbside collection is currently being offered at this time throughout unincorporated Hall County by private waste haulers. This fact can be confirmed via casual observation. Traveling around unincorporated Hall County it's possible to see the waste carts provided by various private waste haulers. Private haulers have developed customer bases, not only in the more densely populated areas, but those that are among the most sparsely populated areas as well.

Also, viewing Table C-1 (see Appendix), it is possible to confirm that some haulers do offer curbside residential waste collection services in unincorporated Hall County and the specific areas where they offer such services. Three of the nine haulers surveyed stated they provided regular weekly service to various areas of unincorporated Hall County. It should be noted these three hauling companies are local or regional firms. The national companies, such as Waste Management and Browning Ferris Industries, do not provide

Collection

residential waste services, choosing to focus instead on commercial and industrial accounts. This might be indicative of enhanced profitability provided by these larger accounts as compared to residential accounts. There is likely less operational cost and increased profitability inherent in servicing a few, larger, core accounts than numerous, small, diffuse accounts.

Although apparently offering less attractive profitability, it appears it is feasible to collect waste from residential accounts in various areas of Hall County. If it were not, it follows that these for-profit private companies would not be providing residential service. By this measure, curbside residential service seems feasible under current conditions.

Curbside Collection In Comparable Communities

By examining what comparable communities are doing, it is hoped that information gained might be transferable to Hall in guiding its decision making and providing another measure of feasibility. Hall could look to nearby Athens/Clarke County as a case study for countywide curbside collection. Appendix Table C-3 provides additional community comparisons

NEEDS/GOALS

There are many issues that require thoughtful consideration with respect to making any major changes to the current collection system in Hall County. More thorough analysis is required than can be done here. It is recommended that the Solid Waste Plan Implementation Committee (PIC) be given the task of looking into the many issues, serving as a conduit for public input and developing recommendations, which may include identification of further information needs and options for further study. This committee could possibly recommend the hiring of a consulting firm to undertake a thorough study.

Collection

ANALYSIS OF ALTERNATIVES FOR HALL COUNTY'S COLLECTION SYSTEM

Some Parameters to Guide this process for the PIC could include:

1. Encourage and request public input
2. Identify potentially interested/affected parties
3. Preliminary identification of possible options
4. Develop list of issues and possible impacts
5. Develop information needs for further research
6. Make recommendations for obtaining information (possibly involving development of RFP and hiring of consultant)
7. Identify possible information sources
8. Determine recommended method for obtaining information
9. Develop possible funding options for any study

RECOMMENDATIONS SUMMARY

Cities

1. Cities should review the need of a Pay As You Throw (PAYT) system as a viable means of financing collection, disposal and enhancing waste reduction.
2. Franchising could be considered by the faster growing and more commercialized cities such as Flowery Branch and Oakwood.
3. Privatizing waste collection might be an option for Clermont to consider.
4. Gainesville should develop a coordinating committee or group composed of sanitation, streets dept, water dept. (billing), enforcement and private contractor (curbside recycling). This group could meet periodically to go over solid waste management coordinating issues.
5. For those cities not offering yard trimmings collection, such as Clermont (yard trimmings) and Oakwood (leaves), review the need to provide service.

County

Maintain compactor site system, making changes as described earlier in Potential Short Term Collection Changes.

Collection

1. Hall County should review the need of a Pay As You Throw (PAYT) system as a viable means of financing collection, disposal and enhancing waste reduction. A shift toward PAYT should occur at the same time other changes are made. At least one year lead time should be allotted to implement such changes.
2. Give the Solid Waste Plan Implementation Committee the task of overseeing an analysis of alternatives for Hall County's collection system.

Collection

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DISPOSAL ELEMENT

Landfill Options

The landfill represents the ultimate disposal method in use today. Even after waste has been recycled, composted or incinerated, there is still residue or by-products requiring disposal. Disposal means landfilling. More and more, however, we are discovering there is no "away", for even though waste may be disposed of in a landfill, it is still with us, only concealed, stored.

Because landfills represent potentially the highest economic investment that will be made in a waste management system, it behooves us to make sure they last as long as possible. This may be done by the reduction efforts explained earlier or by management techniques at the landfill itself.

Waste Densities

Waste densities entering the landfill will differ depending upon the collection equipment used and the climactic conditions (moisture content). The moisture content of waste is typically 25 percent. Typical densities of incoming wastes are as follows:

1. Uncompacted, loose refuse equals 175 to 250 pounds/cubic yard.
2. Compacted refuse in a packer truck exceeds 500 pounds/cubic yard.
3. Compacted, in-place in a landfill should be at least 1,000 pounds/cubic yard after reasonable effort.

Densities of refuse at exceptional depths and additional compactive effort during placement may achieve greater densities. Seldom can in-place densities be expected to exceed 1,500 to 1,600 pounds/cubic yard.

Baling

Waste may be densified by baling before being placed in a landfill. Such a landfill is called a balefill. In theory, less space will be used and the landfill will last longer.

However, unbaled waste eventually densifies to a similar volume under the pressure of

Disposal

compactors, cover material and additional placement of refuse. Balers which process mixed MSW are exposed to high wear conditions.

Shredding

Shredding involves mechanical processing of wastes with low speed, high torque rotating shears or augers. Through such mechanical processing of hard to compact or bulky wastes, it may be possible to achieve higher landfill waste densities.

Shredders which process mixed MSW are exposed to a myriad of materials and high wear conditions that are difficult to predict. There have been cases of shredders exploding volatile materials. Any shredder being used to shred MSW must be equipped with means of protecting against such explosions.

Shredders capable of shredding MSW in the volumes generated by the planning region represent a considerable capital investment. Due to the wear from exposure to MSW, down time should be planned and adequate funds budgeted for operation and maintenance. Shredders add to the expense of a landfill operation and the return in space savings on most materials likely follows the same scenario as baling. In addition, some materials present in MSW should not be shredded, such as potentially explosive items and batteries. Shredding materials can quickly liberate hazardous constituents.

Shredders could be better utilized processing more homogeneous, hard to compact wastes such as tires, stumps, limbs, pallets and other bulky wood wastes. So doing may also open up other uses, such as mulch, boiler fuel or bulking agent for composting.

Compacting

Compacting is the usual method for densifying waste in landfills. The primary workhorse used for compacting waste in-place is called a compactor--a steel wheeled, heavy-duty tractor-type machine. Bulldozers may also be used at the working face to assist in the spreading of waste.

Disposal

Equipment is important in determining compaction efficiency, but operational technique also plays a large role. Waste should be spread in layers that are no more than two feet thick for peak compaction efficiency. In general, waste should be deposited at the bottom of the working face and spread up the slope. Studies have shown that slope (working face) and number of passes with the compactor also influence efficiency.

Analysis of various types of daily cover

Preservation of valuable landfill space is of nationwide concern to private and public operators alike. This concern is economically driven due to the increased costs of Subtitle D requirements. Landfill space is conserved and total revenues over the life of the facility are maximized by replacement of the space that would be consumed by daily cover (soil) with waste. Facility revenues are generated by waste deposited in the landfill not by soil.

Tarp

The Hall County Candler Road Landfill currently uses a tarp as an alternate daily cover. By using this tarp, we drastically cut down on the amount of soil used, and therefore conserve landfill space. The tarp currently used by the facility measures 100 feet by 100 feet. The tarp takes approximately 20 minutes to deploy. The cost of the tarp is approximately \$1,800, and the tarp lasts approximately 4 months.

Advantages: Easy deployment, space saving, relatively inexpensive.

Disadvantages: Not as effective at odor control as soil, not a big deterrent to vermin, short lifespan.

The yearly economic analysis of the tarp is as follows (100 ft. by 100 ft. daily working face):

Capital costs: \$1,800 per tarp*3 tarps per year = \$5,400

Labor costs: 1/3 hour per day*\$25 per hour*312 operational days per year = \$2600

Total yearly tarp cost = \$8,000

Disposal

Foam

Hall County has not employed the use of foams, but foam does have some reported advantages over tarps. Companies producing the foam products claim the foam can cut down on odor concerns and vermin. However, the high level of rainfall experienced in Georgia could be a hindrance in the use of foams as rain can wash the foams away.

Advantages: Possible vermin and odor deterrent.

Disadvantages: High labor requirement (1 hour per day), high cost.

The yearly economic analysis of the foam is as follows (100 ft. by 100 ft. daily working face):

Capital and labor cost: $0.05/\text{square foot} * 10,000 \text{ square feet}/\text{operational day} * 312 \text{ operational days per year} = \$156,000 \text{ per year.}$

Soil

Soil is the most widely used daily cover. EPD regulations require that 6" of soil daily cover is used and 12" of intermediate cover. The major disadvantage of soil over the alternate daily cover methods listed above is that the soil uses valuable landfill space. Another consideration with soil needs to be the amount of soil available on site. In future planning, it is critical that enough soil be available for intermediate cover and closure of the landfill. If soil calculations indicate that the site might be deficient in soil to complete these tasks, a greater priority could be placed on alternate daily covers in order to prevent future costly off-site soil hauling operations. Candler Road Landfill soil calculations indicate that enough soil is present on the site for cover and closure operations.

Advantages: Good vermin deterrent, odor deterrent, economic if available.

Disadvantages: Wasting landfill space.

The yearly economic analysis soil daily cover is as follows (100 ft. by 100 ft. daily working face):

Cost per cubic yard of fill (including labor and equipment): \$1.15/per cubic yard.

Capital and labor cost: $10,000 \text{ square feet} * 0.5 = 5,000 \text{ cubic feet}/27 \text{ cubic feet per yard} = 185 \text{ yards per day} * \$1.15 \text{ per yard} * 312 \text{ operational days per year} = \$66,378 \text{ per year.}$

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Cost of landfill space: 185 yards per day*312 operational days per year*1000#/yard*0.5tons/1000# = 28,860 tons per year*34.50 per ton = \$995,670 per year.

Recommendations

Based on the economic analysis and space saving advantages, Hall County should continue to use synthetic tarps as a means of daily cover. Soil will still need to be utilized for intermediate and final cover.

Owner/Operator Options

Contract Private

There are practically limitless possibilities when contracting for professional landfill management services. An example of a potential option at one extreme would be the owner (government) maintaining title to the land and all equipment and being responsible for providing labor for landfill operations. The owner would pay all payroll, benefits and taxes. The contracted management firm would handle employee supervision, environmental monitoring, reporting requirements and other management functions. The owner is allowed complete control.

On the other end of the spectrum, a contract option might be such that the owner (government) owns title to the land and that is where the involvement ends. A landfill management firm would lease the land and assume all responsibilities for operations, engineering, design, permitting, etc. Such services are available regardless of size and budget.

Areas of responsibility to consider when contracting for landfill services include:

- Communication/Supervision of Employees;
- Contract Length;
- Compensation Method;
- Environmental Monitoring and Testing;
- Regulatory Reporting;

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Regulatory Violations/Fines;
Procurement;
Billing, Collections and Financial Management;
Engineering; and
Equipment.

Municipalities may also contract with private firms for disposal services at private landfills. Such an arrangement should not be entered into lightly. Entities having control of disposal facilities, for the most part, also exercise control over the waste management system. If the local government cannot exercise some control by ownership or other means explained above, the amount of control a local government has is dependent totally on the contract language. As a result, any contracts for such services must be closely scrutinized by legal counsel having experience in solid waste matters.

When considering whether to enter into a contract with a private firm for disposal, one needs to ask some basic questions such as:

What level of involvement and control do we want?
Can our budget support our own staff?
How efficiently is our landfill being operated and managed?
Can we remain in compliance with the regulations without professional management?
Have our inspection reports been favorable?
Do we have adequate equipment for operation?
Are there adequate vendors available to provide this service?

Neighboring Gwinnett County contracts with private companies for disposal and could provide information gained from experience.

Single Jurisdiction

Alternatively, the planning region or individual units of it could contract with another municipality (presumably outside the planning region) for landfill disposal. This has been done in other areas and has worked. Many of the considerations explained above still apply. However, such an arrangement would probably tend to be looked upon more

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favorably by the general population.

Intra-County

This option provides local government with the most control but also the most exposure to risk as well. Currently, Gainesville, Lula, Oakwood, and unincorporated Hall County dispose of solid wastes at the Candler Road Landfill, owned and operated by Hall County. There are no formal agreements between the County and the municipalities outlining use of this facility.

Multi-jurisdictional Intergovernmental Contract

As mentioned above, there are no intergovernmental agreements known to be in existence regarding shared use of the County's Candler Road Landfill.

Regional Authority

As the regulations and requirements for solid waste management become more daunting to local governments, there has not only been an increasing tendency for entering into contracts with private waste management firms, but also a tendency for governments to band together to solve mutual problems. Such regional authorities have arisen in Georgia and nationwide.

Regional authorities, also sometimes known as solid waste management districts, involve two or more governments that are joined pursuant to some type of formation agreement to cooperate on solid waste management matters. This cooperation may include only cooperation on disposal, but it is likely to include all facets of solid waste management. Such formation agreements may have to be ratified by state legislature.

Regional authorities allow solid waste management costs to be borne by a larger population base. A larger population will require larger facilities, but these larger facilities will lower per unit costs due to economies of scale. Economics and increased efficiency are the major factors influencing such regionalization. Facilities such as the lined landfills required by Subtitle D are too expensive for many smaller communities to bear.

Disposal

Hall County Facility Mix

Allen Creek Landfill

Hall County's Allen Creek Landfill stopped accepting waste in July 1997. It was closed to the public at that point. The County does not yet have a closure certificate from the Georgia Environmental Protection Division (EPD).

However, closure work has been completed. All slopes were brought to a state-required 3:1 maximum slope. Hall County actually made slopes 4:1 to make them easier to mow.

Monitoring wells have been installed, amounting to 56 groundwater wells and 15 methane. The entire landfill surface was covered with a geosynthetic clay liner (GCL) to prohibit water from passing into the waste. This will eventually dry the landfill out and help the contaminated groundwater problem. A total of 169 methane vents were installed in the cap to help alleviate methane from leaching into the groundwater. After the cap, vents, and topsoil was placed, permanent vegetation was planted.

The Allen Creek Landfill has been placed on the state's hazardous site inventory (HSI), due to groundwater contamination issues. The County has submitted an assessment of corrective measures (ACM) to the state.

Groundwater is monitored and sampled twice per year; methane four times annually. The landfill is mowed twice per year.

Hall has also recently closed out the inert waste area at the landfill per EPD standards. This is now complete. A closure report will be submitted on this area as well. This closure report will need to be approved in addition to the one already submitted to the EPD. The state will then do a final inspection and Hall could then possibly receive a closure certificate.

Hall should examine potential beneficial use of methane generated by the Allen Creek landfill.

Disposal

Hall County Candler Road Landfill

As recommended, Hall County sited and constructed it's own Subtitle D

municipal solid waste landfill. Named the Candler Road Landfill, the facility began accepting waste on July 22, 1997. The landfill is located two miles southeast from I-985, Exit 20 off Oakbrook Industrial Park, 1700 Oakbrook Drive, Gainesville.

The landfill was originally operated as a balefill. The balers were designed to achieve 1,200 to 1,400 pounds per cubic yard density. However, actual field-testing proved the density of the bales produced to be under 1,000.

It was found that once the bales were placed into the landfill, the overall density was actually lower due to voids between bales (the bales are not perfectly square). The in place density was determined to be under 900 pounds per cubic yard. This density would have significantly lowered the landfill life by five years or more. Hall County went into litigation over the issue with the baler contractor and settled. The balers were removed. The landfill then converted to a more conventional mode using a landfill compactor weighing over 100,000 pounds. With this machine, in place densities of over 1,000 pounds per cubic yard are achieved.

This facility is limited to the acceptance of waste originating from within Hall County. It is a permitted municipal solid waste landfill. As such, it can accept any non-hazardous solid wastes such as that generated by households, industries, commercial businesses, and construction and demolition activities. Acceptable wastes include construction and demolition wastes, as well as inert wastes, other than yard trimmings. Prohibited wastes include liquids, regulated quantities of hazardous wastes, lead acid batteries, tires and yard trimmings. It is the intention of the Hall County Commission to favor retaining public ownership of this facility.

The landfill is projected to reach capacity in the year 2035, thus far exceeding the required assurance of ten-year disposal capacity. This estimate takes into account a 2.5%

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per year increase in the amount of tonnage. Thus far, the estimate is on track. As of 2004, the daily average is 230 tons per day.

The leachate treatment system is a Rochem reverse osmosis system. It can treat 14 gallons per minute of leachate, treating it to very high standards. The system basically separates the clean water from the dirty leachate.

The clean water is used on site for dust control and irrigation, saving on the amount of public water the County has to use. The dirty water, known as "concentrate" is sent back into the landfill for recirculation. This helps break down the waste by utilizing the cell as an anaerobic digester.

This system was installed in 1999. Prior to this system, the County was paying 11 cents per gallon to haul and treat the leachate. The current cost is approximately 1.5 cents per gallon including operator costs and equipment.

Some statistics on the Candler Road Landfill include:

- Entire site comprising 255 acres;
- Permitted area comprising 94.2 acres;
- Waste capacity of 300 tons per day initially, increasing at 2.5% per year to 700 tons per day in 38 years;
- Total capacity of 9,291,000 cubic yards;
- Life expectancy of 38 years;
- Former baler building offering an all-weather tipping area of 125' x 200';
- 29 Groundwater monitoring wells; and
- 11 surface water monitoring points and 26 methane monitoring wells.

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Leachate Management:

- Two leachate tanks of 154,000 gallons each;
- Average volume of 5,124,974 gallons per year; and
- Daily average of 14,031 gallons.

Reliable Tire Service (RTS) Landfill

The RTS Landfill is located off Monroe Drive in Gainesville. It is a permitted construction and demolition debris (C and D) landfill, which is operated as a private commercial landfill by Waste Management. This facility was not operational when the original solid waste planning effort was done. This facility can accept a more limited array of waste types, which would include C and D wastes as well as inert wastes (see below). C and D wastes include waste building materials resulting from various construction and demolition activities. It includes items such as wood, bricks, metals, concrete, wallboard, paper, cardboard, yard trimmings (leaves, limbs, brush, grass clippings, shrub and tree prunings) and inert wastes.

RTS Landfill received EPD approval for a horizontal and vertical expansion giving the facility an estimated fill date of 2022, thus it will have capacity remaining well past the ten year planning period. If it were to fill more quickly than projected, capacity would exist at the Candler Road Landfill. All local governments in Hall County have used this facility.

Recently, Waste Management, owners of the RTS facility, proposed converting a portion of the existing site to a transfer station facility. While this is still in the preliminary stages, it is important to note for this report. However, mention here is not meant to endorse this facility. It would still be necessary for this facility to be reviewed for plan consistency.

Crystal Creek Landfill

This facility is also located on Monroe Drive. It was also not operational during the original solid waste planning effort. This inert waste facility is the most limited as to acceptable items for disposal. Acceptable items include earth and earth-like products,

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concrete, cured asphalt, rock, bricks, yard trimmings (leaves, limbs, brush, grass clippings, shrub and tree prunings) and stumps. No projected fill date is known for this facility.

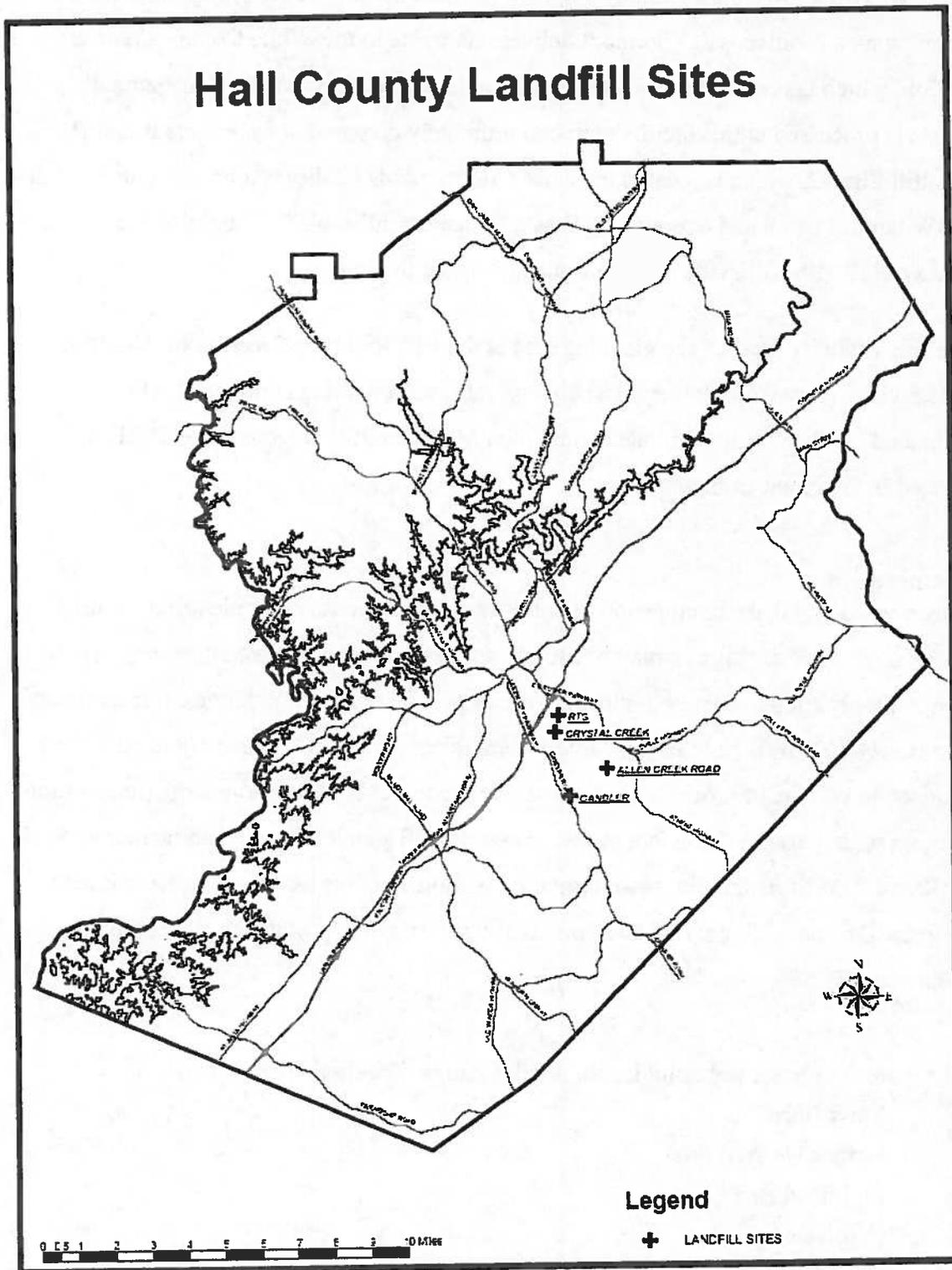
Gainesville Construction / Demolition Landfill

There are approximately 100 acres south of U.S. Hwy 129 and east of Monroe Drive in Hall County that were formerly operated as a sanitary landfill for the benefit of Hall County and the City of Gainesville. This area was permitted as 069-007D by the Georgia Environmental Protection Division. While the prior landfill was closed many years ago, redevelopment of this area for C and D waste disposal, as well as inert waste disposal, has been proposed by Recovery Services, Inc. d/b/a Gainesville Salvage. The redeveloped site would be known as the Gainesville Construction / Demolition Landfill and would consist of the vertical expansion of prior sanitary landfill. The owners have received zoning approval from the Hall County Board of Commissioners and are in the process of obtaining the necessary permitting. The projected life of this proposed facility would be approximately 20 years.

