

**Roane
Solid Waste
Needs Assessment
2011**

Item # 1 Demographic Information

The following table and charts illustrate the population trends of the region, which includes respective municipalities, total municipal residents and county only residents. The 2010 and 2015 projects are based on existing trends for each jurisdiction as well as knowledge of the area.

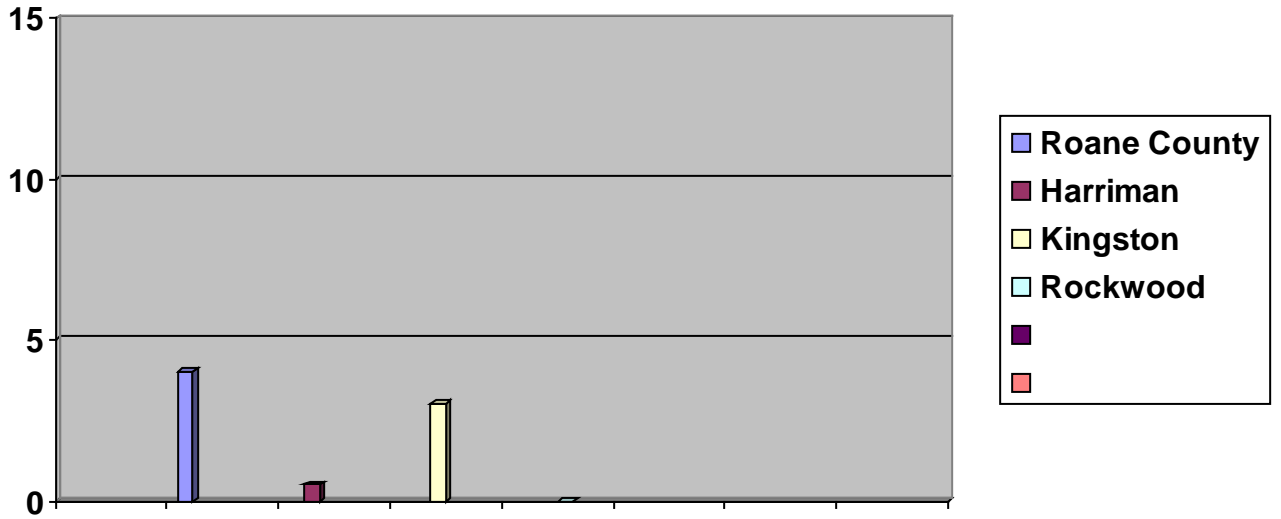
The county as a whole is expected to continue to increase in population between 2000 and 2015. Roane County has seen an average growth compared to the rest of the East Tennessee Region. Part of their growth pattern has a lot to do with the Oak Ridge National Lab and Y-12. New residential influx is directly influenced by these entities. Roane County will continue to see modest growth during the next needs assessment time period that should keep the solid waste issues manageable in the future.

Experts at U.T. are showing that the County will not maintain the growth that is forecasted for the State in the next five-year solid waste needs assessment period. The entities of the region will see the following growth. Harriman will continue to see growth and should get back to the 1990 levels in population. Most of this is due to increase in city boundaries. The City of Kingston will continue to see growth with the continued development of their waterfront properties. Their growth will be more residential rather than industrial. The City of Rockwood will also see modest growth in the future and their growth can be largely tied to the industries in the area that tend to be located more along the Rockwood and Harriman Corridor. The region of Roudon County is not going to see large increase in population in the future unless economic amenities are apparent, such as a new industrial plant that will affect population spurts. Such growth will be shown in the single family dwellings. The rate of growth will vary depending on a host of local, regional, and national trends, as well as the employment of management tools that can affect this rate. These trends will impact countywide land use, housing, transportation and solid waste decisions. Based on past history, Roane County should not see any large increases that would affect their waste stream to the extent of making it un-manageable.

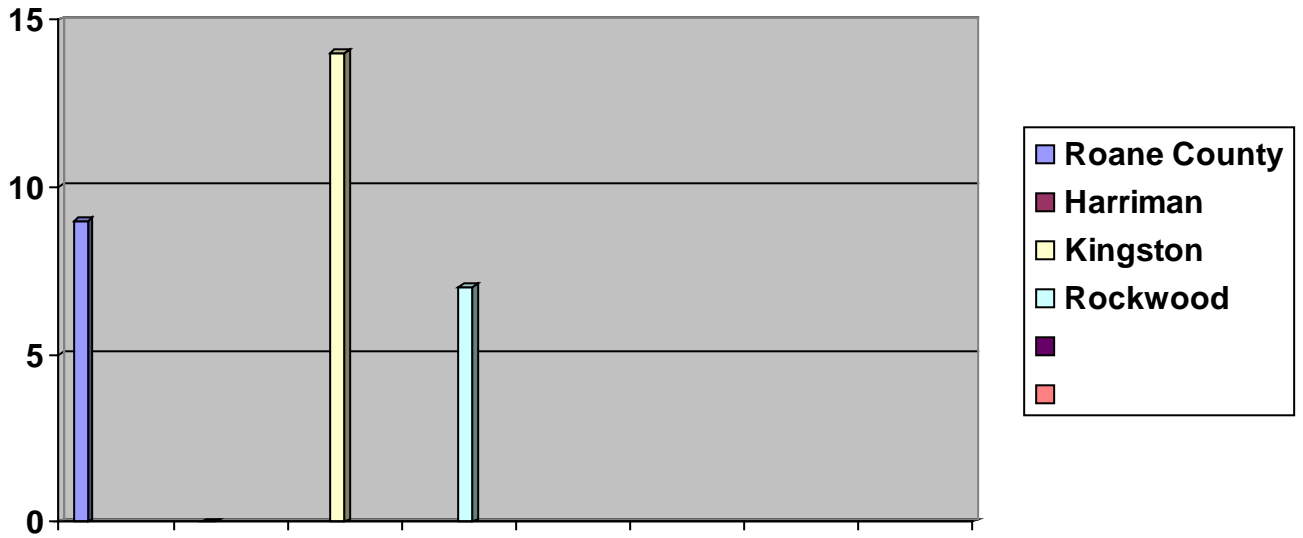
Jurisdiction	1990	2000/% change	2010 / %	2020 / %
Roane County	47,227	51,910/9%	54,181 / 4%	56,776 / 5%
Harriman	7,119	6,743/-5%	6,773 / .5%	7,212 / 6%
Kingston	4,552	5,264 / 14%	5,424 / 3%	5,727/ 5%
Rockwood	5,348	5,774 / 7%	5,460/ -5%	5,751 / 5%

Roane County and Cities

Population Growth Percentage: 2000 - 2010



Population Growth: 1990-2000



Population Growth: 2000 - 2010



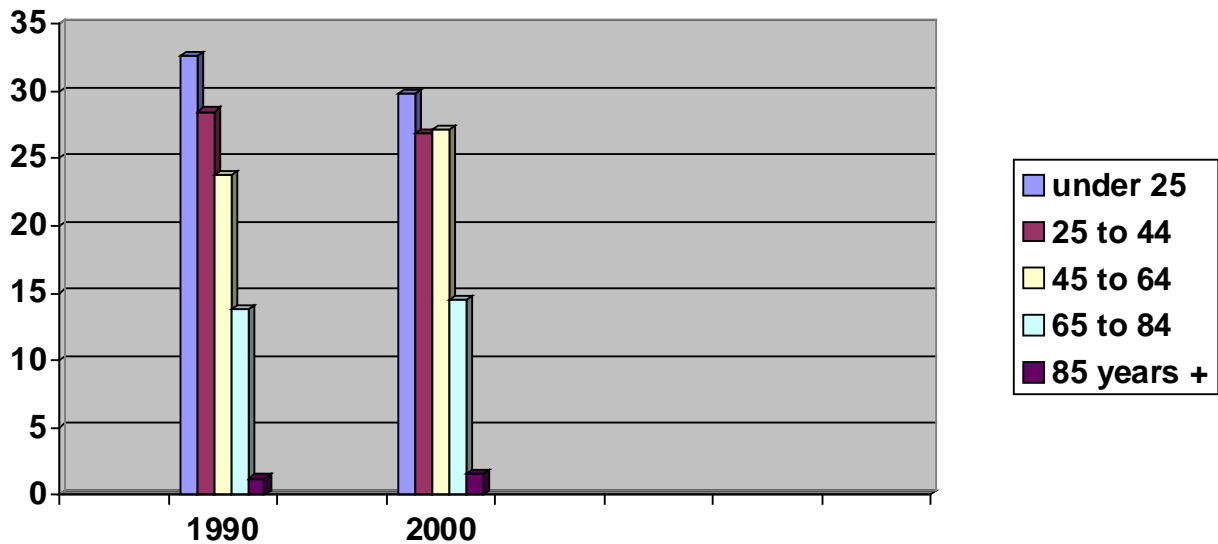
Item 2 Region Economies

The following table and charts show the per capita incomes for the county and each municipality in 1989 and 1999 and estimates for 2010 and 2015. The existing trends are expected to continue for each municipality and the county, though increases will likely be smaller in the future for most municipalities.

