

**CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF SOLID WASTE**



**TEN YEAR SOLID WASTE MANAGEMENT PLAN
JULY 2002**

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**BUREAU OF SOLID WASTE
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**TEN YEAR SOLID WASTE MANAGEMENT PLAN
JULY 2002**



INTRODUCTION

INTRODUCTION

STATEMENT OF PURPOSE

The purpose of this Ten Year Solid Waste Management Plan is two-fold. One purpose is to provide the citizens of Baltimore with a description of the City's current and future solid waste management system. The second purpose is to comply with Maryland regulations. This plan is an update to the Solid Waste Management Plan that was adopted by the Baltimore City Council on March 7, 1995. The 1995 Plan, as is this update, was prepared in accordance with current state planning regulations (Code of Maryland Regulations, Title 26, Chapter 03, Part 03, or COMAR 26.03.03).

The Ten Year Solid Waste Management Plan is divided into five chapters. The first chapter presents the legal and institutional framework for our waste management system, including City goals and objectives. Chapter 2 presents demographic and land use information for the City. Chapter 3 provides waste generation data as well as estimates for waste generation and characterization. It also provides information on current waste management facilities in the City. Chapter 4 assesses and evaluates the operation of our current system and its future potential. Chapter 5 presents a plan of action to be implemented by the City to achieve its solid waste management goals.

PLAN APPROVAL PROCESS

The Bureau of Solid Waste, a unit of the Baltimore City Department of Public Works, prepared this Plan. Affected agencies inside the Department of Public Works, most notably the Office of Recycling and the Bureau of Water and Waste Water, provided input and reviewed the information contained in the plan. There were many other contributors to this plan, including the Baltimore City Department of Planning, Northeast Maryland Waste Disposal Authority, and neighboring Counties. As this is an update of an existing plan, comments from the Maryland Department of the Environment (MDE) were addressed, as requested. A draft version of the Plan was submitted to MDE for preliminary review prior to developing the final Plan. A final draft of the plan was prepared and submitted to the Baltimore City Council, followed by a series of public hearings.

Comments received at the public hearings were addressed and incorporated into the final plan, as appropriate. Comments received during the approval process for the 1995 version of the Plan

were also addressed in this update. The final plan was approved by the City Council on _____, 2003. The approval resolution from the City Council is included in Appendix E.

CERTIFICATION

Through its approval by the Baltimore City Council, this Plan is certified to be in compliance with all City planning and zoning requirements. The Planning Commission recommendation to the City Council is included in Appendix E.

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DEPARTMENT OF PUBLIC WORKS
BUREAU OF SOLID WASTE**

**TEN YEAR SOLID WASTE MANAGEMENT PLAN
JULY 2002**



EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

INTRODUCTION

The purpose of the Ten Year Solid Waste Management Plan is to provide citizens with a description of the City's solid waste management system, as required by State law. Readers of the plan will become familiar with the City's accomplishments and goals regarding solid waste management.

GOAL FOR SOLID WASTE MANAGEMENT:

The City's goal for solid waste management is to protect the public health, safety, and welfare through the provision of comprehensive trash collection, recycling, City-wide cleaning and solid waste disposal in accordance with the mandates of the City, State and Federal governments.

ACHIEVING THE GOAL

In proceeding toward this goal, the City has made a commitment to pursue an aggressive, yet environmentally sound strategy of integrated solid waste management utilizing waste reduction, recycling, composting, waste-to-energy incineration, and landfilling. This strategy includes many of the following elements:

- Practice and promote waste reduction and waste prevention behaviors;
- Maximize the collection and processing of recycling materials, including yard waste;
- Expand educational and community outreach programs;
- Expand the role of sanitation enforcement efforts;
- Utilize performance measurement (CITISTAT) to monitor quality of service;
- Recover energy from and reduce the volume of combustibles;
- Evaluate and implement new technologies to increase efficiency of existing programs;
- Evaluate and improve the routing component of the City's solid waste disposal system;
- Utilize Capital Improvement projects to build and update facilities;
- Identify ways to prolong the life of the Quarantine Road Sanitary Landfill (QRSL);
- Monitor legislation as it is related to the impact of the Solid Waste Plan.

Integrated waste management, which utilizes source reduction and recycling, incineration and landfilling, was recommended in the U. S. Environmental Protection Agency's (EPA) 1989 *Agenda for Action*. This agenda was developed to guide the nation in responding to the "solid waste disposal crisis" that resulted from increased waste generation and decreased landfill capacity. The EPA concerns were that landfill capacity would be insufficient to meet disposal needs due to existing landfills reaching capacities, as the siting procedures for new facilities were becoming more difficult.

To address the disposal crisis, the EPA recommended not only that source reduction and recycling be increased, but also incineration and landfilling be utilized at facilities that meet Federal and State regulations. Only through an integrated approach could the country's disposal capacity be brought into line with its disposal needs.

However, the last five years have seen an overall increase in the construction of very large landfills or "mega-fills" in the United States, that are accepting material at relatively low tipping fees. There are circumstances in which landfilling of certain recyclable materials is more cost-effective than the process involved in the re-use of the material.

It is also important to recognize that no one knows about solid waste management options that may present themselves over the next ten years, just as ten years ago the use of "mega-fills" was not a feasible option. Both incineration and landfilling are subject to increasingly more stringent health and environmental regulations. The viability and acceptability of both these disposal methods as long term solutions to solid waste disposal has been weakened by emerging medical and environmental information about the impacts of incineration and landfilling. The cost to protect public health and the environment from the consequences of traditional waste disposal methods has increased dramatically and is expected to increase in the future. All this while City government struggles with a steadily declining tax base and revenue flow.

Alternatives to incineration and landfilling are relatively new and their success is not guaranteed. For example, solid waste composting may not be economically viable, nor be able to produce saleable material. In addition, the environmental health impacts of solid waste composting are not fully known. The recycling industry's track record has been analyzed both optimistically and pessimistically with varying opinions as to its growth potential. The major benefit of an integrated solid waste management strategy is the pursuit of a range of options without relying on any single method.

Although this change in disposal strategy has permeated the solid waste management establishment, the City believes its integrated waste management strategy will be utilized successfully over the next ten years, with few modifications. The agreement with Baltimore Resource Energy Systems Company (BRESKO) for the disposal of wastes at its waste-to-energy facility and the available capacity at the Quarantine Road Sanitary Landfill ensure a solid foundation for solid waste management in the City by the City for the period covered by this plan. The City's recent emphasis has been and will continue to be directed at the waste reduction and recycling aspects of this strategy. The following sections will describe how these goals will be achieved.

WASTE REDUCTION AND RECYCLING

- Develop, promote, and monitor a Waste Reduction Program.
- Continue the educational strategy to assist citizens and businesses in practicing waste reduction.
- Investigate and develop new aspects of the recycling program to expand yard waste collection.
- Expand the participation base in the recycling program to include more institutions (schools, City offices and businesses, places of worship).
- Encourage multi-family dwellings and public housing units to provide recycling facilities for tenants or residents.
- Continue an aggressive recycling education campaign.
- Continue the City's Recycling Program, which is expected to have a significant impact in diverting valuable materials from the solid waste stream. The City plans to increase recovery of the residential recycling waste it collects from 12 percent in 1996 to 25 percent in 2008.

COLLECTIONS

The Bureau of Solid Waste's Collections Division is responsible for all trash collection and cleaning services provided by the City. Its Routine Services Section is responsible for residential mixed refuse collection services as well as Business District, lot, street and alley cleaning. Its Special Services Section is responsible for Citywide recycling; waterway cleaning; and the collecting and cleaning of residential bulk, leaves, graffiti, eviction chattel, and fire debris. This division is also charged with collection from condominiums, rat eradication, and the support and coordination for community clean-ups

City crews currently collect approximately 500,000 tons of debris and recycling from households and small businesses each year. To maintain effective household collection services, and to keep the City clean, Baltimore plans to:

- Improve customer service and quality control regarding the collection of mixed refuse and recycling materials.
- Evaluate and implement new technology, such as Geographical Information System (GIS) tracking system and high density load packers.
- Conduct a complete assessment of routes in the City and implement modifications where needed and where feasible.
- Update and improve maintenance of waste collection vehicles.

- Continue working with all City agencies and community groups to educate the public on using the proper method of disposing of debris and keeping communities clean.
- Continue to evaluate and use specialized equipment, which will allow employees to maximize productivity, while minimizing man power.
- Continue the use of seasonal workers to address special events such as park cleaning, parades, City festivals, snow removal, community clean-ups and leaf collection during specified times of each year.
- Expand support for communities' participation in community clean-ups.
- Solicit support to relieve the City from the responsibility of removing and/or storing eviction chattel.

MATERIALS RECOVERY

Once the waste is collected, the next objective is to reduce the volume of material requiring disposal. The City's system relies mainly on contracts with private businesses to process the recycling material. Contracts are already in place to handle office paper, "white goods", (such as discarded refrigerators and stoves), mixed household paper, commingled (plastic, metal, and glass containers from households) and tires. To provide increased processing of recycling materials, the City plans to:

- Continue to work with the Baltimore Development Corporation (BDC) and Empower Baltimore to retain and attract recycling businesses. Develop an Eco-Industrial Park with recycling businesses as part of the City's empowerment strategy.
- Monitor the recovered materials markets and support regional and State efforts to expand these markets.
- Investigate the development of a comprehensive composting plan and continue a wood waste chipping operation.
- Support regional recycling of residential and commercial waste through advertising.
- Increase Maryland Recycling Act materials counted in the State report, to include such materials as composted, sewage sludge, and construction and demolition debris (C&D).

ENERGY RECOVERY

BRESCO plays a key role in the City's integrated solid waste management strategy. This facility reduces the volume of waste that must be landfilled by approximately 75 percent. Increasingly stringent environmental controls by the Federal and State governments mandate that this facility does not threaten public health.

Approximately 280,000 tons of City-collected waste is processed annually at the BRESCO plant under a long-term contract. The City expects to continue using BRESCO for the next ten years as a means of reducing dependence on fossil fuel for steam and electricity production while minimizing the amount of waste that must be landfilled. The City has recently completed its negotiations, extending the contract with BRESCO through 2011.

LANDFILL DISPOSAL

The Quarantine Road Landfill (QRSL) remains an essential component of the City's integrated waste management strategy since non-processible waste and residue require a safe landfill for disposal. The QRSL has a conservative, projected life until 2019. The City plans to:

- Conduct a feasibility study for siting and building a new landfill to meet the City's and region's future landfill needs
- Construct Cell 6 Phase II, based on new life span data for the QRSL.
- Evaluate and utilize new technologies designed to prolong the landfill life.
- Monitor and respond to new developments regarding disposal of incinerator ash.
- Implement programs to assure conformance with maintenance-oriented requirements of the landfill.
- Evaluate leachate management and the possible utilization of landfill gas as an energy source.
- Assess the feasibility of expanding the Pennington Avenue Landfill, in coordination with Anne Arundel County.
- Monitor and respond to new State and Federal regulations.

OUTLOOK FOR THE FUTURE

The outlook for solid waste management in the City of Baltimore over the next ten years is positive. Adequate capacity exists at QRSL and BRESKO to accommodate current and projected levels of waste generation. It should be recognized that changes are occurring rapidly in the solid waste industry and that this Plan will require continuous review and updating at three year intervals.

The City of Baltimore has moved assertively to assure adequate landfill capacity, to develop a regional waste-to-energy facility, and to establish comprehensive recycling collection for all City households. The elements of this Plan ensure that the City is fully prepared for the solid waste challenges of the next ten years.

**CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF SOLID WASTE**

**TEN YEAR SOLID WASTE MANAGEMENT PLAN
JULY 2002**



***CHAPTER 1
GOALS AND INSTITUTIONAL/REGULATORY SETTING***

1.0 GOALS AND INSTITUTIONAL/REGULATORY SETTING

State regulations for the development of comprehensive solid waste management plans require that Chapter 1 discuss the subdivision's goals regarding solid waste management; the structure of the subdivision's government as it relates to solid waste management; and State, Federal and local laws and regulations which effect the planning, establishment and operation of solid waste disposal systems by the subdivision. These subjects are addressed in Sections 1.1, 1.2 and 1.3. Section 1.4 describes the public participation processes used in developing this plan and for siting solid waste acceptance facilities.

1.1 GOALS REGARDING SOLID WASTE MANAGEMENT

Since 1872, Baltimore City has provided solid waste collection and disposal services for its citizens in an effort to safeguard public health. While waste that once was collected in horse-drawn carts is now collected in sleek, trash compacting motor vehicles, the original purpose of protecting public health remains.

The effective collection and disposal of solid waste is critical to public health, especially in a high-density urban area like Baltimore City. Efficiently using the City's limited financial resources is vital if sanitation needs are to be met and public health protected. Therefore, the City's major goal regarding solid waste management is to provide and facilitate proper sanitation, including the collection and disposal of all wastes generated within the City, as cost effectively as possible.

The City's primary concern in managing solid waste is for those materials for which it has collection and disposal responsibility. This consists mainly of wastes generated at single-family residences and at condominiums under contract with the City. While the City also collects from some multi-family residences and commercial and industrial establishments, private contractors typically provide collection services in these areas.

The City believes that it can collect and dispose of residential solid waste most effectively and efficiently through an integrated waste management system. Integrated waste management utilizes source reduction, recycling, and incineration, along with the traditional use of landfills as a comprehensive waste management strategy.

Integrated waste management was a recommendation contained in the U.S. Environmental Protection Agency's (EPA) 1989 Agenda for Action. This agenda was developed to guide the nation in responding to the "solid waste disposal crisis" that resulted from increased waste generation and decreased landfill capacity. The EPA concern was that the landfill capacity would be insufficient to meet disposal needs due to existing landfills reaching capacity, as the siting procedures for new facilities were becoming more difficult. Thus, to address the

disposal crisis, the EPA recommended increased source reduction and recycling, and recommended that incineration and landfilling be utilized at environmentally sound facilities. Only through such an integrated approach could the country's disposal capacity be brought into line with its disposal needs.

