

CHAPTER 2.0 WASTE CHARACTERIZATION AND QUANTITIES

2.0 WASTE CHARACTERIZATION AND QUANTITIES

Population growth and the associated residential and commercial development inevitably lead to greater waste generation and increased demand for services. In Loudoun County, the Solid Waste Management Plan will identify the current waste management system and needs; in the face of projected continued growth, the Plan will also prepare for future demand for services and management needs.

2.1 Description of Plan Area

The Loudoun County Solid Waste Management Planning District (LCSWMPD) includes the unincorporated areas of the County and all seven incorporated towns: Hamilton, Hillsboro, Leesburg, Lovettsville, Middleburg, Purcellville, and Round Hill. The surface area of Loudoun County and its towns is 517 square miles.

Loudoun County is located in the Washington, DC-MD-VA-WV Primary Metropolitan Statistical Area (PMSA). The County is bordered by the Potomac River to the north; Clarke County, VA, and Jefferson County, WV, to the west; Fauquier County, VA, and Prince William County, VA, to the south; and, Fairfax County, VA, to the east. The eastern Loudoun County line is approximately 30 road miles from the District of Columbia. Leesburg, the County seat, is located 12 miles west of the border between Loudoun and Fairfax Counties near the geographic center of the County. Dulles International Airport lies along the Loudoun/Fairfax line. In 2002, 60.5% of Loudoun's land area was defined as agricultural, 23.9% was residential, 6.3% was commercial/industrial and 9.3% was public open space.¹ **Figure 2-1** is a location map showing Loudoun County's geographic location in the Washington DC-MD-VA-WV PMSA.

The following information on transportation, jobs, housing and urban concentration provides a profile of Loudoun's changing role in the greater metropolitan Washington DC region. The information also describes Loudoun's internal profile and sets the stage for the challenges of planning for and providing a solid waste management system that meets the needs of the second fastest growing county in the United States.

2.1.1 Transportation

Loudoun's major transportation routes include U.S. Highways 15 and 50; Virginia Routes 7, 9, and 28; and, the Dulles Toll Road and Greenway (VA 267). Commuter and freight railway services are available in nearby Brunswick and Point-of-Rocks, MD, by the Baltimore and Ohio Railroad and the Maryland Rail Commuter Service (MARC). Loudoun County is the location of Washington

¹ Loudoun County Department of Economic Development. (April 2002). *Summary Facts*. p.1.

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Dulles International Airport, now one of the fastest growing passenger airports in the United States.

Loudoun's transportation system is an interesting mix of highly sophisticated and internationally accessible air service from Dulles Airport to a system of Federal and State highways that must handle more traffic than their design ever anticipated. At the same time, Loudoun has more miles of unpaved road than any other county in Virginia. Each of these features symbolize a different set of solid waste management challenges to a County that has changed in twenty years from a rural agrarian county to a bustling international center of residential and commercial growth.

Dulles Airport and its activity symbolize a rapidly urbanizing population and commercial center just west of the nation's capital. Routes 7, 9, 28, and 15 and 50 have increased the County's accessibility for commuters and attractiveness for business. Routes 15 and Route 7 are north-south and east-west routes, respectively. These busy corridors also serve as the routing for some portion of the estimated 8 million tons of solid waste that is being imported annually into Virginia for disposal in large landfills in the Southeastern portion of the State. The County's rural road system represents the challenge of providing solid waste collection and transportation services to the areas west of Route 15 where there are unpaved roads and bridges with width and weight limits that cannot accommodate a modern trash compacting vehicle.