It is apparent the active management of this site as a C and D landfill by private parties would fill the need for the long term disposal of solid waste in suitable areas of the County as well as providing active monitoring of any historic ground water contamination and assure that such solid waste management activities were in a drainage basin away from Lake Lanier and the Chattahoochee River. Accordingly, this site is hereby incorporated into the Hall County Solid Waste Management Plan.

It is important to note that this proposed facility would also be required to be reviewed for plan consistency as part of the permitting process.

Figure 5 Landfills Located in Hall County



Disposal

Out of County Facilities Used by the Planning Area

There are two known out of county disposal facilities used by local governments in the planning area for disposal. Clermont delivers its waste to the White County Transfer Station, which is operated for White County under contract by Waste Management. Waste is processed at this facility and then ultimately disposed at Chambers R and B Landfill Site #2, which is located in Banks County. This facility is a private commercial MSW landfill owed and operated by Waste Management as well. The estimated fill date is May 21, 2040. Gillsville's waste is also disposed there.

The other facility used by the planning area is the BFI-Richland Creek Road Landfill. This facility is used by Flowery Branch's private waste hauling contractor. The estimated fill date for this private commercial MSW landfill is January 29, 2021. It is located in Gwinnett County.

Incineration

Waste-to-energy is the combustion of solid waste to create steam or electricity. Currently in the U. S. there are approximately 140 plants converting solid waste to energy. These plants supply enough energy to meet the needs of over one million homes. It is estimated that nearly 75% by weight of the waste stream is combustible, and that combustion can reduce the volume of processed solid waste by up to 90%. Waste-to-energy incineration is more widely used in other countries. Switzerland, Denmark, and Japan incinerate 80%, 60% and 72% of their solid waste respectively. Some countries, however, have issued moratoriums on additional incinerators. Some states, notably Massachusetts, have followed suit.

There are four basic technologies for solid waste incineration. They are:

- Mass Burn
- Refuse Derived Fuel
- Fluidized Bed
- Pyrolysis

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Mass Burn

Mass Burn systems incinerate municipal waste without any pre-processing other than removal of items too large to be fed into the unit. These facilities can be constructed at the landfill facility and have waterwall combustion chambers designed for energy recovery. Smaller modular mass burn units can be fabricated at a factory and transported to the facility site. These units can also be prepared with energy recovery systems.

Refuse Derived Fuel

Refuse Derived Fuel (RDF) is pre-processed solid waste. The solid waste is first separated into burnable from the non-burnable components (glass, metals, etc.). The burnable components are shredded and densified into pelletized fuel and then incinerated along with other fuels typically in an energy recovery system.

Several different types of RDF can be produced depending upon the amount of pre-processing. They are listed below in the order of the least processed to the most processed:

Coarse - Materials shredded enough to pass through a six inch screen.

Prepared - Coarse RDF further processed by removing ferrous metals, fine materials, glass, ceramics, sand and grit.

Recovery Prepared - Similar to Prepared RDF except that a larger portion of the metallic components are removed (aluminum, zinc, copper, brass, ferrous metals) as are larger glass components.

Fluff - Materials shredded to the point where 95% by weight will pass through a two-inch screen.

Densified - Compaction of fluff RDF into cubes, pellets, briquettes, buttons or similar forms.

Fluidized Bed

Fluidized Bed technology burns processed solid waste in a heated bed of sand in temperatures ranging from 1400°F to 1600°F. The sand is fluidized by blowing air through the bed so that the sand is in constant motion. The RDF combusts in the sand bed, leaving the noncombustible materials in the bed. This type of system can be used in

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conjunction with an energy recovery system to generate steam or electricity from the flue gases.

Pyrolysis

Pyrolysis refers to the thermal decomposition of material in the absence of air, or destructive distillation, particularly when applied to wood and other agricultural materials. Some of the advantages of pyrolysis are:

- 1) Almost all the systems are "net" fuel producers.
- 2) A spectrum of products can be produced including charcoal and/or activated carbon, liquid fuels and low to medium BTU gas.
- 3) Efficient systems can be built for both small and large-scale operations.
- 4) The systems can operate on a variety of feedstocks.

Wood waste, including pallets, crates, land clearing waste, etc. are typical feedstocks. The feedstock can be expanded to include paper, cardboard and similar materials, provided they can be extracted economically in a clean form.

Three technical concerns to be considered when planning for incineration are:

- Compatibility with Recycling
- Air Emissions
- Ash Disposal

Compatibility with Recycling

Recycling programs and waste-to-energy incineration tend to complement each other in that recycling removes the non-combustible materials (glass, metals, etc.) from the waste stream, thus increasing the combustion efficiency. Also, the more non-combustible materials removed by recycling before incineration means that less ash disposal would be required.

There is, however, the possibility of recycling (waste reduction) being in competition with incineration. This happens as a result of incinerators being designed to operate at set

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waste volumes. Operating at less than the design volumes compromises the incinerator's operating efficiency.

Air Emissions

Water vapor and carbon dioxide are the primary emissions from waste-to-energy incinerators. However, carbon monoxide, sulfur dioxide, dioxins, and particles containing heavy metals (lead, cadmium, mercury) are also emitted. Pollutants are removed from emissions generally in one of a combination of the following ways:

Electrostatic Precipitators: With this method incoming fine ash is subjected to a high voltage to cause a negative charge on the ash, which is then collected on positively charged plates. Electrostatic Precipitators have been documented as removing 99% of particulate matter, including heavy metals.

Dry Scrubbers: By injecting lime slurry into a reaction chamber through which gases and particulate matter flow gases and particulate matter are removed. A dry powder containing salt is produced and collected with the fly ash in an Electrostatic Precipitator.

Wet Scrubbers: Inject an aqueous solution of sodium hydroxide into a reaction chamber, neutralizing acid gases and removing most particulate matter.

Fabric Filter: These are heat resistant bags suspended in an enclosed housing. The bags filter particles from the gas stream removing as much as 99% of the particulate matter.

Ash Management

Waste-to-energy incineration reduces solid waste that is processed by up to 90% in volume. All waste is not processable, therefore, the overall volume reduction would be less than 90%. The remaining 10% is transformed into ash. There are two types of ash: bottom ash and fly ash. Bottom ash is the large unburnable matter left over after the waste has passed through the combustion chamber. Fly ash is the powdery material suspended in the gas stream and collected in the pollution control equipment.

Disposal

The greatest concern with ash is proper disposal to avoid release of harmful substances into the surface and ground waters. There are uncertainties of ash relative to impacts on water pollution. These stem from the uncertainties in regulating ash, and whether it is to be considered and regulated as a hazardous material. The more effective the pollution control equipment becomes at removing pollutants from emissions, the greater the possibility of ash being classified as a hazardous material. If regulations should require ash be managed as a hazardous material, the cost of proper management would skyrocket.

Studies are being conducted to find alternative and safe uses for ash. These include mixing with concrete for road pavement, blocks for retaining walls and other structures, to name a few.

From an environmental standpoint, incineration tends to have a negative public opinion, especially in the areas of air and water pollution. In 1986, EPA issued guidance on control technology for new and modified municipal waste incinerators. This guidance notified operators of EPA's intent to regulate incinerators under paragraphs 111(b) and 111(d) of the Clean Air Act. Under these guidelines new and modified municipal waste incinerators must be constructed with prescribed pollution control devices and existing facilities must be retrofitted with pollution control devices to meet the Clean Air Act standards.

Facilities Costs

Facilities cost vary from different areas across the country. Factors which need to be taken into consideration for an incineration system are:

- 1) Size (tons/day)
- 2) Technology
- 3) Location (labor and construction costs can vary from location to location)
- 4) Type of financing
- 5) Ownership
- 6) Pollution control technology
- 7) Cost of ash disposal

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Estimates made by the National League of Cities in 1988 for the construction of modular units (less than 400 tons/day) have capital cost ranging from \$80,000 to \$90,000 per ton of rated capacity. Larger facilities will range in cost from \$90,000 to \$100,000 per ton of rated capacity. Also, from a time standpoint, it is estimated to take between five to eight years to bring a system on-line from its earliest planning stages.

Operation and maintenance costs will also vary due to size, location, and technology used. Labor costs are among the highest operation and maintenance cost. Total operation and maintenance costs have been estimated by the National League of Cities in 1988 to be about \$20 per ton on an annual basis.

A study done for the State of Vermont indicates that an economy of scale exists for waste-to-energy facilities. This study concluded that facility costs decrease as daily capacity of the facility increases. This would indicate the necessity for consideration of a regional facility. The more tonnage that can be disposed of by incineration would reduce the costs to the owner. The costs could be distributed throughout the region on a ratio of tonnage contributed to the system basis.

Ownership - Public / Private

County or public ownership of a waste-to-energy utility system is not as common as ownership of a system providing water, sewer, waste disposal, etc. Public ownership of waste-to-energy system can be justified if it can contribute to the community economically by providing jobs and attracting other industry to the area. A public entity is not required to make a profit on invested capital in the conventional sense, as opposed to private enterprise. Public entities can justify certain investments with marginal profitability if they contribute to the public's interest. If deemed a contribution, this type of system can be such an investment.

Public ownership of a waste-to-energy system exempts that facility from the rate setting powers of the Georgia Public Service Commission. This leaves the pricing and sale of energy derived from the system the responsibility of the local community.

Disposal

An obvious advantage to the public for private ownership is that the private companies will have to provide the capital for the construction and operation of the system. Some companies who are in the business of owning and operating such systems may be interested in acquiring the entire system or certain portions or components of the system's central plant or distribution system. Desiring to own only a portion of the system would be based on an expected rate of return on their invested capital. This would also be reflected in the prices charged to customers. The National Solid Waste Management Association in 1988 did a survey to determine tipping fees for existing waste-to-energy systems. The findings of the survey indicates the average tipping fee at that time was \$39.86, with some fees being as high as \$65.

The addition of the owner's profit in the rate structure may be more than balanced by the specialized knowledge and abilities that an experienced private company would have. This could result in maximizing the efficiency and potential of the system.

Privately owned systems would fall under the supervision of the Georgia Public Service Commission. This removes some local control from the rate setting process.

Special Management Items

Paint and Other Free Liquids Disposal

Waste Management's Live Oak Landfill has State approval to accept and solidify for disposal free liquids at their landfill. Waste Management is a private company providing various solid waste management services.

Waste Management can provide transportation, solidification and approved disposal of qualifying liquids, including paints. Other similar services may be offered in the area by others but were not known as of 2004.

The Dalton/Whitfield Solid Waste Management Authority is known to have implemented a paint solidification operation that they operate in-house. Such an operation could also provide an option for Hall County to investigate. Paints and related products are known to comprise the vast majority, upwards of 80%, of household hazardous wastes.

Disposal

Agricultural Chemicals, Pesticides Waste

The Georgia Dept. of Agriculture has a Pesticide Division that has 2 to 3 clean up days per year for agricultural related chemicals, pesticides, fertilizers and such.

Materials are accepted from residents. They may even go to a resident's house to pick up the material if it is especially hazardous (such as DDT). There is no charge.

Adequacy of Existing Disposal Facilities

Necessary disposal facilities exist to ensure uninterrupted disposal capacity for Hall County and its municipalities during the ten-year planning period (see Appendix D).

Ten Year Forecast of Disposal Practices

Facilities

During the planning period, the planning region will rely on landfill disposal. Existing disposal facilities used by the planning area each have greater than a ten year life expectancy, making them more than adequate.

Cost Projections

Projected costs for future landfill operations can be seen in the Implementation Schedule.

Disposal in Times of Disasters

For discussion of disposal in times of disasters see "Solid Waste Management In Times of Disasters" within the Education and Public Involvement Element.

Needs/Goals

1. Continue public ownership and operation of the MSW landfill facility.
2. Continue use of alternative daily cover.
3. Examine need for alternative means of managing special management items and household hazardous wastes.
4. Incineration is not recommended by this plan.

Disposal

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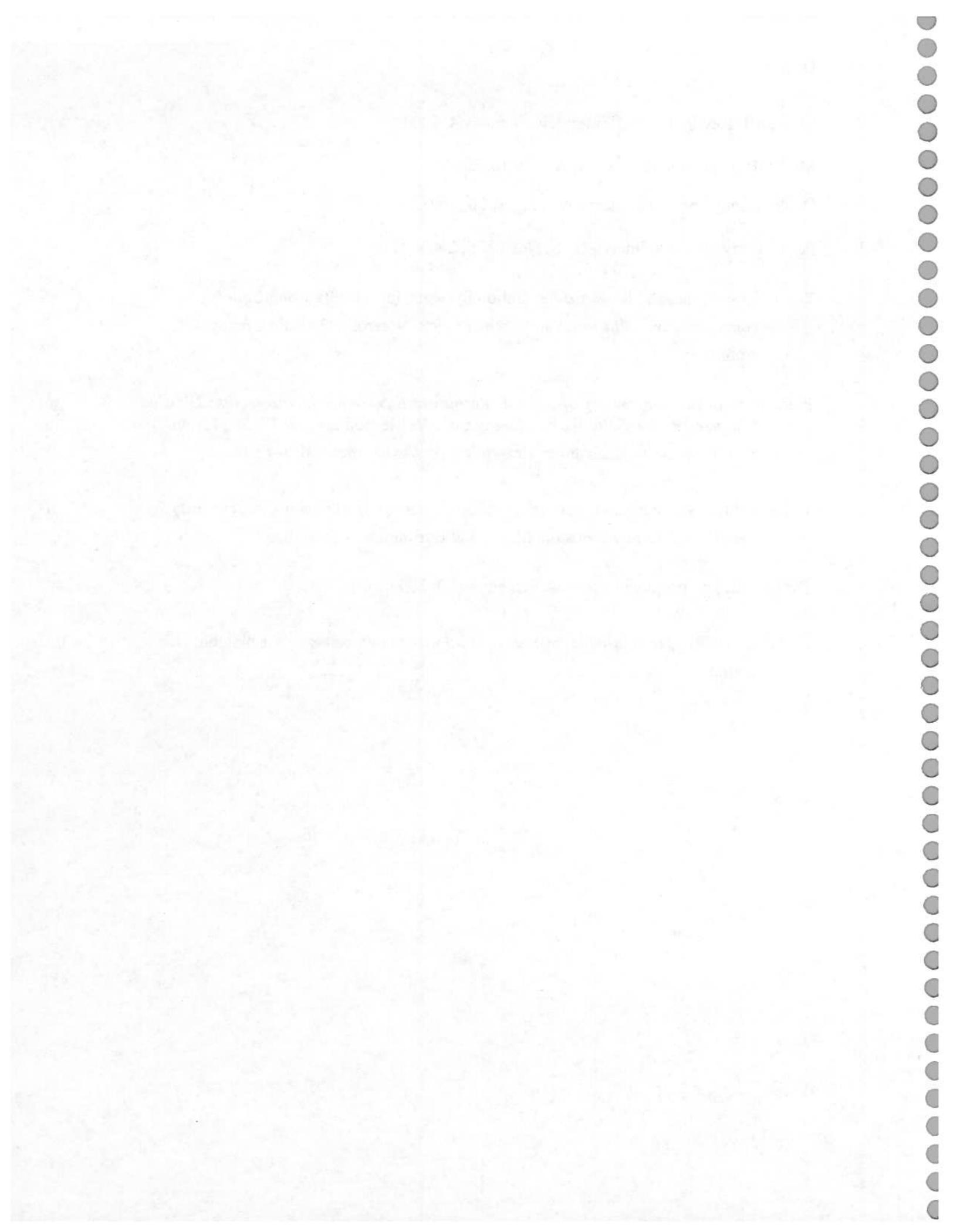
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LAND LIMITATION

ENVIRONMENTAL LIMITATIONS

Floodplains

An ideal municipal solid waste landfill will have little or no floodplain areas within its boundaries. A site located within the 100-year floodplain, however, must not restrict the flow of the 100-year flood, reduce temporary water storage capacity of the floodplain, or result in a river washout of solid waste material. If floodplains and floodways are present, the design must provide adequate capacity without impacting the floodplain areas. Floodplain and floodway maps, as well as soil survey maps, will be used to determine the amount of floodplain present on a proposed site.

Wetlands

A municipal solid waste landfill cannot be located in wetlands unless evidence is provided to the director of the Environmental Protection Division (EPD) that no alternative sites or methods are available to that jurisdiction for the handling of its solid waste and that the use of such wetlands would comply with all other applicable state and federal laws and rules. Most tracts of land will have some amount of wetlands on site. The ideal site would have no or a minimal amount of wetlands. Development in wetlands will require other permits, mainly the Corps of Engineers 404 permit which can take a considerable amount of time to receive; therefore, every effort should be made to avoid wetlands if possible. Wetland maps and soil survey maps will be used to identify wetland areas for potential landfill sites.

Protected River Corridors

Development of new solid waste landfills is prohibited by DNR Rule 391-3-16-.04(4)(h). The Chestatee and Chattahoochee Rivers are both protected; however, the Chestatee is not indicated for protection within Hall County because it is under the jurisdiction of the Army Corps of Engineers as it flows into Lake Lanier.

Land Limitation

Groundwater Recharge Areas

The State of Georgia now requires any municipal solid waste landfill located within two miles of a significant groundwater recharge area to be designed with a liner and a leachate collection system. A regional landfill cannot be located over an area of significant recharge. While all landfills will be designed with some type of liner and leachate collection system, the significance of this requirement is that these areas have received special regulatory protection. A more ideally situated site is one located a distance greater than two miles from a significant groundwater recharge area.

Water Supply Watersheds

Municipal solid waste landfills must not be situated within two miles upgradient of any surface water intake for public drinking water source, unless engineering modifications such as designed liners and leachate collections systems and groundwater monitoring plans and systems are provided. All landfills are required to be constructed with all of these systems in place. However, from an overall environmental and public acceptance standpoint, the landfill should be sited far enough away from a public drinking water intake so as to show no effect on drinking water sources.

For groundwater well zones, the only requirement is a 500-foot buffer zone located between waste disposal sites and an existing groundwater well zone. Well users down gradient of a proposed landfill could possibly affect EPD's approval of the site; therefore, efforts should be made to avoid large numbers of down gradient well users.

Faults

Fault zones located within two miles of a potential site could be reason enough for declaring the site unsuitable by EPD. The unstable nature of the rock in a fault zone can increase the potential of ground water contamination should movement of the rock occur. The Brevard Fault runs in a northeasterly direction from Rest Haven through Gainesville to just north of Lula.

Land Limitation

Karst Terrain

Karst areas, or areas where sinkholes have formed over limestone bedrock, should not be used for future landfill sites. This limitation does not preclude all limestone bedrock areas, but only those areas that have a high probability of new occurrences of sinkholes.

Protected Mountains

DNR Rule 391-3-16-.05(4)(l) prohibits the development of new solid waste landfills in areas designated as protected mountains. No protected mountain areas exist in Hall County.

Proximity to Lake Lanier

There are other criteria that relate to the specific state requirements for distances to surface water users and streams. Lake Lanier is a unique resource providing drinking water and recreation to a large population. It has significant economic benefit to Hall County and surrounding area. While state of the art technology provides for adequate protection of the ground and surface water from a landfill site, the public's perception of locating a disposal site in close proximity to the lake or its drainage basin is important. Ideally the best situation would be to not site a landfill within the Chattahoochee River basin. This would be an extreme position, eliminating most of Hall County. A more reasonable standard would be to not consider sites within two miles of the lake itself.

Other Local Environmental Issues

The following three local environmental issues will need special consideration during future landfill siting processes:

Hall County is currently constructing the Cedar Creek Reservoir in the eastern area of the County. This reservoir is in the North Oconee watershed, where a setback of 150 feet is required for any stream or river. The County enacted special legislation to adequately protect this future drinking water source in 2001. The legislation is inclusive of the watershed feeding the reservoir and adds additional stream buffers, has limits on impervious area, and imposes additional septic tank setbacks. This reservoir was substantially complete and began filling in 2003.

Land Limitation

Another reservoir is proposed on Flat Creek in northern Hall County. As of this date, the County has not completed the permit process on this reservoir. The same rules applying to the North Oconee Reservoir will most likely apply to this future reservoir.

In 2001 Hall County enacted the Watershed Protection Ordinance. This ordinance will need to be considered during future siting processes because it entails stricter stream buffers countywide and has provisions for controlling stormwater runoff quality and quantity.

LAND USE FACTORS

Land Use Plan/Zoning Requirements

For EPD to review an application for a solid waste handling permit, evidence documenting that a potential landfill site conforms to all zoning and/or land use ordinances must be provided. Therefore, any potential site must be zoned properly or be able to be zoned for use as a municipal solid waste landfill.

Heavily Developed Areas

There are no siting criteria that relate to the proximity to populated areas. Landfills are designed with a minimum of 200 feet of on-site buffer that generally protects the adjacent property owner from effects as a result of the landfill operation. Potential landfill sites located more than two miles from a city boundary or 0.5 miles from a subdivision would receive a more favorable rating from EPD when being reviewed for approval. Location of a potential site adjacent to a populated area does not in itself exclude the site from consideration; however, it does reduce its desirability for use as a landfill site.