The City seeks to reduce the amount of solid waste generated and disposed of through source reduction and recycling. The City is rapidly approaching its goal of 40 percent of the waste stream to be recycled by 2007 (see Section 3.3.3). The City seeks to reduce the amount of waste that must be landfilled by utilizing resource recovery facilities for wastes that are not recycled. Finally, it seeks to ensure proper landfilling of wastes that are neither recycled nor incinerated as well as the residues generated from recycling and incineration.

Recycling issues are discussed in greater detail in the Baltimore Regional Recycling Plan. This document is incorporated by reference into this comprehensive solid waste management plan.

1.2 CITY GOVERNMENT STRUCTURE

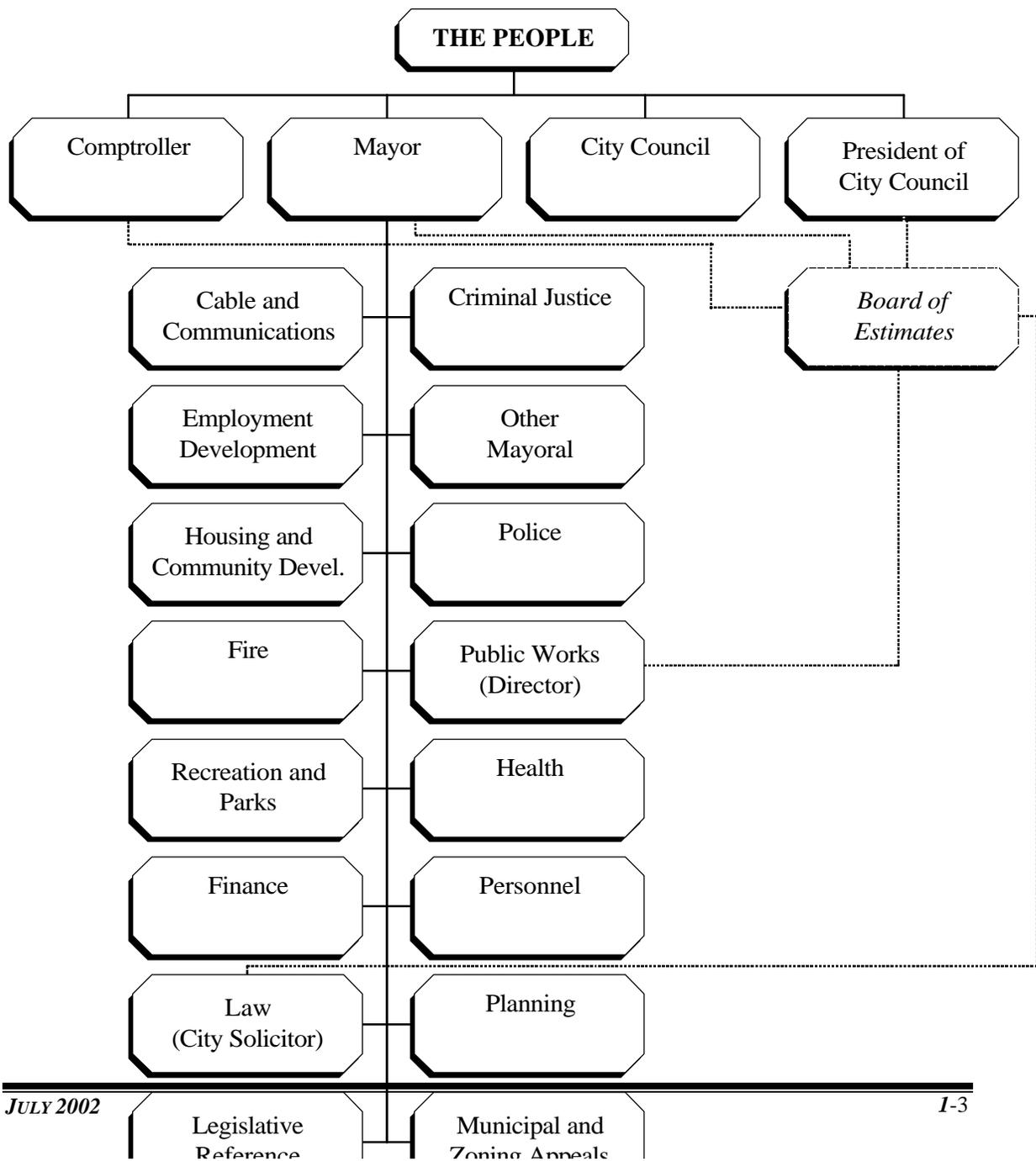
In the City of Baltimore, the Department of Public Works has the major responsibility for planning and implementing solid waste management programs. This responsibility is assigned to the Bureau of Solid Waste. Figures 1-1, 1-2 and 1-3 represent the Organization Charts for the City of Baltimore, The Department of Public Works and the Bureau of Solid Waste, respectively. The format by which the Bureau of Solid Waste operates through its Collections Division, Environmental Services Division and Education and Enforcement Division is shown in Figures 1-4, 1-5 and 1-6.

The Bureau of Solid Waste's Collections Division is responsible for all trash collection and cleaning services provided by the City. Its Routine Services Section is responsible for residential mixed refuse collection services as well as Business District, lot, street and alley cleaning. Its Special Services Section is responsible for Citywide recycling; waterway cleaning; and the collecting and cleaning of residential bulk, leaves, graffiti, eviction chattel, and fire debris. This division is also charged with collection from condominiums, rat eradication, and the support and coordination for community clean-ups

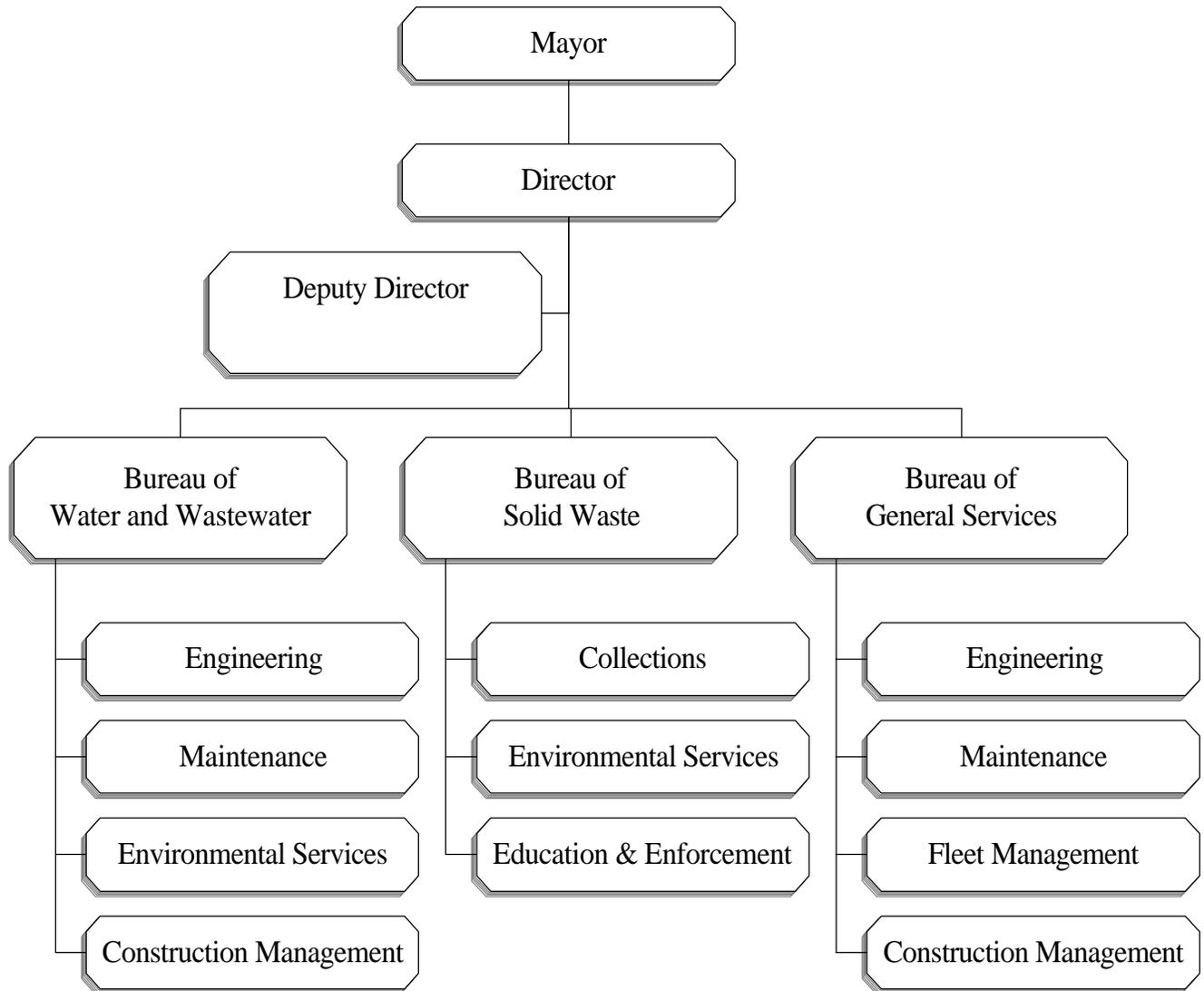
The Bureau's Environmental Services Division provides engineering and project management for its Capital Improvement Program. It also operates and maintains the Northwest Transfer Station, Quarantine Road Sanitary Landfill and all closed landfills that are owned by the City. This division is responsible for compiling the information in this Ten Year Solid Waste Management Plan.

The Education and Enforcement Division is the training and compliance arm of the Bureau. This division is responsible for the internal training of its employees and the dissemination of information regarding solid waste issues to the general public. This division is also responsible for coordinating efforts to enforce regulations that keep the City clean through the proper collection and disposal of solid waste.

**FIGURE 1-1
BALTIMORE CITY MUNICIPAL ORGANIZATIONAL CHART**



**FIGURE 1-2
DEPARTMENT OF PUBLIC WORKS ORGANIZATIONAL CHART**



Other Bureaus and Divisions within the Department of Public Works provide technical knowledge and assistance in solid waste programs. Also, to ensure that the collection, handling, and disposal of solid waste does not become a public health or environmental hazard, the City's Health Department, in conjunction with the Maryland Department of the Environment (MDE), monitors the City's solid waste management system and periodically inspects privately owned solid waste facilities. As of March 2000, the Baltimore City Police Department helps in the enforcement of sanitation regulations in the City as part of Mayor Martin O'Malley's "War on Crime and Grime."