2.1.2 Jobs

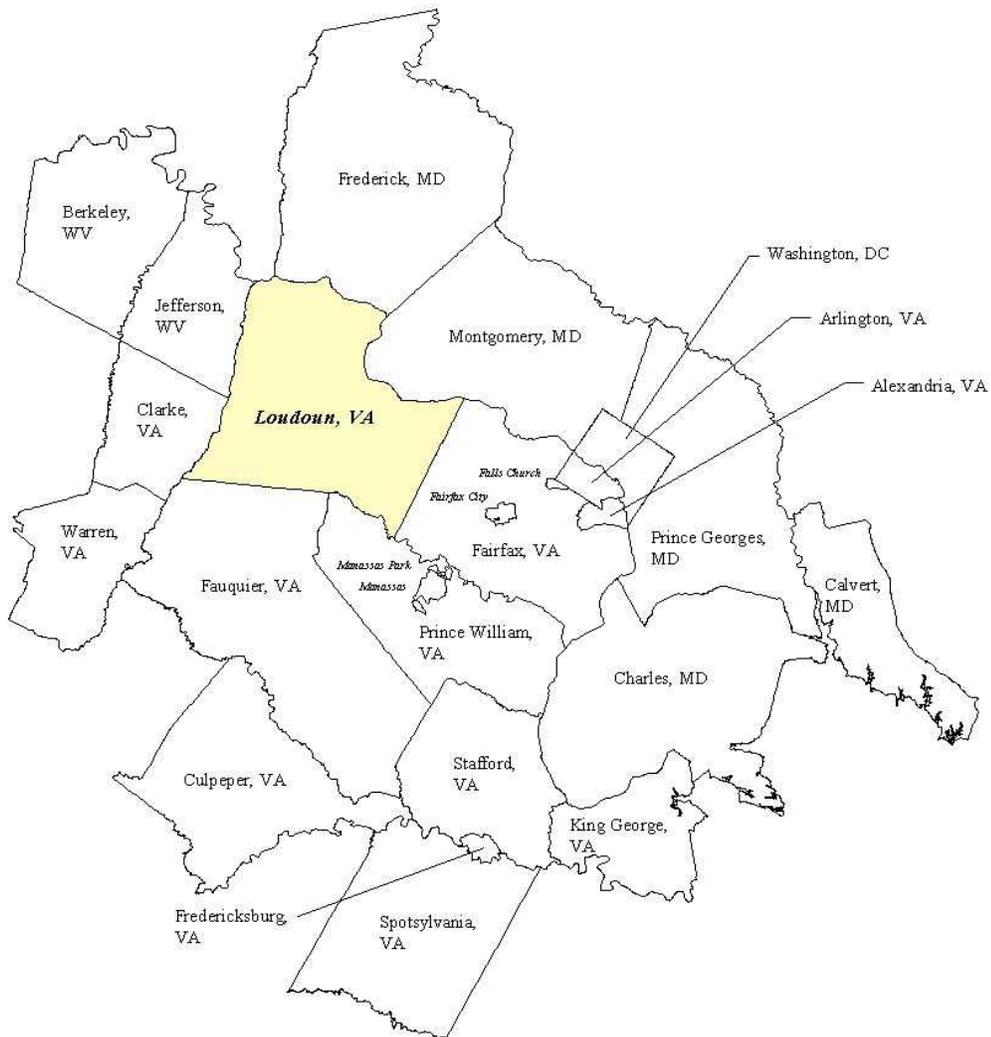
The number of jobs in Loudoun more than doubled in the past 10 years, increasing from 39,861 in 1991 to 97,200 in 2001.² Much of the recent economic development activity in the County can be attributed to a strategic position within the Washington DC Metropolitan Region and proximity to Washington Dulles International Airport. As a result of Loudoun's unique combination of assets, at-place employment is expected to continue to grow over the next 20 years reaching almost 200,000 jobs by 2020. With the growth of jobs comes burgeoning population, and market demand for both residential and nonresidential development is expected to continue.³

² Loudoun County Department of Economic Development. *2001 Annual Growth Summary*. p. 8.

³ Loudoun County. *2001 Revised General Plan*. p. 2-3.

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Figure 2-1: Washington DC-MD-VA-WV PMSA, Loudoun County



Source: Loudoun County Department of Economic Development

2.1.3 Housing

Over the last 50 years, the number of housing units in Loudoun County has increased by almost 1,000 percent. In 1950, there were 5,988 units in the County; in 2000, there were over 60,000 units. The greatest increase occurred since 1990, when nearly half of the County's housing stock was built. During the 1990s, one in four building permits issued in Northern Virginia was issued in Loudoun County. The number issued in Loudoun County during the last decade (39,270 permits) was surpassed only by Fairfax County.⁴

⁴ Loudoun County. 2001 Revised General Plan. p. 2-2.

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2.1.4 Urban Concentration

There is a clear delineation between the western and eastern portions of Loudoun County. The region west of Route 15 is primarily a traditional rural area featuring farmland and six of the seven incorporated towns. The seventh town, Leesburg, lies at the intersection of Routes 7 and 15, near the center of the County. East of Route 15, an urban/suburban assortment of residential subdivisions and commercial development dominates the landscape. The growth and near build-out of the technology industrial corridor in the Reston, VA area and along the Dulles corridor in Fairfax County have facilitated rapid business growth along the Route 28 corridor, which runs south from Route 7 in Loudoun to Centerville in Fairfax County.