National Historic Site

Potential landfill sites cannot be located within 5,708 yards of a National Historic Site. Currently, there are no National Historic Sites within 5,708 yards of Hall County. For locally significant historic sites, a distance of 1,000 feet should be used for site location.

Land Limitation

Proximity to Airports

According to EPD requirements, siting criteria mandates that municipal solid waste landfills shall not be located:

- (1) Within 10,000 feet of any runway used or planned to be used by turbojet and piston-type aircraft; or
- (2) Within 5000 feet of any runway used or planned to be used by piston-type aircraft only. FFA regulations add that any landfill that attracts birds should not be located within five miles of a runway.

Jurisdictional Boundaries

EPD requires that a potential landfill site cannot be located within 0.5 mile of a county boundary unless approval is secured from the adjoining county. This requirement does not prohibit the siting of a landfill near the boundary but represents a potential obstacle to the permitting of the site and should be avoided if possible.

Site Access

There is no specific siting criterion related to site access. Good access roads leading to the landfill are obviously desirable. Ideally, the landfill should be accessed by paved roads and bridges capable of handling truck traffic typical of a landfill operation and should not pass through residential areas.

PLAN CONSISTENCY OF SOLID WASTE HANDLING FACILITIES

In order for EPD to issue or renew a permit for a solid waste handling facility, any new facility or facility expansion must be consistent with a local government's solid waste management plan. The following outlines the local procedure that will be followed to determine whether a proposed facility, public or private, is consistent with the plan.

No proposed facility or facility expansion will be sited in the planning area without a letter from the Hall County Board of Commissioners stating that the proposed facility is consistent with the Solid Waste Management Plan for Hall County. To determine if a proposed facility or facility expansion is consistent with the Plan, an owner/operator of the facility shall:

Land Limitation

A. At least 60 days prior to filing for a solid waste handling or C&D permit, or notifying EPD in the case of a solid waste handling facility that is permitted by rule, the applicant must submit to the local governing authority a written statement documenting the following:

1. How the proposed facility or facility expansion will meet the specific goals and/or needs identified in the Solid Waste Management Plan, specifically what will be:
 - a. the impact upon the collection capability within the planning area; and
 - b. the impact upon disposal capacity identified in the planning area; and
 - c. the impact to the waste reduction and recycling efforts within the planning area, specifically, how the proposed facility or facility expansion will further progress toward achieving the State's 25% per capita waste disposal reduction goal; and
 - d. the impact on underserved geographic areas and segments of Hall County such as individuals, businesses and/or waste types (residential, industrial/commercial, construction and demolition, inert) as identified in the Solid Waste Management Plan.
2. How the proposed facility or facility expansion and its operation will impact the community; specifically what will be
 - a. the impact to vehicle traffic and public safety around the proposed facility and throughout the planning area;
 - b. the impact to the financial viability of the existing solid waste management system within the planning area;
 - c. the impact to individual and business solid waste management rates;
 - d. the impact of the proposed facility or facility expansion to other natural or cultural resources within the planning area; and
 - e. the impact of the proposed facility or facility expansion to the current solid waste management infrastructure within the planning area, both public and private.
3. How the owner/operator of the proposed facility (and any subsequent owner/operators, if sold) will satisfy the financial assurance provisions of the plan and local ordinances.
4. That the proper public notification process was followed, to include a public hearing and notification of all adjacent property owners.

Land Limitation

5. That the proposed facility or facility expansion is sited in an area deemed suitable according to the criteria listed in the plan; and
 6. That the proposed facility or facility expansion is sited in a location that is consistent with local zoning ordinances.
- B. The Governing Authority shall review the "Written Statement of Consistency" and shall determine if the proposed facility or facility expansion is consistent with the Solid Waste Management Plan. Within 30 days of making their determination, the Board of Commissioners shall notify the developer whether or not the proposed facility or facility expansion is consistent with the Plan. If the proposed facility is not consistent with the Plan, the developer may address the inconsistencies and resubmit their request for another review.

Needs/Goals

1. Financial assurance provisions should be investigated and developed more fully than possible here to include specific minimums for various types of solid waste handling facilities.
2. The need for local ordinances to back these key plan consistency provisions should be investigated, as well as a determination as to whether each municipality must adopt similar ordinances.

Land Limitation

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EDUCATION AND PUBLIC INVOLVEMENT ELEMENT

Introduction

Since we all generate waste, it is necessary for all of us to assume an active part in comprehensive solid waste management. Because the changes in solid waste management proposed in this plan will require all of us to change our habits whether at work, at play, or at home, education must assume a major role. Citizens must be adequately educated as to the need for these changes, the reasons for changes, and methods for taking individual positive action towards achieving our waste management goals.

Hall County and its municipalities are dedicated to educating its people about the necessity of caring for our environment. The aim is to educate citizens to become more responsible and progressive in an effort to reach the 25% waste reduction goal and go beyond. While it is evident that a great number of resources have been utilized, many still remain untapped. Four general categories of resources (organizations, facilities, media, and special programs and promotions) are addressed in this section.

Inventory

Organizations

Solid Waste Plan Implementation Committee (PIC)

The purpose of the PIC is to assist in developing and implementing the local comprehensive solid waste plan. Its membership includes one representative from each local government (elected official or staff); one representative from Georgia Mountains Regional Development Center; and seven "at large" representatives (citizens, elected officials, staff, cooperating agencies) for a total of 15 members. Cooperating agencies include Cooperative Extension Service, Soil Conservation Service, Georgia Department of Transportation, Greater Hall Chamber of Commerce, Keep Hall Beautiful, and Elachee Nature Science Center. Other duties include surveying public opinion, analyzing options, and giving direction to local officials.

Education and Public Involvement

Keep Hall Beautiful

Keep Hall Beautiful is the local certified affiliate of the national Keep America Beautiful System, as well as, the local affiliate for the Keep Georgia Beautiful program under the Georgia Department of Community Affairs. Keep Hall Beautiful consists of representatives from public and private sectors from all parts of the County. The organization promotes a clean environment by educating citizens through various programs and media about recycling and other solid waste issues. Eight subcommittees function in the organization: Adopt-A-Stream, Beautification, Education, Finance, Membership, Public Relations, Strategic Planning and Volunteer Projects.

Keep Hall Beautiful has recognized several needs associated with waste management. There is a need to teach more youths and adults about solid waste management as well as motivate them to become involved in programs such as litter clean up and recycling. There needs to be an increase in the number of schools that compete for the Environmental Achievement Award given to schools who satisfy seven specified criteria promoting a clean environment.

Keep Hall Beautiful provides a unique opportunity for public involvement with its Vehicle Litter Incident Report. This takes the form of a self-mailing, postage-paid brochure that residents can fill out when they observe someone littering from a vehicle in Hall County. The program is in partnership with the Hall County Sheriff's Office, who upon receiving a completed report form sends a letter with specifics on the observed incident to the registered vehicle owner. While not being legally enforceable, the procedure puts the alleged violator on notice that people are watching and care about preventing litter.

There are a number of other programs employed throughout the County to promote waste reduction and recycling. A listing of various programs or events is as follows:

- **Cell Phone Recycling**
- **Adopt-A-Road**
- **Kidney Car**
- **Mule Camp Springs**
- **Great American Cleanup**

Education and Public Involvement

- **Crimes Against the Environment Workshop**
- **Waste In Place**
- **There's No Such Thing As Away**
- **Unkempt Properties**
- **Keep Hall Beautiful Work Crew**
- **Appliance and Furniture Pick Up Week**

Greater Hall Chamber of Commerce

The Greater Hall Chamber of Commerce is a local organization of businesspeople dedicated to promoting commercial and industrial interests within the community. The chamber provides support to the local business environment and makes a positive contribution to the greater community. The chamber has recognized the connection between quality of life issues and economic development as evidenced by its past support of the Clean Hall Task Force and the committees below.

Greater Hall Chamber Environmental Management Committee - This Chamber committee is active in pursuing environmental, health and safety issues pertaining mainly to the business community. It provides members to the EnviroShare Team. It continues to organize educational opportunities in the form of workshops and seminars of interest to businesses. The committee has recently branched out to the general public by assisting with a household mercury collection program in partnership with Hall County Resource Recovery Division.

Greater Hall Chamber of Commerce Beautification Committee -The Chamber Beautification Committee works together on planned projects to promote enhance and assist in the plans for beautification. Each subcommittee selects projects that are implemented through the committee. Periodic beautification awards are presented in various categories ranging from residents to businesses.

Education and Public Involvement

Hall County Code Enforcement Division

The Hall County Code Enforcement Division is a certified law enforcement agency that enforces County ordinances and State laws relating to a variety of disciplines including but not limited to property maintenance and environmental issues.

Clean & Green; City of Gainesville, Public Works Department

Clean & Green is a new city program as of February 2004. The major goal is to first maintain, then enhance the major arterial roadways into Gainesville, Georgia.

Community pride and involvement are key elements of the Clean & Green program.

Using existing plantings and litter pick up arrangements, the initial plan is to provide basic maintenance as well as explore enhancement possibilities.

Friends of the Parks

“Friends of the Parks” is an organization committed to promoting beautification through greenways and through ongoing beautification efforts to parks, trails, entrances and other Gainesville common areas. Interested citizens, take part in programs such as “Adopt a Bed”, “Honor someone you love by the purchase of a park bench or tree” and “Park Rooters.”

Lake Lanier Association

“Operation Shore Sweep” is an annual event held each spring and fall for the purpose of cleaning-up Lake Lanier’s shoreline. The Lake Lanier Association coordinates a large number of volunteers to pick-up litter along the shore. Hall County Government typically supports the effort by allowing disposal of collected materials at its landfill free of charge. Volunteer groups compete for prizes by trying to collect the largest amount of litter. Music and food are part of the festivities afterwards.

Georgia Mountains Regional Development Center

The Georgia Mountains RDC coordinates the Regional Environmental Issues Action Committee, which was formally known as the Solid Waste Action Committee. Solid waste management issues still serve as the backbone; however, the name change reflects a broadened scope. Future activities are expected to reflect this broadened scope. This committee plans meetings and informative tours of area solid waste facilities and projects

Education and Public Involvement

for the Solid Waste Task Force, which is composed of elected officials, administrative staff and solid waste staff of this 13 county region. The committee plans and conducts educational meetings on an as needed basis, catering mainly to the aforementioned representatives of local government.

School Environmental or Recycling Clubs

There are a number of environmental clubs at schools throughout the planning region. Such groups can provide a structure for in-depth learning about solid waste management. Their efforts should be duly noted within the overall plan and technical and professional assistance be provided when and where needed. This would increase student awareness and hopefully increase student involvement.

Girl Scouts/Boy Scouts

The area Girl Scouts and Boy Scouts are organizations that can provide assistance with various projects and are looking for presentations on solid waste topics. Anniversary celebrations and other functions represent opportunities for disseminating solid waste information to children and adult leaders alike.

League of Women Voters

The League of Women Voters is active in promoting and sponsoring informational forums and other public meetings to foster understanding of topical issues, increase public awareness and educate the public on solid waste issues.

Cooperative Extension Service

The Cooperative Extension Service is dedicated to increasing public awareness and participation in a host of issues relating to solid waste and topics of consumer interest such as backyard composting and household hazardous wastes.

American Association of Retired Persons (AARP)

The AARP may represent a largely untapped resource of volunteers that could be involved and should be recruited for assistance in solid waste educational activities.

Education and Public Involvement

Other Organizations

To identify human resources that could be used in educational programs, a community resource survey could be developed and mailed to the following types of organizations listed in the Chamber of Commerce Club/Organization Directory:

- * Youth Organizations (Boy Scouts, Boys & Girls Clubs, Girls, Inc., 4-H, Junior Achievement)
- * Church Organizations and Groups
- * Civic Organizations (Lions, Rotary, Kiwanis, Optimist, etc.)
- * Professional/Business Organizations
- * Nature/Environmental Organizations

The Media

Radio

Local English and Hispanic radio stations might be used to air more public service announcements and advertisements regarding recycling and other solid waste events. A study of airing these public service announcements and ads during peak listening times may help. Submitting plenty of announcements in a timely manner is in order. Interview shows provide another radio format that has and should see additional use.

Television

TV-18, the joint effort between the City of Gainesville and Hall County, provides a ready and free outlet for information dissemination. This outlet has been used in the past and will continue to be used to air public service announcements and ads of educational elements that are best illustrated visually and to reach an additional audience. A series of public service announcements about plastics recycling could be aired to educate people about the various resin codes. A talk show could be conducted to introduce different segments of waste management.

Press Conferences

Press conferences may be a useful way of disseminating information to the press in a manner that allows two-way communication and confirmation of details. Two-way

Education and Public Involvement

communication increases the accuracy of public information regarding solid waste management programs. Press conferences should be held to unveil new programs or major changes to existing programs.

Paid Advertisements

When it is imperative that specific information be relayed to the public, paid advertisements can provide that such information is presented and in a specific way and as accurately as possible. Paid advertisements should be used on an as needed basis.

Newspaper

News articles are a staple in getting information before the majority of the public. Waste management officials need to coordinate with Gainesville's local English and Hispanic newspapers, in reporting accurate and timely information about special events such as "Appliance and Furniture Pick up Week" etc., or in relaying important information such as recycling site locations.

A key editor or reporter should be assigned by the newspapers to attend Keep Hall Beautiful meetings to serve as a liaison to the newspapers and have first-hand knowledge and accurate information pertaining to publicity goals. Another idea might be to identify one newspaper representative from each newspaper who could take responsibility for all Keep Hall Beautiful public service announcements and ads.

Newspapers can also be used to publish inserts in conjunction with special events such as Earth Day to educate about solid waste management, or environmental fairs to publicize the event and educate, or to print articles by the Natural Resources Coordinator.

Interviews

Interviews of key people involved in solid waste management activities may be used in radio, television or print media to provide a format that would give detailed information to the public.

Education and Public Involvement

Exhibits, Display Boards, Information Booths

Displays, exhibits and information booths may be used to reach people missed by other local media. There are many opportunities in the planning region for setting up displays, exhibits and information booths. Some of these include the Annual Home Show, Earthfest at Elachee, and Mule Camp Market. This type of media should be placed in public places and staffed by Master Composter/Recyclers and/or Keep Hall Beautiful members, etc.

World Wide Web

Use of various web sites such as the official sites of Hall County, EnviroShare, City of Gainesville, Keep Hall Beautiful and others may be useful at reaching those that have access to the Internet.

Special Promotions & Programs

Graffiti Hotline

The "Graffiti Hotline" is a program, whose goal is to continually reduce the number of occurrences by giving citizens a way to report graffiti locations. Volunteer groups, officially authorized to remove graffiti will receive information regarding graffiti on private property and make arrangements for removal with the property owner. Boys and Girls Clubs remove graffiti on public property using the county and city manpower and equipment.

Adopt-A-Stream

Adopt-A-Stream is a program with a three-part focus: To monitor water quality both chemically and biologically, to clean up streams, and to educate the public on the importance of good water quality. At this time the local Adopt-A-Stream program has twenty-one groups who have volunteered to adopt a one-mile stream segment.

Bring One for the Chipper

"Bring One for the Chipper" is a Christmas tree chipping program intended to show people the varied methods for waste reduction and to treat wastes as resources. Involved parties include the Hall County Resource Recovery Division, Keep Hall Beautiful, Hall

Education and Public Involvement

County Road Maintenance Division, City of Gainesville's Department of Sanitation, and some other municipalities in the planning area. Free mulch is provided to area residents. The program should be expanded to increase public involvement.

Hispanic Community Needs

Due to the county's considerable Hispanic population, consideration needs to be given to this segment of the population and the communications difficulty resulting from the language barrier and cultural differences. Hall County has done a good job of producing bi-lingual publications related to solid waste management. However, there appears to be a need for more and perhaps, personalized, one on one communication. There are areas of the planning region known to be problem areas of concern as to potential solid waste code violations.

The idea has been proposed of offering a targeted sweep of such areas and providing free assistance in removing problem waste materials. This would be somewhat similar to the Appliance and Furniture Pick Up Week but more targeted geographically.

The intent of this program would not be a show of the heavy hand of a regulator or government but an effort to provide a concentrated effort to provide needed assistance in alleviating problematic conditions. Such a sweep approach has been conducted in Athens, Georgia with success. The effort would involve many groups and agencies, such as, but not limited to, local Hispanic organizations, Keep Hall Beautiful, Hall County Department of Public Works, Gainesville Department of Public Works and the citizens in the neighborhoods themselves. The goals of the sweep program would be an improved quality of life in the particular neighborhoods and the planning region and a lessened concern of potential code violations.

Recycling Contests

Recycling contests have been used in some areas to increase awareness of and participation in recycling. Some curbside recycling programs have a contest component. Usually, they take on the form of selecting a household's trash at random. The trash is

Education and Public Involvement

sorted and if no recyclables are found, cash or other incentive reward is given. Such programs have been somewhat effective; however, once started they must be continued or risk lowering participation levels.

Local Recycling Awards

A local awards program was developed by Keep Hall Beautiful but has taken a hiatus the last two years. An awards program should be created for area businesses and/or individuals who are doing a good job of waste reduction. The Chamber of Commerce should be consulted in creating the business program and Keep Hall Beautiful in creating the program for individuals.

Home Composting Demonstration Site

The planning region has access to the regional home composting demonstration site located at Elachee Nature Science Center.

In order to maximize exposure and to connect home composting with source reduction efforts, mini demonstration sites could be established at each county compactor site. Instructional signs similar to those at the regional site could be used and displayed each compactor site.

Facilities

Elachee Nature Science Center

Elachee Nature Center is open to the public and serves to educate visitors about nature and the environment. Elachee provides environmental education as a contracted service to Gainesville City Schools and perhaps others. The facility is utilized for its indoor/outdoor meeting and demonstration space, and as stated previously, Elachee hosts the area's Home Composting Demonstration site.

Education and Public Involvement

Hall County Library System

One goal is to utilize display space available in the library's lobby. Keep Hall Beautiful and Hall County Resource Recovery or other interested groups could possibly design and set-up displays.

Hall County Recycling Center

Hall County is currently operating a recycling center at a county owned facility at 1008 Chestnut Street. The goal is to further develop, expand and publicize the operation by providing educational tours of the facility.

Solid Waste Management In Times of Disasters

Weather-related or man-made disasters may result in quantities of wastes requiring special operations. The severity and manner of a disaster will dictate how the planning region will react with respect to solid waste management functions. A localized, less severe event that might generate debris, could be dealt with by the affected local government on it's own. However, a more severe or widespread event dictates activation of a countywide response.

Hall County has a plan entitled "Hall County Emergency Management Agency Emergency Operations Plan", which outlines disaster preparedness. Hall County and all the municipalities in the County have adopted a "Local Government Resolution for Emergency Management", which places coordinated emergency management functions with Hall County, as the lead, through the Emergency Management Agency Director.

The County's Emergency Operations Center (EOC) will be activated in times of disasters, as declared by the Chairman of the Hall County Commission, the Governor of Georgia and/or President of the United States. As of the writing of this plan, the EOC would be housed in the Hall County Fire Services Headquarters on East Crescent Drive or the Fire Services Training Center on Allen Creek Road. Sometime late in 2004 a new facility is planned to be operational, which would not only serve as the EOC, but also provide offices for Hall County Fire Services and Hall County Public Safety.

Education and Public Involvement

Debris Clearance

“Hall County Emergency Management Agency Emergency Operations Plan” provides a comprehensive listing of area personnel and equipment resources residing in the private and public sectors. The private sector suppliers include construction and transportation contractors. The public sector suppliers include Hall County, City of Gainesville and City of Oakwood.

Hall County Public Works Department maintains information relevant to disaster response in a manual entitled “Emergency Support Functions for Hall County Public Works”. This is a subset of the larger Emergency Operations Plan that contains areas of responsibilities organized by division within Public Works. These divisions are Engineering, Road Maintenance, Traffic Engineering, Solid Waste, Fleet Maintenance, and Resource Recovery. Also included is a detailed roster of equipment and personnel with contact information, certifications, licenses, training and skills. This manual provides anyone responding to a disaster with the needed resources, whether in the field or office, to begin to adequately address the situation.

The first priority in responding to a disaster is public safety. For the most part this means taking the measures necessary to make any blocked roads passable. It is most important that public safety vehicles have access for emergency response. Once emergency response for provision of public safety has been addressed, then general clean up can begin. One caveat to this would be that in times of man-made disasters, agencies such as the GBI or FBI might have jurisdiction that supersedes the County’s. For example, the need to preserve evidence could halt or alter clean up efforts.

Waste Reduction/Processing

Hall County has an air curtain destructor that is used to burn clean, untreated wood, which is basically limited to trees and parts thereof. There have been times, such as the March 20, 1998 tornado, that an additional air curtain destructor was rented from private sources. When possible, these are set up on public lands, such as public school property, but can be set up on private property under the proper emergency situation and at the

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directive of the EMA Director. These are operated by Road Maintenance personnel and, in times of major disasters, on a round-the-clock basis.

An annual open burning ban, which takes effect each May 1 and continues through Sept. 30, makes burning, even with an air curtain destructor, an unacceptable option five months out of the year. The ban covers the original 13 counties that comprise the Atlanta Ozone Non-attainment Area and 32 additional counties that surround the Ozone Non-attainment area, including Hall.

The county has also employed contractors to grind woody debris. This was done in the case of the county's last major ice storm in spring of 2000. This storm event produced an estimated 12,700 cubic yards of processed wood mulch. After this mulch was produced, it was stored in two large piles for a period of months until the County contracted with another contractor to remove the wood mulch. The contractor hauled the vast majority of the mulch to a composting operation outside of Hall County.

The RFP also called for approximately 700 cubic yards to be hauled and dumped at the Smithgall Arboretum located at Lakehill Drive and Cleveland Highway (Rt. 129) on the north side of Gainesville. This still developing project could perhaps provide a future outlet for mulch.