In looking at per capita incomes, one must realize that this purchasing power is largely affected by the in-migration of working-age people, 25 to 64 years of age. Conversely, the higher proportions of young and old people are often associated with lower rates of per capita income growth. The median age in Roane County has increased every census year from 1980, 32.1 to 1990, 37.4 and 2000, 40.7. As the region gets older, one could suggest that more recycling will be done in the future that will help to reduce the amount of waste that is going into the landfill. Also, the amount of waste per household will also go down as families get older and children move out of the home.

Ages	1990 Number of People	Percent	2000 Number of People	Percent
Under 25	15,310	32.6	15,489	29.8
25 to 44	13,371	28.5	13,938	26.9
45 to 64	11,131	23.8	14,132	27.2
65 to 84	6,476	13.8	7,519	14.5
85 years and older	579	1.2	832	1.6

Age Distribution

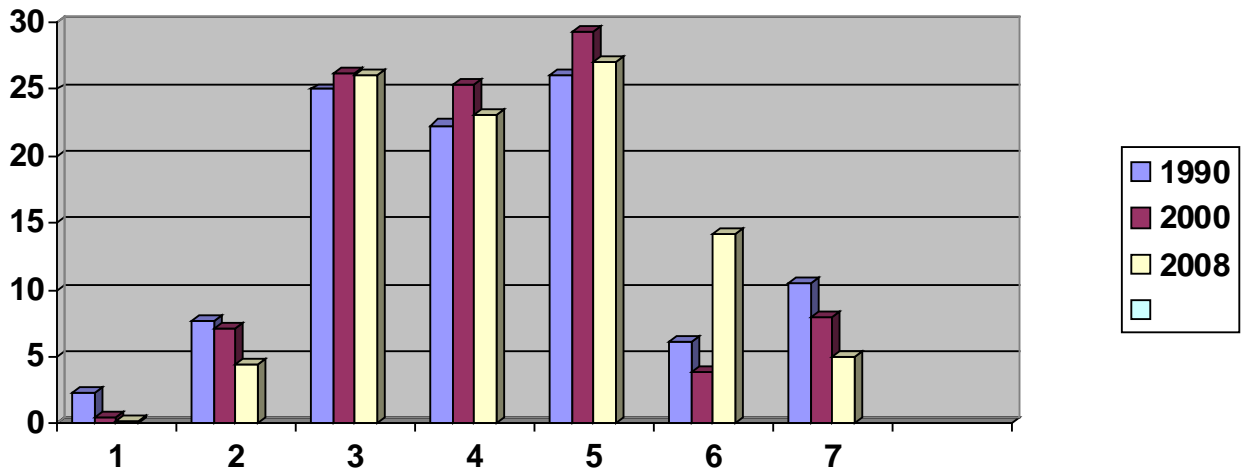


The estimates for the current per capita incomes show that most all entities have experienced an increase in the purchasing power of their residents. Most residents are likely to use this increased purchasing power to spend more monies in the future. This is likely to mean an overall increase in solid waste generated by economic growth. However, this increase in solid waste will be from the consumer industries and not large industries that have the potential to create problem waste. The region of Roane has seen its per capita increase 54% in the last twenty years. This increase is compared to the State increase of 55%. One could suggest that the County has been able to attract the higher paying jobs that the rest of the State has seen. Knowledge of the area would suggest that the region has been able to attract more industries and industrial warehouses that have brought residents into the area with higher paying jobs, than the more rural areas of the East Tennessee that attract the lower manufacture jobs.

Jurisdiction	1989	1999	2010	2015
Roane County	\$12,015	\$18,456	\$22,425	\$26,462
Harriman	\$8,785	\$14,763	\$14,722	\$14,869
Kingston	\$13,196	\$20,301	\$24,461	\$28,619
Rockwood	\$9,654	\$13,106	\$15,980	\$18,856
Tennessee	\$12,255	\$21,587	\$23,418	\$27,165

The following table takes a look at the types of businesses in Roane County that can have an effect on the amount of solid waste being generated. The table looks at the percentage of each classified work from 1990, 2000 and 2010. The Census Bureau changed their classification in 1997, so the seven (7) shown are based on a uniform categorization by the author to derive at similar numbers for comparison. As the table shows, manufacturing, professional services and retail trade continue to be the leading industries in the region. This basically results in less garbage that is produced in terms of large volume. The manufacturing jobs will generally produce a lot of cardboard, paper and glass that can be recycled. Also, the public industry and the professional industry are closely related and that generates a lot of paper and will not put any extra burden on the waste stream in the future. The downturn in the economy has also taken its toll on Roane County with jobs decreasing from 2000 to 2008 as shown by the following numbers, 20,183 (1990) to 22,773 (2000) to 18,671 (2008) for Roane County.

Industry	1990	2000	2010
1. Agriculture, Forestry, Fisheries, Mining	2.3%	.4%	.2%
2. Construction	7.7%	7.1%	4.4%
3. Manufacturing	25.0%	26.2%	26%
4. Trade and Finance	22.3%	25.3%	23.1%
5. Professional Services	26.1%	29.3%	27.1%
6. Public Administration	6.1%	3.8%	14.2%
7. Other	10.5%	7.9%	5%

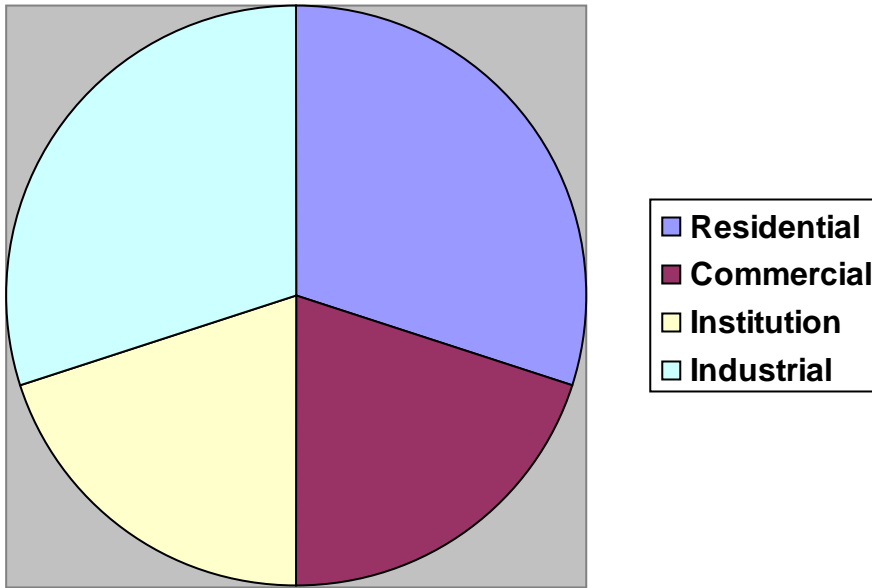


In looking at the job patterns for the region, one can see that there has been more of a shift from the labor intensive jobs to the white collar jobs in the region. Public administration jobs have seen the largest increase from 2000 to 2010. Manufacturing jobs have leveled off and those kinds of jobs are becoming more warehouse type jobs rather than the sewing operations. The numbers above show that Roane is a bedroom community that has the mobility to shop in Knoxville and Chattanooga, which reflects on the retail trade in the area. Construction numbers have come to a halt, which emulates the economy where no new houses are being built. The Region of Roane County will continue to experience its largest increase in white collar jobs with the employees having a more environmental awareness. This will shift some of the taxes being spent to more environmental programs that will create more opportunities to divert waste from Class I landfills. The next needs assessment should see a slight increase in waste from residents due to population increases and that should not adversely affect the waste stream or cause a financial burden on the region.