The County's *2001 Revised General Plan* identifies and plans for these eastern portions of the LCSWMPD as the "Suburban Policy Area," the area that will experience the highest rates of growth for the next several years. The distinctions between Eastern Loudoun, Western Loudoun, and the incorporated towns are significant because they identify geographically the various levels of solid waste services that are available to District residents, with densely populated areas having higher levels of solid waste service available. In general, residents in Eastern Loudoun receive curbside pick-up and recycling from major solid waste collectors⁵ via contracts made individually or by homeowners' associations (HOAs) or property management companies. Residents of rural Western Loudoun contract with minor solid waste collectors⁶--if available--but often no service is available due to the higher costs associated with rural collection. Within the seven incorporated towns, residents receive service through contracts between the towns and the collectors.

2.2 Population Data and Projections

2.2.1 Population

Three events occurred in the 1960's that changed Loudoun's future to make it now the second fastest growing county in the United States:

- a) Population growth in neighboring Fairfax County;
- b) Construction of the Broad Run Interceptor that would provide sewer service for suburban development in the eastern part of the LCSWMPD; and,
- c) Construction of Washington Dulles International Airport.⁷

Loudoun County's population was 20,000 to 25,000 persons until 1960. During the 1960s, and in each decade that followed, the County's population rose by at

⁵ Loudoun County Codified Ordinances, Chapter 1084.02 (27). Defines major collectors as those that operate four or more collection vehicles and/or collect more than 2,000 tons of solid waste per year.

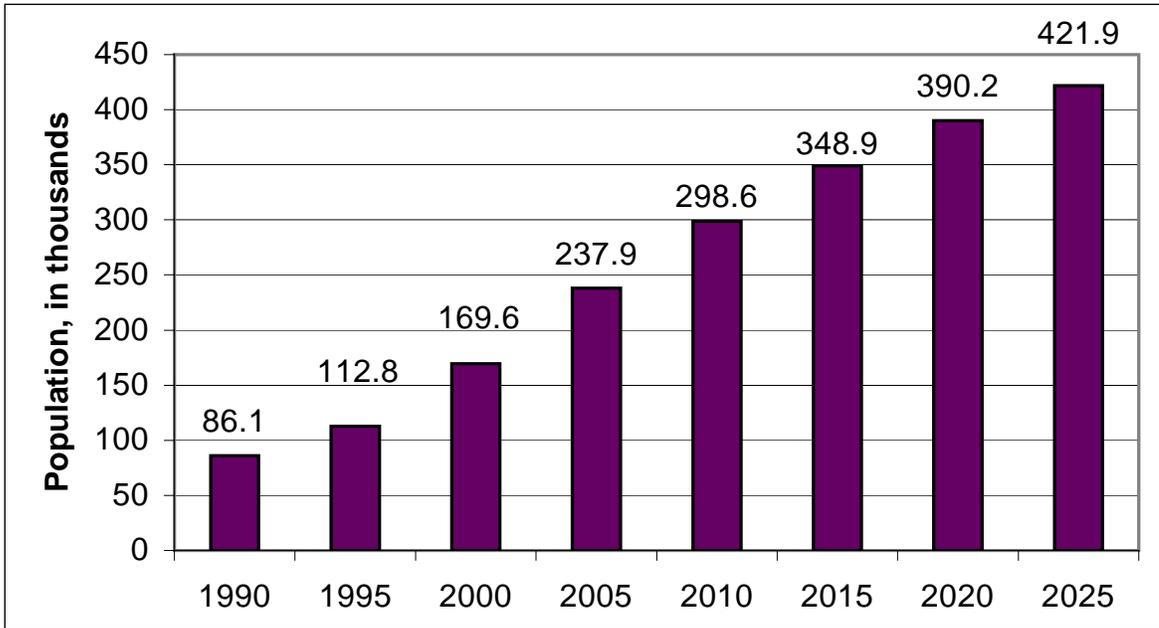
⁶ Ibid. Defines minor collectors as those that operate three or fewer collection vehicles and collect 2,000 tons or less of solid waste per year.

⁷ Loudoun County. *2001 Revised General Plan*. p. 2-1.