**FIGURE 1-3
BUREAU OF SOLID WASTE ORGANIZATIONAL CHART**

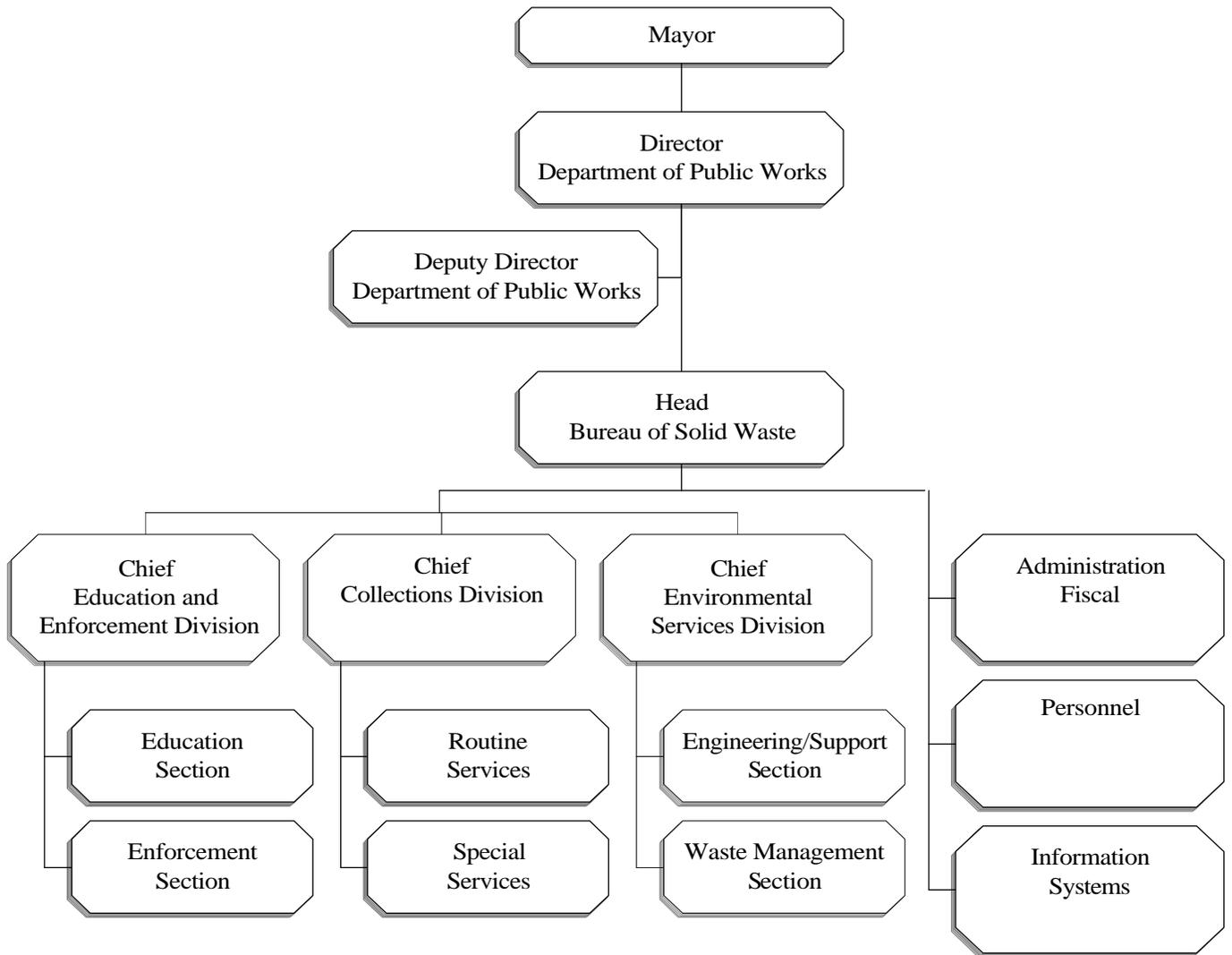


FIGURE 1-4
COLLECTIONS DIVISION ORGANIZATIONAL CHART

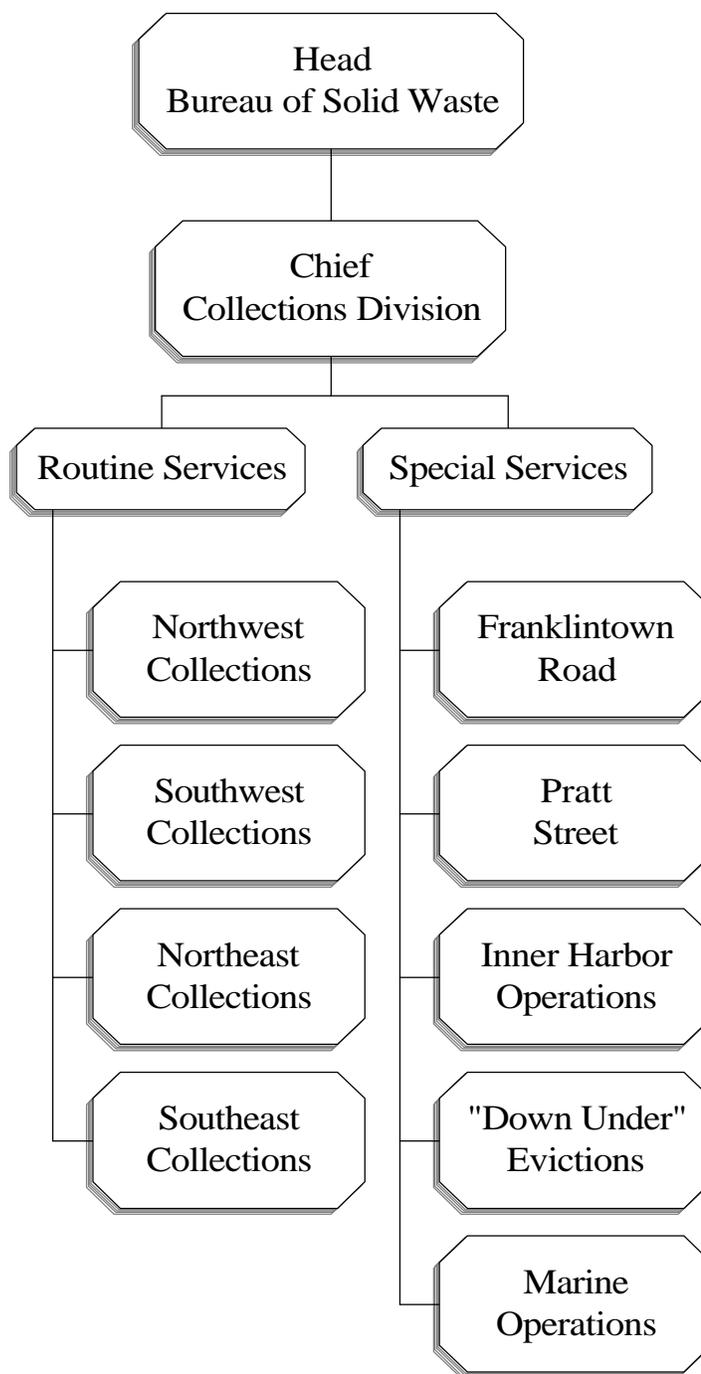


FIGURE 1-5
ENVIRONMENTAL SERVICES DIVISION ORGANIZATIONAL CHART

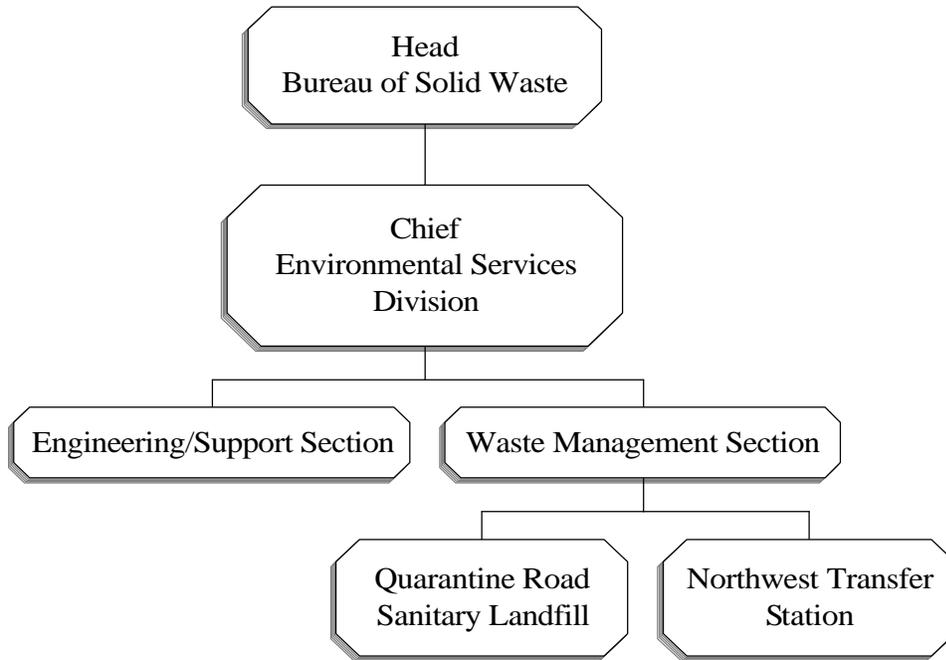
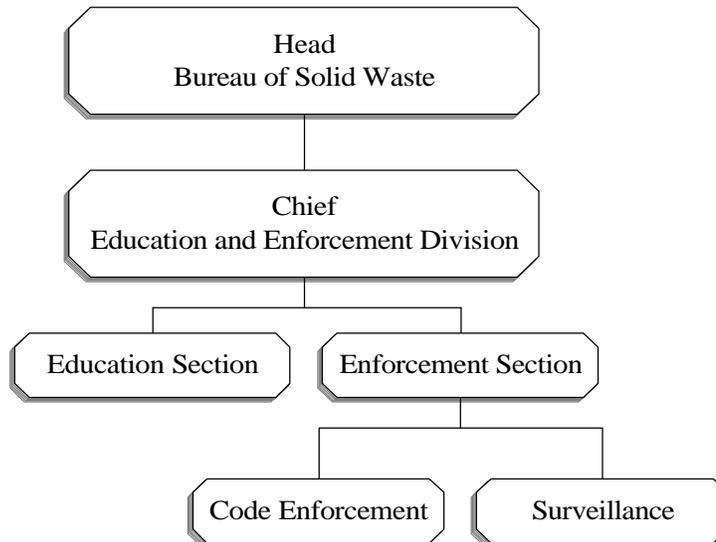


FIGURE 1-6

EDUCATION AND ENFORCEMENT DIVISION ORGANIZATIONAL CHART



1.3 LAWS AND REGULATIONS

Solid waste planning is primarily a local responsibility. Federal and State laws and regulations control local practices to protect public health and welfare. The major Federal, State and City laws and regulations related to

solid waste management are listed below. The implications of these laws and regulations are discussed throughout this plan, especially in Section 4.3.

1.3.1 Laws and Regulations Focusing On Municipal Solid Waste

1.3.1.1 Federal Laws and Regulations

Federal Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901 et seq.

In 1976, the Federal Resource Conservation and Recovery Act (RCRA) was passed to improve solid waste disposal methods. It was amended in 1984 by the Hazardous and Solid Waste Amendments.

An expressed objective of RCRA is to “provide for the promulgation of guidelines for solid waste, collection, transport, separation, recovery and disposal practices and systems.” RCRA is divided into nine subtitles, A through I.

Under Subtitle C, hazardous waste is regulated through standards for generators, transporters, owners and operators of hazardous waste treatment, storage and disposal facilities, and for the management of specific hazardous wastes and management facilities. Subtitle C established a “cradle to grave” hazardous waste management system. The Environmental Protection Agency (EPA) has authorized the State of Maryland, through the Maryland Department of the Environment, to administer a State hazardous waste program, which generally parallels the Federal program.

Under Subtitle D, municipal solid waste is regulated through technical standards for solid waste management facilities and a program under which States may develop and implement solid waste management plans.

Subtitle F of RCRA requires the Federal government to participate actively in procurement programs to foster the use of recycled materials. The role of the EPA in the Subtitle F program is to prepare guidelines for procuring products made from recovered materials.

Federal Municipal Waste Management Regulations (40 CFR Part 258)

On October 9, 1991, the EPA promulgated new Federal requirements for construction and operation of municipal solid waste landfills in accordance with Subtitle D of RCRA¹.

The Federal regulations set forth minimum criteria for municipal solid waste landfills which include: location restrictions, operating requirements, design criteria, groundwater monitoring and corrective action protocol,

¹ RCRA – Federal Resource Conservation and Recovery Act

closure and post-closure care, and financial assurance requirements. New Federal regulations require random inspections of incoming loads at landfills and training of all relevant personnel are now required. The regulations also impose an extensive record keeping protocol.

With respect to air emissions, the Federal regulations require quarterly monitoring of methane levels at municipal solid waste landfills. Furthermore, the Federal regulations prohibit violations of a Clean Air Act State Implementation Plan. In March 1996, EPA promulgated a regulation governing emissions from municipal solid waste landfills, which emit more than 50 megagrams of volatile organic compounds (VOCs). EPA also established a New Source Performance Standard (“NSPS”) for new municipal solid waste landfills, which include those which began construction, modification, reconstruction, or began accepting waste after May 30, 1991. The NSPS requires the owner or operator of a municipal solid waste landfill having a design capacity less than 2.5 million megagrams to submit an initial design capacity report. Larger facilities must submit a design plan for a gas collection control system.

With respect to closure, the Federal regulations dictate that closure must begin within 30 days of the last deposit and must be completed within 180 days. Generally, post-closure groundwater, gas, and leachate monitoring must be performed for 30 years. Subtitle D also imposes substantial financial assurance requirements that will assure the ability to pay for closure, post closure and corrective action.

The effective date of the regulations was October 9, 1993, except for financial assurance requirements (effective October 9, 1994) and groundwater monitoring requirements (phased in beginning October 9, 1994). Facilities that stopped receiving waste prior to the publication date are exempt from the Federal rule. Facilities that stop receiving waste prior to the effective date are exempt from the Federal rule except for the final cover requirement. Facilities that receive waste after the effective date must comply with all requirements of the Federal rule. MDE received a final partial approval of its Municipal Solid Waste Landfill Program on August 2, 1995. Until MDE receives full and final approval, a municipal solid waste landfill is subject to both Federal and State regulations.

States with existing solid waste regulation programs, such as MDE, will be required to apply to EPA for program approval in accordance with the State/Tribal Implementation Rule. This rule has not been published to date.

1.3.1.2 State Laws and Regulations

State Laws Governing the Construction and Operation of Solid Waste Acceptance Facilities Generally
(Environment Article of the Annotated Code of Maryland §§ 9-101 through 9-229)

Subtitle 2, Part II of the Environment Article establishes permit requirements to construct and operate refuse disposal systems (sanitary, rubble and industrial landfills, transfer stations, solid waste acceptance facilities, solid waste processing facilities and incinerators) as part of the State's overall power to regulate water supply, sewerage facilities, and refuse disposal systems. It sets forth requirements for public hearings for waste disposal facilities; landfill permit provisions (issuance, denial, revocation, term); security requirements for landfills, incinerators, and transfer stations; prohibitions on siting and waste acceptance; and financial assurance requirements for sanitary landfills.

Under § 9-228, scrap tires may not be stored longer than 90 days, and a Statewide scrap tire recycling system is established. The material from scrap tires is to be recovered and reused, or if this is impractical, the tires may be incinerated. Scrap tires may not be disposed of in a landfill.

Under §§ 9-1701 and 9-1708, a system for wood waste recycling activities is established. Recycling of tree debris, grass clippings and other natural vegetative matter is regulated under COMAR 26.04.09.

State Ten-Year Solid Waste and Recycling Plan Requirements (Environment Article of the Annotated Code of Maryland § 9-501 through § 9-512, § 9-1703)

These sections of the Annotated Code require Maryland counties and Baltimore City to prepare comprehensive water, sewer and solid waste plans that describe that jurisdiction's requirements for the next ten years. The jurisdiction must review these plans at least once every 3 years. In counties with populations greater than 150,000, the plan must include a recycling plan that provides for a reduction through recycling of at least 20 percent of the county's solid waste stream by weight. Full implementation of such recycling plans was required by January 1, 1994. The Baltimore Regional Recycling Plan is incorporated into this Solid Waste Management Plan by reference.

Maryland Solid Waste Management Regulations (COMAR 26.04.07)

This chapter of COMAR includes permitting requirements, operating procedures, closure requirements, and post-closure monitoring requirements for sanitary, rubble, land clearing debris, and industrial landfills. This chapter also describes permitting and operating procedures for processing facilities, transfer stations, and incinerators. In addition, this chapter provides guidelines and requirements for construction plans, specifications and operation procedures for waste acceptance facilities.

Development of County Comprehensive Solid Waste Management Plans (COMAR 26.03.03)

This chapter of COMAR describes the solid waste plan's required contents, and the proper procedures for revising/amending the plan.

Storage, Collection, Transferring, Hauling, Recycling, and Processing of Scrap Tires (COMAR 26.04.08)

This section of COMAR establishes a regulatory system for proper management of scrap tires. MDE authorizes scrap tire facilities and haulers by issuing licenses and approvals for facilities. The regulations provide general technical and operational standards for scrap tire facilities including storage procedures, closure procedures, and financial assurances. The system is to be funded by a recycling fee of one dollar per tire for each new tire sold in the State.

Natural Wood Waste Recycling Facilities (COMAR 26.04.09)

Management of natural wood waste recycling facilities is regulated under this part of the code. Permitting requirements for processing facilities are established. General operational requirements and procedures are prescribed.