Item # 3 Region Waste Stream

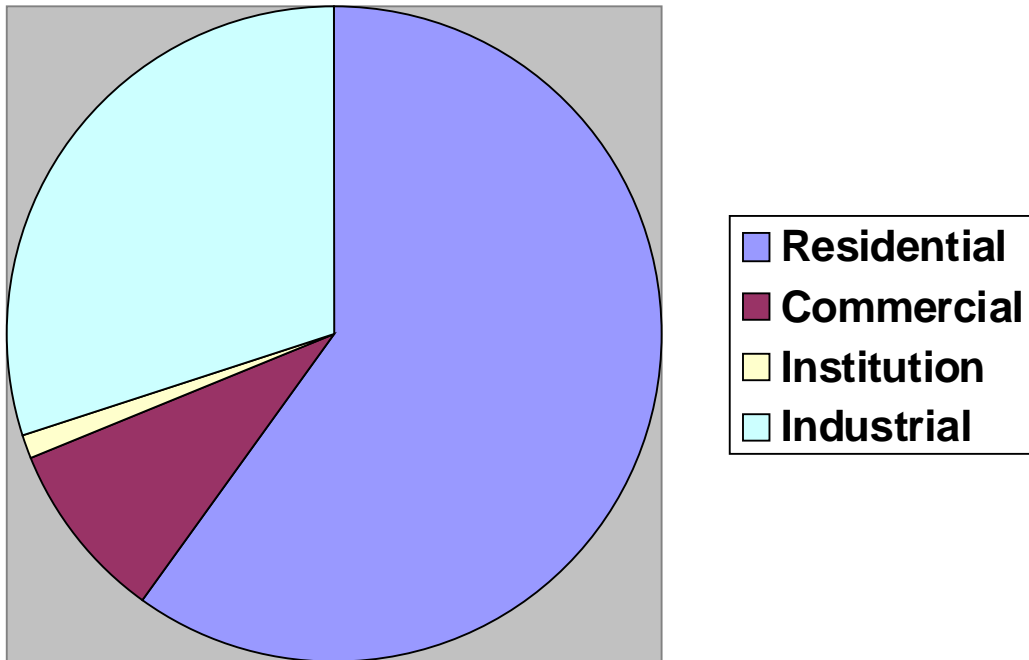
Roane County solid waste stream is shown below.

Residential 30%
Commercial 20%
Institution 20%
Industrial 30%



The waste stream during the last needs assessment looked like the following.

Residential 60%
Commercial 9%
Institution 1%
Industrial 30%



This can be further broken down into the following:

Recycling – 9,271 – 18.92%

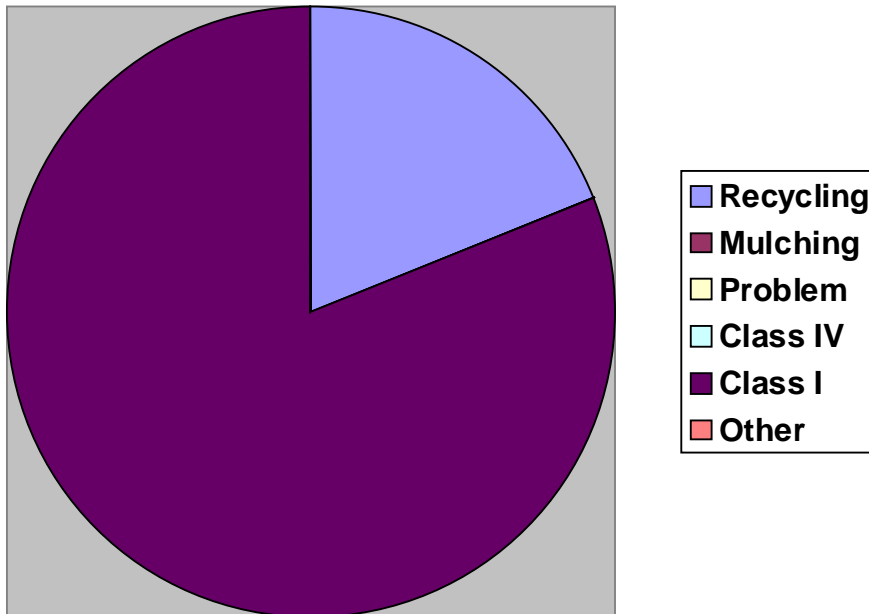
Mulching – 125 – .02%

Problem Waste – 258 – .06%

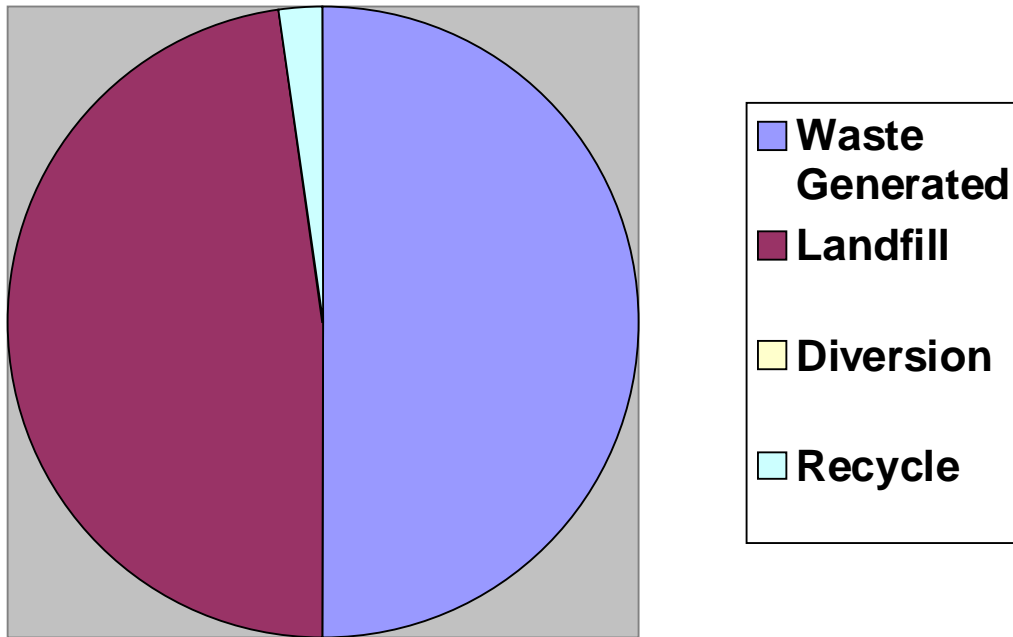
Class IV Waste – 0 – 0%

Class I Waste – 40,957 – 81%

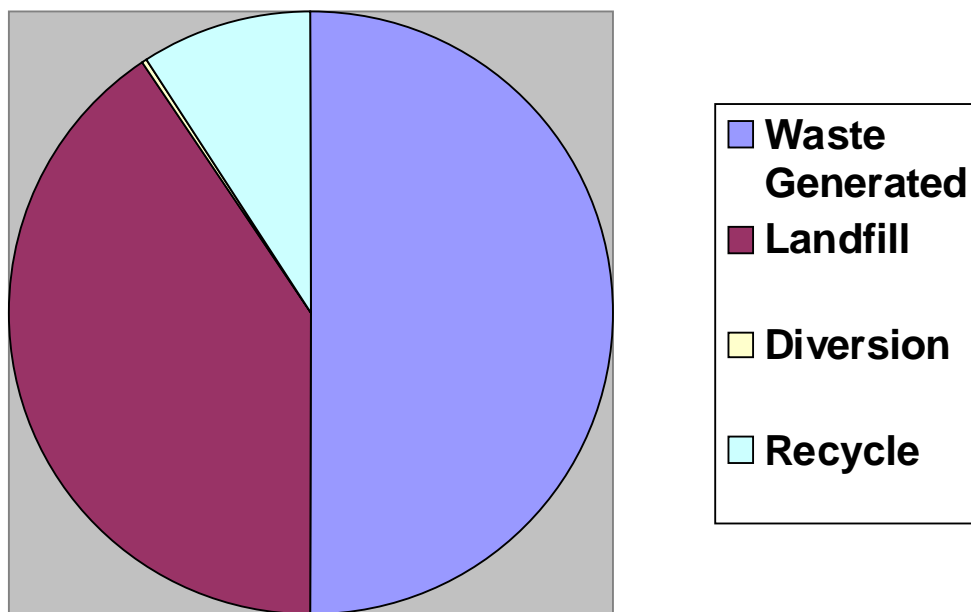
Total = 50,611 – 100%



Waste Stream 2005 Totals



Waste Stream 2010 Totals



The pie charts above show the percentage of waste that has changed from 2005 report needs assessment update to the current needs assessment. Class I Landfill waste was shown as 96% in 2005 and is now 81% of the waste. Diversion methods were shown at 0% in 2005 and are now shown as 0%, Recycling efforts shown as 4.3% in 2005 are now shown as 19%. The chart shows that the generated waste has decreased from 63,480 tons in 2005 to 50,611 tons in 2010. The main reason for this reduction is the recycling efforts that have increased and the slow population growth. The annual reports for Roane County provide one of the true reports in that industrial numbers have not been accounted for in their reports. The 1995 base year rate of .87 tons per person is compared to the 2010 report that shows a tonnage per person of .76 tons per person. This shows that the region has continued to provide alternative recycling opportunities from the traditional cardboard and paper recycling. The region has expanded their recycling to include plastic and electronic goods. This year the region will begin a mulching program that will also assist in keeping waste out of the Class I landfills or will help to keep from polluting the air through burning. The State average is 1.2 tons per person.

The components of solid waste are being handled the following way by the entities in the Roane County region.