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least 50 percent. A population explosion from 24,549 persons in 1960 to 86,129 persons in 1990 amounted to a 250 percent increase in thirty years. By 2000, Loudoun's population had nearly doubled again to 169,599.⁸ This rapid population growth and number of households will be discussed as indicators that affect solid waste generation. **Figure 2-2** shows population figures and projections for Loudoun County.

Figure 2-2: Population, 1990-2025, in thousands of people



U.S. Census provided 1990 and 2000 figures.

Loudoun County Department of Economic Development provided baseline planning estimates for 1995 and 2005-2025.

Other demographic changes occurred between 1990 and 2000. Loudoun's median age increased from 31.5 years to 33.6 years and the average household income grew from \$72,433 to \$97,987. In both cases, these increases were at lower rates than the Northern Virginia and Washington Metro Areas. This may reflect the high percentage of young children in the District and an increase in family size. For 2001, the working-aged sector of the population, aged 25-64 years, represented the largest age cohort in Loudoun County (nearly 59 percent). Loudoun County's average household income is one of the highest in Virginia; however, the County has a relatively lower per capita income, which reflects the large number of households with children.⁹ School-age children comprised the second-largest cohort in 2000--nearly 31% of the population.

⁸ Loudoun County. *2001 Revised General Plan*. p. 2-2.

⁹ Loudoun County Department of Economic Development. *2001 Annual Growth Summary*. p. 20.

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Loudoun's share of the Northern Virginia regional population increased from 5 percent in 1990 to 8 percent in 2000. Population is an important factor in Solid Waste Management planning, as it is population that determines largely the types and amounts of solid waste that will be generated. Generally, as populations increase and become more urban, waste generation rates per capita increase due to both more affluence and smaller parcel sizes. Two other growth indicators that will be used to calculate waste generation are the number of automobiles registered and the number of acres of forested land cleared each year. Cars generate special automotive wastes such as tires, batteries, antifreeze, and waste oil. Landclearing for development generates debris that must be handled either as a commodity or as solid waste.

Table 2-1 shows the growth in each of these five factors (population, households, employment, automobiles registered, and acres of land cleared) from 1990 – 2025.

Table 2-1: Population, Households, Employment, Automobiles, and Landclearing, in thousands

	1990 ¹	1995	2000 ²	2005 ³	2010	2015	2020	2025
Population	86.1	112.8 ⁴	169.6	237.9	298.6	348.9	390.2	421.9
Households	30.5	40.3 ⁵	59.9	84.3	105.8	123.6	138.2	149.4
Employment	50.5	67.3 ⁶	87.0	126.2	165.6	206.0	248.4	294.7
Automobiles Registered	81.1 ⁷	107.3 ⁸	150.1 ⁹	210.7 ¹⁰	264.5	309.0	345.6	373.6
Acres of Land Cleared	Information not available at this time							

1. Loudoun County Department of Economic Development. *2001 Annual Growth Summary*. p. 6.
2. Ibid. p. 5.
3. Loudoun County Department of Economic Development. *Population Projection for 2005*.
4. Loudoun County Department of Economic Development. op. cit. p. 15.
5. Loudoun County Department of Economic Development. loc. cit. Planning projection of 2.8 people per household.
6. Loudoun County Department of Economic Development. op. cit. p. 21.
7. Loudoun County Commissioner of Revenue. 1995 actual rate of 2.66 cars per household.
8. Ibid. Actual number of cars registered as of July 1, 1995.
9. Ibid. Actual number of cars registered as of July 1, 2000.
10. Ibid. Estimate based on 2000 actual rate of 2.51 cars per household.

2.2.2 Households

The number of households is used to calculate waste generation, particularly domestic yard waste generation. The average household size in the District declined from 3.94 in 1950 to 2.80 in 1990, but recent data suggest a shift toward larger households. In 2000, the overall household size was 2.82. Households in

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single-family detached homes averaged 3.1 persons, households in townhouses averaged 2.8 persons, and those in multifamily units averaged 2.0 persons.¹⁰

2.2.3 Employment

From 1990 to 2000, the District's share of employment in Northern Virginia increased from 4.6 percent to 8.5 percent - an increase of more than 85 percent. In 2000, Fairfax County accounted for more than 50 percent of all jobs in Northern Virginia, Arlington County accounted for more than 15 percent, and Alexandria accounted for nearly 9 percent. Through 2020, Loudoun County is projected to experience the fastest job growth in Northern Virginia. An estimated 45 percent of the region's employed are in skilled "white collar" managerial, administrative, executive and professional occupations, reflecting the strong government, technology and business service sector base of the region.¹¹ In terms of solid waste management, high incomes result in increased consumption of consumer goods and waste generation.¹²

Table 2-2 shows 2001 employment in Loudoun County by industry classification.