Rubble Landfill Regulations

In the fall of 1997, MDE adopted regulations to require liners and leachate collection systems for any new rubble facilities or new cells at existing facilities. Existing facilities needed to install liners and leachate systems, or close by July 2001.

1.3.1.3 City Laws

Sanitation, Article 23, Baltimore City Code Subtitles 1 through 21.

Article 23 of the Baltimore City Code deals directly with the collection and disposal of solid waste in the City. It defines in detail the responsibilities of the City and the citizen regarding the handling of solid waste. The City's responsibilities include the collection of mixed refuse (under the purview of the Director of Public Works), the cleaning of City thoroughfares, and the frequency of collection from households. Citizens' responsibilities outlined in the article include the number and sizes of containers allowed to be set out for collection, and what is not allowed to be set out for collection. Article 23 details fees associated with operating solid waste hauling vehicles as well as fines for violating these regulations. The article in its entirety is included in Appendix D.

Health Code of Baltimore City – Title 7

Title 7 of the Health Code deals directly with the handling and transportation of solid waste by private enterprises that choose to do so in the City of Baltimore. Synopses of the more pertinent subtitles in this article are listed below. The entire article is included in Appendix D.

Solid Waste Collection

Subtitle 2 requires the Commissioner of Health to issue permits for private parties engaged in the collection and disposal of solid waste. City collection activities are exempt. These sections also regulate collection methods and times and provide for inspection of vehicles.

Permit for Operating Landfill

Subtitle 4 requires private landfill operators to obtain an operating permit, obtain City approval of engineering plans, and post security against hazardous or unsafe operation. However, the City zoning laws do not permit anyone to operate a sanitary landfill except City government.

Litter Control

Subtitle 7 provides a penalty for the disposal of trash in other than a proper receptacle or a manner approved by the City. It provides for the issuance of citations by a police or an enforcement officer.

Environmental Control Board

Article 1, Subtitle 40 of the Baltimore City Code establishes an Environmental Control Board to adjudicate civil citations issued for violations of City Code provisions pertaining to sanitation.

1.3.2 Laws and Regulations Governing Special and Hazardous Wastes

1.3.2.1 Federal Laws and Regulations

Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601 et seq.

In December 1980, Congress enacted the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly referred to as “Superfund”, and substantially amended it in 1986 by the Superfund Amendments and Reauthorization Act (SARA). In contrast to RCRA, which generally regulates current hazardous waste handling and disposal, CERCLA focuses on both short-term and long-term remediation of past contamination. The Federal government can use the Superfund trust fund to clean up a property and then sue the responsible parties for reimbursement, or the government may order responsible parties to clean up the site. Maryland has created a parallel State Superfund, the Hazardous Substance Control Fund.

CERCLA has identified in its National Priorities List (NPL) two sites in Baltimore as Superfund sites. One site, located at the intersection of Kane and Lombard Streets used to contain nearly 1,200 drums of flammable solids, but since its clean up in the mid 1980's, it is now known as the "SuperFun" golf driving range. The other location at the Chemical Metals Industries sites at 2001 and 2103 Annapolis Road has been removed from the NPL since December of 1982. It is now used by MDE as an Emergency Response Field Office.

Management of Hazardous Waste, Subtitle C of RCRA (40 CFR Part 264 and Part 265)

Regulations pursuant to Subtitle C of RCRA established the hazardous waste management system, including identifying and listing hazardous wastes, establishing standards for generators and transporters and for the management of hazardous wastes for the owners and operators of hazardous waste treatment, storage, and disposal facilities. They require stringent administrative and record keeping practices by permitted facilities.

1.3.2.2 State Laws and Regulations

Hazardous Materials and Hazardous Substances (Environment Article of the Annotated Code of Maryland §§ 7-101 through 7-516)

This part of the Annotated Code defines controlled hazardous substances, establishes requirements for facility permits, imposes obligations on transporters and provides for appropriate enforcement actions.

Maryland Used Oil Recycling (Natural Resources Article of the Annotated Code of Maryland § 8-1401)

In this subtitle, the Maryland Legislature expressed its desire that used oil be collected and recycled to the maximum extent possible. The Department of Natural Resources is required to develop a public education program and to designate used oil collection facilities. The Act prohibits disposal of used oil into sewers, drainage systems, or natural waters, or by incineration, or as refuse.

Maryland Hazardous Waste Regulations (COMAR 26.13)

These rules concern the disposal of Controlled Hazardous Substances. Included are definitions of what is considered to be hazardous waste, standards applicable to generators of hazardous waste, standards for owners and operator of hazardous waste treatment, storage and disposal facilities.

Management of Special Medical Wastes (COMAR 26.13.11 through 26.13.13)

The definition of special medical wastes is set forth and standards for generators are established including a manifest system to track the transportation of special medical wastes. Standards for transport vehicles are established. Special medical wastes include anatomical material and blood-soiled articles.

Voluntary Cleanup Program

One negative aspect arising from the Comprehensive Environmental Response, Compensation and Liability Act was the extreme difficulty involved with the redevelopment of “Brownfields.” Brownfields are abandoned or underutilized properties where redevelopment is complicated by real or perceived environmental contamination. Recognizing this problem, the EPA devised the Brownfields Economic Redevelopment Initiative. This program is designed to empower states to assess, safely cleanup, and vitally reuse brownfields. From this initiative the State of Maryland established its Voluntary Cleanup Program. Signed into law on February 25, 1997, this emergency legislation provides a streamline remediation approval process, changes the liability scheme for prospective developers, and clarifies liability to the State for all participants in the program.

1.3.3 Laws and Regulations Controlling Air Emissions

1.3.3.1 Federal Laws and Regulations

Federal Clean Air Act (CAA), 42 U.S.C. 7401 et seq.

The Clean Air Act Amendments of 1970 passed by Congress established the current framework for Federal and State enforcement of air pollution. The Act authorizes the Federal government, through the EPA to set standards for the control of air pollution and directs the State toward achievement of these standards.

The regulation of air quality is managed through a combination of ambient air quality standards, emission standards, State planning processes, and construction and operating permits. Existing sources are subject to a different regulatory scheme than are new or modified sources.

Ambient standards seek to establish maximum levels of acceptable pollution levels in the air in general, without regard to their cause or source. The EPA has developed National Ambient Air Quality Standards, which establish maximum allowable levels of certain pollutants, regardless of source. The primary standard is the maximum amount of pollutant that can exist in the air before public health would be endangered. An area that is in compliance with the ambient air quality standard is called an attainment area. An area which exceeds the

standard is a non-attainment area. EPA recently issued a “SIP² call” to 22 States and the District of Columbia, directing a revision of requirements. It is anticipated that these new requirements, which may require compliance as early as 2002, may result in an 85 percent reduction in emissions by utilities. In addition, ozone transport regions were created in 1990, whereby each State was assigned a maximum Nitrogen Oxide Gasses (Nox) budget, which the State must allocate to all sources.

With respect to emission standards, the 1970 Clean Air Act Amendments established a special program entitled National Emission Standards for Hazardous Air Pollutants for the regulation of certain hazardous air pollutants. These standards are health based. Title III of the 1990 Clean Air Act Amendments established a technology-based standard for the control of hazardous air pollutants, whereby sources would be required to adopt the “maximum allowable control technology” to reduce certain toxic emissions.

Federal New Source Performance Standards

These standards impose national emission standards for newly constructed or modified industrial facilities, by imposing limitations based on the pollution control technology available to each particular category of new sources.

New Source Review

EPA has published guidance for new source review, whereby requirements were promulgated to ensure that major new sources do not adversely affect Maryland’s attempt to achieve compliance with the national ambient standards.

Prevention of Significant Deterioration

This program was designed to ensure that air quality would not significantly deteriorate in areas where the ambient standards are being met, primarily controlling new sources of pollution.

1.3.3.2 State Laws and Regulations

State Ambient Air Quality Control Laws (Environment Article of the Annotated Code of Maryland §§ 2-101 through 2-614)

² SIP – State Implementation Plans

The regulation for the construction, modification, operation and use of sources and controls over these emissions is authorized by this title of the State code. It authorizes the adoption of rules and regulations for air pollution control including testing, monitoring, recordkeeping, and reporting. It allows for the identification of air quality control areas and mandates the MDE set emission and ambient air quality standards for air quality control areas. Training for municipal solid waste incinerator operators is required under these provisions of the law.

Control of Incinerators (COMAR 26.11.08)

Air emissions and operation of incinerators, which thermally destruct municipal solid waste, industrial waste, special medical waste and sewage sludge, are regulated. The regulations require continuous monitoring of air emissions. These incinerators must also comply with general emission standards in COMAR 26.11.06.01 – 12 and 40 CPR § 60.

1.3.4 Laws and Regulations Controlling Water Pollution

1.3.4.1 Federal Laws and Regulations

Federal Clean Water Act, 33 U.S.C. 1251 et seq.

The Clean Water Act (CWA) is the framework for Federal and State enforcement of water pollution control laws. The CWA's objective is to "restore and maintain the chemical, physical, and biological integrity of the nations waters". The CWA includes: water quality standards based on a waterway's designated use; a permit program for the discharge of wastewater directly into waterways; minimum effluent standards based on the capabilities and costs of pollution control technology for each industry; pre-treatment standards for industries that discharge into publicly-owned treatment works ("POTWS"); the handling of spills of oil and hazardous wastes; and minimization of non-point source pollution. All states are required by the Clean Air Act to consider the development of Total Maximum Daily Loads, which will formulate procedures for setting upper limits on pollutants through permit discharge limits.

Every two years the MDE will submit a prioritized list of waterways that currently do not meet water quality standards or will not meet the standards after all technology-based controls are in place. Modeling is then used to establish the maximum load of quality standards. Once this maximum pollutant load is defined, it must be allocated between point and non-point sources, accounting for the margin of safety and future growth.

The CWA requires solid waste disposal facilities discharging wastewater to: (1) obtain a National Pollution Discharge Elimination System (NPDES) permit to discharge into surface waters, using best available

technology to control pollution; or (2) meet pre-treatment standards and discharge to a sewer system. Furthermore, storm water management plans are required and facilities sited in wetlands need a Section 404 permit. The amendments also require an increased EPA effort to establish regulations for permits for storm water discharge associated with landfills and other treatment, storage and disposal facilities for municipal waste.

National Pollutant Discharge Elimination System (NPDES) Program (40 CFR Parts 122 through 125)

The NPDES program serves as the permit program for the CWA. NPDES is responsible for issuing, monitoring, and enforcing permits for direct wastewater discharges to waters of the State or Federal government. The CWA established the NPDES permit program under §402 of the Act to implement regulations, limitations, and standards promulgated for point source direct discharges including certain storm water discharges. NPDES permits contain applicable effluent standards (i.e. technology-based and/or water quality-based), monitoring requirements, and standard and special conditions for discharge. Part 123 describes how states may obtain approval to operate a permit program in lieu of the Federal program. Maryland's permit program, administered by MDE, ordinarily operates in lieu of the Federal program.

NPDES permits are now required for storm water discharges associated with industrial activity and discharges from municipal separate storm sewer systems under 40 CFR 122.26. Among those entities considered to be engaging in industrial activity are landfills that receive or have received any industrial wastes, and facilities involved in the recycling of materials. These regulations are applicable to State NPDES programs such as Maryland's.

National Pre-treatment Program (40 CFR Part 403)

The national pre-treatment program authorized under the Clean Water Act controls the discharge of pollutants to municipal wastewater treatment facilities. The goal of the pre-treatment program is to protect municipal wastewater treatment plants and the environment from damage that may occur when hazardous, toxic, or other non-domestic wastes are discharged into a sewer system. It may pass through the Publicly Owned Treatment Works (POTWs) untreated, or which make it difficult for POTWs to meet the effluent limitations in their NPDES permits. This objective is achieved through pre-treatment of wastewater discharged by industrial users such as incinerators. The discharge standards specify quantities or concentrations of pollutants or pollutant properties that are permitted to be discharged to the municipal wastewater collection system.

Safe Drinking Water Act (SDWA), 42 U.S.C 300f et seq.

The SDWA requires EPA to establish regulations to protect human health from contaminants in drinking water. The legislation authorizes national drinking water standards and a joint Federal-State system for assuring compliance with those standards. Maximum contaminant levels and treatment techniques ensure the quality of public drinking water supplies. The 1986 amendments to the SDWA established a wellhead protection program that the states may use to protect public drinking wells and springs from contaminants, including contaminants from landfills. The 1996 amendments overhauled the water standard scheme; changed enforcement mechanisms; appropriated one billion dollars for State loan funds; required EPA to develop arsenic, sulfate and radon standards; implemented public right to know requirements; imposed new monitoring requirements; budgeted Federal money for source water protection and the construction, rehabilitation and improvement of water supply systems.

1.3.4.2 State Laws and Regulations

Maryland Water Pollution Control Regulations (COMAR 26.08)

These regulations contain:

1. Water quality standards that specify the maximum permissible concentrations of pollutants in water, the minimum permissible concentrations of dissolved oxygen and other desirable matter in the water, and the temperature range for the water;
2. Effluent standards that specify the maximum loading or concentrations and the physical, thermal, chemical, biological and radioactive properties of wastes that may be discharged into the waters of the State;
3. Procedures for water pollution incidents or emergencies that constitute an acute danger to health or the environment;
4. Provisions for equipment and procedures for monitoring pollutants, collecting samples, and logging and reporting of monitoring results.

As part of this regulatory scheme, these regulations require a discharge permit for discharges of wastes, wastewater, and storm-water into the waters of the State. Sanitary landfills and incinerators receive special attention to determine whether they contribute pollution to storm-water runoff.

1.3.4.3 Septage Management

Article 25 of the Baltimore City Code, as amended by Ordinance 129 (approved June 28, 1984) and Ordinance 775 (approved June 28, 1991), provides the mechanism for the City's Waste Hauler/Scavenger Program. The Waste Hauler/Scavenger Program became effective on January 1, 1987. Under the program, any company

wishing to dispose of septage to the City wastewater system must first apply for and obtain a Waste Hauler Permit and Vehicle Permit Tag for each vehicle, and pay an annual permit and tag fee.