Class I waste is being handled through a network of convenience centers that are serviced by the County. A total of thirteen (13) convenience centers are scattered throughout the county and one (1) recycling center that is also a drop off site for Class I Waste. All of the convenience centers are manned with county employees and the containers are owned by the county. Extra or overflow containers are provided by Santec. The Class I waste from the convenience centers is collected using a roll-off system and taken directly to the landfill by way of a contract with Santec. The waste is taken either to Rhea County or Anderson County depending on the nearest route from the convenience center. All of the centers except the five smallest have compactors for the class I waste. The region of Roane does not collect waste for the commercial or industrial establishments. These entities must arrange for their own collection. The city of Harriman contracts out the collection of their waste with Waste Management and provides weekly curbside service. A fee of \$10 a month is being charged for this service. The city of Kingston also collects Class I waste house to house curbside by way of a contract with Waste Management. A fee of \$11 a month is being charged for this service. The waste is taken to Chestnut Ridge. The residents are picked up once a week. Commercial and Industrial entities must contract out their waste disposal on their own. The city of Rockwood collects their waste once a week utilizing their own personnel. A three man crew using a rear loader picks up the waste and takes it to Rhea County landfill. The City charges a \$7 a month fee. The landfills that the regions utilize have life expectancy of over 10 years that will last as long as the contracts that each entity has signed off on.

C&D waste or Class IV waste is collected at the recycling center with the use of 40 cu.yd containers and Santec hauls the waste to the landfill. However, currently Rhea County does not have a Class IV landfill, so the items are being disposed of in the Class I landfill. The City of Harriman has a container at the public works compound that they use when they pick up C&D waste from the residents. This is small amounts and Waste Management hauls the materials away. The City of Kingston collects small amounts of C&D waste and household items such as couches and take them back to the public works compound and place in a dumpster. Waste Management hauls the material away. The City of Rockwood collects small amount of waste and places into a dumpster at the Public Works Compound and takes it to Rhea County Landfill.

Waste Tires are collected at the recycling center by way of a contract with Mac Tires. Two trailers are provided at the recycling center, where residents can unload their tires into the trailer. There is also one trailer that is placed at a truck dealership. No tires are collected at the convenience centers. The cities of Harriman, Kingston and Rockwood will pick up small amounts of tires from the residents. A total of 218 tons of tires were collected and diverted from the Class I landfill in 2010.

Used Oil is collected at all of the convenience centers, except the smallest convenience center that may be in the process of closing in the near future. The recycling center also has a drop off site. The used oil that is collected is taken to the recycling center where it is used as heat for the recycling center building. Any excess used oil is sold to McClean Fuels. The city of Harriman has a used oil collection site at the public works compound and the oil collected is used to heat their maintenance garage. The city of Kingston does not provide a public drop off site for their residents. The city does collect their own used oil and sells the oil to a private company. The city of Rockwood collect their own used oil and gives it to a private trucking company. A total of 32 tons of used oil was collected in 2010.

E-Waste is collected at the recycling center and a company called 5 R picks up the materials. No e-waste is collected at the convenience center sites. The Cities of Harriman and Kingston through their contract with Waste Management allows residents to have their e-waste collected as part of the curbside program. The city of Rockwood does not provide this service in terms of recycling. Any e-waste that is collected is taken to the Rhea County landfill. A total of twenty-eight (28) tons of electronic waste was collected in 2010.

White Goods / Metals are collected at the recycling center and taken by County employees to Roane Metal in Roane County, where they receive monies that goes back into their recycling program. The metal is collected in 40-cu.-yd. open-top containers. No white goods or metals are collected at the convenience centers. The city of Harriman, Kingston and Rockwood will collect metals from their residents and take the metals to Roane Metals to generate some revenue. A total of 8,075 tons was collected in the Roane County region.

Brush / Compost materials are collected at the recycling center. This is a program that has just been started this year and should help to see a good diversion rate in the future. No brush or compost material is collected at any of the convenience center sites. Roane County contracts with a grinding company to come by when needed and turn the material into mulch. The city of Harriman collects brush daily on a call in system or when people set it out and the garbage crew alerts the city. A two man crew is used to collect the brush and take to a designated public works site. The chips are then grind into mulch by a private contractor, when needed. The City of Harriman also collects leaves in the fall and utilizes the same method as the brush. The City of Kingston picks up their brush daily and leaves during the fall utilizing a three man crew. The material is taken back to the public works compound and then a private contractor is brought in to grind the material into mulch at a cost of about \$5,000 per year. The finish product is then used by the City and the residents of the City are also allowed to pick up the material. The City of Rockwood collects brush and leaves utilizing a two man crew and takes the material loose to a designated public site for storage and then has the material chipped and uses the material for in house projects.

A total of 125 tons of mulch was reported in the region of Roane in 2010.

Sewer sludge that is being produced by the utilities in the region is taken to the landfill for disposal.

Paint is collected at one of the convenience centers for the County. The latex paint is mixed with chips and placed in a dumpster and when its dry it is taken to the landfill for disposal. The oil base paint that is collected is saved and the State picks it up during one of the HHW events. The Cities in the region do not provide any pain collection. The paint program is new so no totals where recorded in 2010.

Paper and cardboard is collected at each convenience center utilizing 4-cu.-yd. containers. The recycling center is also used as a drop off site for cardboard and paper. The material is brought to the recycling center loose and is placed onto a conveyor belts that takes it to the horizontal baler for processing. The materials is then stored and when enough is gathered the material is currently being sold to Rock Tenn. The City of Harriman and the City of Kingston does not collect any recyclables, but Michael Dunn Center does pickup materials from businesses and small industries within the city limits. The City of Rockwood does not provide for this collection. A total of 1,118 tons of paper and cardboard was collected and properly disposed of in 2010 by the region.

Plastic is collected at each convenience center utilizing a recycling container. The plastic that is recycled at the centers is taken to the Roane County Recycling Center, where the material is baled and then picked up by Rock-Tenn of Knoxville. None of the cities provide for the collection of plastic. A total of 42 tons of plastic was recycled in 2010.

Glass is not collected at the convenience centers and none of the cities collect glass.

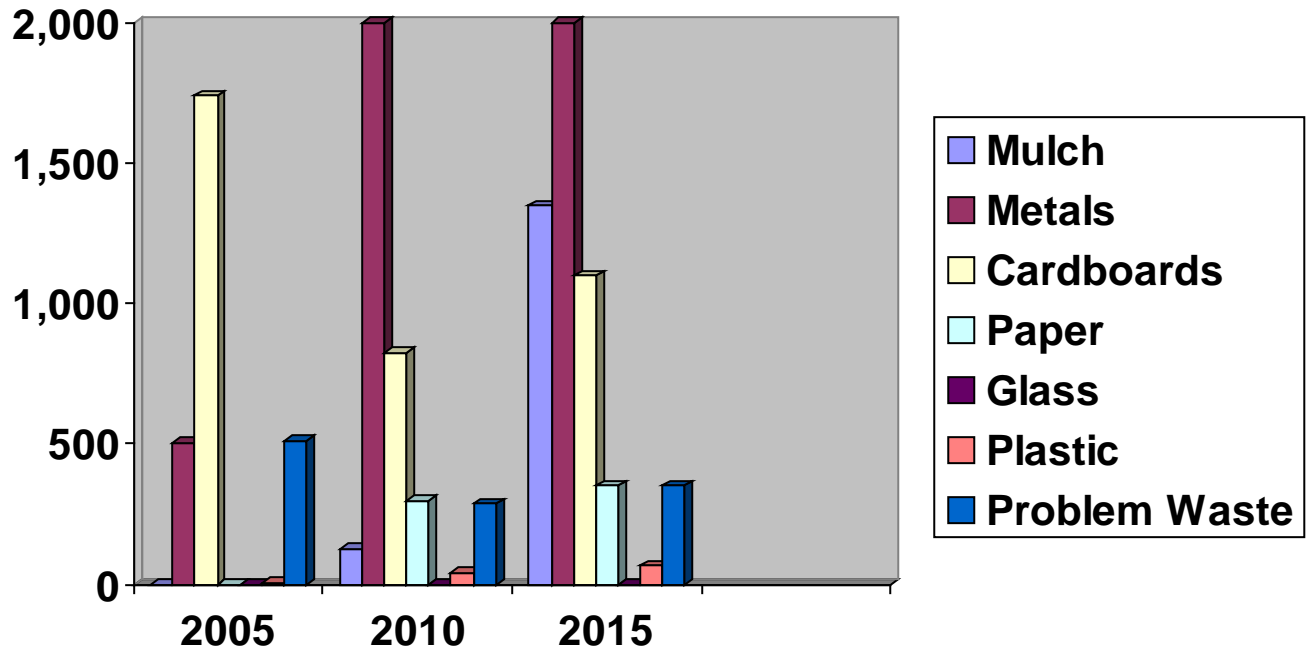
Aluminum cans are collected at all of the convenience centers and the recycling center. The cans are baled and then taken to Roane Metal and sold. The Cities of Harriman, Kingston and Rockwood don't have aluminum can programs at the present time. A total of 8 tons was reported in 2010.

The above information represents a good analogy of the public sector and how it takes care of its waste. Below is a table showing an analysis for two known amount periods and one estimated period that will be the next needs assessment. The numbers below only represent the public entities.