Table 2-2: At Place Employment in Loudoun by Major Industry Classification and Number of Employees (2001)

Industry Classification	Number
Agriculture	2,418
Mining	198
Construction	9,983
Manufacturing	4,359
Transportation, Communications, Public Utilities	14,711
Wholesale Trade	3,072
Retail Trade	16,158
Finance, Insurance, Real Estate	2,561
Services	29,983
Government (State, Local, and Federal, combined)	13,757
Total	97,200

Source: Loudoun County Department of Economic Development. *2001 Annual Growth Summary*.

The types and number of jobs in a locality affects solid waste generation. For purposes of the current solid waste planning process, employment is an indicator of solid waste generation as at-place employment for the County is a variable used often in economic development and planning for a growth indicator.

¹⁰ Loudoun County, *2001 Revised General Plan*. p. 2-3.

¹¹ Loudoun County Department of Economic Development. *2001 Annual Growth Summary*. p. 9.

¹² Northern Virginia Planning District Commission. (September 1998). *1998 Northern Virginia Solid Waste Status Report*. p. 7.

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2.2.4 Automobiles

Automobiles are an integral part of life in suburban and rural areas. The number of automobiles operating is an important waste generation indicator because it is tracked by the Commissioner of Revenue and because the wastes generated from car maintenance require special handling so they do not pollute the environment. Between 1995 and 2000, the number of cars per household declined slightly in the LCSWMPD, although the total number of cars registered increased.¹³ This could reflect the increase in population coupled with an increase in the average family size. **Table 2-3** illustrates waste generation associated with car maintenance.

Table 2-3: Automobile Waste Generation Projections, in thousands

Waste	1990	1995	2000	2005	2010	2015	2020	2025
Waste Tires ¹	86.1	112.8	169.6	237.9	298.6	348.9	390.2	421.9
Waste Antifreeze ²	36.5	48.3	67.5	94.8	119.0	139.1	155.5	168.1
Waste Oil ³	288.7	382.1	534.3	749.9	941.7	1,100.2	1,230.4	1,329.8
Waste Oil Filters ⁴	288.7	382.1	534.3	749.9	941.7	1,100.2	1,230.4	1,329.8

1. 1000's of tires; estimate based on 1 tire per resident, per year, provided by Allan Lassiter, Waste Tire Program Manager, VA DEQ.
2. 1000's of gallons of antifreeze; usage estimate based on 1.8 gallons per vehicle every 4 years. VA Used Oil, Filter, and Antifreeze Consumer Management Study (UOFACMS), NVRC, Oct 4, 1999.
3. 1000's of gallons of waste oil; estimate based on 3.56 gallons per vehicle, per year, from American Petroleum Institute Study Model (1993) and UOFACMS.
4. 1000's of oil filters; annual use estimate based on 1 oil filter change per gallon of oil used, (UOFACMS).

2.2.5 Landclearing

Landclearing activity is both an indicator and a result of the exponential growth in the District. It is estimated that 3,000 acres of forestland are cleared per year for land development.¹⁴ An acre of woodland cleared for development creates approximately 150 tons of debris waste.¹⁵ Much of this waste is hauled and disposed of by the landclearing company. There is no information available on the degree to which this landclearing waste is reduced by removal of saw timber or firewood, or by burning on site. Therefore, the maximum estimated generation rate is used.

¹³ Refer to Table 2-1, page 2-6.

¹⁴ Dana Malone, Loudoun County Department of Building and Development.

¹⁵ Tim Hutchinson, Loudoun Composting, LLC, and Rick Hurwitz, William A. Hazel, Inc. An acre of woodland generates 600 cubic yards (CY) of mulch and wood chips. The EPA uses a standard weight for these wastes of 500 lbs. per CY.