Based on this experience, this approach could be followed again with some modifications. It would likely be less costly to employ a single contractor to handle both grinding and removal of the wood mulch, as it should reduce mobilization costs. Also, caution should be used when storing large amounts of wood mulch, as spontaneous combustion can result. Fires, so started, are difficult to completely extinguish.

Collection

Collection will be dependent on the particular circumstances of the disaster. In less severe cases, wastes may be self-hauled by residents and/or local government staff; in more severe cases, private contractors may haul wastes. In these more severe cases, it is

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assumed that there would be official state and/or federal disaster declarations for which there would be financial aide available to cover the higher costs associated with employing private contractors. Staging areas may be used for the temporary storage of waste prior to processing and ultimate disposition. In all cases, it is anticipated and recommended that the staging areas be staffed.

For disaster clean up for which reimbursement is available from federal/state sources, Hall Co. Road Maintenance Division would keep detailed records of any disaster related clean up including types of equipment used, size, horsepower, name of operator, tons hauled to disposal and disposal location(s). This Division has past experience in this due to managing the clean up from tornadoes and ice storms that have struck the County in the past.

Suggested Policies/Procedures Governing Staging Areas

The basic intent of disaster mode operations is to clean up debris resulting from the recent disaster as opposed to “opportunistic” wastes that individuals, seeing an opportunity, might unfairly take advantage of to dispose of non-disaster related wastes. This is designed to help guard against further stretching already over-extended resources. Also, certain disaster declarations may carry with it funding assistance for clean up, which rightly ought to be used for its intended purpose.

In light of the above, staging areas should be staffed. Staff at staging areas should have the following duties:

1. Direct residents to dump debris in the proper location.
2. Try to keep the debris pile as compact as possible rather than having it spread out over a large area.
3. Monitor the site to ensure non-storm debris is not dumped illegally. If bagged garbage or other unacceptable items are brought in, they should be directed to use the Hall County Landfill or compactor sites (bagged garbage only).
4. Keep waste types separate when advantageous and practical to do so, e.g., tree sections that could be used for firewood. Some wastes, such as yard trimmings,

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can't be disposed of in lined landfills, such as the County's Candler Road Landfill, and should go to inert landfill. Hall County's experience with disasters has shown that waste separation tends to work better at staging areas as opposed to out in the field.

5. In cases of disaster funding, assist in keeping required records for cost reimbursement.

Potential Debris Staging Areas

The following is an outline of the staging areas that could be used in the event of an emergency. It seems that heavy rains always accompany these severe storms. Therefore, these selected areas are paved or graveled. The areas around Lake Lanier would only be used as a last resort and then only with inert debris. These areas would have priority in getting them back to normal with the assurance that any damage caused by equipment would promptly be repaired.

Hall County

1. Parking areas at Hall County parks
2. Cleared area behind Road Maintenance Division offices off Barber Road

Gainesville

1. Ivey Watson parking area
2. Alta Vista complex.
3. Free Chapel Church parking area.
4. City of Gainesville's Industrial Park West
5. Chattahoochee Golf Course parking area and the County Club area.
6. Dunlap Landing Park (if needed as a last resort).
7. Wessell Park.
8. City of Gainesville's water treatment facility on Crepe Myrtle at Valley Drive off Riverside
9. American Legion's parking area.
10. Enota School parking area.
11. City Park and the Civic Center.
12. Georgia State Patrol Post on Cleveland Highway
13. Area behind Regions Bank at the old Sherwood Plaza Shopping Center.
14. Club on MLK at Downey.
15. Airport on Aviation

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Gillsville

The City of Gillsville does not have any maintenance staff. Any clean up effort would be performed by individual property owners, volunteers who offer their services and County/State personnel who might be assigned to assist.

City Park, located on County Line Road approximately 2 miles north of town could be used for the storage of debris.

If the need arises to set up a local Command Center, Gillsville has a Community Center building in the City Park, which could be made available.

Oakwood

Graveled parking area for the Oakwood Community Center located at the corner of Railroad Street & Allen Street.

Clermont

Clermont Park located across from Concord Baptist Church

Flowery Branch

None listed

Lula

None listed

Collection Contingency Strategy

In the event the normal collection infrastructure were disrupted due to any disaster, the following would guide putting in place contingency waste collection.

Normally, due to bidding procedures that must be followed by the public sector when purchasing goods and services, this process could take upwards of a month. However, given an emergency situation, the local governing body can waive normal bidding procedures to expedite the process of putting a collection contract in place.

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For those local governments that contract with private haulers for collection (Flowery Branch and Gillsville), they could simply contract with another hauler serving the planning area (see appendix).

For those local governments in the planning area that provide collection services directly (Clermont, Gainesville, Lula, Oakwood, and Hall County), contracts for service would have to be developed. Sample contracts could be obtained from within the planning area to use as a model in developing these.

The estimated time it would take to put such collection measures in place is 24 to 48 hours.

Disposal

Disposal options are dependent on the type of disaster generating the waste and the areas affected. In agricultural areas, an event such as the most recent tornado that struck Hall County, Hall County was permitted to dispose of livestock on site by burying, but this option depends on specifics such as number of livestock involved, size of the property, distance to streams, water, etc. At times, on-site disposal is the preferred method. This should always be done with the agreement of environmental regulatory agencies.

Tornados, being indiscriminate, can generate an impossible to predict hodge podge of materials. This mixture may at times be intertwined and impossible or impractical to separate. The burning of mixed materials is not possible, even at times not prohibited by the open burning ban. When possible, the materials should be disposed of in a C and D landfill as these are often less costly than MSW landfills. Also, since yard trimmings are often a large component, the material may not be disposed of in MSW (lined) landfills.

Disposal contingency strategy

The planning region is known to be served by the following facilities:

1. Hall County's Candler Road Landfill, Hall County (MSW);
2. RTS Landfill and Recycling Center, Hall County (C and D);
3. Crystal Creek Landfill, Hall County (inert);
4. BFI Richland Creek Road Landfill, Gwinnett County (Flowery Branch);
5. Chambers R & B Landfill, Banks County (Gillsville); and

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6. White County Transfer Station (Clermont)

In the event the normal means of disposal becomes interrupted due to any disaster, the following procedure would be used to provide for interim disposal of solid waste. If the RTS Landfill were to become disabled, construction and demolition wastes generated from within the planning region could easily be diverted to the Candler Road Landfill for disposal until such time as the RTS facility could be brought back on-line. In fact, the Candler Road Landfill could easily handle C and D waste from the planning region on an ongoing basis.

Should the Crystal Creek Landfill become incapacitated, its waste could easily be diverted to RTS Landfill. It could not, however, be diverted to the County's lined landfill, as least with respect to the yard trimmings portion.

The most crippling impact would be the disabling of Hall County's Candler Road Landfill, since MSW is most highly regulated. Hall County could contract, on behalf of the planning region, for temporary disposal capacity. Given an emergency situation, the Hall County Commission could vote to waive normal bidding procedures to put in place this temporary contract for out-of-county disposal capacity at an MSW landfill.

The affected local governments could handle hauling to an out of county facility, such as nearby Chambers-R and B Landfill or BFI-Richland Creek Road Landfill on a short-term basis.

For those local governments relying on private out-of-county facilities, should their elected disposal option become incapacitated due to a disaster, they could simply elect, once again, to use the Hall County's landfill.

The estimated time it would take to put contingency disposal measures in place is 24 to 48 hours.

Education and Public Involvement

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The EOC provides the hub from which internal and external (public) communications would originate. The Emergency Management Director would communicate public information through the Public Information Officers of Hall County and/or City of Gainesville. Pertinent information may also be released by governing officials as the situation dictates (Refer to Appendix PUBLIC INFORMATION EMERGENCY SUPPORT FUNCTION).

Noteworthy disaster events often garner the attention of local, state and national news media. It is important that the media get its information from a few official sources. These are listed above.

With such events being the focus of much public attention, it's been Hall County's experience that public involvement, i.e., securing volunteers to assist with recovery, is not a problem. Quite the contrary has been the case. Often, too many volunteers create a situation requiring their management, lest they become unmanageable, counterproductive and slow the very recovery they are trying to assist. The sheer numbers can create a dedicated management need (Refer to Appendix VOLUNTEER SERVICES EMERGENCY SUPPORT FUNCTION).

Needs/Goals

The above-mentioned programs should strive to ensure that sound waste management practices and procedures are brought to the general public's attention.

1. Citizens need to be educated regarding efforts that may be implemented in the household to reduce waste generation. The Hall County Resource Recovery Division should coordinate this educational program. The county should support the continuance of state funding, through the State's Solid Waste Trust Fund for education and enforcement in regards to solid waste management. When the funding mechanism

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sunsets, Hall County should lobby, through ACCG (Association County Commissioners of Georgia), for renewal.

- 2. Targeted outreach to the Hispanic community via neighborhood sweeps.**
- 3. The Solid Waste Plan Implementation Committee should continue to advise government regarding public opinion and views of entities potentially affected by solid waste management goals contained in this plan. Membership should be re-energized with new goals.**
- 4. Students and schools need to be involved in the educational process regarding solid waste management.**
- 5. Keep Hall Beautiful should assist Resource Recovery in increasing the number of presentations on solid waste management issues to schools and youth organizations.**
- 6. A speaker's bureau should be formed to make educational presentations to professional, business, civic and church organizations.**
- 7. Increase public awareness and participation in the Christmas tree chipping program.**
- 8. Increase public awareness of the littering problem in the planning area.**
- 9. Educate Boy and Girl Scouts about solid waste management issues.**
- 10. Conduct forums or debates on solid waste issues.**
- 11. Work with Cooperative Extension Service in educating the general public.**
- 12. Utilize the time and talents of American Association of Retired Persons (AARP).**
- 13. Continue and expand corporate education program, in conjunction with EnviroShare, to target heavier users of disposal facilities to help them seek out and find alternatives for**

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their solid waste disposal. Conduct workshops and meetings for businesses, industries and institutions regarding solid waste issues.

14. Citizens need to be educated regarding efforts that may be implemented in the household to reduce waste generation. Hall County Resource Recovery Division should coordinate this educational program.

15. Hold workshops for training teachers on how to educate their students about solid waste management issues.

16. Hold environmental fairs at local colleges (student union/cafeteria) to educate college students, faculty and staff about solid waste and teach them how they could become involved.

17. Utilize seasonal educational opportunities such as Earth Day and America Recycles Day as an opportunity to focus on solid waste education.

18. Provide the public with more education on household hazardous waste (alternatives) and source reduction. One item of local concern to the planning area is the issue of marine fuels. Due to seasonality of boating on Lake Lanier, such fuels are prone to fuel instability and deterioration during storage. These effects can harm performance in service and cause damage to the fuel system. Fuel filter plugging, injector nozzle fouling and combustion chamber deposits are typical problems. Educating boaters on the need to add fuel stabilizers before winter storage could be helpful.

Education and Public Involvement

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LITTER REDUCTION AND BEAUTIFICATION

Keep Hall Beautiful

Keep Hall Beautiful is the local, certified affiliate of the national Keep America Beautiful System, as well as the local affiliate for the Keep Georgia Beautiful program under the Georgia Department of Community Affairs. Keep Hall Beautiful consists of representatives from public and private sectors from all parts of Hall County. The organization promotes a clean environment by educating citizens through various programs and media about recycling and other solid waste issues. Eight subcommittees function in the organization: Adopt-A-Stream, Beautification, Education, Finance, Membership, Public Relations, Strategic Planning and Volunteer Projects.

Needs/Goals

1. Keep Hall Beautiful has recognized several needs associated with waste management. There is a need to teach more youths and adults about solid waste management as well as motivate them to become involved in programs such as litter clean up and recycling. There is a need to increase the number of schools that compete for the Environmental Achievement Award given to schools that satisfy 14 specified criteria promoting a clean environment.
2. KHB would like to see an increased participation of the public and business in programs such as cell phone recycling, donation of cars to the Kidney Car Program and in an Adopt-A-Road Program.
3. Keep Hall Beautiful has also seen the need for an increase in the amount of publicity and thus number of volunteers who participate in special events such as "One of the Chipper", "Operation Clean Sweep" and to help with the recycling efforts for "Mule Camp Market", the "Great American Cleanup" and other community events. "One for the Chipper" is a Christmas tree chipping program intended to show people the varied methods for waste reduction and to treat wastes as resources. Involved parties include Keep Hall Beautiful, Hall County Resource Recovery Division, Hall County Road

Litter Reduction and Beautification

Maintenance Division, Hall County Sanitation Division, and the City of Gainesville Solid Waste Department.

4. Keep Hall Beautiful needs to be provided the resources and support required to assume the lead in coordinating all interested parties concerned about litter reduction and beautification in the planning area to bring about a concerted effort of all interested parties, doing their part to implement features of this plan element to effect real change.

PROGRAMS

Great American Cleanup

The Great American Cleanup is an annual nationwide initiative in which Keep America Beautiful requests all its affiliates to participate. The program consists of using community volunteers to conduct litter pickups, community cleanups, graffiti removal, clothes collections, illegal dumpsite cleanups and beautification projects such as planting gardens, trees and flowers. National sponsors donate goods such as garbage bags, gloves, and equipment, such as a Yardman Vacuum machine or tiller, to help with these projects. The costs associated with this program include advertising and producing brochures and flyers for promotion.

Adopt-A-Road

“Adopt-A-Road” is a proposed program that would apply to county roadways. It is patterned after the state Adopt-A-Highway program, which pertains to state roadways. Adopt-A-Road would concentrate on county roads. The “adoptee” would agree to do litter control on at least a mile of their roadway at least four times per year and keep records of volunteers, hours spent and the amount of litter picked up. These statistics would be reported to Keep Hall Beautiful for compilation, showing how much litter is abated from this program. The program is in its planning stages at this time. Cost estimates will be forthcoming as the program is implemented.

Litter Reduction and Beautification

Local Clean Up Efforts

Unkempt Properties is a program designed to help the city and county governments with the problem of run down properties. These private properties cannot be cleaned by governmental entities. Keep Hall Beautiful can, with the property owner's permission, take volunteers onto the private property and help with the problem. Properties that meet certain criteria are referred to Keep Hall Beautiful by either the environmental court or by code enforcement personnel. Costs associated with this program are minimal because of volunteer workers and in-kind services from the county landfill and area businesses.

Keep Hall Beautiful Work Crew consists of three paid individuals who spend forty hours per week picking up litter along county maintained roadways and cleaning up illegal dump sites. Cost for this program is approximately \$100,000 per year.

Appliance and Furniture Pick Up Week is an annual event scheduled in May that allows county residents to arrange for collection of large waste items, such as appliances and furniture. It is especially useful for citizens such as seniors, the infirm, or citizens without transportation, who would otherwise not be able to haul these materials. It is hoped that the program reduces the potential for illegal dumping of such items in order to avoid landfill fees. KHB recruits volunteers and coordinates schedules, to help get items moved to the right of way for pickup by Hall County Public Works.

Kidney Car

The Kidney Car program allows people with unwanted cars to recycle the vehicles. The donor agrees to donate the car and fills out the proper paperwork showing ownership of the vehicle. The Kidney Foundation makes arrangements for the car to be picked up at no cost to the donor. If the vehicle is operable, it is sold at auction. If not, it is sold for scrap, and the money is used for kidney research. The donor gets to take a tax deduction for donating the unwanted car. Keep Hall Beautiful serves as a clearinghouse in connecting the donors and the Kidney Foundation and keeps records of how many unwanted vehicles are donated from Hall County each year. There is no cost to Keep Hall Beautiful at this time.

Litter Reduction and Beautification

Mule Camp Market

Mule Camp Market is an annual three-day festival on the Gainesville downtown square. Keep Hall Beautiful organizes the recycling of cardboard from the vendors and plastic soda bottles and cans from the festivalgoers. KHB also staffs an educational booth to distribute educational literature on recycling, litter prevention, beautification, composting and proper solid waste disposal. The recycling and the staffing of the booth are all done by volunteers. The cost of this program is approximately \$150 for booth space.

Crimes Against the Environment

A local event, Crimes Against the Environment, is an annual class for law enforcement personnel. It is offered to the participants at no cost to them and gives them POST (Police Officers Standards and Training) certification hours. The class is coordinated by Keep Hall Beautiful and taught by personnel from the Department of Natural Resources, Law Enforcement Division and other agencies. The subject matter helps anyone, who has the authority to write citations or deals with environmental crimes, such as deputies, policemen, judges and prosecutors keep updated on state laws and regulations. Costs for this class are approximately \$250.

Programs for Schools

Waste In Place is a program offered to teachers at no cost. The class shows teachers how to incorporate solid waste management practices as well as reinforce the message of litter prevention and recycling into any curriculum they teach. Keep Hall Beautiful coordinates the program. Keep Georgia Beautiful provides the class instructor and all written materials. Costs associated with this program are minimal.

Beautification

Keep Hall Beautiful has partnered with the South Hall Kiwanis, the DOT, area businesses, schools and the City of Oakwood on a beautification project on the I-985 off ramps on Exit 16. The medians in the area have been tilled, planted with flowers and mulched. Area businesses have donated flowers and mulch. Keep Hall Beautiful provided weeding, watering and litter control. Plans for expanding this project are being discussed at this time. Businesses along other exits on I-985 will be approached to

Litter Reduction and Beautification

provide funding for beautification of their exits. The long-range goal is to beautify all exits. The streetscape program in Daugherty County is a good example of this type of program. Costs will be determined by the kind of plants used in each area and size of each project.

The "Vehicle Litter Incident Report" is a program whereby concerned citizens can fill out a form, supplied by Keep Hall Beautiful or any of the local law enforcement agencies, to report observed incidents of littering from vehicles. The tag number, date and place of the violation are taken down and a series of check boxes, which provide information identifying the vehicle and the violator, are filled out. The form is sent to the Keep Hall Beautiful office, where the information is reviewed and sent to the proper law enforcement agency for processing. The violator is then contacted about the incident. This report is an education tool, because at this time, no case can be made in court because of the lack of prosecutable evidence.

Needs/Goals

1. A Litter Index is performed annually to measure the impact of litter prevention programs in the community.
2. A Cost to Benefit Ratio is done annually to show the correlation between money received and services rendered.
3. The above mentioned programs should strive to ensure that the waste reduction methods and procedures are brought to the general public's attention.
4. A means to recognize those participating in the Adopt-A-Road program that does not rely on road signs, due to a goal of reducing the number of road signs.

Adopt-A-Stream

Adopt-A-Stream (AAS) is a program with a three-part focus: To monitor water quality both chemically and biologically, to clean up streams, and to educate the public on the importance of good water quality.

Litter Reduction and Beautification

At this time, the local Adopt-A-Stream program has 21 groups who have volunteered to adopt a one-mile stream segment. When a stream is adopted, the "adoptee" agrees to do litter control in the streams and the surrounding area, and to monitor the water quality in the stream either chemically or biologically. Inspections are made to determine what area is in the most need of clean up. Plans are then made to meet this need. Volunteers from the area are recruited to carry out stream clean ups. Statistics are kept on the water monitoring and how much litter is gathered from the area. The water testing results are reported to the state and the litter statistics are reported to Keep Hall Beautiful, who in turn, sends reports to Keep Georgia Beautiful.

The main source of litter seems to come from visitors to the streams. Secluded areas seem to be the target of those who practice habitual littering.

Recruitment of neighborhood volunteers should increase a sense of pride in the appearance of an area, producing improved standards of cleanliness.

Needs/Goals

1. There is a need to create awareness for a cleaner area for the neighborhood to enjoy. By involving local citizens in the clean up, the awareness and pride in the Flat Creek area will increase. Other stream segments will be targeted as needed.
2. A public education and outreach program is planned for the Gainesville and Hall County Schools to heighten awareness as to how on-going practices of litter control will impact the future of our community. Four stream clean ups are planned per year. Approximate costs for a stream segment cleanup are \$250.

Graffiti Hotline

The Graffiti Hotline is a program whose goal is to continually reduce the number of occurrences by giving citizens a way to report graffiti locations.

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Once a call is placed to 911 (although there is an official hotline number), the determination is made as to whether the location is in Gainesville or the county or is on private property. The calls for the city are referred to the Public Works-Street Division, the county calls are referred to Hall County Traffic Engineering, and the private property calls are referred to the Boys and Girls Clubs. If mailboxes are involved, the call goes to the federal post office police.

Volunteer groups officially authorized to remove graffiti will receive information regarding graffiti on private property and make arrangements for removal with the property owner. Boys and Girls Clubs remove graffiti on public property using county and city manpower and equipment.

Although the calls are separated, the city and the county use the same high-powered pressure washer to remove graffiti, usually within 48 hours. The clean up time of 48 hours helps discourage reoccurrence. The graffiti problems seem to be somewhat seasonal. In cold weather the number of calls decreases.

Educating the public through the use of flyers and refrigerator magnets should help heighten awareness and decrease the number of occurrences.

It seems that the present practices will be adequate for the ten-year planning period; however, if they prove to become less effective, modified plans will be considered and implemented as needed.

Greater Hall Chamber of Commerce Beautification Committee

The Chamber Beautification Committee works on planned projects to promote, enhance and assist in the plans for beautification. Each subcommittee selects projects that are implemented through the committee. The committee holds an annual Arbor Day observance and recognizes private individuals and businesses with periodic beautification awards.

Litter Reduction and Beautification

Hall County Code Enforcement Division

The Hall County Code Enforcement Division is a certified law enforcement agency that enforces county ordinances and state laws relating to a variety of disciplines, including but not limited to, property maintenance and environmental issues.

Their primary focus is concentrated on activities dealing with crimes against the environment such as illegal dumping, property maintenance issues, littering, zoning, land use issues, inoperable vehicles, dilapidated structures, unsafe living conditions and housing code violations.

When complaints have been received, or a neighborhood has been surveyed for environmental crimes, officers go into the neighborhood and hand out bilingual information. The pamphlets contain information explaining who the agency is, what they do, and what the violations are. The pamphlets also contain phone numbers for questions, for reporting violations, and they contain the county ordinances and their code numbers. They also explain that failure to correct a violation within the specified timeframe may result in a court citation being issued, with fines ranging up to \$1,000 and 60 days in jail.

Hall County Code Enforcement's goal is for Hall County to be a model of excellence that promotes a sustainable quality of life by partnering with citizens and businesses to make this a community of choice for living, working and leisure activities. This will be accomplished through varied approaches and ideas, while working together with other groups toward this goal, as well as meeting the needs of the Citizens of Hall County.