Material	Material – 2005	Material –2010	Material –2015
Sanitation - Land filled	60,722	40,957	37,832
Metals / White Goods	502	8,083	8,500
Cardboard	1,742	822	1,100
Paper	0	296	350
Glass	0	0	0
Plastic	2	42	65
Problem Waste – tires, batteries, automotive fluid, e-waste, paint.	512	286	350
Sewer Sludge	0	0	0
Mulch	0	125	1350
Class III/IV	0	0	0
Total Generated	63,480	50,611	49,547

The 2015 number is a simple guess with very little data to go on. This will also affect the Total Generated for 2015. Based on University of Tennessee Data, the 2015 population for Roane County should be 55,636. Assuming the region will continue to reduce their tons per person generated and using .68 as that number that is disposed. The Class I disposal should continue to show reduction with an amount of 37,832 tons per year. The other numbers will provide a good analysis on what is currently happening in the region and what can be expected.

The region has done a good job to make residents more aware of the need to divert as much waste from the landfill as possible. Below are the numbers for materials that are not being landfilled in either Class I or Class IV.



Item # 4: Waste Collection System and Life Cycle

The Region of Roane County utilizes thirteen (13) convenience centers and the recycling center to collect Class I waste for Roane County. The cities of Harriman and Kingston contract out the collection and hauling of their waste. The City of Rockwood utilizes their own vehicles, equipment and manpower. The residents pay a monthly fee to have the curbside service. Waste in the region is either taken to the Rhea County, Loudon County or Chestnut Ridge Landfill in Anderson County. All of the landfills mentioned have enough landfill space to cover the next needs assessment time period from 2011 to 2016.

Class IV waste can be taken by residents to the recycling center and placed in a 40 yard open top. The waste currently is collected by Santec and taken to Rhea County and placed in their Class I landfill. The cities pick up small amounts of this waste and have their contracted Class I providers take it to the landfill. The convenience centers do not accept Class IV waste.

Brush and leaves are collected at the recycling center and disposed of onto open grounds and when needed a private contractor grind up the materials. The mulch is then used by the County and its residents. The Cities in the region also collect brush and leaves house to house and the material is taken back to the city public work compounds and when needed a private company grinds the material into mulch that is used by the city and its residents.

Tires are collected at the Recycling Center where residents can place the tires into trailers that are provided by Mac Tires. The trailers when full are taken by Mac Tires to an end user. An additional trailer is also set out at a truck dealer site in the region. Tires are not collected at the convenience centers and none of the cities collect tires except for small amounts.

Metals are collected at most of the convenience centers and taken to the recycling center for storage and then taken to Roane Metal where by the County receives revenues. The Cities also collect metals from their residents and take them to Roane Metal to receive revenue.

Recyclable items that include plastic, cardboard, news print and mixed paper are collected at most of the convenience centers in the Roane County region. All of the items are collected by County employees and hauled back to the recycling center for processing. The items are baled and then picked up by Rock-Tenn in Knoxville and then taken to a paper mill. The cities of Kingston and Harriman do not provide any kind of collection of recyclables. However, Michael Dunn Center does provide collection of cardboard and paper, for small commercial, industrial and some governmental offices. The city of Rockwood does not collect any recyclables at the present time.

Used oil is collected at most of the convenience centers in the region and the used oil is then transported back to the recycling center where it is used for heat. Any excess used oil is sold to a private company. The city of Harriman provides a used oil collection site for its residents and uses the used oil to heat one of the public works buildings. The City of Kingston collected its own in house used oil and sells it to a private company. The City of Rockwood collects its own used oil and gives it to a private trucking company in the City.

E-Waste is collected at the recycling center. No convenience centers collect E-Waste. The waste is picked up by a private company. The Cities of Harriman and Kingston will pick up small amounts and their Class I contractor hauler will take care of the E-Waste for them. The City of Rockwood does not recycle e-waste, but takes the small amounts that is collected to the Rhea County Landfill.

Paint has started being collected at their Post Oak Convenience Center only. No other convenience centers take paint. Latex paint is landfilled and oil-base paint is taken by the State for disposal or reuse. None of the cities provide for the collection of paint.

Sewer sludge is not being recycled by any of the utility boards in the region. The dry sludge is taken to the landfill for disposal.

Section 5 – Roane County Reduction Rate

Current Year Generation	Current Year Disposal	Base Year Disposal	Current Year Population	% Reduction compared to Base Year	Real Time Comparison
50,611	40,957	59,812	54,181	32%	19%

The region of Roane County currently meets the 25% waste reduction goal in 2010 as shown in the table above. Below is an illustration on what items are needed or in the process of starting that will help the Region to continue meeting the goal in the future. Initial review of last year's annual report showed that very little commercial establishments reported and no industrial numbers were reported. Grocery stores would probably create another 400 tons of recyclables that are collected in the region. Roane Metal alone would create another 1,700 tons of recyclables in the region. The City of Kingston, Harriman and Rockwood have not been reporting their numbers to the County for the report. The mulching numbers should create another 1,500 tons a year. We need to see if we can receive these numbers in the future. The author had received data from the Dollar Store and Dollar General that would have produced another 200 tons on this report.

Since the original solid waste plan was implemented, the region of Roane County has been very active in the pursuit of providing recycling opportunities for their citizens. The region has added such items as computers/electronics, used oil, plastic and paint collection. These items are in addition to the cardboard and mixed papers that are available in the region.

Class I waste in the region of Roane County will continue to be exported out of the region during the next needs assessment. The landfills being used by the County has enough permitted landfill space to operate for another 20+ years. The entire process seems to be running quite efficient and no major changes are needed in the foreseeable future. The convenience centers seem to be well equipped to handle the collection of Class I waste. Economic reasons may require the region to close some of their convenience centers during the next needs assessment. Both Kingston and Harriman will continue to contract out their waste and the City of Rockwood will continue to provide its own collection of Class I waste.

Class IV waste in the region of Roane County is practically non-existent due to any waste that is collected at the recycling center is currently being directed to a class I landfill for disposal. If meeting the 25% waste reduction rate becomes a problem in the future, the region might want to haul the Class IV waste to a Class IV landfill for reporting purposes. Such a move may result in an additional 1,500

tons of Class IV waste that is collected in the region. There is no reason for the region to change how they handle Class IV waste at the present time.

Waste tires are being handled efficiently by the region. No changes in the process are needed for the region.

Used oil drop-offs have been made accessible to most residents in the region. The convenience centers and the City of Harriman provide for public drop off sites. The City of Kingston and Rockwood will need to look at this within the next needs assessment to evaluate the need in their city. The used oil program seems to be running efficiently in the region.

E-waste is one of the new areas of recycling that is provided by the Region. The recycling center is the lone site for disposal, which gives room for the region to expand its collection sites into the convenience centers. The County has a very good program with the collection of e-waste and the cities of Harriman, Kingston and Rockwood provide small pickups for their residents. No changes are needed at the present time.

Metals are being collected at the convenience centers and the program is run quite efficiently. All of the cities collect metals and metals have been a revenue source for all of the entities in the region. No changes are needed at the present time.

Brush / Compost materials in the County are now being collected at the Roane County Recycling Center. Would it be easier for most residents to take their brush/leaves to the convenience centers? The answer is yes, but that is not fiscally prudent to offer such services. The recycling center operation is being operated in an efficient manner and all three cities provide for the collection and disposal of this material.

Paint is another area that the region has started providing collection for. The County provides one of the convenience centers for the collection and processing of paint and still continue to utilize the State HHW program for the collection of paint. The region dries the latex paint and takes it to the landfill and has the State pickup the oil base paint. The region needs to examine the possibility of having paint dropped off at the convenience centers for ease of residents and then transport the paint to the paint processing center. The numbers that are shown on next year's report may dictate the growth of paint collection in the future.

Sewer sludge is being landfilled by all of the utilities in the region. Any changes will probably not happen due to more stringent EPA regulations.

Paper and cardboard is collected at each convenience center in the region. None of the cities provide such collection. A non-profit operation that deals with handicap individuals provides for the collection of such items. Most of their collection is done with commercial and small industrial entities in the region. There is an opportunity for both Kingston and Harriman to start the collection of paper and cardboard due to the fact that the company that they contract out the collection of Class I waste has started a program with Jefferson City. This will be an area that the cities will need to look at in terms of savings from reduced Class I landfill fees in the future. The County has the ability to process the material that is collected and knows the market in order to move the product. The collection of such material house to house will never be a great money revenue, but it could save money on the tipping fee charges. In order to make the program more acceptable for the cities, the collection of the recyclable items needs to be single-stream. This would make it easier for city employees to collect and make it easier for residents to store. The County has the equipment to handle the dumping of cardboard and paper into a hopper that would disperse the material onto a conveyor belt that will take the material from point A to point B for baling. It is estimated that an additional **150 tons** of waste could be diverted through this process. The county also has the potential for growth into the governmental offices for the collection of paper and the collection of paper and cardboard at the schools. The problem right now is the ability to find funding to provide containers to be placed into these entities.