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2.3 Composition of Solid Waste Generated in Loudoun County

Solid waste is defined in the Virginia Solid Waste Management Regulations as “any discarded material” (9 VAC 20-80-140, A. The full definition is provided under Part III of the regulations.). A reliable description of the composition of the waste stream will help ensure a responsive solid waste management program. While detailed waste stream evaluations are desirable for use in solid waste planning, they are expensive and time consuming to complete, and often do not produce sufficient new information to justify their cost. The waste composition described here is based on the known waste handled in the County by private solid waste companies as reported according to County Ordinances, County solid waste operations and other nonresidential waste-generating activities.

There are eight different “waste types” generated in Loudoun County. The waste types are listed and then defined below:

1. Municipal Solid Waste (MSW)
2. Construction and Demolition Waste (C&D)
3. Vegetative Waste (VW) –includes yard waste and landclearing debris
4. Consumer Separated Recyclables
5. Waste Dirt
6. Hazardous Waste
7. Regulated Medical Waste (RMW)
8. Special Wastes

2.3.1 Municipal Solid Waste (MSW)

MSW is comprised of those wastes generated daily by residential, institutional, or commercial sources. Examples of MSW include household garbage, food waste, inorganic wastes, container packaging, durable and non-durable goods and agricultural wastes.

2.3.2 Construction and Demolition Waste (C&D)

C&D wastes are generated from the renovation, demolition or construction of homes, buildings or development activity. Examples of C&D waste include concrete, lumber, steel, wire, sheetrock/drywall, bricks, shingles, plaster, glass, metal and plastic construction materials.

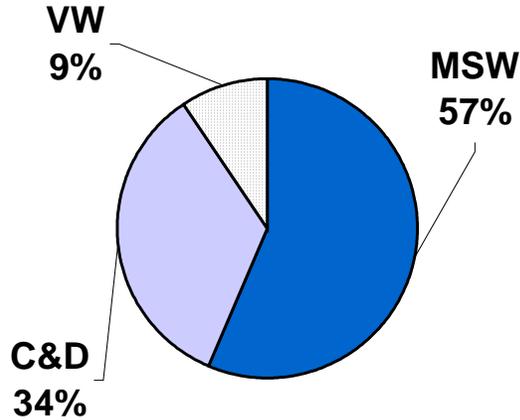
2.3.3 Vegetative Waste (VW)

VW includes yard waste generated by lawn or yard care activities and debris generated from landclearing activities or operations. Examples of VW include decomposable materials such as leaves, grass trimmings, brush, wood chips, tree/shrub trimmings, stumps, logs and tree trunks.

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Figure 2-3 shows generation estimates of MSW, C&D, and VW for 2000.

Figure 2-3: MSW, C&D, and VW as proportions of their total in 2000



2.3.4 Consumer Separated Recyclables

Consumer separated recyclables are those materials separated for curbside collection or transported to recycling collection centers. Examples of recyclables include glass jars and bottles, plastic bottles, aluminum and steel food cans, newspapers, magazines, phone books, mixed office paper, cardboard, paperboard and appliances.

2.3.5 Waste Dirt

Waste dirt is generated in Loudoun County primarily from land clearing and development activities. The District does not have any historical volumetric information with respect to the generation of waste dirt. However, in recent years annual generation rates have steadily increased as a result of land development activities. This solid waste is typically high shrink swell clays and boulders that are not suitable for engineered fills. The waste dirt is often mixed with waste concrete and asphalt or woody materials. Waste dirt is included in this plan as a local solid waste management issue. The District does not intend to consider this material in calculating total waste generation or in the calculation of recycling rates.

2.3.6 Household Hazardous Waste (HHW)

Household hazardous wastes are those residentially generated products that may contribute to soil and water contamination if disposed of improperly. Examples of HHW include mercury thermometers, fluorescent light bulbs, degreasers and solvents, oil-based paints and varnishes, contaminated fuels, insecticide and pesticides.

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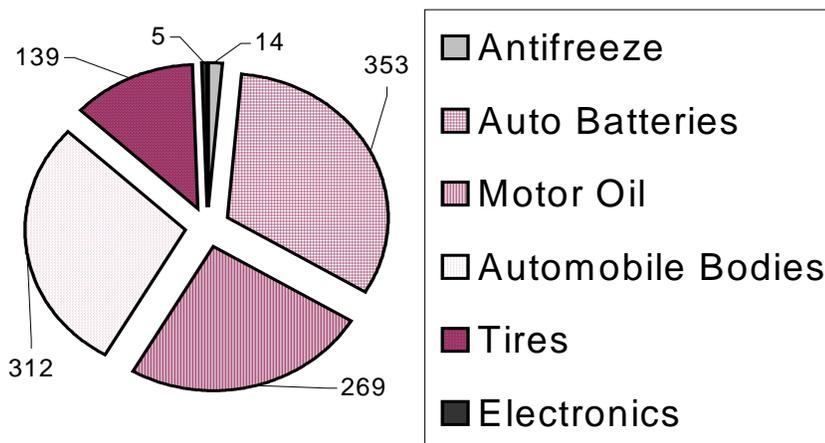
2.3.7 Regulated Medical Waste (RMW)