Gainesville Clean & Green

Clean & Green is a new city program as of February 2004. The major goal is to first maintain, then enhance major arterial roadways into Gainesville, Georgia, as well as its business corridors.

Litter Reduction and Beautification

Community pride and involvement are key elements of the Clean & Green program. Using existing plantings and litter pick up arrangements, the initial plan is to provide basic maintenance as well as explore enhancement possibilities. The way an area looks either improves or damages business and city reputations. Businesses will be asked to financially support the maintenance and enhancement efforts. Appropriate signage and other publicity will acknowledge their participation in this program.

Large and small businesses will be involved. Smaller businesses may choose to participate through industry and trade associations, civic clubs and geographical groupings. Families and individuals will be given the opportunity to honor a person of their choice. The general public will be invited to participate through fundraising at public events.

Clean & Green will coordinate its efforts with existing organizations, including: Keep Hall Beautiful, Hall County Public Works, Hall County Resource Recovery Division, Hall County's Parks and Leisure Services, the Chamber of Commerce Beautification Committee, Friends of the Parks, GA DOT, and various gardening clubs. Clean & Green supports education efforts in the schools from pre-school to college as well as general community efforts to raise consciousness about not littering and caring for our living environment.

Friends of the Parks

Friends of the Parks (FOTP) is an organization committed to promoting beautification through greenways and through ongoing beautification efforts to parks, trails, entrances and other Gainesville common areas.

Interested citizens take part in programs such as Adopt a Bed, "Honor someone you love by the purchase of a park bench or tree" and Park Rooters.

Adopt a Bed is a program where local groups, such as Eagle Scouts, "adopt" a flower bed within a park and maintain the flower beds for a one year period.

Litter Reduction and Beautification

“Honor someone you love by the purchase of a park bench or tree” is a program where a park bench or tree is purchased and then placed in one of the parks. The bench or tree honoring the person for whom it was placed displays a plaque.

The Park Rooter program solicits donations for the funding of day-to-day operations for the organization. This is a donation only program.

One of the major projects at this time is the restoration of the Rock Creek Greenway. The greenway includes Ivy Terrace, Wilshire Trails and Longwood Parks. Land is being acquired along the linear corridor, and a detention pond will be constructed. This is not only essential for beautification, it also stabilizes stream banks, helps in the mitigation of storm water runoff, and creates walking trails to connect downtown Gainesville with Lake Lanier.

Friends of the Parks is also committed to restoring, preserving and developing a green way network that provides attractive, convenient routes for jogging, biking or walking to nearby destinations.

Needs/Goals

1. Commitment from more volunteers is needed to promote efforts in continuation of preservation and restoration.
2. All programs will be ongoing through the next 5 years.
3. Plans are to raise \$500,000 for a permanent endowment for “Let’s Connect Gainesville’s Green-ways” through citizen contributions is now underway. Expenses for 2004 are estimated to be just over one million dollars.

Litter Deputies

“Litter Deputies” are members of the Federated Garden Club, who have been “deputized” to help catch and stop litter law offenders.

Litter Reduction and Beautification

The program was developed to catch contractors, builders, businesses and others who have been practicing littering and illegal dumping.

The deputized citizens take down the tag number of vehicles and the name of the company, if it is visible, and report the offence to the Sheriff's office for disposition.

Hall County Master Gardeners

Hall County Master Gardeners is a program that focuses on beautification through preparing and planting flowerbeds and gardens. Clean up and policing of the areas are conducted prior to preparing and planting the beds.

Hall County Master Gardeners works with a variety of programs to enhance beautification projects. Some of the projects include stream cleanups with the Gainesville Adopt-a-Stream group and Elachee Nature Science Center. Other projects have included starting new garden clubs, ongoing maintenance or garden installation, clean ups at the Humane Society, donation of plants and installation of raised beds at the Sonrise Camp, helping with the Rivers Alive "Help Keep Waterways Healthy" program, installation of a butterfly garden at Lula Elementary School, maintaining the butterfly garden at Mt. Vernon School, maintaining flower beds at Wilshire Trails park, and planning and implementing spring plantings at Riverside Park.

Newtown Florist Club

In the 1950s housewives in the African American neighborhood of Gainesville started a social service club to collect money for funeral wreaths. Over the years, Newtown Florist Club members have become leaders for civil rights and community improvement. Members of the club often take on the role of environmental activists.

The Newtown Florist Club has developed a land trust to buy neighborhood houses, which come up for sale. The thought is that it's better to find low-income buyers than let the houses fall into the hands of outsiders and even drug tenants, which is already beginning to happen.

Litter Reduction and Beautification

Lake Lanier Association

Founded in 1966, the LLA is the oldest group working to protect Lake Lanier and to preserve its valuable legacy for future generations. The LLA sponsors many programs to keep the water and shorelines clean and beautiful for all users.

Today, the group has grown to a 5,500 member organization with a variety of missions and programs, acting as an education and knowledge resource for many government and private groups interested in the health of Lake Lanier.

Lake Lanier Association has organized and run an annual Shore Sweep program since 1988. The association organizes concerned citizens to help clean the shores of the lake by picking up trash and removing boat dock floatation. Each year, hundreds of volunteers participate in Shore Sweep. Since its inception, civic groups, youth groups, individuals and businesses have removed over 300 tons of trash from the lake.

Clean Hall Task Force

No longer active as of this writing, the Clean Hall Task Force was a multi-agency group that met under the coordination of the Greater Hall Chamber of Commerce. Represented on the task force were chamber officials, city and county officials, city and county law enforcement, courts officials, code enforcement, Keep Hall Beautiful, Gainesville Community Foundation, and concern citizens. The task force was concerned with aesthetics and quality of life issues of the community and their impacts on local economic development efforts in attracting new industries to the area.

The focus was to combine efforts and partner with different agencies and governmental departments to enhance the living conditions and aesthetics in the area. The Greater Hall Chamber of Commerce spearheaded the group and helped to promote programs that would accomplish this goal.

The task force was instrumental in securing a private anonymous donation to fund Keep Hall Beautiful's litter crew for the first year.

Litter Reduction and Beautification

Hall County Sheriff's Department

The Hall County Sheriff's Department has been and continues to be very supportive of local litter prevention and beautification efforts.

The "Inmate Trash Detail" has been in place for the past 3 years; however, it has been less active the last year due to the crime rate and available staff. The detail provides litter control on county roadways on the weekends and statistics are reported to Keep Hall Beautiful.

Deputizing Garden Club Members is a program where concerned citizens are deputized in an official swearing in of Anti-Litter Official Deputies. This ceremony is conducted after a criminal background check has been completed. An Oath of Anti-Litter Official is signed and presented by the Sheriff. These "deputies" have the authorization to report observed illegal dumping by contractors and builders and report vehicles transporting unsecured loads.

Better Home Town for Flowery Branch

Better Home Town (BHT) for Flowery Branch is a group of concerned citizens and volunteers who strive to make and keep the City of Flowery Branch a cleaner, more aesthetic and safer community in which to live, work and play. This program is sponsored by the Georgia Department of Community Affairs. One of the benefits of being a Better Home Town is being partnered with the University of Georgia's Department of Environmental Design.

The program consists of four committees including Organization, Design, Promotion, and Economic Development. These committees promote beautification and cleanliness by holding neighborhood cleanups, planting and maintaining flowerbeds, and by erecting signs, which have been designed by the Environmental Design Department of the University of Georgia.

Litter Reduction and Beautification

The goal is to raise public awareness and to educate citizens through multi media ad campaigns, a calendar of events, and by upholding the City ordinances that Flowery Branch is a city that will not tolerate trash and debris.

Flowers for the Branch is a program where lily beds are planted and maintained.

Better Home Town has various rock planter/ retainer wall signs, including welcome and directional signs that have flower beds planted and maintained around them.

When littered roadways are reported to the Better Home Town office, community service workers are assigned to clean the roadways. Maps of the area are furnished and a time frame given to have the litter pick up done. Community service workers report that the job has been finished and the job is inspected by someone from the City's Better Home Town office.

Needs/Goals

1. Future plans include a new sign at the intersection of Atlanta Highway and Phil Niekro Blvd., where flowers will be planted and maintained.

Litter Reduction and Beautification

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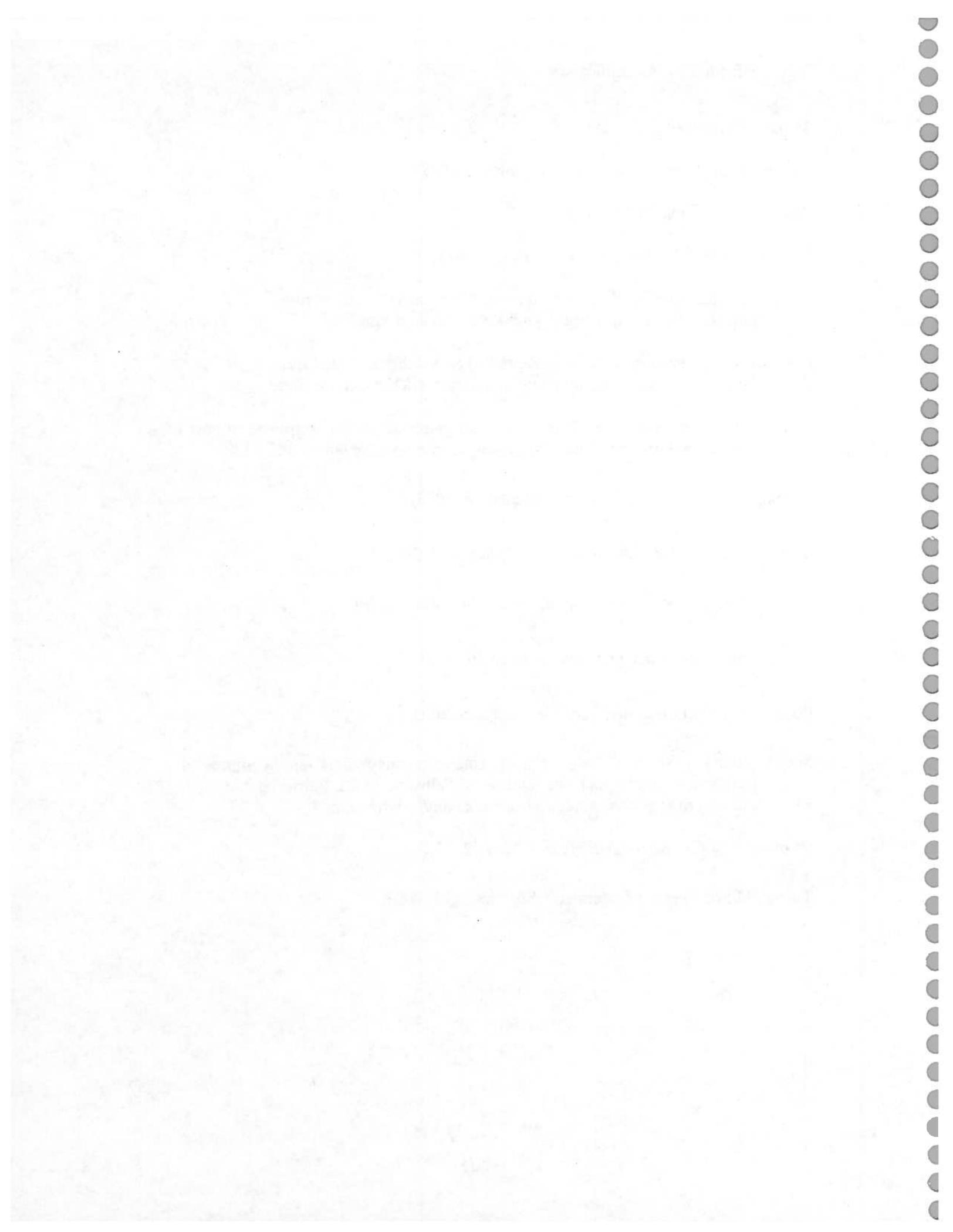
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LOCAL FINANCING OPTIONS

Enterprise Fund

Hall County converted a number of years ago to enterprise funding for all of its solid waste management activities, as was recommended in the 1993 Comprehensive Solid Waste Management Plan. The Solid Waste Enterprise Fund covers the County's three solid waste functions of collection, disposal and reduction. These functions are housed in the Solid Waste and Resource Recovery Divisions.

Funds are generated within the enterprise fund three ways: via an annual Solid Waste Assessment, landfill tipping fees, and revenues from sale of recycled materials.

Solid Waste Assessment

Again, as part of implementing recommendations of the 1993 plan, Hall County began instituting a charge to cover the actual cost of collection and disposal of residential solid waste. The fee is charged to those property owners having residences on them capable of generating solid waste. They are not charged, for example, to a property owner who has only forested acreage with no improvements on it. For the last few years, the assessment has been \$50 per year per household. The fee covers the costs of operating the county's compactor sites (convenience centers) and the disposal of waste collected from them.

Landfill Tipping Fees

Hall County charges a tipping fee of \$34.50 per ton for all acceptable solid waste delivered to the facility. There is a minimum fee of \$5 for use of the landfill. The tip fees cover the daily operational costs of the landfill and the portion of the Resource Recovery Division budget not recovered by sale of recycled materials. Over the lifetime of the Candler Road Landfill, the tip fees collected are projected to be sufficient to cover the closure costs of the facility.

Implementation Schedule

Recyclable Materials Revenues

All recyclable materials generated by Hall County's recycling efforts are sold at prevailing market prices. Revenues vary according to each commodity and market pricing at time of sale. Market pricing is influenced by numerous and increasingly global market influences.

Grants

State grants from agencies such as Georgia Environmental Facilities Authority, Environmental Protection Division, and Department of Community Affairs have been used to good advantage in Hall County to finance purchases of equipment and services related to reduction and proper management of solid wastes. Over the past decade, over \$300,000 in grants have been received.

SPLOST

Hall County has historically used SPLOST, on several occasions, as a funding source for large capital expenditures for solid waste management. The county has used SPLOST to fund closure costs of Allen Creek Landfill as well as development of cells at the county's Candler Road Landfill, which became operational in 1997. Voters passed the latest SPLOST, known as SPLOST V, in March 2004. The SPLOST V is expected to generate \$8.5 million to be used for the Candler Road Landfill as follows:

- Cell 4 design and construction: \$ 2,000,000
- Cell 5 design and construction: \$ 4,500,000
- Cell 1 closure of 26-acre phase: \$ 1,000,000
- Replacement of capital equipment: \$ 1,000,000

PAYT

Pay as you throw (PAYT) is a key recommendation of this plan in order to provide an economic incentive to spur further waste reduction. It should be computed so as to cover the actual cost of solid waste management. PAYT should be implemented countywide. At least one year lead time should be allotted to implement such changes.

Implementation Schedule

Franchise Fees

In keeping with the current enterprise funding for solid waste management, such funds should be required to go to dedicated solid waste management uses such as education, litter control, administration and enforcement, as well as capital funding for equipment and buildings for recycling.

PLAN ELEMENT AND IMPLEMENTATION ACTIVITY	YEAR TO BE IMPLEMENTED											RESPONSIBLE	ESTIMATE COST	FUNDING
	04	05	06	07	08	09	10	11	12	13	PARTY(IES)	(\$) IF ANY	SOURCES	
WASTE REDUCTION														
EnviroShare	X	X	X	X	X	X	X	X	X	X	RR, GHCC	minimal	County	
Cooperative Marketing for Businesses		X	X	X	X	X	X	X	X	X	RR, GHCC	minimal	County in-kind	
Partnering	X	X	X	X	X	X	X	X	X	X	RR, GHCC, others	minimal	County in-kind	
Educating Businesses	X	X	X	X	X	X	X	X	X	X	RR, GHCC	minimal	County in-kind	
Targeted Business Reduction--OCC			X	X	X	X	X	X	X	X	RR	minimal	Enterprise, Franchise	
Educating Residents	X	X	X	X	X	X	X	X	X	X	RR, KHB	\$20K/yr.	Grants/County	
Recycling and Composting Bins Distribution			X	X	X	X	X	X	X	X	RR	\$80K	Franchise fees	
Review periodic grinding need			X								RR, DPW	\$5K/yr.	County, user fees	
Curbside Recycling/PAYT			X	X	X	X	X	X	X	X	RR, DPW, PIC, others	(see collection)	User fees	
Increased Residential Recycling			X	X	X	X	X	X	X	X	RR	minimal	Enterprise Fund	
Drop Off Collection Frequency Changes		X	X	X	X	X	X	X	X	X	RR, SW	\$10K/yr.	Enterprise Fund	
Drop and Swaps					X					X	RR	\$500/event	Grants/County	
Require Private Haulers to Offer Recycling			X	X	X	X	X	X	X	X	RR, DPW, PIC		User fees	
Continue/Expand Drop Off Recycling	X	X	X	X	X	X	X	X	X	X	RR, SW	\$47.50/T.	Enterprise Fund	
Expand Used Oil to Municipalities			X	X	X	X	X	X	X	X	RR, cities, PIC	\$2,500/city	Cities	
Continue Hall Co. Recycling Center	X	X	X	X	X	X	X	X	X	X	RR	\$515K/yr.	Enterprise Fund	
Review Recycling Center Facility		X	X	X	X	X	X	X	X	X	RR, consultant	\$47K	Grants/Co. in-kind	
WCC Reduction	X	X	X	X	X	X	X	X	X	X	RR	minimal	County in-kind	
Building Codes for Recycling				X							RR, PIC	minimal	County in-kind	

PLAN ELEMENT AND IMPLEMENTATION ACTIVITY	YEAR TO BE IMPLEMENTED											RESPONSIBLE PARTY(IES)	ESTIMATE COST (\$ IF ANY)	FUNDING SOURCES
	04	05	06	07	08	09	10	11	12	13				
WASTE COLLECTION														
Cities: Review PAYT				X								RR, Cities	minimal	Cities
Clermont: Examine Privatization								X				Clermont	minimal	City In-kind
Clermont: Examine Yard Trimmings		X										Clermont	minimal	City In-kind
Fl. Branch: Examine Customer Service					X							Fl. Branch	minimal	City In-kind
Fl. Branch: Examine Franchising					X							Fl. Branch	minimal	City In-kind
Gainesville: Education/Program Reinforce.		X										Gainesville	\$2K/yr.	City
Gainesville: Coordinating Committee		X										Gainesville	minimal	City In-kind
Lula: Examine Curbside Recycling			X									Lula	minimal	City In-kind
Oakwood: Examine Leaf Collection		X										Oakwood	minimal	City In-kind
Hall: Maintain compactors (option 2)	X	X	X	X	X	X	X	X	X	X	X	SW	\$1.5 to \$2 mill./yr	Enterprise Fund
Hall: Thorough analysis of alternatives	X	X										PIC, RR, DPW, others	\$100,000	Grants/County
Hall: Review PAYT			X	X	X	X	X	X	X	X	X	Admin.,RR, DPW, PIC	\$10,000 (startup)	"
PLAN ELEMENT AND IMPLEMENTATION ACTIVITY	YEAR TO BE IMPLEMENTED											RESPONSIBLE PARTY(IES)	ESTIMATE COST (\$ IF ANY)	FUNDING SOURCES
	04	05	06	07	08	09	10	11	12	13				
WASTE DISPOSAL														
Continue use of Candler Road Landfill	X	X	X	X	X	X	X	X	X	X	X	SW, DPW	\$3 million/yr.	Enterprise, SPLOST
Continue Alternative Daily Cover	X	X	X	X	X	X	X	X	X	X	X	SW	Incl. In above	Enterprise fund
Examine use of Methane (Allen Creek)				X								DPW	minimal	County In-kind
Examine Special Mgt. Items/HHW				X								RR	minimal	In kind, Franch. Fees
Allen Creek Landfill-Post Closure	X	X	X	X	X	X	X	X	X	X	X	DPW	\$125K/yr.	Enterprise fund
LAND LIMITATIONS														
Examine Plan Consistency Issues	X	X										RR, PIC	minimal	County In-kind
Examine Need for Local Ordinances	X	X										RR, PIC	minimal	County In-kind

PLAN ELEMENT AND IMPLEMENTATION ACTIVITY	YEAR TO BE IMPLEMENTED										RESPONSIBLE PARTY(IES)	ESTIMATE COST (\$ IF ANY)	FUNDING SOURCES
	04	05	06	07	08	09	10	11	12	13			
EDUCATION AND PUBLIC INVOLVEMENT													
Support Continued State Grant Funding		X	X	X	X	X	X	X	X	X	Admin., ACCG		
Hispanic Community Sweeps		X	X	X	X	X	X	X	X	X	Various city/county	\$10K/yr.	County/City
Continue PIC	X	X	X	X	X	X	X	X	X	X	RR		
Education in Schools	X	X	X	X	X	X	X	X	X	X	RR, KHB	minimal	In-kind
Utilize Keep Hall Beautiful	X	X	X	X	X	X	X	X	X	X	RR, KHB		
Speaker's Bureau				X							RR, KHB, others		
Continue One for the Chipper	X	X	X	X	X	X	X	X	X	X	KHB, RR	minimal	County/City/State
Anti-Littering Awareness	X	X	X	X	X	X	X	X	X	X	KHB	\$2K/yr.	KHB
Educate Scouts	X	X	X	X	X	X	X	X	X	X	RR, KHB	minimal	In-kind
Debates/Forums	X	X	X	X	X	X	X	X	X	X	KHB, RR	minimal	In-kind
Utilize Cooperative Extension	X	X	X	X	X	X	X	X	X	X	RR, Ext.		
Utilize AARP	X	X	X	X	X	X	X	X	X	X	RR, AARP		
Corporate Education Program	X	X	X	X	X	X	X	X	X	X	RR, GHCC	minimal	In-kind, Sponsors
Waste Reduction Education--Residents	X	X	X	X	X	X	X	X	X	X	RR, KHB	\$2K/yr.	County/KHB/Grants
Teachers Workshops			X			X			X		KHB, KGB	minimal	In-kind
Environmental Fairs		X	X	X	X	X	X	X	X	X	RR, KHB, Others	minimal	In-kind, Grants
Utilize Seasonal Educational Opportunities	X	X	X	X	X	X	X	X	X	X	RR, KHB	1K/yr.	In-kind, Grants

PLAN ELEMENT AND IMPLEMENTATION ACTIVITY	YEAR TO BE IMPLEMENTED										RESPONSIBLE	ESTIMATE COST	FUNDING
	04	05	06	07	08	09	10	11	12	13	PARTY(IES)	(\$) IF ANY	SOURCES
Litter Reduction and Beautification													
Education of Youths/Adults	X	X	X	X	X	X	X	X	X	X	KHB	\$5K	KHB, Grants, Govts.
Increase Participation in KHB Programs	X	X	X	X	X	X	X	X	X	X	KHB	\$1K	KHB, Local Bus.
Increased Publicity and KHB Volunteers	X	X	X	X	X	X	X	X	X	X	KHB	\$1K	KHB
KHB Overall Coordinating Function	X	X	X	X	X	X	X	X	X	X	KHB, various		
Annual Litter Index	X	X	X	X	X	X	X	X	X	X	KHB		
Annual Cost/Benefit Ratio	X	X	X	X	X	X	X	X	X	X	KHB		
Adopt A Road		X	X	X	X	X	X	X	X	X	KHB, Hall Traffic Eng.	\$1K	KHB, County
Community Awareness and Pride	X	X	X	X	X	X	X	X	X	X	AAS		
Stream Clean Up Events	X	X	X	X	X	X	X	X	X	X	AAS	\$1K	Gainesville
Additional Volunteers	X	X	X	X	X	X	X	X	X	X	FOTP	\$1K	fundraising, sponsors
Gainesville Greenways Connector		X	X								FOTP	\$1 million	fundraising, sponsors
New BHT Sign—Flowery Branch			X								Flowery Branch	\$2.5K	City

Implementation Schedule

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APPENDIX B

WASTE REDUCTION

Table B-1.--Recycling Opportunities in Hall County

Newspapers, glass (clear, green, brown) aluminum cans, aluminum foil, tin cans, corrugated cardboard, magazines, bound books, plastics (HDPE #2, PETE #1) and used motor oil are accepted at the following sites:

- 1) Allen Creek Compactor
- 2) East Crescent Dr. Compactor
- 3) Gaines Ferry Compactor
- 4) Sardis Road Compactor
- 5) Murrayville Compactor
- 6) Tadmore Compactor
- 7) Lula Compactor
- 8) Blackshear Place Compactor
- 9) Wauka Mountain Compactor
- 10) Candler Compactor
- 11) Balus Creek Compactor
- 12) Flowery Branch Compactor
- 13) Gould Lane Compactor

Newspapers, glass (clear, green, brown) aluminum cans, aluminum foil, tin cans, corrugated cardboard, plastics (HDPE #2, PETE #1) are accepted at the drop off area at:

- 14) Hall County Government/Education Bldg. - 711 Green St. (Collection containers are located in the parking lot)

In addition to those materials listed above, mixed paper, rechargeable portable batteries and used cooking grease are accepted at the Recycling Center.