The Back River and Patapsco Wastewater Treatment Plants have facilities to accept discharge of septage between the hours of 8:00 a.m. and 5:00 p.m. Monday through Friday, excluding City holidays. These are the only two locations the City allows for septage discharge. A two-cent per gallon (\$0.02/gal) charge is assessed. Emergency requests are dealt with on a case by case basis.

The program is regional in scope, recognizing programs in Baltimore, Howard and Anne Arundel Counties, which were developed, cooperatively with the City program. The program dictates the types of wastes to be accepted, allows for City sampling of the septage, and preserves the City's right to refuse acceptance of any load. Any violation of the program conditions can result in fines, revocation of permits and/or prosecution of the permit holder.

Septage received at the Back River and Patapsco Plants from private haulers currently account for less than 1 percent of the daily flow at either plant. The septage discharged becomes part of the plant flows and is subject to the same treatment processes. The solids also become part of the overall sludge production and are subject to the same solids processing and disposal.

**CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF SOLID WASTE**

**TEN YEAR SOLID WASTE MANAGEMENT PLAN
JULY 2002**



***CHAPTER 2
POPULATION, ZONING AND LAND USE PLANS***

2.0 POPULATION, ZONING AND LAND USE PLANS

State regulations for the development of comprehensive solid waste management plans require that Chapter 2 addresses the subdivision's present and projected population, municipalities and Federal facilities within the subdivision, its zoning requirements as they relate to solid waste management activities, and the status of the subdivision's comprehensive land-use plan. These subjects are addressed in Sections 2.1, 2.2, 2.3 and 2.4 of this Plan, respectively.

2.1 POPULATION

According to the U.S. Census Bureau, Baltimore's 2000 population was 651,154, comprised of a household population of 625,401 and a group quarters population of 25,753. (The group quarters population consists of people living at colleges, nursing homes, treatment centers, the State correctional facilities in Baltimore, and other such locations).

The Maryland Department of Planning (MDP) released preliminary population projections in July 2001 that projected an annual increase in the population of Baltimore City of 0.07 percent between 2000 and 2005, an annual increase of 0.09 percent between 2005 and 2010, and an annual increase of 0.08 percent between 2010 and 2015. According to the MDP, the projected quinquennial populations for Baltimore City are 653,400 in 2005 and 656,200 in 2010. Using the data supplied in these projections, the populations shown in Table 2-1 for 2001, 2006 and 2011 were calculated.

Similarly, the MDP made household population projections over the period covered by this Plan. The projected quinquennial household populations for 2005 and 2010 are 626,807 and 628,015, respectively. The MDP also projects an increase of 7,600 in the household population from 2000 to 2005, an increase of 5,100 from 2005 and 2010, and an increase of 3,300 between 2010 and 2015. The household projections in Table 2-1 for 2001, 2006 and 2011 were calculated using this information. The projected group quarters population is assumed to be the remainder of the total population.

**TABLE 2-1
BALTIMORE CITY POPULATION PROJECTIONS***

YEAR	TOTAL POPULATION	HOUSEHOLD POPULATION	GROUP QUARTERS POPULATION
2000	651,154	625,401	25,753
2001	651,610	625,682	25,928
2006	653,988	627,049	26,939
2011	656,740	628,452	28,288

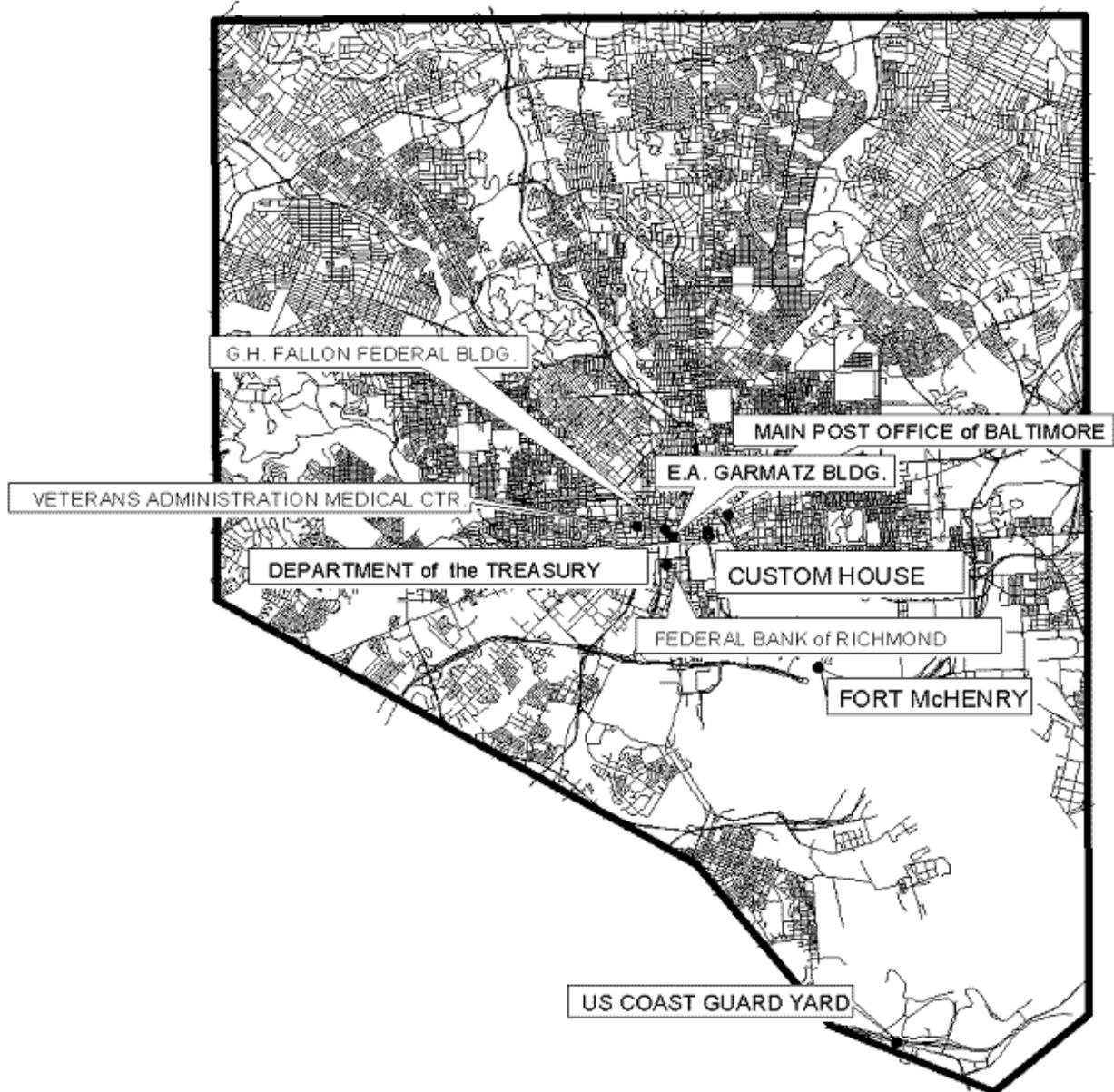
*Based on Maryland Office of Planning Census data and July 2001 quinquennial projections for Baltimore City

2.2 MUNICIPALITIES/FEDERAL FACILITIES WITHIN THE SUBDIVISION

Baltimore City is the largest incorporated municipality within the State of Maryland, both in population and land area, and the only municipality in the State that is also a designated subdivision. For purposes of this plan, the terms subdivision and municipality are interchangeable.

The major Federal facilities within the City are the G.H. Fallon Federal Building, the E.A. Garmatz Building, the Federal Bank of Richmond, the Veterans Administration Hospital, the Main Post Office of Baltimore, the United States Customs House, the U.S. Coast Guard Yard and the Ft. McHenry National Park. These facilities are shown on the map in Figure 2-3. Others include, The Departments of Treasury, Labor, and Transportation, U.S. Army Corps of Engineers, Veterans Administration, General Services Administration, Office of Personnel Management, and the Federal District and Bankruptcy Courts. Private contractors collect solid waste generated at all Federal facilities in Baltimore City.

FIGURE 2-3



MAJOR FEDERAL FACILITIES IN BALTIMORE CITY

2.3 ZONING REQUIREMENTS

The comprehensive zoning regulations for Baltimore City provide for the siting and operation of a broad range of solid waste management facilities, including incinerators, landfills, recycling collection stations, materials recovery facilities, and other types of facilities. Generally, these solid waste facilities are confined to industrial and commercial districts, to ensure compatibility with other allowed uses. Additionally, these facilities are generally designated as conditional uses, requiring case-by-case consideration of proposals by the City's Board of Municipal and Zoning Appeals or the City Council.

Commercial or municipal incinerators established after July 1, 1987, are conditionally allowed only in the M-3 (heavy industrial) district. A City ordinance is required for approval. Prior to July 1, 1987, incinerators were permitted by right in the B-3 (community commercial), B-5 (downtown commercial), M-1 (light industrial), and M-2 (general industrial) zoning districts as well as the M-3 district.

Sanitary landfills accepting mixed refuse as well as other waste, are exempt from zoning regulations if they are to be operated by the City, and if they are established through a City ordinance. Otherwise, such landfills are not allowed anywhere within the limits of Baltimore City. Landfills not accepting mixed refuse are conditionally allowed in the M-2 (general industrial) and M-3 (heavy industrial) districts, with Board of Municipal and Zoning Appeals approval required.

Solid waste acceptance facilities of any kind are not allowed to be sited within the City's Critical Area, which is the environmental overlay zone in Maryland, 1,000 feet wide measured from the mean high tide around the Chesapeake Bay and its tributaries. The affected tributaries in Baltimore City include the Patapsco River, Gwynns Falls, Jones Falls and Colgate Creek. The siting of recycling facilities is also prohibited within the Critical Area.

Any solid waste acceptance facility wishing to operate in Baltimore must, along with zoning approval, be permitted by the Maryland Department of the Environment (MDE) and become a part of the Ten Year Solid Waste Management Plan through legislation within the Baltimore City Council. Meeting the goals of this Plan will be strongly considered during the zoning process for the permitting of these facilities. Recycling facilities are not required to submit to these regulations.

To facilitate recycling, small collection stations are conditionally allowed throughout the City, and larger processing centers are conditionally allowed in industrial areas. These uses were specifically defined and provided for in the 1989 zoning regulations, which had previously addressed only automobile dismantling and junk or scrap storage areas (i.e., "junkyards").

Specifically, recycling collection stations are now conditionally allowed in all zoning districts. These stations are defined as portable receptacles, usually trailers or roll-offs, for the collection of paper, cans, aluminum scrap, other

non-ferrous metal scrap, glass bottles and plastics. With approval of the Zoning Board, these stations are allowed in the residential districts (R-1 through R-10) and office-residence districts when they are considered as accessories or when used at schools, churches, recreation facilities or public facilities. They are also conditionally allowed (with Board approval) as principal uses in the B-1 (neighborhood business), M-1 (light industrial), M-2 (general industrial) and M-3 (heavy industrial) districts.

Materials recovery facilities, where recycling materials except ferrous metals can be mechanically processed and packaged for resale, are conditionally allowed in the M-2 (general industrial) district and the M-3 (heavy industrial) district with Board approval, and in the B-3 (community commercial) district with enactment of a City ordinance. When located in the B-3 district, the recycling materials must be stored as well as processed indoors.

Dismantling, processing and storing of scrap metal and discarded automobiles are conditionally allowed (with Board approval) in the M-3 (heavy industrial) district. These uses tend to require extensive outdoor storage of large items and include ferrous metal, and are therefore distinguished from materials recovery facilities.

The City's comprehensive zoning regulations also accommodate facilities for managing certain special categories of solid waste. Handling of radioactive waste is conditionally allowed (with Board approval) in the M-2 (general industrial) and M-3 (heavy industrial) districts. Handling and storage of hazardous materials as defined in Title 7 of the Environment Article Annotated Code of Maryland are conditionally allowed (with enactment of a City ordinance) in the M-3 (heavy industrial) district. Composting of sewage sludge or yard wastes is provided for in the zoning laws by treating it as an additional industrial use. These facilities would also require MDE and City Council approval. A summary of the City's zoning regulations is included in Appendix E.

2.4 LAND USE PLAN

Baltimore's urban landscape presents land use challenges that are unique in the State of Maryland. The vast majority of land in the City is zoned and utilized. While there is essentially no room for development in the City, there is a consistent amount of "redevelopment" in existing areas and will continue to be throughout the period covered by this Plan.

Recognizing Baltimore City's importance as the state's premier urban area, the State of Maryland has designated the City of Baltimore, in its entirety, to be a priority Funding Area. Revitalization of the City's neighborhoods and preservation of their unique community character is a major policy of the City, as articulated in the City's Comprehensive Plan. Adopted in 1976, the City's Comprehensive Plan provides the policy basis for the redevelopment and revitalization of the city's neighborhoods, and since its adoption has been expanded through numerous topical and area plans and programs. These include the adoption of:

- *Baltimore City Heritage Area Management Action Plan, 2001*
- *Sensitive Areas Plan for Baltimore City, 1997*
- *Baltimore City Critical Area Management Program, 2002* (This program was originally adopted in 1988)
- *Baltimore City Land Preservation and Recreation Plan, 1994*
- State of Maryland Statutory *Visions of the Economic Growth, Resource Protection, and Planning Act of 1992*
- *Marina Master Plan, 1989* (currently under revision)
- **Annual Capital Improvement Programs**
- Annual Action Plans prepared by the City's Department of Housing and Community Development for submission to the US Department of Housing and Urban Development, qualifying the City for Community Development Block Grant, HOME Investment Partnerships, and other funding.
- Many urban renewal plans to achieve revitalization.

In 2000, the City prepared *Plan Baltimore*, a draft Comprehensive Plan that is now being used as a policy guide for many planning issues.

**CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF SOLID WASTE**

**TEN YEAR SOLID WASTE MANAGEMENT PLAN
JULY 2002**



***CHAPTER 3
WASTE GENERATION, COLLECTION AND DISPOSAL***

3.0 WASTE GENERATION, COLLECTION AND DISPOSAL

State regulations for the development of comprehensive solid waste management plans require that Chapter 3 describes solid waste generation, import or export of wastes for disposal, solid waste collection systems, and waste acceptance facilities within the local subdivision. These subjects are addressed in Sections 3.1, 3.2, 3.3 and 3.4 of this Plan, respectively.

In general the key characteristics of the existing solid waste management system in Baltimore City are its mixed public/private system and its regional scope. Historically, the City has taken responsibility for collecting and disposing of most residential solid waste, especially household wastes. Under current law the City will collect and dispose of up to 80 gallons of mixed refuse twice a week from households and small businesses. Establishments such as apartment complexes and businesses that generate larger amounts of waste must arrange for private collection and disposal of their waste.

Unlike residents of jurisdictions with purely private systems, most residents can rely on solid waste services provided by the City and do not have to pay private hauling fees in addition to their regular property taxes. Solid waste services for larger generators, who may in fact require more specialized, extensive and flexible services than the City could reasonably provide, rely on private companies.

The City has not attempted, as some jurisdictions have, to monopolize the solid waste market. The City has not enacted a "flow control" law-claiming ownership of all solid waste generated within its boundaries. Such flow control laws are sometimes enacted in urban towns and counties to ensure a supply of waste to finance and operate publicly owned waste acceptance facilities. Supreme Court decisions have placed a constitutional cloud over attempts to restrict or control interstate commerce as it relates to the waste industry.

In Baltimore City, private haulers are allowed to dispose of waste generated in the City at any legal disposal facility inside or outside of the City. This is one element of a regional solid waste management system.

Another element allows private haulers to dispose of wastes generated outside the City at waste acceptance facilities inside the City such as the Baltimore Refuse Energy Systems Company (BRESKO) and the Quarantine Road Sanitary Landfill (QRSL). The constraints for importing solid waste into the City (as for exporting wastes out of the City) are the capacities of acceptance facilities and market considerations, including tipping fees and hauling costs. Since BRESKO is privately owned and operated, as are most of the other waste acceptance facilities in the City, they are free to compete in the marketplace to provide waste disposal services in response to demand from their customers.

Thus, the private component of the solid waste management system operates regionally and quite independently of City government in many respects. Private companies perform the same basic waste collection and management functions as the government without conflict.

The City initiated a pilot project that was scheduled to commence in late 1999, in which a private contractor would collect residential mixed refuse and recycling from approximately 10,000 households. The goals for this project included the assessment of the market for privatization of solid waste collection and the evaluation of the performance of the contractor in lieu of government forces. However, the City only received one bid for this project and it was prohibitively expensive in comparison to the City's costs for performing these services. Therefore, the contract was not awarded and the future of private contracting of solid waste services for the City is uncertain.

The fact that so much of the solid waste management system in the City is independently and privately operated has implications for solid waste planning. The City's ability to quantify or precisely describe this solid waste and to determine how all of the solid waste generated within its boundaries is managed could impact the preciseness of the data in this chapter.

In an effort to comply with State regulations on comprehensive solid waste planning, this Plan has attempted to include regional considerations for privately collected waste generated within its boundaries and solid waste from outside its boundaries that reaches solid waste acceptance facilities within the City.

3.1 WASTE GENERATION

State regulations require that Chapter 3 contains a table that shows existing and projected annual generation of specified categories of waste within the subdivision. Technical requirements state that projections shall be given for the succeeding ten-year period at intervals of not more than 5 years. Further, the basis for the data presented in the table must be discussed.

In compliance with these requirements, estimates of existing and future generation of fourteen categories of solid waste in Baltimore City for 2001, 2006 and 2011 are presented in Table 3-1.

The State regulations do not define the specified categories of waste or explain the classification system; however, the specified categories appear to fall into two overall groups. One group includes kinds of waste that can be better distinguished by the source of the waste rather than by the nature of the waste itself (residential waste, commercial waste and institutional waste). Residential waste includes all waste generated by residents, commercial waste is waste generated at businesses, and institutional waste is generated at schools, government buildings and hospitals (with the exception of medical waste). For the purpose of this Plan, institutional waste is included with commercial waste. The second group includes kinds of waste that can be better distinguished by the nature of the

WASTE GENERATION, COLLECTION AND DISPOSAL

waste rather than by its source. For example, the category "bulky or special wastes (automobiles, large appliances, etc.)" refers to a kind of waste that can be generated at residences, businesses or institutions.

Most of the solid waste generated at residences, businesses and institutions is what the Bureau of Solid Waste calls "mixed refuse", as opposed to bulky (white goods) or special waste. Mixed refuse does not require special handling in collection or disposal. It can be deposited in trashcans, collected in trash collection vehicles (load packers), and processed by incineration. It consists largely of paper, cardboard, plastic containers and packaging, glass containers, metal containers, food waste/garbage, and yard waste (grass clippings, leaves, etc.). Much of the mixed refuse stream can be and is recycled.

**TABLE 3-1
ESTIMATED WASTE GENERATION
(Tons per Year)**

TYPE OF WASTE (REFERENCE)	2001	2006	2011
Residential (3.1.1)	305,800	294,700	295,400
Commercial* (3.1.2)	224,800	250,660	253,240
Rubble (3.1.3)	4,950	5,000	5,000
Controlled Hazardous Substances** (3.1.4)	900,000	900,000	900,000
Dead Animals (3.1.5)	250	250	250
Bulk - White Goods, Scrapped Autos (3.1.6)	8,500	9,000	9,000
Tires (3.1.7)	527	600	625
WWTP Sludges and Septage (3.1.8)	58,000	59,000	59,000
Leaves (3.1.9)	11,000	15,000	17,000
Christmas Trees (3.1.10)	55	55	55
Marine Debris (3.1.11)	335	350	370
Parks (3.1.12)	1,563	1,500	1,500
Street Sweeper (3.1.13)	16,134	16,000	16,000
Animal Manure (3.1.14)	713	560	560

Notes:

*Includes institutional and industrial waste

**Projections based on 1997 data

3.1.1 Residential Waste

The estimates in Table 3-1 were derived from data on existing amounts of waste collected by the City in 2001 in addition to an estimate of the residential waste collected by private haulers. Per capita generation rates were calculated for City-collected wastes and then used to estimate amounts collected by private haulers. The same generation rates were used to project amounts for 2006 and 2011, based on population, school enrollment and employment.

Projections are based on the actual amount of mixed refuse collected annually by the City because this amount is the most reliable indicator of waste generation available to the City. Daily records are kept of the amount of materials delivered by City collection crews to the waste acceptance facilities. These records show that 305,556 tons of mixed refuse was collected by City crews in 2001. Please note that this section of the plan does not pertain to residential recycling, as it will be addressed in Section 3.3.3.

3.1.2 Commercial Waste

Since City crews collect only part of the mixed refuse generated in the City, 306,000 tons do not represent the total generated. The balance is commercial waste, collected by private haulers. In 2001, private haulers delivered approximately 469,200 tons of mixed refuse generated in Baltimore City and Baltimore County to waste acceptance facilities (BRESKO, the Eastern Sanitary Landfill & Solid Waste Management Facility and QRSL). This amount can serve as a reasonable estimate of the commercial waste generated in the two subdivisions (See Table 3-2).

**TABLE 3-2
MIXED REFUSE COLLECTED BY PRIVATE HAULERS IN 2001
IN THE BALTIMORE REGION (TONS)**

Delivered to BRESKO	299,200
Delivered to Eastern Sanitary Landfill	16,500
Delivered to QRSL	153,500
Total	469,200

It is not known what percentage of this 469,200 tons of privately collected mixed refuse is generated in the City as opposed to the county. In order to satisfy State requirements, it has been necessary to adopt some assumption about this proportion. Since much of the privately collected refuse is generated at businesses, the assumption made in this Plan is that the percentage of waste generated in the City as opposed to the county is similar to the percentage of jobs located in the City as opposed to the county. According to Maryland State Department of Planning figures,

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approximately 51 percent of the jobs between the City and County are in the City. Using this assumption, it can be estimated that 239,292 of the 469,200 tons are generated in the City.

The estimated total amounts of City-collected and privately collected mixed refuse generated in the City were generated using per capita generation rates. It should be noted that these per capita generation rates should be viewed as a means to allocate total amounts among residential, commercial and institutional generators, as required by the State. The per capita rates were also used to estimate how waste generation may vary in the future with changes in employment, population and school enrollment. The method by which data pertaining to the amounts of mixed refuse collected by City crews and private haulers was used to calculate per capita generation rates and project future amounts is presented in Appendix A. The statistics on population, school enrollment and employment used in the calculations are included.

Institutional Waste

The State regulations include hospitals, schools and government buildings as institutions generating "institutional waste." Therefore, general waste or mixed refuse generated at hospitals, schools or government buildings in the City are included in the estimates for institutional waste. As explained in Appendix A, school students and government employees data obtained from the Maryland Office of Planning was utilized to prepare the data. Hospital data was obtained from the Northeast Maryland Waste Disposal Authority's 1988 medical waste disposal project, which found that hospitals in Baltimore City generate approximately 16,000 tons of general waste per year. For the purpose of this plan institutional waste, as well as industrial waste, will be included with commercial waste.

Industrial (Non-Hazardous) Wastes

Industrial (non-hazardous) wastes are solids, liquids and sludges generated by manufacturing or industrial processes that are not hazardous wastes regulated under Subtitle C of the Federal Resource Conservation and Recovery Act (RCRA). In general, the City does not collect information on the character and quantity of this waste from the companies generating. Several industries dispose of industrial non-hazardous waste at QRSL. The amounts and types of these wastes are included in the projections.

3.1.3 Land Clearing and Demolition Debris (Rubble)

Land clearing and demolition debris is refuse generated from demolition of buildings, streets and other improvements and clearing of sites to prepare them for new construction, rehabilitation, street improvements or utility installation. In the City, which has little undeveloped land, this refuse is primarily inorganic, consisting of concrete, brick, bituminous paving material, lumber, drywall, plaster, roofing material and insulation.

The estimates of rubble generation in Table 3-1 are based on the actual amount of refuse identified as rubble that was accepted in 2001 at the City's QRSL. Most of this rubble is generated by City operations. Private demolition and construction contractors find it more economical to use private facilities to dispose of any rubble, given the current tipping fee of \$67.50 per ton at QRSL (includes \$7.50 per ton surcharge for most rubble). No information is available to the City on the total amount of rubble handled by the private sector and removed for disposal outside the City boundary.

The amount of City rubble has increased significantly since 1998. However, the 2001 data for City rubble is assumed to remain constant or increase slightly in the next ten years. The demolition of public housing and vacant properties for purposes of urban renewal has essentially been completed and there is no foreseeable significant increase in the amount of demolition in the period covered by this plan. Most rubble is handled either by private recyclers or private rubble landfill facilities.

It should be noted that materials containing friable asbestos are not permitted to be disposed of at the landfill. Any debris containing friable asbestos that is generated in the City must be exported for disposal, since there are no waste acceptance facilities in the City at this time that accept this material.

3.1.4 Controlled Hazardous Substances

Controlled hazardous substances are those wastes whose disposal is regulated under Subtitle C of the Federal Resource Conservation and Recovery Act (RCRA, see Section 1.3.1.1). Local governments in Maryland have not been granted authority to enforce Federal or State regulations on the disposal of hazardous wastes. The Maryland Department of the Environment (MDE), however, compiles information on the producers and the amounts of hazardous wastes being handled within Baltimore City limits. Current information is unavailable at this time. However, the most recent records indicate that approximately 11,700 tons of solid hazardous waste and 208,500,000 gallons of liquid hazardous waste, equating to a total of 900,000 tons of hazardous waste were handled by 45 identified large businesses and industries in 1997. This tonnage is expected to remain the same for the next ten years.

The largest producers of these materials were:

Vista Chemical Company	Clean Harbors
GM Truck and Bus Group	Maryland Environmental Service
A1 Plating Company	

These five generators handled 95 percent of the total amount of hazardous waste in the City.

Each producer is responsible for proper handling and disposal of its hazardous waste. There are no hazardous waste disposal facilities in the State of Maryland. These firms are required to use out-of-state processing plants or emplacement facilities.

3.1.5 Dead Animals

Since Baltimore City is fully urbanized, most animal carcasses requiring disposal in the City are those of stray or unwanted cats and dogs. The City is responsible for removing animal carcasses from public property and for removing live animals that are defined as strays under the law. Approximately 90 percent of stray dogs and other animals are subjected to euthanasia because homes cannot be found for them. These animal carcasses are currently collected for disposal by private forces under a contract with the City. The City's animal shelter estimates 250 tons of animal carcasses are generated annually.

3.1.6 Bulky or Special Wastes

Bulky or special wastes as cited in the State regulations are automobiles and large appliances. It is estimated that 7,236 tons of scrapped automobiles were generated in the City in 2001. The tonnage of automobiles is based on the proportion of motor vehicles registered to owners in the City as opposed to the entire state in 1999 (6.7 percent or 271,762 of 4,061,561 registered in the entire state.). Applying the same percentage to the number of automobiles scrapped in the State in 1999 (80,000) and assuming no significant change in the number of scrapped autos, it is estimated that 5,360 automobiles in the City were scrapped in 2001. At 1.35 tons per automobile, this number of vehicles weighs approximately 7,236 tons.

The tonnage of appliances is based on the number that is accepted by the City Bureau of Solid Waste or deposited at one of the City's drop-off centers. In 2001, 1,442 tons were processed in the City. It is assumed that this will remain relatively constant for the next ten years based on the assumption that the tonnage of scrapped automobiles does not change significantly from year to year. The 2001 tonnage of approximately 7,200 tons of scrapped automobiles is combined with the 2001 tonnage of appliances to equal a total bulk tonnage of approximately 8,500.

3.1.7 Vehicle Tires

The number of 527 tons per year of tires generated in the City is based on the tonnage of tires collected in 2001 by City forces. This number is largely representative of tires that have been recovered by City forces at drop off locations and collected by City forces at illegal dumping locations. It is assumed that this tonnage will vary from year to year, but not change significantly in the next ten years.