Regulated medical wastes are generated by hospitals, doctor and dentist offices, clinics and medical facilities. Examples of RMW include discarded vaccines, human blood and body fluids or items contaminated with these fluids, tissues, organs, body parts, needles and syringes (sharps). Regulated medical waste is a source of concern for proper handling, transport and disposal, but is beyond the scope of this Solid Waste Management Plan and is governed under specific State regulations for medical waste.

2.3.8 Special Wastes

Special wastes are those wastes that require special handling and precautions prior to disposal or recycling, and that may be included in the above waste types. Examples of special wastes include waste lumber, petroleum contaminated soils, oil filters, wet cell batteries, refrigerated appliances, asbestos, sludge, waste oil, antifreeze, electronic devices, and waste tires. **Figure 2-4** shows special wastes collected in the County for recycling and reported to the Virginia DEQ as part of the Commonwealth of Virginia Locality Recycling Rate Report for CY 2001 (VA DEQ Form 50-30). While all materials are not included, the report does show the variety of materials captured for reporting to the State. Revisions to the County's Solid Waste Ordinances in 2002 (Chapters 1084 [**Appendix E**] and 1086 [**Appendix F**]) are intended to provide more frequent reporting from the solid waste collectors in the County and hopefully improve the amount and accuracy of the information reported.

Figure 2-4: Special Wastes Collected in Loudoun County, Virginia in 2001 for Recycling – in Tons



Source: Commonwealth of Virginia Locality Recycling Rate Report, 2001

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Other special wastes that are generated in the County include sludge, septage, asbestos, spill residues, and agricultural wastes. Mining wastes are not generated in Loudoun County. Sludge, septage, asbestos, spill residues, and agricultural wastes are collected in Loudoun County for disposal primarily by specialized firms under contract to individuals, businesses, or government entities. The quantities of these wastes that generated in the County are unknown.

2.3.9 Hazardous Waste

Hazardous waste is a source of concern for proper handling, transport and disposal, but is beyond the scope of this Solid Waste Management Plan and is governed under specific State regulations for hazardous waste.

2.4 Solid Waste Generation Projections

LCSWMPD's solid waste generation rate depends on previously discussed factors of population, households, employment and other business, institutional, industrial, agricultural and manufacturing solid waste sources. Solid waste also includes special wastes such as automotive maintenance wastes, yard waste (brush, yard trimmings, leaves) from households, commercial landscaping, agricultural activities and landclearing for development.

2.4.1 Data Sources Used in Determining Waste Generation

Effective solid waste management planning requires methods for approximating the quantities of each waste type generated. Information available for identifying waste types and for estimating waste quantities in Loudoun County include:

- National per person estimates of MSW;
- National estimates for yard waste generation;
- Acres of woodland cleared for debris waste generation;
- National estimates for C&D waste generation;
- Annual reports from solid waste collectors permitted to operate in the District;
- Annual reports from solid waste facilities permitted to operate in the District;
- Regional solid waste management reports & jurisdictional comparisons; and,
- Annual compilations from the Office of Solid Waste Management for the County's Solid Waste Information and Assessment Program (VA DEQ Form 50-25) and the County's annual Commonwealth of Virginia Locality Recycling Rate Report.

Waste volume projections have been estimated on the following assumptions:

- Population is the best growth indicator, especially in one of the fastest growing jurisdictions in the country, and a good measure of waste generators in terms of volume and type of waste;

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- Number of households is a growth indicator that also affects waste generation rates over time;
- Employment numbers indicate commercial activity and affect waste generation;
- Special waste generation can be demonstrated by estimating waste generated from a base number such as number of automobiles for the various waste types of associated wastes;
- Rapid development in the County generates large quantities of additional waste such as C&D and landclearing debris.