- 15) Hall County Recycling Center, 1008 Chestnut St.

Newspapers only are accepted at the following site:

- 16) Clermont – Clermont Library at King Street.

Appendix

Table B-2.--Hall County Scrap Metal Recyclers

<u>Recycler</u>	<u>Materials Purchased by Recycler</u>
Regional Recycling	most metals, aluminum cans, appliances (compressor must be removed)
Gainesville Scrap Iron & Metal	most metals, aluminum cans, appliances (Freon must be removed)

Source: Hall County Resource Recovery Division

APPENDIX C

COLLECTION

MUNICIPAL SOLID WASTE COLLECTION VEHICLES

Front Loaders:

These trucks feature forklift type projections at the front of the vehicle, which fit into sleeves on either side of the refuse container. The container is hydraulically lifted overhead. Open doors at the top of the truck body allows refuse to fall into the truck. A hydraulic ram compacts the refuse.

Advantages:

- ◆ Labor efficient (one man operation)
- ◆ Speed and ease of loading
- ◆ Carrying capacity (35-44 cu. yds.)

Disadvantages:

- ◆ Difficult to back safely
- ◆ Vehicle weight can damage pavement
- ◆ Requires highly skilled operator
- ◆ High maintenance costs
- ◆ Services commercial containers only

Rear Loaders:

These have an opening in the rear of the truck body and must be backed to the container to be serviced. Rear loader containers have two pegs attached to either side near the top. The pegs fit into corresponding hooks on the truck body. An overhead winch with a hook on the end is used to hook into a loop at the top edge of the container farthest from the truck. The winched cable lifts the container. The pegs pivot in the hooks on the truck body and the waste falls into the rear hopper. A hydraulic ram compacts the waste into the truck.

Advantages:

- ◆ Can be used on residential and commercial (container) routes
- ◆ Can be used for residential curbside collection
- ◆ Can access places front loaders cannot
- ◆ Safety in numbers (2-3 man operation, extra man is available to direct backing of vehicle)

Disadvantages:

- ◆ High rate of workmen's compensation on rear loading vehicles

Appendix

MUNICIPAL SOLID WASTE COLLECTION VEHICLES (cont.)

Side Loaders:

These trucks have an opening at the side of the truck body. Bagged waste is thrown into the opening and then compacted. They are most conducive for residential curbside pick up.

Advantages:

- ◆ Workers can work from the curb without exposure to vehicular traffic

Disadvantages:

- ◆ Primarily for residential operation only
- ◆ Not suited for container service

Roll-Off Trucks and Trailers:

Roll-off trucks feature a truck bed, which accepts roll off containers. A hydraulic hoist inclines the bed for both loading/unloading and dumping containers. A winch is used to pull the container onto the truck bed. Roll off trucks are used to service container routes only, such as transfer stations or construction/demolition projects. They are also used to service specially designed recycling containers. A pull behind trailer may be used to double the payload for long hauls.

Advantages:

- ◆ Can handle wide variety of materials
- ◆ Containers are easily adapted to stationary compactor
- ◆ Most wear and tear is on the container and not the vehicle
- ◆ Labor efficient (one man operation)

Disadvantages:

- ◆ Containers are expensive

Scooter Trucks:

Scooters have a 1/2-ton truck chassis with a small dump bin, which mimics a rear loader container in function. Scooters are used to collect refuse from short, dead end or narrow streets, which are not conducive to the use of larger trucks. Scooters collect refuse from such areas and then dump the refuse into the hopper of rear loader trucks, commonly called the "mother truck".

Advantages:

- ◆ Maneuverable (well suited for long driveways, narrow streets, dead end streets)
- ◆ Requires little training to operate
- ◆ Inexpensive to purchase and operate

Disadvantages:

- ◆ Limited hauling capacity

Appendix

MUNICIPAL SOLID WASTE COLLECTION VEHICLES (cont.)

Pick-Ups, Stake Body Trucks and Flatbed Trucks:

Both modified and unmodified pick-ups and stake body trucks may be used to collect residential refuse. Such trucks are most often used by small, independent haulers and lack compaction capability. They may or may not have a dump body.

Advantages:

- ◆ Handles wide variety of items
- ◆ Inexpensive to purchase and operate
- ◆ Handles wide variety of lengths of materials

Disadvantages:

- ◆ No compaction, leaving voids in loads carried
- ◆ May be difficult to unload unless equipped with dump body

Vacuum Truck:

Vacuum trucks have a motorized, housed impeller, which creates a vacuum that can be used to pick up leaves, and other small debris. The unit may be self-contained or placed on a trailer and pulled behind an enclosed body vehicle.

Advantages:

- ◆ Best way to handle small debris items such as leaves and limbs
- ◆ Very fast

Disadvantages:

- ◆ Limited use vehicle

Chipper Truck:

These are enclosed body trucks behind which is pulled a trailer. Mounted on the trailer is a chipping unit having motorized, rotating cutting knives with hydraulic in-feed system that will process limbs and other woody materials into usable mulch and ground cover material.

Advantages:

- ◆ Densifies items on site
- ◆ Makes best use of labor, shuttle time to and from landfill is minimized
- ◆ Produces usable product
- ◆ Personnel work at waist height

Disadvantages:

- ◆ Care must be taken in separating out non-chippable items
- ◆ Limited to limbs 12" in diameter or smaller

Transfer Trailers:

Transfer trailers are the workhorses of the long distance refuse transportation business. They are available in two forms-- open top and enclosed. Open top trailers are loaded from an elevated

Appendix

MUNICIPAL SOLID WASTE COLLECTION VEHICLES (cont.)

ramp, with the refuse being pushed off the ramp into the trailer below. Various mechanisms are used for unloading the refuse. The most efficient for the small to medium volume transfer operation is the "live bottom" trailer. The floors of these trailers are basically conveyors that can unload the trailer in three to five minutes.

The enclosed trailer is the predominant transfer system in use today. A transfer trailer is backed into position and locked to a stationary compactor that is firmly anchored in a concrete foundation. Refuse is loaded into the compactor from above and the ram of the compactor forces the refuse into the trailer through the door opening. At the disposal site, the rear section is opened, and the waste is pushed out by an ejection ram.

Open Top

Advantages:

- ◆ Less expensive purchase price
- ◆ Requires less maintenance

Disadvantages:

- ◆ High haul cost due to low density achieved in direct dump operations
- ◆ Trailer covers must be handled with each loading and unloading

Enclosed

Advantages:

- ◆ Low transportation costs due to high density achieved through compaction
- ◆ Trailer covers do not have to be handled

Disadvantages:

- ◆ More expensive purchase price
- ◆ Should the compactor fail, there is no other way to load the trailer

APPENDIX C

TABLE C-1 HAULER SURVEY OF SERVICES OFFERED

Hauler	Service Area	Collection Freq. Residential	Collection Freq. Business	Collection Services Provided	Containers Provided Waste	Containers Provided Recycling
Advanced Disposal Svcs. Michael Cosman, Owner 1009 Industrial Court, Suite 1 Suwanee, GA 30024	All of Hall County & Areas Outside County	Once/Week	Once/Twice/Week Bi-Weekly Once/Month By Request	Curbside-Residential Waste Bulky Waste Construct/Demolition Waste Yard Waste Business/Industry Waste Curbside-Residential Rcy. Business Industry-Rcy. Plastic, Metal	Wheeled Carts Open Roll Off Closed Roll Off Front Loader Container	Open Roll Off Closed Roll Off Front Loader container Curbside Bins
BFI - Gainesville Browning Ferris Industries 1681 Fullenwider Road Gainesville, GA 30607	All of Hall County & Areas Outside County	N/A	Once/Twice/Week	Construction/Demolition Waste Business Industry Waste Business Special Waste Business Industry Recyclables: Cardboard, Metal	Open Roll-Off Closed Roll-Off Front Loader Cont.	Open Roll-Off Closed Roll-Off
HT Waste Removal Doug Turk, Owner P.O. Box 232 Gillsville, GA 30643	All of Hall County & Areas Outside County	By Request	Once/Week By Request	White Goods Bulky Waste Construction/Demolition Waste Yard Waste	Open Roll-Off Customer Owner Comp-actor Box	Open Roll-Off
J & R Services James L. Osborne, Owner 3613 Osborne Road Flowery Branch, GA 30642	Gainesville	N/A	Once Week	Business/Industry Waste Business Industry Recyclables:	1 1/2 Ton Dump Truck	1 1/2 Ton Dump Truck
Meaders Grading Phil Meaders, Owner 5444 Clarks Bridge Road Gainesville, GA 30643	Clermont, Gainesville, Lula, North Hall, South Hall, West Hall, East Hall	By Request	By Request	Construction/Demolition Waste	Open Roll-Off	

APPENDIX C

<p>Nix Septic Tank Co. Darrell Webb, Owner 6604 Saddle Club Road Gainesville, GA 30606</p>	All of Hall County & Areas Outside County	By Request	By Request	<p>Bulky Waste Construction/Demo. Waste Yard Waste Business/Industry Waste Business Industry -Recyclables Glass</p>	Open Roll-Off	Open Roll-Off
<p>Red Oak Sanitation Lynn Luce, Owner P.O. Box 1777 Gainesville, GA 30603</p>	All of Hall County & Areas Outside County	Once/Week	Once/Week	<p>Curbside Residential Waste Construction/Demolition Waste Business/Industry Waste Curbside Residential Waste</p>	<p>Wheeled Carts Open Roll-Off</p>	
<p>United Waste Svcs. Jayne Mills, Owner P.O. Box 1108 Auburn, GA 30011</p>	<p>Flowerly Branch Gainesville Oakwood South Hall East Hall</p>	Once/Week	By Request	<p>Curbside Residential Waste Bulky Waste Construction/Demolition Waste Business/Industry Waste Business Industry Recyclables: Cardboard, Metal</p>	<p>Wheeled Carts Open Roll-Off Closed Roll-Off Front Loader Cont.</p>	<p>Open Roll-Off Closed Roll-Off Front Loader Cont.</p>
<p>Waste Mgt. Cindy Kinsmon, Owner 7744 McFarland Road Alpharetta, GA 30004</p>	<p>Flowerly Branch Gainesville Oakwood Oakwood</p>	N/A	Once/Twice/Week	<p>Construction/Demolition Waste Business/Industry Waste</p>	<p>Open Roll-Off Closed Roll-Off Front Loader Container</p>	N/A

Source: Hall County Resource Recovery Division

Appendix

Table C-2.--Compactor Site Locations in Hall County

SITE	ADDRESS/LOCATION
Allen Creek Road	2684 Allen Creek Road - located approximately 1 mi. from intersection of Monroe Drive and Hwy. 129 South.
Balus Creek	3845 Old Flowery Branch Road - (south side of Mundy Mill Road) approximately 0.2 mi. from Mundy Mill/McEver intersection.
Blackshear Place	2931 Atlanta Highway - Atlanta Hwy. approximately 1/4 mi. south of I-985, behind South Hall Library.
Candler	5064 Poplar Springs Road - South side of S.R. 332, 10 mi. west of S.R. 60 near Candler, next to Hopewell to Hopewell Baptist Church.
East Crescent Drive	734 East Crescent Drive - just off Jesse Jewell across from Fire Station Headquarters and next to the Farmers Market.
Flowery Branch	4395 Atlanta Highway - approximately 1/4 mi. south of intersection with Hog Mountain Road.
Gaines Ferry	6173 Gaines Ferry Road - between Atlanta Highway and McEver Road behind County Fire Station #8.
Gould Lane	2216 Gould Lane - between McEver Road Extension and Spring Road.
Lula	6174 Lula Road - 1/2 mi. north of intersection with Hwy. 365.
Murrayville	5113 Thompson Bridge Road - Hwy. 60 next to Fieldale, just inside Murrayville Corporation limits.
Sardis	2801 Sardis Road - on Sardis Road west of Sardis Elementary School.
Tadmore	3320 Holly Springs Road - Hwy. 82 just east of Tadmore Elementary and 1/4 mile from the intersection with Highway 323.
Wauka Mountain	5800 Brookton-Lula Road (Hwy. 52) - approximately 1/2 mile east of Quillians Corner.

Source: Hall County Resource Recovery Division

Appendix

Table C-3.-- Additional Comparisons of Communities with County-Wide Curbside Collection

	Glynn County	Crawford County
Population	67,568	12,495
Size: Square Miles	422.37	325.01
Density: People/Square Mile	160.0	38.4
Housing Units	32,636	4,872
Housing Units/Square Mile	77.3	15.0
People Per Housing Unit	2.4	2.8

Sources: 2000 Census, U.S. Census Bureau
 Georgia Department of Community Affairs

Appendix

ADDITIONAL COMMUNITY COMPARISONS

Brief Glynn County Facts:

- ◆ Countywide curbside waste collection available (if user chooses it)
- ◆ Countywide curbside yard trimmings and recyclables (added charge)
- ◆ Contracted service via single hauler
- ◆ Costs: Waste is \$172/yr; recycling is \$34/yr both collected weekly
- ◆ Fees currently collected via county billing
- ◆ Mulling possible conversion from billing to funding via General Fund

Brief Crawford County Facts:

- ◆ Countywide curbside waste collection
- ◆ Utilizes roll-carts and a single contracted hauler
- ◆ Private hauler to offer bulky item pick up once/mo.
- ◆ Cost: \$90/yr./cart for weekly collection
- ◆ Fees included on tax bill (General Fund)
- ◆ Recycling is drop off based at central recycling center

Sources: Keep Brunswick/Golden Isles Beautiful
Keep Roberta/Crawford Beautiful

HALL COUNTY COMPACTOR SITE USERS' SURVEY 2004

A survey was conducted to gather information from Hall County compactor site users that could be used by County officials to help determine residential collection needs. In partial fulfillment of community service project requirements, Cooperative Extension 4-H youths administered the survey to residents using County compactor sites. A total of 69 completed surveys were obtained. 25 from Blackshear Place, 21 from Balus Creek, 16 from Flowery Branch, 6 from East Crescent, and 1 from Wauka Mountain.

The number of surveys completed is small compared to the actual number of compactor site users. This is because of the limited time frame the volunteers had to survey (one-half day) and the fact that the volunteers were asked by the attendants at some of the sites to leave. The reasons for this are not known. The study is also limited because not all compactor sites were surveyed. For these reasons, the findings of this study cannot be construed to represent the entire user base. Nonetheless, this information will help government officials begin to learn what they can do to improve solid waste management services in the planning area.

Appendix

HALL COUNTY COMPACTOR SITE USERS' SURVEY 2004 (cont.)

Findings:

Out of 69 surveys there were 68 responses. Of the 68 responses, none used the compactor site for recycling only, 26% used the sites for trash only and 74% used the compactor sites for both trash and recycling.

Out of 69 people surveyed, 30% of those used the compactor site most often while making a trip solely to use the compactor site, 17% used the compactor site while on their way to work, 4% while on their way to school, and 19% while on their way to do shopping. Nineteen percent reported a combination of several practices, and 10% reported some "other" practice.

It is interesting to note that the 1992 survey reported similar results:

"It is most common for those surveyed (42%) to return home after using the site. On the other hand, 21% use the site on their way to do shopping and 15% use it on their way to work or school. Thirteen percent reported a combination of the three practices, and 4% reported some other practice."

As to estimated time and distance required for one-way travel to the most commonly used compactor site, out of 66 responses, 68% of those surveyed drove fewer than 5 minutes and 27% drove 5-10 minutes. The remaining 5% drove longer than 10 minutes. In correlation with the reported distance traveled, 49% of those surveyed drove fewer than 2.0 miles and 43% drove 2-5 miles. The remaining 8% reported driving 5 or more miles.

Out of 69 surveys, 56 people responded on the frequency of the site(s) being used. Three people or 5% of those responding used the site less frequently than once/week.
20 people or 36% used the site once per week.
23 people or 41% used the site twice per week.
10 people or 18% used the site more than twice per week.

Out of 69 surveys, 52 people responded to the question regarding whether they have ever had to throw recyclables away due to the recycling container being full. Thirty-six people or 69% of those who responded had never thrown recyclables away because of the container being full. However, 31% reported they have had to throw their recyclables

Appendix

HALL COUNTY COMPACTOR SITE USERS' SURVEY 2004 (cont.)

away. Of those reporting they had experienced full recycling bins, they estimated this occurred 27% of the time.

Similarly, out of 69 surveys, 53 people responded to the question as to whether they have ever had to put trash on the ground because the compactor was full. 42% of those responding reported never having to place their garbage on the ground. However, 31 people or 58% had placed their garbage on the ground. Of those reporting they had experienced having to place their garbage on the ground, they estimated this occurred 4% of the time.

Out of 69 surveys, there were 50 responses on curbside waste collection. When asked whether they would support a plan requiring curbside waste collection, which would offer increased convenience but at a cost, 66% responded they would not support a plan requiring curbside, while 24% would support a curbside program. Of those 12 that would support a curbside program 80% of those only supported it at a cost of \$10/week. The remaining 10% were undecided.

Conclusions:

A finding that would help in planning the administration of future surveys was that people were more willing to participate in the survey when the 4-H surveyors indicated the survey was a 4-H community service project rather than a government project. The information obtained through this survey is valuable to County officials involved in solid waste management planning. More valuable information could be obtained by administering this survey to more users at all of the compactor sites, and especially those not represented in this survey.

Appendix

Table C-4.-- 2003 Hall County Compactor Site Traffic Counts

Allen Creek Compactor Site

Date: 6/16/2003

Interval Begin	Mon 6/16	Tue 6/17	Wed 6/18	Thu 6/19	Fri 6/20	Sat 6/21	Sun 6/22	Week Avg.
6AM	0	1	0	2	2	3	0	
7	4	2	4	0	1	2	7	
8	4	1	8	0	14	17	3	
9	8	0	2	6	10	8	8	
10	6	8	3	2	6	8	5	
11	2	2	3	2	2	12	7	
12PM	2	3	4	5	8	8	5	
1	12	4	8	2	10	12	3	
2	2	2	10	3	2	10	7	
3	3	8	4	4	2	5	13	
4	3	5	13	10	4	11	11	
5	6	10	10	4	10	8	6	
6	7	10	14	0	6	2	5	
7	4	2	10	8	6	3	0	
8	7	6	4	5	7	7	0	
TOTALS	70	64	97	53	90	116	80	81

Source: Hall County Traffic Engineering Division

Table C-4. (cont.)

Balus Creek Compactor Site

Date: 6/30/2003

Interval Begin	Mon 6/30	Tue 7/1	Wed 7/2	Thu 7/3	Fri 7/4	Sat 7/5	Sun 7/6	Week Avg.
6AM	7	9	11	7	1	6	0	
7	52	16	38	52	16	18	4	
8	57	14	38	50	38	49	24	
9	53	19	55	74	48	52	38	
10	50	26	55	50	56	92	42	
11	58	22	60	53	50	85	53	
12PM	35	21	49	40	55	78	63	
1	51	24	40	51	40	66	55	
2	49	12	50	44	52	53	75	
3	44	22	47	30	23	51	64	
4	43	16	46	50	32	56	49	
5	46	18	46	60	28	48	58	
6	64	15	55	46	23	40	60	
7	32	9	51	44	15	31	0	
8	22	8	31	30	15	22	0	
TOTALS	663	251	672	681	492	747	585	584

Source: Hall County Traffic Engineering Division

Appendix

Table C-4. (cont.)