The region may want to look at what the Cocke County region has done in terms of recycling at the schools in the future. Their program, although infant in its inception, has done quite well. The Cocke County region has tied the recycling at the schools to an incentive program, whereby the schools can receive monies that can be used for the classrooms. The region could possibly contract this out with a company like Goodwill Industries.

Plastic is collected at the convenience centers in the same manner as cardboard and paper. The same potential growth that was outlined above would apply to plastic. Plastic is quite bulky and the region needs help in funding to provide a better method of handling plastic. The region probably needs to go ahead and identify a more efficient method in order to better prepare for future changes in the handling of plastic. None of the cities provide for the collection of plastic. The problem is that plastic takes up a lot of space in a container and has to be dumped more frequently. Until plastic becomes a high dollar commodity for recycling, very little else can and should be done in the region.

Glass is not collected at the convenience centers and is not collected in the region. The problem is that the region does not have a good end user to make collecting glass a viable commodity. The region has looked at using glass as a component of road resurfacing, but that has not taken hold at the present time. The collection of glass by the region could easily net 125 tons a year in waste diversion.

The region of Roane County has made great strides in providing new services to its residents in terms of recycling. The region of Roane County needs to find ways to get the cities more involved in the future.

Item # 6: 10-Year Regional Disposal Assurance in Roane County Region.

Site Name	Annual Tons Disposed by Roane Loudon County	SNL Permit #	Current Landfill Capacity (daily throughput)	Maximum capacity	Projected Life of Facility
Matlock Bend Landfill	9,236	SNL-53-0203	300 per day	Depends on compaction rate and Landfill Design and Operations Plan	11 years left
Rhea County Landfill	18,332	SNL-72-000-0269	185 per day	Depends on compaction rate and Landfill Design and Operations Plan	20 years left
Chestnut Ridge Landfill	11,059	SNL-01-0160	1,500 per day	Depends on Compaction	22 years left

Note: Roane County region does also dispose of waste at the Carter Valley landill, but the author had no information on this site.

Public and Private Collection Service in the Roane County Region (class I waste)

Service Provider	Service Area	Frequency of Service	Estimated average annual tons collected	Type of Service
Roane County	County Wide	Four days a week	23,102	Convenience Centers
City of Harriman	City Limits	Once a Week	5,125	Door to Door Collection
City of Kingston	City Limits	Once a Week	4,001	Door to Door Collection
City of Rockwood	City Limits	Once a Week	4,388	Door to Door Collection

** Estimated tonnage is based on .76 tons per person times population of entity.

All commercial and industrial establishments contract out the collection of their waste with private haulers.

Public and Private Collection Service in the Roane County Region (Recycling)

Service Provider	Service Area	Frequency of Service	Estimated average annual tons collected	Type of Service
Roane County	County Wide	Six Days a Week	9,656	Convenience Centers (recycling drop off sites)
City of Harriman	City Limits	No Service	110	Small pickup of white goods; used oil collection, brush and leaf program.
City of Kingston	City Limits	No Service	110	Small pickup of white goods; brush and leaf program.
City of Rockwood	City Limits	No Service	110	Small pickup of white goods; brush and leaf program.

Roane County has thirteen registered convenience centers that are scattered throughout the region. All of the convenience centers operate as recycling drop off sites. The larger sites handle mixed paper, cardboard, plastic, scrap metal, used oil and aluminum cans. The operating hours are 7:30 a.m. – 5:30 p.m.; M, T, R and Friday.

Industries and Commercial establishments coordinate their own recycling efforts.

Item # 7: Solid Waste Management Infrastructure

Roane County

Expenditures			
Description	Present Need \$/year	Unmet Needs \$/year	Total Needs (Present + Unmet) \$/year
Salary and Benefits			
Transportation/hauling			
Collection and Disposal Systems			
Equipment	\$0.00	\$160,000.00	\$160,000.00
Sites			
Convenience Center	\$937,480.00	\$125,000.00	\$1,062,480.00
Transfer Station	\$0	\$0	\$0
Recycling Center	\$631,023.00	\$70,000.00	\$701,023.00
MRF	\$0	\$0	\$0
Landfills	\$0	\$0	\$0
Site	\$0	\$400,000.00	\$400,000.00
Operation	\$13,855.00	\$0	\$13,855.00
Closure	\$0	\$0	\$0
Post Closure Care	\$20,886.00	\$0	\$20,886.00
Administration (supplies, communication cost, etc.)		\$0	
Education	\$56,875.00	\$0	\$56,875.00
Public			
Continuing Education			
Capital Projects	\$0	\$0	\$0
Total	\$1,660,119.00	\$755,000.000	\$2,415,119.00
Revenue			
Host agreement fee	\$0	\$0	\$0
Tipping fees		\$0	
Property taxes	\$328,586.00	\$0	\$328,586.00
Sales tax	\$350,000.00	\$0	\$350,000.00
Surcharges	\$316,829.00	\$0	\$316,829.00
Disposal fees	\$93,883.00	\$0	\$93,883.00
Collection charges			
Industrial or Commercial charges	\$0	\$0	\$0
Residential charges	\$0	\$0	\$0
Convenience Centers charges	\$0	\$0	\$0
Transfer Station charges	\$27,748.00	\$0	\$27,748.00
Sale of Recyclables & Commodity Rebates	\$215,500.00	\$0	\$215,500.00
Other sources: (Grants, bonds, interest, sales, etc.)	\$347,134.00	\$0	\$347,134.00
Total	\$1,679,680.00	\$0	\$1,679,680.00

The region of Roane County needs are for the following:

1. New Maintenance Truck = \$10,000; 2. Compactor for CC = \$25,000
3. Construct new CC site = \$100,000; 4. Roll-Off Truck = \$150,000
5. New Baler = \$70,000; 6. Develop C&D Landfill Site = \$400,000

City of Harriman

Expenditures			
Description	Present Need \$/year	Unmet Needs \$/year	Total Needs (Present + Unmet) \$/year
Salary and Benefits	\$15,408.00	\$0	\$15,408.00
Transportation/hauling		\$0	
Collection and Disposal Systems	\$305,025.00	\$0	\$305,025.00
Equipment	\$0	\$0	\$0
Sites	\$0	\$0	\$0
Convenience Center	\$0	\$0	\$0
Transfer Station	\$0	\$0	\$0
Recycling Drop Off Center	\$0	\$0	\$0
MRF	\$0	\$0	\$0
Landfills	\$18,150.00	\$0	\$18,150.00
Site	\$0	\$0	\$0
Operation	\$0	\$0	\$0
Closure – See total under post closure	\$0	\$0	\$0
Post Closure Care	\$0	\$0	\$0
Administration (supplies, communication cost, etc.)	\$0	\$0	\$0
Education	\$0	\$0	\$0
Public			
Continuing Education			
Capital Projects	\$0	\$0	\$0
Total	\$338,583.00	\$0	\$338,583.00
Revenue\$			
Host agreement fee	\$0	\$0	\$0
Tipping fees	\$0	\$0	\$0
Property taxes	\$123,123.00	\$0	\$123,123.00
Sales tax	\$0	\$0	\$0
Surcharges	\$0	\$0	\$0
Disposal fees	\$0	\$0	\$0
Collection charges			
Industrial or Commercial charges	\$0	\$0	\$0
Residential charges	\$215,461.00	\$0	\$215,461.00
Convenience Centers charges	\$0	\$0	\$0
Transfer Station charges	\$0	\$0	\$0
Sale of Methane Gas	\$0	\$0	\$0
Other sources: (Grants, bonds, interest, sales, etc.)	\$	\$0	\$
Total	\$338,584.00	\$0	\$338,584.00

The city of Harriman reported no needs during next needs assessment.

City of Kingston

Expenditures			
Description	Present Need \$/year	Unmet Needs \$/year	Total Needs (Present + Unmet) \$/year
Salary and Benefits	\$0	\$0	\$0
Transportation/hauling	\$0	\$0	\$0
Collection and Disposal Systems	\$248,369.00	\$750,000.00	\$998,369.00
Equipment	\$0	\$0	\$0
Sites	\$0	\$0	\$0
Convenience Center	\$0	\$0	\$0
Transfer Station	\$0	\$0	\$0
Recycling Center	\$0	\$0	\$0
MRF	\$0	\$0	\$0
Landfills	\$0	\$0	\$0
Site	\$0	\$0	\$0
Operation	\$0	\$0	\$0
Closure – See total under post closure	\$0	\$0	\$0
Post Closure Care	\$0	\$0	\$0
Administration (supplies, communication cost, etc.)	\$0	\$0	\$0
Education	\$0	\$0	\$0
Public			
Continuing Education			
Capital Projects	\$0	\$0	\$0
Total	\$248,369.00	\$750,000.00	\$998,369.00
Revenue			
Host agreement fee	\$0	\$0	\$0
Tipping fees	\$0	\$0	\$0
Property taxes	\$0	\$0	\$0
Sales tax	\$0	\$0	\$0
Surcharges	\$0	\$0	\$0
Disposal fees	\$0	\$0	\$0
Collection charges			
Industrial or Commercial charges	\$0	\$0	\$0
Residential charges	\$248,369.00	\$0	\$248,369.00
Convenience Centers charges	\$0	\$0	\$0
Transfer Station charges	\$0	\$0	\$0
Sale of Methane Gas	\$0	\$0	\$0
Other sources: (Grants, bonds, interest, sales, etc.)	\$0	\$0	\$0
Total	\$248,369.00	\$0	\$248,369.00

The City of Kingston needs a tub grinder and a knuckleboom during the next needs assessment.