In making long term waste generation projections, estimates were made for residential generators including population and number of households. Other growth and economic indicators have been used to project waste generation including employment, special wastes from the perspective of automobiles operating in the County, and acres of land cleared for development that can then generate estimates of certain debris waste. Factors for calculating estimates of waste generation rates are described below in **Table 2-4**.

Table 2-4: Calculating Waste Quantity Estimates

Waste Material	Calculation Based on
Municipal Solid Waste (MSW)	Actual District generation of 7.3 pounds per person per day
Construction and Demolition Waste (C&D)	EPA Estimate of 2.8 pounds per person per day
Vegetative Waste (VW) –yard waste	Estimate of 0.4 tons per household per year
Vegetative Waste (VW) –debris waste	3,000 Acres of woodland cleared per year and 150 tons of vegetative waste generated per acre
Consumer Separated Recyclables	Annual Solid Waste Collector Reports to County, County program and contracted service reports
Hazardous Waste	No estimate available
Household Hazardous Waste	County program and contracted services reports
Regulated Medical Waste	No estimate available
Special Wastes	Annual Solid Waste and Assessment Reporting to County, County special waste collection program, and contracted service reports

Quantifying solid waste can serve as a basis for important policy and financial decisions. Policy decisions can begin with a review of the solid waste system, how well the system is working for current and future conditions, and whether new or changed policies can affect the system. Financial decisions can be made

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based on waste estimates for planning and funding desired future solid waste management infrastructure, whether for more recycling, materials recovery and processing, waste transfer, or disposal.

Table 2-5 projects waste generation for the period 1990 to 2025. The twenty-year planning horizon in this Solid Waste Management Plan moves out to approximately 2025, so the projection provides a 35-year look at the County’s solid waste generation rates. The year 1990 is used as a benchmark here for two reasons:

- 1) The decade between 1990-2000 represents a nearly 100% increase in the District’s growth and consequently in the generation of solid waste within the District, and
- 2) The County had accurate numbers for waste generation in 1990 since all of the County’s solid waste was handled by the County’s Solid Waste Management Facility.

Table 2-5: Waste Generation for Loudoun County, 1990-2025, in thousands of tons per year

Type of Waste	1990	1995	2000	2005 ¹	2010	2015	2020	2025
MSW	68.8 ²	90.2 ³	142.3 ⁴	316.8 ⁵	397.8	464.8	519.9	562.1
C&D Waste	44.0 ⁶	57.7	86.7	121.6	152.6	178.3	199.4	215.6
Yard Waste	12.2 ⁷	16.1 ⁸	23.6 ⁹	28.1 ¹⁰	35.3	41.2	46.1	49.8
Debris Waste ¹¹	25	30	40	45	45	45	45	45
Total	150.0	194.0	292.5	433.4	537.6	615.6	682.2	733.9

1. Loudoun County Department of Economic Development. Waste generation figures for 2005-2025 is based on standard per-person and per-household multipliers and population projections.
2. Extrapolation based on trends.
3. Loudoun County. (1995). *Loudoun County Solid Waste Management Plan*.
4. Loudoun County. (2000). *Commonwealth of Virginia Locality Recycling Rate Report*.
5. Loudoun County. 7.3 pounds per person per day, based on actual reports from solid waste collectors and facilities in Loudoun County for CY2003.
6. U.S. EPA. (June 1998). 1990-2025: 2.8 pounds per person per day, from “Characterization of Building-related C&D in the U.S.”
7. This number calculated by 0.4 tons per household, the effective rate in CY2000.
8. Ibid.
9. Loudoun County. loc. cit.
10. 2005-2025: one-third of a ton per household per year.
11. X acres multiplied by 150 tons of waste generated per acre

2.5 Solid Waste Management System Demand

An effective Solid Waste Management Plan must assess the County’s current and future demand for solid waste management resources. Chapter 2

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demonstrates the demand for a solid waste system that can accommodate various types of waste and an increase of 53 % in waste tonnage (253 tons to 388 tons) from 2000 to 2005 and a 172 % increase in waste tonnage (253 tons to 689 tons) from 2000 to 2025.

Chapter 3 will describe the system required to manage these waste volumes and types. The system components include collection, transportation, transfer, and processing of solid waste as well as the diversion of solid waste for reuse and recycling for the major waste types of MSW, C&D, Yard, and Debris waste. Chapter 3 will also describe the components that are in place in the solid waste management system, the current and projected capacity of various components to handle the demand, and whether and when action should be taken to ensure the system's viability.