Blackshear Place Compactor
Site

Date: 6/30/2003

Interval Begin	Mon 6/30	Tue 7/1	Wed 7/2	Thu 7/3	Fri 7/4	Sat 7/5	Sun 7/6	Week Avg.
6AM	12	4	10	10	3	2	0	
7	53	14	55	47	19	19	8	
8	56	16	50	45	37	62	23	
9	43	34	48	57	60	83	46	
10	60	26	62	48	70	95	52	
11	58	22	55	62	65	122	49	
12PM	50	20	58	46	50	87	54	
1	63	16	68	63	58	69	50	
2	45	13	56	48	46	75	70	
3	44	17	48	50	36	64	47	
4	49	23	47	48	28	61	63	
5	50	23	54	41	28	56	40	
6	37	14	65	50	22	36	44	
7	38	10	44	32	14	24	4	
8	25	3	35	32	10	18	0	
TOTALS	683	255	755	679	546	873	550	620

Source: Hall County Traffic Engineering Division

Table C-4. (cont.)

Candler Compactor Site

Date: 7/21/2003

Interval Begin	Mon 7/21	Tue 7/22	Wed 7/23	Thu 7/24	Fri 7/25	Sat 7/26	Sun 7/27	Week Avg.
6AM	8	1	8	7	7	5	0	
7	30	26	21	20	28	12	10	
8	43	28	22	24	22	27	28	
9	23	14	10	23	22	41	32	
10	14	20	20	10	22	38	28	
11	16	17	20	22	16	38	46	
12PM	14	12	23	17	18	35	30	
1	30	18	20	19	31	32	34	
2	24	16	25	11	16	28	28	
3	18	10	23	14	22	28	26	
4	22	20	22	30	22	30	27	
5	31	33	20	24	21	32	40	
6	35	38	44	22	27	26	42	
7	36	29	33	38	18	19	0	
8	26	12	17	22	17	6	0	
TOTALS	370	294	328	303	309	397	371	339

Source: Hall County Traffic Engineering Division

Appendix

Table C-4. (cont.)

East Crescent Compactor Site

Date: 6/16/2003

Interval Begin	Mon 6/16	Tue 6/17	Wed 6/18	Thu 6/19	Fri 6/20	Sat 6/21	Sun 6/22	Week Avg.
6AM	13	5	9	12	11	8	0	
7	60	28	34	31	40	22	10	
8	67	41	28	39	37	56	32	
9	50	37	18	46	45	74	33	
10	58	39	18	56	40	69	38	
11	52	39	22	38	39	71	49	
12PM	41	33	21	38	37	60	54	
1	49	42	30	44	42	47	51	
2	40	40	30	32	27	47	38	
3	43	27	36	32	35	48	38	
4	31	32	30	33	41	35	43	
5	35	53	46	30	37	38	50	
6	50	38	44	42	24	41	44	
7	43	24	19	34	34	27	0	
8	13	16	10	22	16	17	0	
TOTALS	645	494	395	529	505	660	480	530

Source: Hall County Traffic Engineering Division

Appendix

Table C-4. (cont.)

Flowery Branch Compactor
Site

Date: 6/30/2003

Interval Begin	Mon 6/30	Tue 7/1	Wed 7/2	Thu 7/3	Fri 7/4	Sat 7/5	Sun 7/6	Week Avg.
6AM	9	2	4	8	3	1	0	
7	38	7	20	32	8	10	2	
8	22	10	18	34	18	36	12	
9	26	11	30	30	30	30	20	
10	38	18	20	25	50	56	32	
11	24	18	28	18	30	54	36	
12PM	25	20	33	20	28	44	32	
1	28	10	20	28	28	25	36	
2	20	6	28	26	18	42	34	
3	30	12	26	26	16	30	40	
4	35	19	25	27	23	18	30	
5	36	12	24	18	22	27	38	
6	30	8	30	38	6	31	36	
7	18	8	40	38	6	22	0	
8	10	11	11	13	2	14	0	
TOTALS	389	172	357	381	288	440	348	339

Source: Hall County Traffic Engineering Division

Table C-4. (cont.)

Gaines Ferry Compactor Site

Date: 7/14/2003

Interval Begin	Mon 7/14	Tue 7/15	Wed 7/16	Thu 7/17	Fri 7/18	Sat 7/19	Sun 7/20	Week Avg.
6AM	12	11	12	11	10	4	0	
7	49	34	32	35	45	30	12	
8	44	28	32	44	30	39	34	
9	38	37	36	40	31	60	36	
10	35	32	22	34	32	70	42	
11	34	28	30	24	26	60	48	
12PM	25	22	22	32	16	50	23	
1	18	20	31	24	28	40	57	
2	26	26	10	18	26	31	58	
3	26	18	27	15	24	29	36	
4	36	26	20	24	28	31	36	
5	28	29	20	32	28	32	49	
6	31	28	42	32	28	28	44	
7	38	36	32	36	25	18	0	
8	28	25	23	32	22	11	0	
TOTALS	468	400	391	433	399	533	475	447

Source: Hall County Traffic Engineering Division

Appendix

Table C-4. (cont.)

Gould Compactor Site

Date: 7/21/2003

Interval Begin	Mon 7/21	Tue 7/22	Wed 7/23	Thu 7/24	Fri 7/25	Sat 7/26	Sun 7/27	Week Avg.
6AM	2	3	1	2	2	2	0	
7	21	13	12	17	12	15	8	
8	33	20	14	30	26	26	18	
9	23	23	21	23	33	32	32	
10	25	28	33	32	18	36	57	
11	38	32	28	20	22	45	62	
12PM	36	32	28	18	24	56	43	
1	42	31	20	15	26	44	30	
2	20	28	22	14	34	42	32	
3	24	24	22	21	17	34	26	
4	30	29	25	28	23	40	32	
5	27	20	30	31	26	34	21	
6	40	38	39	23	36	23	27	
7	28	30	26	25	20	19	0	
8	29	20	12	19	28	10	0	
TOTALS	418	371	333	318	347	458	388	376

Source: Hall County Traffic Engineering Division

Appendix

Table C-4. (cont.)

Lula Compactor Site

Date: 6/16/2003

Interval Begin	Mon 6/16	Tue 6/17	Wed 6/18	Thu 6/19	Fri 6/20	Sat 6/21	Sun 6/22	Week Avg.
12AM								
6AM	6	5	2	5	6	2	0	
7	26	22	20	10	15	13	4	
8	26	24	9	20	15	24	6	
9	22	15	10	18	17	24	15	
10	16	19	10	16	12	17	17	
11	16	12	6	18	20	24	10	
12PM	12	14	9	14	8	20	27	
1	19	10	17	13	16	20	24	
2	20	16	15	12	18	18	21	
3	12	12	11	11	17	20	16	
4	11	16	17	13	19	22	11	
5	21	18	20	12	19	11	16	
6	16	16	20	20	10	16	16	
7	18	17	9	11	14	14	0	
8	9	7	7	6	9	10	0	
TOTALS	250	223	182	199	215	255	183	1507

Source: Hall County Traffic Engineering Division

Appendix

Table C-4. (cont.)

Murrayville Compactor Site

Date: 8/11/2003

Interval Begin	Mon 8/11	Tue 8/12	Wed 8/13	Thu 8/14	Fri 8/15	Sat 8/16	Sun 8/17	Week Avg.
6AM	12	14	5	7	10	4		
7	48	41	32	21	23	18	8	
8	40	33	23	28	42	48	20	
9	38	34	24	32	44	64	37	
10	42	29	26	29	20	55	52	
11	34	24	31	29	34	52	34	
12PM	39	28	22	25	25	62	58	
1	33	33	23	34	26	51	42	
2	30	21	24	24	25	47	42	
3	25	22	35	17	38	35	30	
4	26	27	30	22	28	41	34	
5	36	31	33	22	23	34	35	
6	48	30	29	27	26	13	40	
7	30	22	15	32	15	22	0	
8	19	11	11	14	4	17	0	
TOTALS	500	400	363	363	383	563	432	429

Source: Hall County Traffic Engineering Division

Appendix

Table C-4. (cont.)

Sardis Compactor Site

Date: 8/4/2003

Interval Begin	Mon 8/4	Tue 8/5	Wed 8/6	Thu 8/7	Fri 8/8	Sat 8/9	Sun 8/10	Week Avg.
6AM	17	8	5	3	6	8	0	
7	54	53	68	57	64	55	16	
8	90	62	106	58	86	112	65	
9	102	84	56	106	95	120	112	
10	85	70	75	79	67	160	98	
11	100	57	94	78	56	113	112	
12PM	67	74	54	70	80	112	98	
1	58	76	58	50	90	96	98	
2	70	67	62	56	53	102	130	
3	68	77	49	67	78	108	83	
4	75	78	48	52	58	87	102	
5	93	82	62	68	56	70	115	
6	87	83	80	83	76	54	70	
7	90	76	60	78	39	51	0	
8	50	36	33	45	40	29	0	
TOTALS	1106	983	910	950	944	1277	1099	1038

Source: Hall County Traffic Engineering Division

Appendix

Table C-4. (cont.)

Tadmire Compactor Site

Date: 8/11/2003

Interval Begin	Mon 8/11	Tue 8/12	Wed 8/13	Thu 8/14	Fri 8/15	Sat 8/16	Sun 8/17	Week Avg.
6AM	8	4	6	2	1	0	0	
7	27	32	26	23	28	16	6	
8	24	25	15	28	26	54	45	
9	28	20	15	20	26	38	56	
10	25	26	22	34	26	54	62	
11	31	28	30	30	33	41	54	
12PM	40	17	28	28	20	52	54	
1	34	34	19	32	17	55	50	
2	28	31	28	22	26	45	36	
3	20	20	23	38	30	50	43	
4	36	38	39	35	40	21	54	
5	41	42	36	48	44	28	58	
6	59	46	46	38	22	22	0	
7	48	58	25	20	14	9	0	
8	23	21	0	0	0	0	0	
TOTALS	472	442	358	398	353	485	518	432

Source: Hall County Traffic Engineering Division

Appendix

Table C-4. (cont.)

Wauka Mountain Compactor
Site

Date: 8/11/2003

Interval Begin	Mon 8/11	Tue 8/12	Wed 8/13	Thu 8/14	Fri 8/15	Sat 8/16	Sun 8/17	Week Avg.
6AM	7	5	2	8	3	4	0	
7	40	42	34	19	20	19	6	
8	52	22	20	42	26	40	16	
9	37	36	27	34	44	58	30	
10	30	30	26	31	28	67	30	
11	38	23	30	31	27	52	34	
12PM	25	24	24	14	21	52	34	
1	30	18	30	28	24	54	38	
2	28	24	27	22	24	31	38	
3	18	18	26	14	25	48	31	
4	17	29	20	26	32	41	42	
5	41	29	29	28	30	34	44	
6	39	26	38	30	39	26	46	
7	36	16	25	24	23	14	0	
8	29	15	22	16	7	9	0	
TOTALS	467	357	380	367	373	549	389	412

Source: Hall County Traffic Engineering Division

Appendix

Table C-5.-- High and Low Weekly Traffic Count Comparisons at Hall County Compactor Sites 1991 to 2003

		1991	2003
Allen Creek	Low	N/A	53
	High	N/A	116
	Ave.	N/A	84.5
Balus Creek	Low	566	251
	Ave.	1174	747
	High	870	499
Blackshear	Low	761	255
	High	1322	873
	Ave.	1041.5	564
Candler	Low	121	293
	Ave.	233	397
	High	177	345
East Crescent	Low	468	395
	High	998	660
	Ave.	733	527.5
Flowery Br.	Low	N/A	172
	Ave.	N/A	440
	High	N/A	306
Gaines Ferry	Low	394	391
	High	570	533
	Ave.	482	462
Gould	Low	N/A	318
	Ave.	N/A	458
	High	N/A	388
Lula	Low	120	182
	Ave.	256	255
	High	188	218.5
Murrayville	Low	377	363
	High	647	563
	Ave.	512	463

Appendix

Table C-5. (Cont.)

		1991	2003
Sardis	Low	729	910
	Ave.	1107	1277
	High	918	1093.5
Tadmire	Low	315	353
	High	475	518
	Ave.	395	435.5
Wauka Mtn.	Low	315	357
	Ave.	707	549
	High	511	453
TOTALS High/Low		11655	11679

Source: Hall County Traffic Engineering Division

TABLE C-6 GEORGIA COMMUNITIES WITH PAY AS YOU THROW

Community	Type	Fees	Recycling	Other Comments/Results
Athens-Clarke Co. Pop: 47,500	Subscription	1 20-g: \$13/mo. 1 32-g: \$14/mo. Increases up to 5 32-g: \$43/mo.	Free curbside	Residents can change level (free) once each year then pay \$10 to change. Can purchase stickers for \$2 each to pay for extra bags. Bulky items are charged for based upon actual cost of service. All franchised haulers must offer volume-based rates. Spends approximately \$270,000 on education programs. Fees cover costs of collection, disposal, and recycling.
Austell Pop: 6,000	Bag	1 20-g: \$1.50 1 32-g: \$2.75	Curbside, \$2.54 charge on water bill	Fees cover cost of collection and disposal.
Coweta County Pop: 98,797	Bag	1 32-g: \$1.50 1 16-g: \$.75	Free drop-off at most convenience centers	Senior citizen discount (ten cent bags with proof of max. income level) Fees almost cover all solid waste management costs (this is the County's goal) Bags are sold at grocery stores, all fire stations and convenience stores.
Decatur Pop: 18,000	Bag	33-g: \$1.00 15-g: \$.50 8-g: \$.30	Curbside (included in sanitation fee)	Spent \$12,000 on initial public outreach and education, used public hearings, neighborhood meetings, sanitation worker input to help design program. Recycling increased from 80 to 150 tons in first month of PAYT program. Program is very effective.
Douglasville Pop: 20,065	Bag plus Base Rate	40-g: \$6 / 5 pack 20-g: \$7 / 10 pack Plus base fee of \$8 per month	Free curbside	Fees cover costs of collection, disposal, and recycling. PAYT plus recycling and yard waste mulching (limbs must be 6: x 5') allows the city to reduce solid waste by 38.8%. \$14 charge for white goods pickup, \$25 for a special bulky item pickup.
Duluth Pop: 23,000	Bag	Twenty 32-g: \$22.23	Free curbside	Senior citizens discount. Collection by private hauler. Fees do not necessarily cover the cost of the program. Significant decrease in the volume of solid waste being landfilled.
Forsyth County Pop: 110,296	Bag	\$.25 per bag, up to 50-gallon	Free, but there are only two recycling centers.	Residents can throw unlimited bagged waste ONLY at recycling centers. County has 17 known waste haulers; 7 of which offer recycling services.
Gordon County Pop: 44,104	Weight (convenience center)	5 cents per pound	Free at convenience centers	
Hart County Pop: 20,430	Bag (convenience center)	32-g: \$1.00 16-g: \$.50	Free at convenience centers	Fees do not fully cover solid waste management costs, but program has been well received.

Lincoln County Pop: 7,442	Bag (convenience center)	\$1.25 for any size, free if resident brings recyclables	Free at convenience center for ONP and OCC	Residents resisted change. As a result, County has seen an increase in illegal dumping and burning. Fees do not fully cover solid waste management costs.
Marietta Pop: 61,308	Subscription Cans 1-20 gal 1-32 gal 2-32 gal 3-32 gal	\$18.50/mo. \$20.75/mo. \$25.75/mo. \$31.50/mo.	Free curbside	Resident supplies cans for service level requested, the City supplies stickers for each can to verify service level per customer. No appreciable increase in illegal dumping. Fees do not fully cover solid waste management costs. Yard waste (curb side only) is free up to 200 cubic feet, bulk rate charges apply thereafter. 25% reduction in solid waste since program began. Overflow bags cost \$5 for the first 2 to 10 bags and \$5 for additional 1 to 10 bags thereafter. Newspapers are picked up for recycling by the City of Marietta. Additional charges apply for bulk items.
Oconee County Pop: 25,666	Bag (convenience centers)	32-g: \$1.50 20-g: \$1.00	Free at convenience centers	The amount of solid waste had declined, resulting in tipping fees paid by county decreasing from \$18,000 to \$6,000 per year. Bags also available at local grocery stores. Reduced dumping, county sells the bags.
Oglethorpe County Pop: 12,635	Bag (convenience centers)	30-g: \$.75 15-g: \$.25	Free at convenience centers	Items being recycled are free. The fees charged do not cover the solid waste removal cost but it helps fund the recycling program for the county. There is a \$15 charge per refrigerator.
Pickens County Pop: 14,432	Bag (convenience center) Weight (landfill)	33-g: \$1.00	Two Recycling Centers	Collection is by private hauler.
Sugar Hill Pop: 12,800	Bag Roll-a-Way can	30-g: \$1.13 each 90-g: \$10.90 per month	Free Curbside	
Snellville Pop: 17,000	Subscription	Twenty 32-gal. bags, \$25/box		Yard debris bags \$2 each.
Thomasville Pop: 18,500	Subscription	32. Gal. \$8/mo. 96 Gal. \$8.50/mo. Additional can, \$5/mo.	Free drop-off	Flat fee of \$7.50/month for yard trimmings collection. Fees cover costs of collection, disposal and recycling.
Tifton Pop: 14,215	Subscription	\$14.50/mo. per can	Free drop-off	Fees do not fully cover solid waste management costs.
West Point Pop: 3,182	Subscription	45-g: \$8/mo. Additional cans: \$4/mo. Each	Free drop-off	Additional bag for \$2 each, 3 cans max. per household. Yard trimmings free; up to 5 cubic yards. Fee do not fully cover solid waste management costs.

Source: Georgia Department of Community Affairs

Table C-7 Haulers Operating in Hall County

Business Name	Owner Name	Address	City	State	Zip	Telephone
BROWNING FERRIS INDUSTRIES	BROWNING FERRIS INDUSTRIES	1581 FULLENWIDER RD	GAINESVILLE	GA	30507	(770) 297-6535
J & R SERVICES	OSBORNE, JAMES L	3613 OSBORNE RD	FLOWERY BRANCH	GA	30542	(770) 532-4831
RED OAKS SANITATION, INC	LUCE, LYNN	P O BOX 1777	GAINESVILLE	GA	30503	(678) 455-7819
ADVANCED DISPOSAL SERVICES	ANN HUDMAN	1009 INDUSTRIAL COURT, SUITE 1	SUWANEE	GA	30024	(770) 831-6420
H. T. WASTE REMOVAL	DOUG TURK	P. O. BOX 232	GILLSVILLE	GA	30543	(770) 869-9030
MEADERS GRADING	PHIL MEADERS	5444 CLARKS BRIDGE ROAD	GAINESVILLE	GA	30506	(770) 983-1200
NIX SEPTIC TANK COMPANY	DARRELL WEBB	5504 SADDLE CLUB ROAD	GAINESVILLE	GA	30506	(770) 532-8207
UNITED WASTE SERVICE	JAYNE MILLS	P. O. BOX 1108	AUBURN	GA	30011	(770) 867-4367
WASTE MGT. OF ATLANTA	CINDY KINSMON	7744 MCFARLAND ROAD	ALPHARETTA	GA	30004	(770) 772-4443

Appendix

APPENDIX D

DISPOSAL

Disposal Capacity Assurance Letter



ENGINEERING DEPARTMENT HALL COUNTY, GEORGIA

JAMES H. MILLER, P.E.
County Engineer

POST OFFICE DRAWER 1435
GAINESVILLE, GEORGIA 30503
Phone: 770/531-6800
Fax: 770/531-3945

June 17, 2004

Mr. Rick Foote
Hall County
Natural Resource Coordinator
P. O. Drawer 1435
Gainesville, GA 30503

RE: Candler Road Municipal Solid Waste Landfill
EPD Permit No. 069-015D(MSWL)
Disposal Capacity Assurance

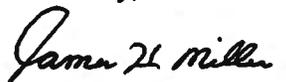
Dear Mr. Foote:

As per your request, we have prepared waste projections and associated capacities for years 2004 – 2013. These calculations reflect an estimated disposal of 272,589 tons in 2004, increasing to a projected figure of 389,397 tons in 2013. The numbers represent an amount of waste that would be equal to the entire waste stream of Hall County and the cities of Clermont, Gainesville, Gillsville, Flowery Branch, Lula, and Oakwood.

Based on these amounts, the Candler Road Landfill will have adequate capacity through the year 2013. Please see attached projection calculations.

However, as you are well aware, these calculations are based on waste disposal rates that are much higher (five times higher) than what we actually receive. Projections based on actual tonnage rates indicate that the landfill will have adequate capacity until the year 2035, as is shown in the original engineering studies.

Sincerely,


James H. Miller, P.E.
County Engineer

JHM/KJM/dpg

Attachment

APPENDIX E

EDUCATION AND PUBLIC INVOLVEMENT

PUBLIC INFORMATION EMERGENCY SUPPORT FUNCTION (ESF) - 17

I. INTRODUCTION

The emergency support function of public information involves direction and coordination, operations, and follow through during an emergency or disaster.

II. PURPOSE

The purpose is to provide public information through pre-planning, collecting, and disseminating facts and updates about a potential or actual emergency or disaster to the public.

III. CONCEPT OF OPERATIONS

Standard Operating Procedures (SOPs) will be developed and maintained by the agency or organization that has primary functional responsibility for this ESF, in cooperation with the EMA. This function will be coordinated with and involve other support agencies and organizations.

The public information services function is the primary responsibility of the Hall County Emergency Management Agency and secondary support for this function is the responsibility of the Hall County Board of Commissioners and includes, but is not limited to, the following:

A. Mitigation/Preparedness

- Assist agencies and organizations with ESF responsibilities in development of uniform procedures for media releases (*refer to Appendix J-1, Public Information Procedures*);
- Maintain a media directory (*refer to Appendix J-2, Media Contact and Resource List*);
- Support disaster public awareness initiatives through dissemination of information, news articles, PSAs, and presentation of audio-visual materials;
- Establish communication resources to provide people with sensory disabilities (e.g., visual and hearing impaired) and non-English speaking persons with emergency management information regarding emergencies or disasters;

Appendix

ESF -17 (cont.)

- Educate the public on alert messages such as watches and warnings through media such as radio, television, and newspaper;
- Inform the news media that the Hall County Emergency Agency is the point of contact for emergency public information (EPI);
- Coordinate agreements for the dissemination of EPI; and
- Participate in drills and exercises to evaluate public information capability.