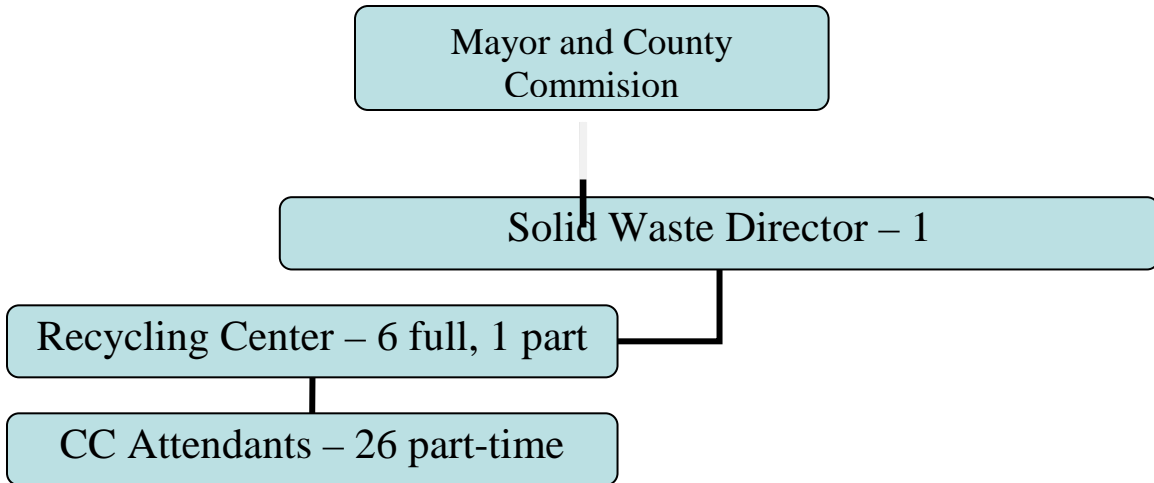
City of Rockwood

Expenditures			
Description	Present Need \$/year	Unmet Needs \$/year	Total Needs (Present + Unmet) \$/year
Salary and Benefits	\$0	\$0	\$0
Transportation/hauling	\$0	\$0	\$0
Collection and Disposal Systems	\$150,000	\$45,000	\$195,000
Equipment	\$0	\$0	\$0
Sites	\$0	\$0	\$0
Convenience Center	\$0	\$0	\$0
Transfer Station	\$0	\$0	\$0
Recycling Center	\$0	\$0	\$0
MRF	\$0	\$0	\$0
Landfills	\$0	\$0	\$0
Site	\$0	\$0	\$0
Operation	\$0	\$0	\$0
Closure – See total under post closure	\$0	\$0	\$0
Post Closure Care	\$0	\$0	\$0
Administration (supplies, communication cost, etc.)	\$0	\$0	\$0
Education	\$0	\$0	\$0
Public			
Continuing Education			
Capital Projects	\$0	\$0	\$0
Total	\$150,000	\$45,000	\$195,000
Revenue			
Host agreement fee	\$0	\$0	\$0
Tipping fees	\$0	\$0	\$0
Property taxes	\$30,000	\$0	\$30,000
Sales tax	\$0	\$0	\$0
Surcharges	\$0	\$0	\$0
Disposal fees	\$0	\$0	\$0
Collection charges			
Industrial or Commercial charges	\$0	\$0	\$0
Residential charges	\$120,000	\$0	\$120,000
Convenience Centers charges	\$0	\$0	\$0
Transfer Station charges	\$0	\$0	\$0
Sale of Methane Gas	\$0	\$0	\$0
Other sources: (Grants, bonds, interest, sales, etc.)	\$0	\$0	\$0
Total	\$150,000	\$0	\$150,000

The City of Rockwood needs a leaf truck - \$45,000.

Item # 8: Solid Waste Department Organization and Location

Roane County

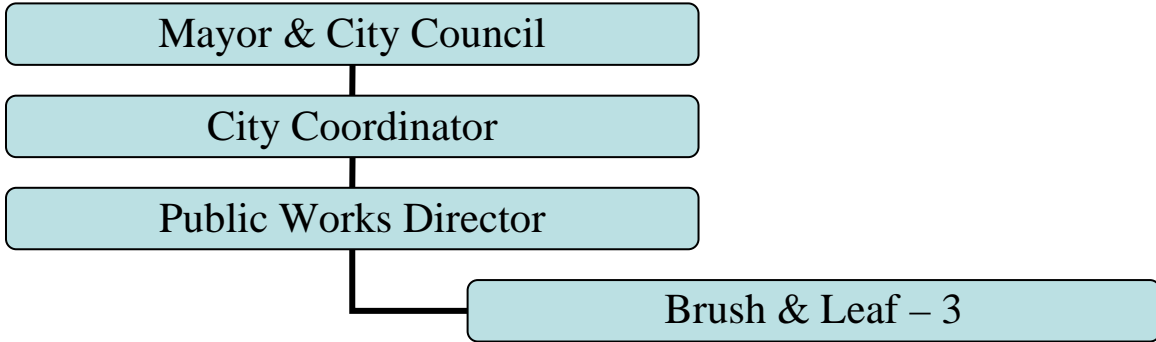


Roane County has thirteen convenience centers with the following locations:

1. Swann Pond CC – 104 Swan Pond Road, Harriman
2. South 58 CC – 107 Walnut Grove Road, Kingston
3. North Gallaher CC – Gallaher Road, Kingston
4. Orchard View CC – 123 Orchard View Road, Oliver Springs
5. Post Oak CC – 123 Post Oak Valley Road, Rockwood
6. Pumphouse CC – 1237 Pumphouse Road, Rockwood
7. Clax Gap CC – 624 Clax Gap Road, Harriman
8. Blair CC – 131 Rays Park Road, Harriman
9. Bradbury CC – 3343 Buttermilk Road, Kingston
10. Cave Creek CC – 329 Cave Creek Road, Loudon
11. Glen Alice CC – 1913 Spring City Highway, Rockwood
12. Paint Rock CC – 125 Paint Rock Road, Kingston
13. Blue Springs CC – 3810 River Road, Kingston

Roane County has a recycling center that is located at 215 White Pine Road, Harriman TN.

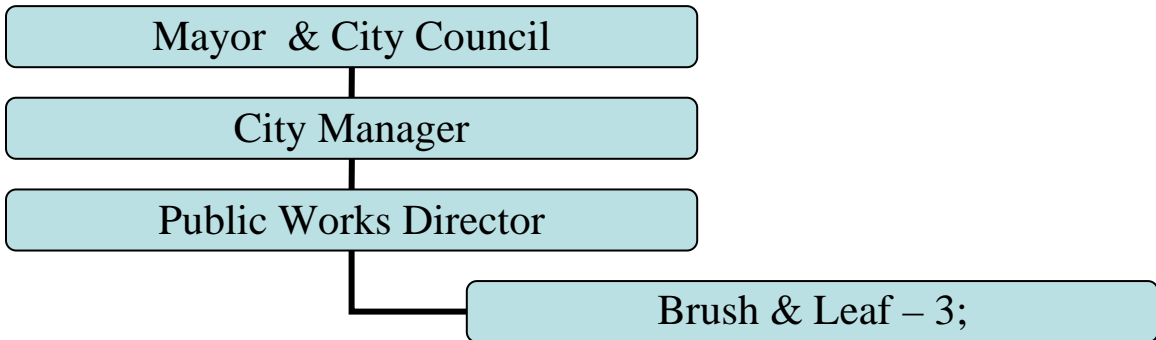
City of Harriman



The Harriman Public Works Compound is located at the following location:

1. Lower Margrave, Harriman, TN. 377481

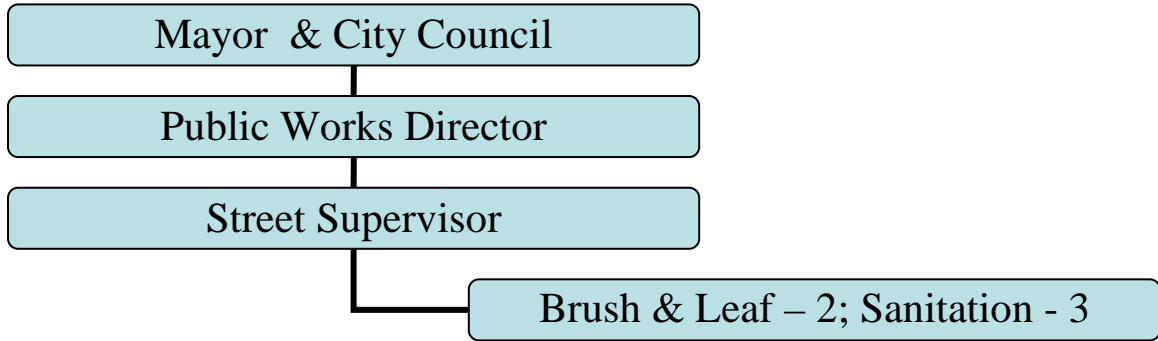
City of Kingston



The Kingston Public Works Compound is located at the following location:

1. 201 Patton Ferry Road, Kingston, TN. 37763

City of Rockwood



The Rockwood Public Works Compound is located at the following location:

1. 115 N. First Street, Rockwood, TN.37854

Item # 9: Future Waste Management Needs

Roane County Region

Collection

Equipment	Operational Use	Estimated Cost	Potential Revenue Source	Entity
Leaf Vacuum Truck	Leaves	\$45,000	Grants	Rockwood
Tub Grinder	Brush and Leaves	\$600,000	Grant	Kingston
Knuckleboom	White Goods, Brush	\$150,000	Grant	Kingston
Construct New CC Site	Refuse and Recycling	\$100,000	Grant	Roane County
Roll-Off Truck	Recycling	\$150,000	Grant	Roane County

Disposal

Equipment	Operational Use	Estimated Cost	Potential Revenue Source	Entity
Baler	Recycling Center	\$70,000	Grant	Roane County
C&D Landfill Site	Old Landfill Site	\$400,000	Grant	Roane County
Compactor for CC	Convenience Center	\$25,000	Grant	Roane County
Maintenance Truck	Recycling Center	\$10,000	Grant	Roane County

The region of Roane County has equipment needs as shown above that will take time to purchase on their own. The region has some areas that can be improved upon, if money was available. The region has identified the need for a C&D Landfill site in the future to handle this waste that is now being taken to a Class I landfill. The landfill site would not only make the region money and reduce the amount of waste going to a Class I landfill site, but will also save the region monies from tipping charges at the current landfill site. The region has also realized that the only way they can increase their recycling efforts is for the cities to begin door to door collection. In order for the program to be cost efficient for the cities, the region would need to allow for single-stream collection. This is basically in place, but a sorting line would have to be developed to take single stream recycling.

Item # 10: Residents Attitude and Participation

No formalized surveys have been done to measure the public's attitude of Roane County residents concerning support for environmental programs. The mindset of the people is changing as the population gets older as illustrated by the decrease in the tons per person in the region. Most residents that were casually asked about recycling agree that it is a good way to help do their part in saving the environment. However, most are not willing to go out of their way to recycle. The word convenience tends to come in mind towards the reaction towards recycling. Most feel it is the government's job to provide recycling opportunities and that it should be left up to that person to choose to do so. Most feel that stringent regulations should not be passed that force residents to recycle. As the school age children become older and they are used to recycling items at school, a habit of recycling will dictate the increase in public participation in the future. That is why it is important to start a recycling program in the schools. None of the cities provide recycling opportunities for their residents at the present time. The region of Roane County has the resources available to grow with the public in terms of recycling.

Item # 11: Regional Solid Waste Plan / Executive Summary

The Roane County Region's plan for the next five years is to continue to find ways to expand services within their recycling program. As part of the needs assessment, I will take a look at every area of the solid waste stream to give my thoughts on the needs in those areas.

Class I waste is currently being handled in the region by a network of convenience centers that also operate as recycling drop-off sites. The region has a contract to pick up the Class I waste and take it to the landfill. The County picks up the recyclables and takes them to the landfill site. This contract will take the region through the next needs assessment. As shown on the attached map, the convenience centers have been strategically placed throughout the region. A five-mile radius shows that every section of the county can be reached by a convenience center. The region has been very proactive in building convenience centers around growth areas in the past. The region is currently looking at eliminating one of their convenience centers due to low volume. The lack of any major dumps in the area illustrates that the current convenience centers are taking care of the need for Class I disposal. The cities of Harriman and Kingston contract out the collection of their Class I waste and provide house-to-house collection of Class I waste. The waste is taken by a private company to a regional landfill. The City of Rockwood provides its own equipment and manpower for the collection of Class I waste house to house and take the waste to the regional landfill. It is the author's belief that the Class I waste is being handled very efficiently for the region of Loudon and no immediate changes are needed.

Class IV waste collection is available at the recycling center. The region does not count the Class IV waste as a diversion because currently the waste is being taken to a Class I landfill for disposal. The region has already began planning for the development of a Class IV landfill within the next needs assessment time period. Since, the space is available at the old landfill site, the author feels that this is a step in the right direction. The only other avenue is for the region to contract out the hauling of the Class IV waste to a Class IV landfill. That is something that the region will need to examine during the next contract period.

Waste tires are being handled efficiently at the recycling center for Roane County. The region has a contract with a private company to dispose of the tires when a trailer load is collected (Mac Tires of Nashville). The state probably needs to provide more funding for this program, but other than that, there is no reason to change what is being done for the collection of waste tires.

Used oil collection sites are scattered throughout the region and seem to be operating quite efficiently. The burners become quite troublesome for communities after about five years of use. The state needs to look at providing some of the used oil funds to replace these burners more often for the communities that used the oil for heat. The region is adequately covered with used oil collection centers by having the collection of used oil at all of their convenience centers.

E waste is something that the region has added since the last needs assessment. E waste is collected at the recycling center. The region has a contract for the disposal of the waste. The cities do provide for small pick-ups of such waste during annual clean-up days. No changes to the program are needed at the present time.

White goods and metals are collected at all the convenience centers. The method of handling the metals is working quite well for the county. The cities also provide for the collection of metals. The collection sites are there for people to use and the author sees no way that the region could increase such collection.

Brush/Compost has been added for collection at the Roane County Recycling Center during the past year. The cities in the region have done a good job in providing the collection of brush and leaves for its residents and providing the material for mulching. There are no changes needed in the region on how the collection of brush and leaves is currently taken place. The region may want to examine the possibility of a joint purchase and ownership of its own tub grinder in the future. That being said all of the entities have a contract with a private company for such mulching and it seems to be working fine.

The collection of paint has also been added since the last needs assessment for the region. It is too early to tell if the one convenience center site is enough for the region and that can be examined during this needs assessment time period. The region has a site that can be used for the collection of paint—Post Oak Convenience Center. The region will need to pay close attention to the labor intensive side of operating a paint reuse center. The region will probably need to experiment on different scenarios to find the most efficient way to handle the paint. Other regions in East Tennessee have been able to utilize prison labor that helps to offset the personnel cost involved in operating a paint recycling center.

Paper and cardboard have always been collected at the convenience centers in the region. The region processes its own paper and cardboard at the Roane County Recycling Center. However, the region needs to look at ways to provide for door-to-door collection at the city level. It is the author's belief that in order to make this happen, the region will need to develop a separate processing center that will allow for the cities to collect single-stream and take the recyclables to the processing center and at that point the items are separated and processed. Grants to help purchase containers will need to be available for the cities in order to make the process easier for their residents. The region also needs to look at ways to start a more comprehensive recycling program in the schools. The region will need to secure funding for equipment in the future to start the program. The region might want to look at an incentive program at the schools where some of the proceeds go back to the classrooms as a way to increase participation.

The region does not collect glass at the convenience centers and the cities do not provide the service. The market will dictate if the region should make such

steps to increase the collection of glass in the future. Glass may become more of a viable option, if meeting tonnage diversion becomes a problem in the future.

In summary, the region has met the 25% waste reduction goal that is mandated by the state. The region needs to do a better job in getting numbers from area businesses and industries and should concentrate on getting more Class IV numbers in the future. The region, as illustrated, has made steps to improve the collection of recyclables since the last needs assessment. The region has growth potential in terms of more diversion by having the cities become more active in recycling and the schools to become more involved with recycling. As is the case in all regions there are still things that can be done to further enhance the diversion of waste from a Class I landfill. The economy has dictated more of a cost benefit analysis on future programs during the next needs assessment period. The region has come a long way since the last needs assessment and will continue to reach their goal of having one of the most comprehensive recycling programs in the East Tennessee Region.

Sources:

Roane County Solid Waste Department

Roane County Home Page
U.S. Census Bureau
City of Harriman
City of Kingston
City of Rockwood
Tennessee Division of Solid Waste Management
[www. City-data.com](http://www.City-data.com)
[www. Headwaterseconomics.org](http://www.Headwaterseconomics.org)
Tennessee Advisory Committee on Intergovernmental Relations