3.1.8 Treatment Plant Sludges and Septage

Treatment plant sludges are the solids remaining after wastewater and raw drinking water treatment. The estimates presented in Table 3-1 of sludge generation in the City reflect the proportion of the sludge generated at the City's three water filtration and two wastewater treatment plants.

The Back River Wastewater Treatment Plant currently generates about 182,000 wet tons of sludge annually. Through competitively bid contracts, private firms utilize 100 percent of this sludge. 21 percent of this sludge goes on agricultural lands as a growth stimulant. The Baltimore City Compost Facility in Hawkins Point, a private company, utilized 27 percent of Back River's sludge production to compost for horticultural purposes. The Baltimore Pelletech Facility treats 52 percent of the sludge and makes pellets for use as a fertilizer.

The Patapsco Wastewater Treatment Plant generates approximately 80,000 wet tons of sludge annually calculated at an equivalent 25 percent total solid content. All sludge generated at Patapsco is heat dried at Stericycle, Inc. located on site prior to distribution and marketing. The heat-dried product is rich in nutrients and is used as a partial fertilizer thus recycling the product in an environmentally sound manner.

The City's three water filtration plants (Montebello Plants 1 and 2 and Ashburton) currently generate about 2,400 tons of sedimentation sludge per year. Since Baltimore City residents and businesses utilize 53 percent of the total water filtration plant capacity, about 1,000 tons of sludge can be said to be generated within the City.

The City's Bureau of Water and Wastewater expects sludge generated at the Patapsco Plant to increase by approximately 35 percent over the next ten years to about 109,000 wet tons at an equivalent total solids content of 25 percent. This increase will result mostly from growth outside the City and is not expected to be attributable to City residents. Sludge production at the Back River Wastewater Treatment Plant and the three water filtration plants is not expected to increase appreciably. The Back River Wastewater Treatment Plant is at capacity and there are no planned additional processes that would generate considerably more sludge. The Montebello Plants 1 and 2 and Ashburton Water Filtration Plant are not slated for expansion or major process changes, and sludge production should be maintained at current levels.

The City's Waste Hauler/Scavenger Program became effective on January 1, 1987. Under the program, any company wishing to dispose of septage into the City wastewater system must obtain a Waste Hauler Permit, Vehicle Permit Tag for each vehicle and pay annual permit and vehicle tag fees.

The program is regional in scope, recognizing programs, which were developed cooperatively with the City program in Baltimore, Howard and Anne Arundel Counties. The program dictates the types of wastes to be accepted, allows

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for City sampling of the septage, and reserves the City's right to refuse acceptance of any load. Any violation of the program conditions can result in fines, revocation of permits and/or prosecution of the permit holder.

Septage received at the Back River and Patapsco Plants currently accounts for less than 1 percent of the daily flow at either plant. The septage discharge becomes part of the plant flows and is subject to the same treatment processes. The solids also become part of the overall sludge production and are subject to the same solids processing and disposal.

3.1.9 Leaves

The City collects leaves by vacuum units, mechanical sweepers, and loadpackers each fall. The leaves are taken to mulch sites operated by the Department of Recreation and Parks. The principal mulch site is located at Camp Small. Camp Small is a 13 acre site located in the 2000 block of West Cold Spring Lane. The Bureau of Solid Waste delivers approximately 10,000 tons of leaves there each year. The City also delivers leaves to a smaller site at Leakin Park. At the mulch sites, leaf mulch and wood chips produced are used by the Department in its horticultural program. The mulch is also utilized in community gardens throughout the City. In 2001, the City according to Bureau of Solid Waste records generated 11,000 tons of leaves.

3.1.10 Christmas Trees

During the month of January, two days are designated as drop-off days for Christmas trees. They are also collected on the second collection day of each week. The trees are taken to Camp Small Composting Area where they are mulched. According to recycling records, seventy-five tons of Christmas trees were generated in the city in 2001. The tonnage of Christmas trees is expected to remain constant over the next ten years.

3.1.11 Marine Debris

In an effort to keep Baltimore attractive, Marine Operations cleans local waterways such as the Inner Harbor. Nine boats are utilized including four "Skimmer" boats which load and then off load trash and debris. There are two boats called Romarines, which are smaller boats used by the crews to scoop trash and debris from the water. Three bass boats are also used by crews to scoop debris from the water.

3.1.12 Parks

The tonnage of waste collected from parks as reflected in Table 3-1 is generated by the major parks. The five major parks, Druid Hill, Leakin, Patterson, Carroll, and Clifton are collected from three times a week using regular sixteen cubic yard loadpackers. The corner cans located in the smaller neighborhood parks are picked up twice a week along

the mixed refuse routes in which the park is located.

3.1.13 Street Sweepers

Street sweepers consist of mechanical street sweepers and sidewalk sweepers. The sweepers collect litter and trash from the main streets and sidewalks. Mechanical sweeper operations include 74 routes on a weekly basis. Sidewalk sweepers operate on a daily basis usually in the business district areas. In 2001, mechanical street sweepers and sidewalk sweepers gathered 16,134 tons.

3.1.14 Animal Manure

The City's major producer of manure is the Baltimore Zoo. The zoo contacts the city when there is a significant load of manure. The city sends a dump truck to collect the waste, which is delivered to Quarantine Road Sanitary Landfill. In 2001, the Quarantine Road Sanitary Landfill used the 233 tons collected as part of its daily cover.

3.2 IMPORT/EXPORT OF SOLID WASTE

State regulations require that Chapter 3 of comprehensive solid waste management plans include a discussion of the types and quantities of solid waste, if significant, which are entering or leaving the subdivision for processing, recovery or disposal. In compliance with this requirement, the types and quantities of solid waste imported to the City for disposal which are known to be significant are discussed below. These wastes include residential mixed refuse, commercial/institutional mixed refuse, scrapped automobiles, special hospital waste and wastewater treatment plant sludges. Wastes believed to be exported are listed also, although the City has very little information concerning amounts of these wastes.

3.2.1 Imported Mixed Refuse

Mixed refuse collected by Baltimore County is currently imported to the City for processing at BRESKO, and the ash residue remaining after processing is used as an alternative daily cover at QRSL. In 2001, Baltimore County delivered approximately 91,000 tons of residential waste and 228,000 tons of commercial waste to BRESKO. Total mixed refuse for Baltimore County imported into BRESKO was approximately 319,000 tons. Thus, the total waste imported to BRESKO is estimated to be 319,000 tons per year.

All of the ash remaining after processing is deposited at the QRSL. This equates to approximately 216,000 tons of ash resulting from imported waste; representing approximately 20% of all waste disposed of at QRSL in 2001.

Mixed refuse (as well as special hospital waste) is also imported to the Baltimore Regional Medical Waste Facility (see subsection 3.4.3). The most recent data indicated that this incinerator processed approximately 25 tons per day

of imported refuse (about 9,000 tons per year). The ash residue remaining after processing, 35 percent by weight or about 3,150 tons per year, had been disposed of at QRSL but is now exported to an out-of-state landfill.

3.2.2 Imported Scrapped Automobiles

Scrapped automobiles from wrecking yards throughout the metropolitan area are imported to the 11 licensed automobile scrap processors and recyclers located in the City. Although metal from these automobiles is ultimately reused inside or outside the City, processing also generates 0.3 tons per automobile of non-recycling material ("fluff") that requires disposal.

The major metal scrap processor in the City, The David Joseph Company, operates a shredder with the capacity to process 500 cars a day. It is estimated that this company processes at least 35,000 cars per year that originate outside the City, generating at least 11,000 tons of "fluff" per year. Fluff can be accepted at QRSL, however, due to the cost of disposal at QRSL, this material has been disposed of outside of the City.

3.2.3 Imported Scrap Tires

The major tire recycler in the City is Emanuel Tire Company. Emanuel has a capacity to process 6 million scrapped tires annually. Currently it is reported to be handling approximately 3 million tires per year or 52,000 tons per year. Approximately 40,000 tons originate outside of the City. The processed shredded scrap rubber is sold to various customers within and outside the region. Miscellaneous steel resulting from the tire shredding operation is recycled.

3.2.4 Imported Special Medical Waste

As previously discussed in Section 3.1.2, special medical waste as well as mixed refuse from medical facilities is imported to the Baltimore Regional Medical Waste Facility. In addition, special hospital waste is imported for processing at the Stericycle incinerator, although the ash residue generated at this facility is exported for disposal (see Subsection 3.4.4).

3.2.5 Exported Wastes

The vast majority of waste that is collected by City forces is disposed of in the City at either the Quarantine Road Sanitary Landfill (3.4.2) or at BRESKO (3.4.1). Most of the City's waste that is exported is done so by private waste collectors and haulers, limiting the City's knowledge of the amount of waste that is exported from the City. Although it can not be assumed that all waste that is collected by private waste haulers is exported, as many of these haulers utilize BRESKO, QRSL and other City based facilities (see Section 3.4), it is assumed that parts of all the privately collected waste stream is exported. This is based on a limited amount of facilities to service the disposal

needs of the private waste stream. Because no records are available pertaining to these waste constituents, it is not known whether the amounts of these wastes being exported are significant.

It is believed that much of the controlled hazardous substances generated in the City are exported, since there is little disposal capacity for such waste in the City. While the City is aware of treatment facilities in the City (such as Clean Harbors of Baltimore referred to in Subsection 3.4.9), it is not aware of facilities located in the City for ultimate disposal of sludges or residues remaining after treatment.

All of the estimated 250 tons per year of animal carcasses collected by the City were delivered to Valley Proteins, Inc.'s transfer facility then exported to an out-of-state rendering plant. On June 30, 2000, Valley Proteins, Inc. disallowed animal carcasses to be disposed of in its facilities. The Health Department signed a contract with Phoenix Medical Waste Incinerator that allows the city to send cats and dogs to that facility until other contracts can be negotiated. The alternatives are discussed in Chapter 5 of this Plan.

3.3 WASTE COLLECTION

State regulations require that Chapter 3 of comprehensive solid waste management plans include a description of existing solid waste collection systems, including service areas. Such a description is presented below, with more detail on the public than the private collection system (see introduction to this chapter).

All of Baltimore City is served by the public waste collection system. Under Article 23 of the Baltimore City Code, the City is responsible for collecting all "mixed refuse" from dwelling houses, apartment houses, tenement houses, boarding houses, hotels, restaurants, hospitals and other places where such refuse is accumulated, in amounts not exceeding the contents of four 20-gallon containers twice a week (see Section 1.3.1.3).

As a pilot project, the City issued a request for proposals (RFP) in April of 1999 to allow private contractors to provide solid waste collection services for approximately 10,000 households (see introduction to this chapter). While there were no acceptable bids or proposals made by contractors for this project, the possibility exists that some aspect of waste collection currently performed by the City will be privatized in the period covered by this plan. In the event that this occurs, any waste collected would be considered part of the public collection system.

Property owners who accumulate solid waste that is not collected by the City are served by the private waste collection system. The private system consists of numerous haulers who contract individually with property owners to provide collection services (and who also may contract with waste acceptance facilities). Beyond the City's Health Department issuing permits to haulers operating in the City in order to safeguard public health, the City is not involved in the functioning of the private waste collection system. Consequently, our discussion of the private waste collection system will be limited in scope.

3.3.1 Collection System and Service Areas

The City of Baltimore provides a wide variety of sanitation services with the goal of maintaining a clean and safe Baltimore. These services are provided primarily by the Department of Public Works, Bureau of Solid Waste, Collections Division (the organizational structure of this Division is shown in Figure 1-4). The base of the Bureau of Solid Waste's operations is Room 1000 of the Abel Wolman Municipal Building located in downtown Baltimore. This office and the other locations of Bureau of Solid Waste operated facilities are shown in Figure 3-1.

The Bureau has operations seven days a week, excluding holidays. Legal holidays when no collection services are provided are New Year's Day, Martin Luther King's Birthday, Lincoln's Birthday, Presidents' Day, Good Friday,

Memorial Day, the Fourth of July, Labor Day, Columbus Day, General Election Day, Thanksgiving Day and Christmas Day.

While the Bureau of Solid Waste is primarily responsible for trash collection in the City, other City agencies provide waste collection services as well. These agencies include the Department of Housing and Community Development, the Department of Education and the Department of Recreation and Parks. The scope of these agencies' involvement is limited to the facilities owned and operated by the agencies.

The Solid Waste Collections Division, whose responsibilities include all municipal collection and cleaning functions, employs more than 1000 people and approximately 500 pieces of equipment in providing these services. Along with the traditional equipment of rear-loading loadpackers, front end loadpacking vehicles (primarily used for dumpsters), and mechanical street sweepers, this task is also augmented by small front-end loaders ("Bobcats"), large open dump trucks, lift gate trucks, vacuum leaf-loaders, and alley sweepers. Business districts are cleaned by small sweeper/vacuum units and "hokey" carts. Waterways are cleaned by utilizing the marine equipment detailed in 3.1.11.

Mixed Refuse Collection

Residential mixed refuse collection is provided by the Bureau of Solid Waste's Collections Division, Routine Services Section. Regular mixed refuse collection services are provided twice a week by the City to each location served, Mondays through Saturdays except on legal holidays. Each location is served either on Monday and Thursday, Tuesday and Friday, or Wednesday and Saturday (see Figure 3-2).

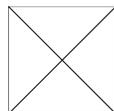
Bureau of Solid Waste Collections operations is divided into four districts: Northeast, Northwest, Southeast, and Southwest. These operations are based out of their corresponding yard facilities shown in Figure 3-1. The collection districts are in turn subdivided into 21 collection boroughs or zones (see Figure 3-2). Each borough has a supervisor responsible for the residential collection operation in the borough and the overall cleanliness of the right-of-ways.

The City collects all mixed refuse generated at City Parks, single-family residences, and City litter baskets. In its residential operation, the City utilizes 3 person crews on two different sized rear loadpacker vehicles; one holds a compacted load of approximately 16 cubic yards of material and the other holds 20 cubic yards of material. The number of collection locations served ("stops") is approximately 205,000. With twice a week collection service, this works out to be about 68,500 stops per day.