B. Response/Recovery

- Define public notification timeframe regarding an emergency or disaster and disseminate information to the media;
- Maintain a system to ensure accurate dissemination of emergency information such as location, type of hazard, extent of damage, casualties, shelters open, evacuation routes, and other protective actions;
- Provide a designated area for media briefings and/or press conferences and conduct briefings in a timely manner;
- Provide updates (*e.g., response to inquiries about missing relatives, restricted areas of access and re-entry*) regarding the emergency or disaster;
- Continue provision of public safety and other necessary assistance information throughout the recovery phase;
- Provide advanced media releases to the GEMA-SOC:
- Work with areas and counties surrounding the county which have no emergency public information capability;
- Maintain records of expenditures and document resources utilized during recovery.

IV RESPONSIBILITY

- A. The Hall County Emergency Management Director, under the direction of the local governing officials, is responsible for the overall Emergency Management Public Information effort in Hall County.
- B. The Hall County Public Information Officer, under the direction of the EMA Director, will carry out the Emergency Public Information Program.

Appendix

ESF -17 (cont.)

C. The Hall County Public Information Officer will supplement the information staff by utilizing the following supporting departments/agencies:

- Department/agencies designee
- Selected personnel from all local news media within Hall County

V DIRECTION AND CONTROL

A. Operational direction and control of the Hall County Emergency Public Information function will be carried out by the EMA Director through the Public Information Officer.

B. Pertinent information may also be released by the governing officials as the situation dictates.

**Source: "Hall County Emergency Management Agency Emergency Operations Plan",
June 2002.**

**VOLUNTEER SERVICES
EMERGENCY SUPPORT FUNCTION (ESF) - 18**

I. INTRODUCTION

This ESF outlines the concept of operations, responsibility, direction and control necessary for the performance of volunteer services during an emergency.

II. PURPOSE

The purpose of this ESF is to outline policies and procedures for the coordination of governmental, private and volunteer organizations and individuals that provide and deliver the broad array of volunteer services required by the victims of disaster.

III. CONCEPT OF OPERATIONS

Standard Operating Procedures (SOPs) will be developed and maintained by the agency or organization that has primary functional responsibility for this ESF, in cooperation with the EMA. This function will be coordinated with and involve other support agencies and organizations.

The volunteer services function is the primary responsibility of the Hall County Emergency Management Agency and secondary support is the responsibility of the Hall County Chapter of the Red Cross and includes, but is not limited to, the following:

A. Mitigation and Preparedness

1. Maintain a list of volunteers and private relief organizations, local business and individuals available to support volunteer services during an emergency;
2. Execute, as necessary, MOU's between local government and supporting organizations;
3. Develop procedures for augmenting emergency response forces;
4. Identify population groups requiring special attention in disaster situations and develop procedures to ensure that the appropriate care is provided; and
5. Use training offered by the Georgia Emergency Management Agency and private relief organizations to train emergency management personnel and supporting organizations.

Appendix

ESF – 18 (cont.)

B. Response/Recovery

1. **Notify relief and volunteer organizations when an emergency or disaster is threatening or underway. Describe the nature of the emergency and the anticipated response requirements. Request assistance, or standby alert, as appropriate;**
2. **Coordinate the delivery of volunteer services to the victims and keep the Emergency Operations Center (EOC) informed of participants and activities;**
3. **Ensure that the physical and emotional needs of the emergency workers are met particularly during extended operations;**
4. **Maintain accurate records of expenditures related to the delivery of volunteer services during emergency operations;**
5. **Assess continuing volunteer services needs for the disaster victims;**
6. **Provide staff support to disaster application centers if requested;**
7. **Evaluate human services operations for effectiveness and revise plans and SOPs to eliminate deficiencies; and**
8. **Give recognition for services rendered by private relief organizations, volunteer groups and individuals through Public Information Center.**

I. DIRECTION AND CONTROL

- A. **The Hall County Chapter of the Red Cross is responsible for Direction and Control of the Volunteer Services coordination with cooperation through the Hall County Emergency Management Agency;**
- B. **Supporting departments/agencies include but are not limited to the Health Department, DFACS, and the County Administrator.**
- C. **This ESF will be implemented upon the direction of the County/City Chief Executive(s) or the Emergency Management Director acting in their behalf.**

Source: "Hall County Emergency Management Agency Emergency Operations Plan",
June 2002.

TABLE E-1 HALL COUNTY SOLID WASTE MANAGEMENT PUBLIC INFORMATION PLAN

<u>Media</u>	<u>Message/Audience</u>	<u>Style</u>	<u>Length</u>	<u>Frequency</u>	<u>Cost</u>
1. Newspaper	Source Reduction, Recycling, Composting, Environmental Care, Special Events, etc.	UPI/AP	Varied: Articles Ads, "Spots" in Paper	Continuous	Free; Occasionally purchase paid ads makes the newspaper owners and managers more inclined to grant free space
2. Radio	Source Reduction, Recycling, Composting, etc. (see above)	A. Broadcast Format: PSAs B. Talk Shows	A. 30 sec., 60 sec. B. 30 minutes	Continuous	Occasionally purchase ads.; otherwise, public service time
3. Speakers' Bureau (use props and/or AV	All the recommended alternatives to landfilling. Speak to all groups that will schedule such as: Civic Clubs, Schools, Garden Clubs, Business Meetings, etc.	Condensed message, age appropriate	Prepared talks of 10 to 20 minutes Students: 15 to 30 minutes	Continuous	Materials Only
4. Chamber, Company & Association newsletters	Source Reduction, Efficiency Improvement, Recycling,	UPI/AP	Brief; to the point	Continuous	Free service by community groups & businesses
5. Church bulletins	Same as above; also can use to announce special events	UPI/AP	Brief; only main message	Periodic	None
6. Magazines	Can be more lengthy than newspapers. Can tell more complete story--Jackson EMC & other periodicals	Expanded AP; Short paragraphs w/ pictures	Determined by magazine.	Periodic	None
7. Brochures Flyers	Brochures need to be stylish and provide a straightforward message that explains the importance of the message and provide ways to get additional information. Flyers need to be very specific, e.g., special events	AP with a stylish twist to capture the reader's interest	Brochure: not more than legal size sheet Flyer: one page	Continuous	Layout, printing, graphics

TABLE E-1 HALL COUNTY SOLID WASTE MANAGEMENT PUBLIC INFORMATION PLAN

<u>Media</u>	<u>Message/Audience</u>	<u>Style</u>	<u>Length</u>	<u>Frequency</u>	<u>Cost</u>
8. Direct Mail	Property owners or persons paying utility bills	AP (if flyer); English letter composition (if letter)	One page maximum	Occasional	Printing, processing and postage
9. Outdoor Advertising (billboards and marquees donated by businesses)	Brief. Slogan and picture (billboards) illustrating basic information to relay in a few words	UPI	Very brief	Occasional	Graphics & printing for billboards. No cost for marquees
10. Posters and Signs	Special events	UPI	Very brief	As needed	Graphics and printing
11. Special Events	A media event gets a lot of publicity for your project. Hold the event for citizens interested. Recruit if necessary.	AP/UPI	Discretionary	Occasional	Printing, supplies, food, etc.
12. Television	Cable TV viewers; Short to long in length	Broadcast	Stills, PSA's, 30 & 60 sec. spots, news segments, talk shows	Continuous; as requested	TV 18 = free; other cable channels = Fees for ads.
13. Exhibits	Topical to general	Booth, Presentation format	N/A	Whenever feasible	Booth space fees
14. Internet	Internet users	web site	N/A	Constant	Site hosting, domain registration, site maintenance
15. Movie theaters	Movie-goers (shown before movie)	still, graphic-based w/text	Very brief	Occasional	Ad costs

Appendix

APPENDIX F

ADOPTION RESOLUTIONS

STATE OF GEORGIA
HALL COUNTY

RESOLUTION

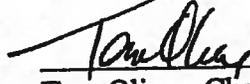
WHEREAS, Hall County in conjunction with the cities of Clermont, Flowery Branch, Gainesville, Gillsville, Lula and Oakwood, has developed a Solid Waste Management Plan as required by the Solid Waste Management Act; and

WHEREAS, this plan has been reviewed and approved by the Georgia Mountains Regional Development Center and State of Georgia for compliance with the Minimum Planning Standards and Procedures for Solid Waste Management;

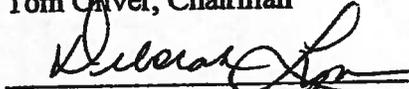
NOW THEREFORE BE IT RESOLVED that the Hall County Board of Commissioners hereby officially adopts the SOLID WASTE MANAGEMENT PLAN for Hall County and the Cities of Clermont, Flowery Branch, Gainesville, Gillsville, Lula and Oakwood dated 2004, prepared by the Hall County Resource Recovery Division, Hall County Public Works and Utilities.

Adopted, this the 13th day of January, 2005.

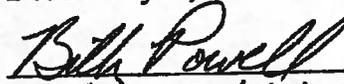
HALL COUNTY BOARD OF COMMISSIONERS



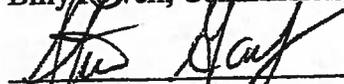
Tom Oliver, Chairman



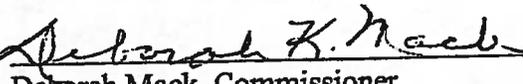
Deborah Lynn, Commissioner



Billy Powell, Commissioner



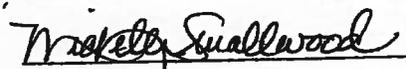
Steve Gailey, Commissioner



Deborah Mack, Commissioner



ATTEST:



Commission Clerk

HALL COUNTY
CITY OF Clermont

RESOLUTION

WHEREAS, the City of Clermont in conjunction with Hall County has developed a Solid Waste Management Plan as required by the Solid Waste Management Act; and

WHEREAS, this plan has been reviewed and approved by the Georgia Mountains Regional Development Center and State of Georgia for compliance with the Minimum Planning Standards and Procedures for Solid Waste Management;

NOW THEREFORE BE IT RESOLVED that the City Council of Clermont, Georgia hereby officially adopts the SOLID WASTE MANAGEMENT PLAN for Hall County and the Cities of Clermont, Flowery Branch, Gainesville, Gillsville, Lula and Oakwood dated 2004, prepared by the Hall County Resource Recovery Division, Hall County Public Works and Utilities.

Adopted, this the 1 day of February, 2004.

John W. Brady

Mayor

Paul Weaver

Council Member

Robert Allison

Council Member

William T. Jones

Council Member

Council Member

ATTEST:

Lanana Helton

Clerk

HALL COUNTY
CITY OF FLOWERY BRANCH

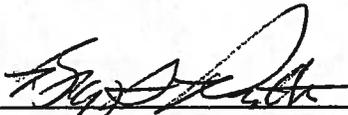
RESOLUTION 04-062

WHEREAS, the City of Flowery Branch in conjunction with Hall County has developed a Solid Waste Management Plan as required by the Solid Waste Management Act; and

WHEREAS, this plan has been reviewed and approved by the Georgia Mountains Regional Development Center and State of Georgia for compliance with the Minimum Planning Standards and Procedures for Solid Waste Management;

NOW THEREFORE, BE IT RESOLVED that the City Council of Flowery Branch hereby officially adopts the SOLID WASTE MANAGEMENT PLAN for Hall County and the Cities of Clermont, Flowery Branch, Gainesville, Gillsville, Lula and Oakwood dated 2004, prepared by the Hall County Resource Recovery Division, Hall County Public Works and Utilities.

Adopted this 9th day of December, 2004.



Bryan G. Puckette, Mayor

ATTEST:



Judy L. Foster, City Clerk

**RESOLUTION
BR-2004-69**

JOINT SOLID WASTE MANAGEMENT PLAN

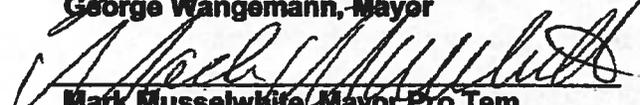
WHEREAS, the City of Gainesville, in conjunction with Hall County, has developed a Solid Waste Management Plan as required by the Solid Waste Management Act; and

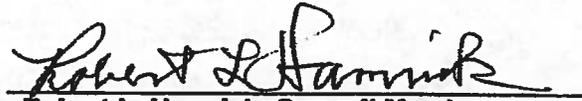
WHEREAS, this plan has been reviewed and approved by the Georgia Mountains Regional Development Center and State of Georgia for compliance with the Minimum Planning Standards and Procedures for Solid Waste Management.

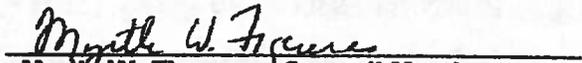
NOW THEREFORE BE IT RESOLVED that the City Council of Gainesville, Georgia hereby officially adopts the **SOLID WASTE MANAGEMENT PLAN** for Hall County and the cities of Clermont, Flowery Branch, Gainesville, Gillsville, Lula and Oakwood dated 2004, prepared by the Hall County Resource Recovery Division, Hall County Public Works and Utilities.

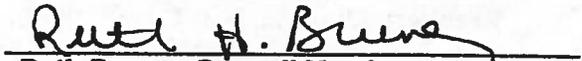
Adopted this 21st day of December, 2004.


George Wangemann, Mayor

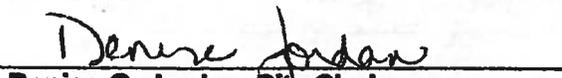

Mark Musselwhite, Mayor Pro Tem


Robert L. Hamrick, Council Member


Myrtle W. Figueras, Council Member


Ruth Bruner, Council Member

ATTEST:


Denise O. Jordan, City Clerk

STATE OF GEORGIA
HALL COUNTY
CITY OF GILLSVILLE

RESOLUTION

WHEREAS, the City of GILLSVILLE in conjunction with Hall County has developed a Solid Waste Management Plan as required by the Solid Waste Management Act; and

WHEREAS, this plan has been reviewed and approved by the Georgia Mountains Regional Development Center and State of Georgia for compliance with the Minimum Planning Standards and Procedures for Solid Waste Management;

NOW THEREFORE BE IT RESOLVED that the City Council of _____
GILLSVILLE hereby officially adopts the SOLID WASTE MANAGEMENT PLAN for Hall County and the Cities of Clermont, Flowery Branch, Gainesville, Gillsville, Lula and Oakwood dated 2004, prepared by the Hall County Resource Recovery Division, Hall County Public Works and Utilities.

Adopted, this the 7TH day of DECEMBER, 2004.

Harry Pool

Mayor

J. Todd Dale

Council Member

Jim House

Council Member

Ronald A. Ferguson

Council Member

Mark Lewis

Council Member

Ronald J. Whiting

ATTEST:

BY: Paula Whiting
CLERK

CITY OF LULA

RESOLUTION

WHEREAS, the City of Lula in conjunction with Hall County has developed a Solid Waste Management Plan as required by the Solid Waste Management Act; and

WHEREAS, this plan has been reviewed and approved by the Georgia Mountains Regional Development Center and State of Georgia for compliance with the Minimum Planning Standards and Procedures for Solid Waste Management;

NOW THEREFORE BE IT RESOLVED that the City Council of Lula, Georgia hereby officially adopts the SOLID WASTE MANAGEMENT PLAN for Hall County and the Cities of Clermont, Flowery Branch, Gainesville, Gillsville, Lula and Oakwood dated 2004, prepared by the Hall County Resource

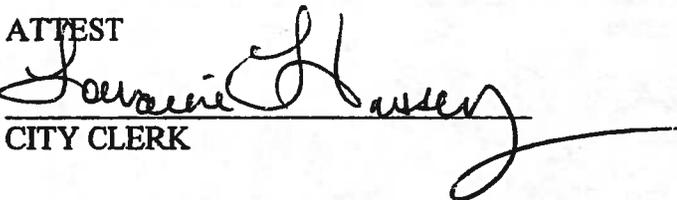
Recovery Division, Hall County Public Works and Utilities.

Adopted, this the 20th. day of December, 2004.



Mayor Milton Turner

ATTEST



CITY CLERK

WHEREAS, the City of Oakwood in conjunction with Hall County has developed a Solid Waste Management Plan as required by the Solid Waste Management Act; and

WHEREAS, this plan has been reviewed and approved by the Georgia Mountains Regional Development Center and State of Georgia for compliance with the Minimum Planning Standards and Procedures for Solid Waste Management;

NOW THEREFORE BE IT RESOLVED that the City Council of the City of Oakwood hereby officially adopts the SOLID WASTE MANAGEMENT PLAN for Hall County and the Cities of Clermont, Flowery Branch, Gainesville, Gillsville, Lula and Oakwood dated December 13 2004, prepared by the Hall County Resource Recovery Division, Hall County Public Works and Utilities.

Adopted, this the 13th day of December, 2004.

H Lamar Snodgrass
Mayor

Samuel B. Eno
Council Member

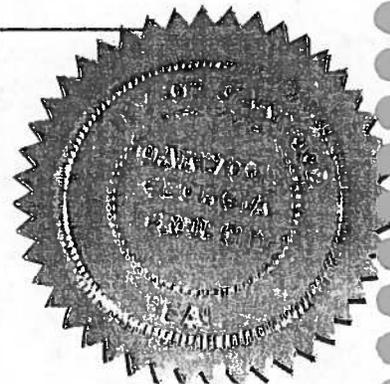
Martha Collins
Council Member

Maurice Robinson 32
Council Member

Ken McFarland
Council Member

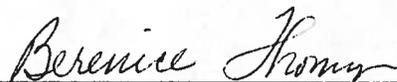
Tom Adam
Council Member

ATTEST:
Christy C. Davidson
Christy C. Davidson
Interim City Clerk



Certification

I hereby certify that I am an officer of the public entity shown below and that I hold the title indicated. The 134 pages attached hereto are true, correct, and accurate copies of the original and current adopted Solid Waste Management Plan for Hall County as documented and maintained in my office.



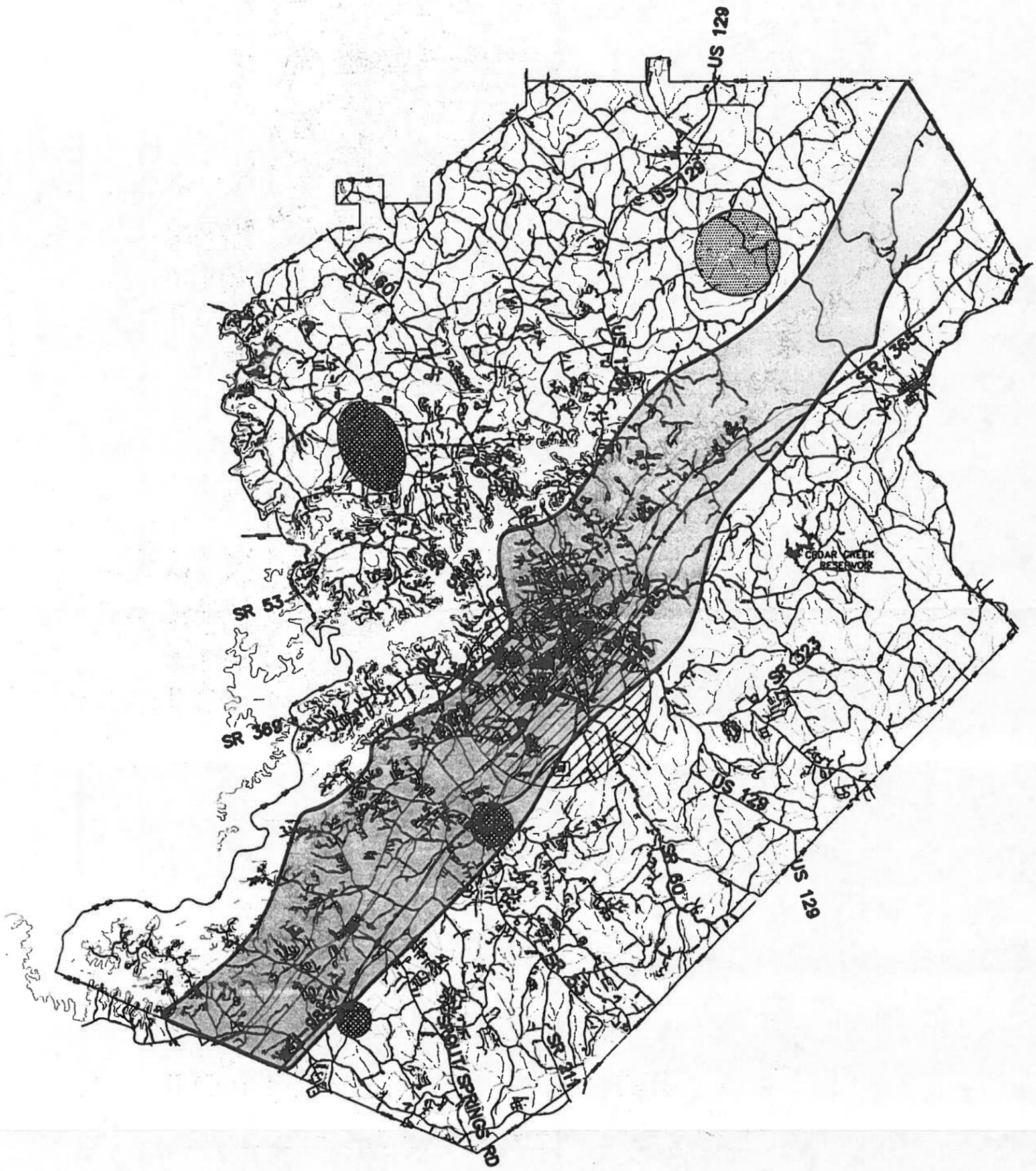
Berenice Thomas, Secretary 2
Office of Environmental Management
Georgia Department of Community Affairs

Sworn to and subscribed
Before me this 19th day
of February, 2008.



Notary Public

JO M. PONCE
Notary Public, Cobb County, Georgia
My Commission Expires Feb. 17, 2012



LandFill Site Limitations Hall County, Georgia

- Brevard Fault
- Airport Restricted Area
- Flood Plains/Streams
- Future Reservoir Areas
- Groundwater Recharge Areas



Drawn by: K. Forrester
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Sheet 1 of 1
N.T.S.