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The Collections Division's Special Services Section provides mixed refuse collection services for those multi-family residences (generally condominiums) that the City is obligated to service through the utilization of front-end loaders. This operation is based out of the Franklinton Road facility (see Figure 3-1).

From 9:00 p.m. to 5:00 a.m., there are approximately nine (9) crews assigned to mixed refuse routes in the Mount Vernon area of the City and to service the City's litter baskets along major thoroughfares and business areas. This is a daily per week operation (excluding the Mount Vernon area, which is only serviced on Tuesdays and Fridays). This operation is based out of the Routine Services Section's Northwest Sanitation Yard (see Figure 3-1).



EMBED PBrush

**FIGURE 3-1
BUREAU OF SOLID WASTE FACILITIES**

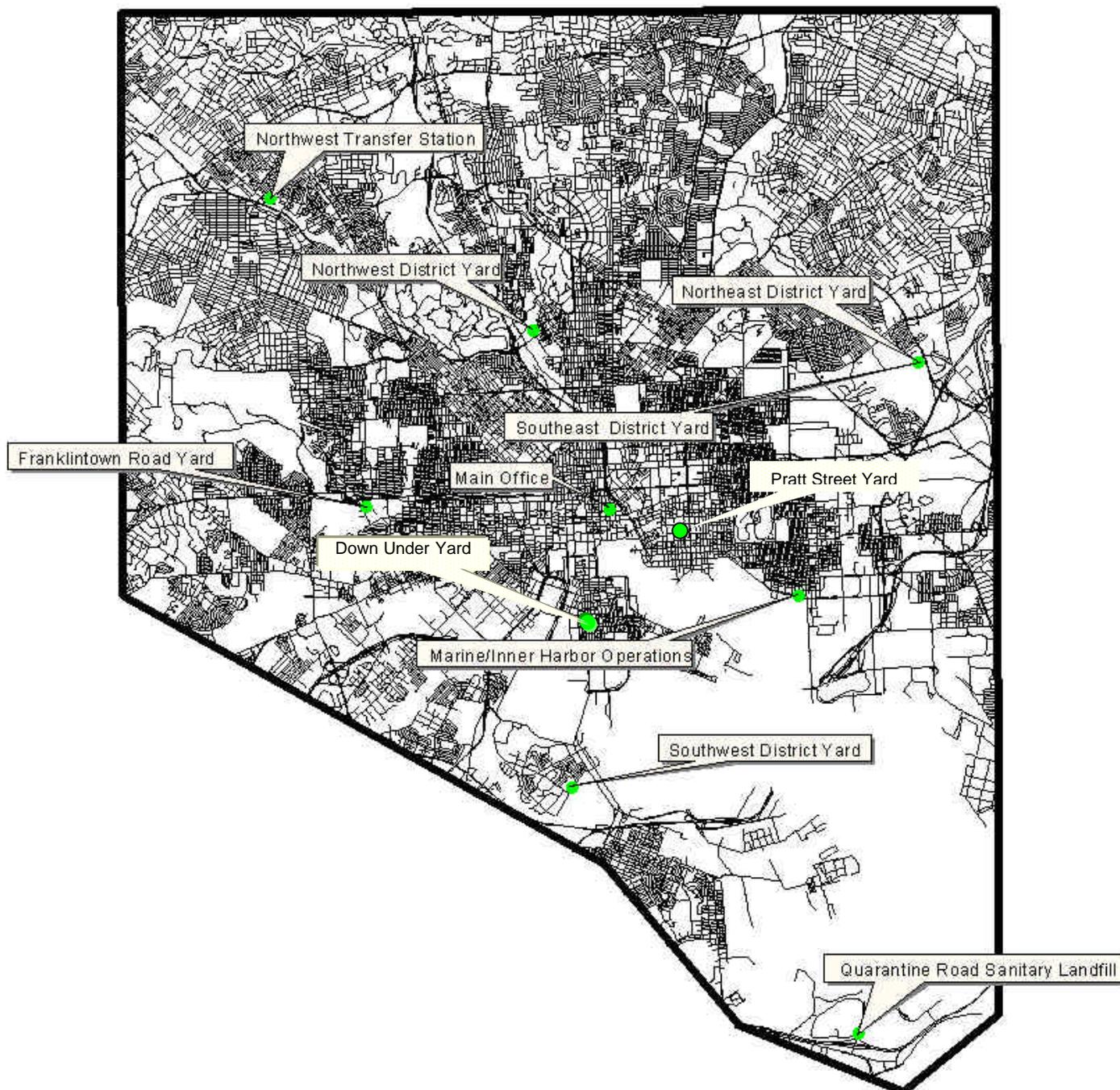
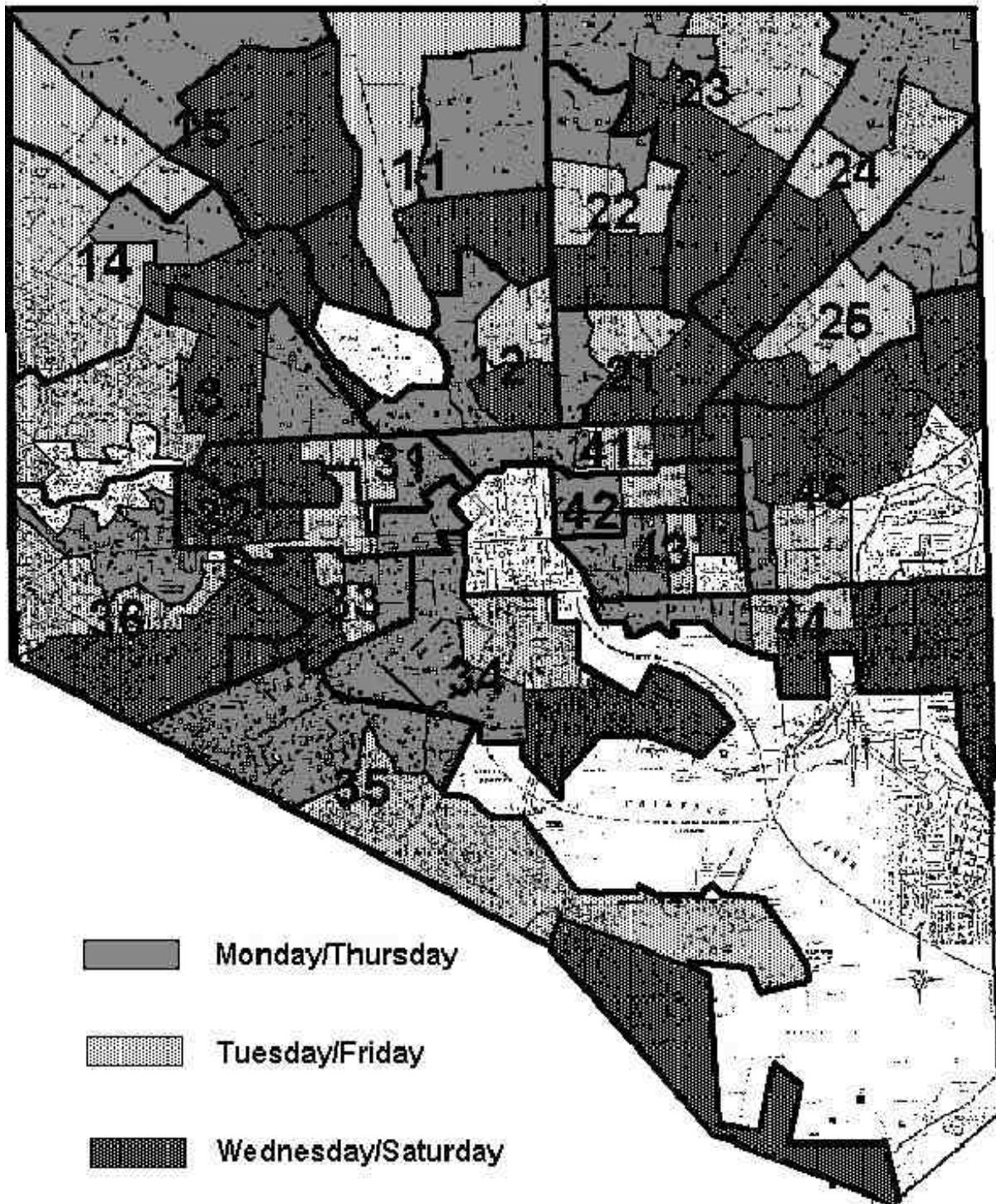


FIGURE 3-2
BUREAU OF SOLID WASTE COLLECTION DAYS AND BOROUGHES



WASTE GENERATION, COLLECTION AND DISPOSAL

The Routine Services Section also provides regularly scheduled cleanings of business districts, streets and alleys and some City-owned lots and parks. These operations are coordinated by the same borough supervisors responsible for the residential mixed refuse operation.

The amount of residential mixed refuse collected by City crews varies from season to season. Generally, tonnage collected is higher in spring and summer than in the winter, with the greatest amount collected in May and July. In 2001 approximately 230,000 tons of mixed refuse was collected by City residential mixed refuse crews (see Table 3-3).

For purposes of delivering collected residential mixed refuse to acceptance facilities, the City is essentially divided into two parts. Boroughs 11, 12, 14, 15, 22, 23, 24, and parts of 13 and 21 generally comprise the service area for the Northwest Transfer Station. Waste that is brought there is dumped and placed in large trailers for transport to the Baltimore Refuse Energy Systems Company (BRESKO, see Section 3.4.1) for incineration or to the Quarantine Road Sanitary Landfill (QRSL, see Section 3.4.2). All of the other boroughs and parts of boroughs generally comprise the service area for BRESKO.

Infrequently, BRESKO will close for a period of time in order to perform routine maintenance or to tend to emergencies that occur which may disrupt operations. During these periods, waste that would have been brought to BRESKO, public and private, is diverted to QRSL for disposal.

Bulk Trash Collection

For purposes of bulk trash collection, the City is divided into 20 zones (see Figure 3-3) with each zone being serviced one day a month. On this day, residents of the zone who call or e-mail the City requesting this service, may place up to three bulky items out for pickup (construction material is not included in the bulk items eligible for pickup by the City). Once collected, bulk that is not recyclable is transported to the Northwest Transfer Station (see Figure 3-1), BRESKO or directly to the QRSL, similarly to the residential mixed refuse routes.

Other Waste Collection Operations

The Solid Waste Collections Division, Special Services Section's Marine Operations unit, based in the Canton area of the City (see Figure 3-1), cleans the shores and waterways of the Inner Harbor and the Middle Branch and Northwest Branch of the Patapsco River (see Figure 3-4). This operation is responsible for removing over 250 tons of debris from these waterways on an annual basis.

The Special Services Section also performs various functions that are seasonal and require weekend cleaning

attention (Community Clean-ups, Parades and Festivals, Leaf Collection, etc.) These functions are performed using seasonal employees (temporary employees used for specific short-term activities) to collect the debris. This allows for the efficient operation of these services without impacting year-round waste collection services.

Special Services also provides mechanical street sweeping services along major thoroughfares and in neighborhoods on a regularly scheduled basis. This section is also responsible for the collection of eviction chattel and removal of fire debris from City right-of-ways. Additionally, this section provides graffiti removal services as well as the performance of rat eradication.

Waste Collected

The amount of waste collected by the Bureau of Solid Waste varies from month to month based on seasonal fluctuations. Waste collected is traditionally highest in the Spring and Summer months based on an increase in both household and community cleaning and increases in outdoor activity. The monthly totals of waste collected by the Bureau in 2001 for several categories of waste are listed in Table 3-5.

FIGURE 3-3 MONTHLY BULK COLLECTION ROUTES



WASTE GENERATION, COLLECTION AND DISPOSAL

Although the City is obligated to collect solid waste in the entire City, stipulations in the City Code limiting the amount and type of solid waste to be set out for collection give opportunities for private waste haulers to provide the remaining waste collection needs of the City. These haulers range from multi-billion dollar international corporations to small operators owning single pick-up trucks. They are all significant in the City's integrated solid waste management system.

The Baltimore City Health Department issues permits to operate in the City based upon the types of wastes the private haulers wish to collect and the sizes of vehicles being used to do the work. Haulers whose vehicles have a gross vehicle weight (GVW) of over 7,500 pounds are referred to as Large Haulers. As of August 1, 2000, there were a total of 535 Large Haulers registered to operate in the City at a cost of \$50.00 per year. These haulers with eligible loads are permitted to dump at the QRSL at the tipping fee of \$67.50 per ton.

Haulers whose vehicles have a GVW of 7,500 pounds or less and a rated capacity of 1,500 pounds or less are considered Small Haulers. There are approximately 2,500 registered Small Haulers that pay a fee of \$20.00 and are allowed to dump at the QRSL at a cost of \$5.00 per dump.

The City has no direct knowledge of the types and amounts of wastes collected by these haulers. The City knows what portion of the waste is delivered to QRSL (see Section 3.4.2) by these private haulers. The majority of this waste is assumed to be disposed of in and through private facilities in the City or exported from the City.

In accordance with the City Code, citizens with proof of residency may dispose of their wastes at City owned facilities at no cost. This is limited to wastes that are carried in passenger vehicles and that are not prohibited for disposal at the facilities.

TABLE 3-3 MONTHLY TONNAGES OF DEBRIS REMOVED BY BUREAU OF SOLID WASTE IN 2001

Waste Categories	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
Residential Mixed Refuse	18,156	16,062	17,852	19,087	21,519	20,438	20,687	20,832	18,334	19,606	19,819	19,360	231,752
Bulk Trash	449	497	527	502	530	552	607	598	590	538	564	587	6,541
White Goods	106	73	110	120	152	118	155	201	151	178	188	133	1,685
Sweepers	1,274	926	1,158	1,205	1,504	1,332	1,359	1,328	1,254	1,732	1,694	1,368	16,134
Tires	21	22	44	24	32	40	26	26	27	35	69	53	419
Mixed Paper	1,047	863	1,029	955	998	944	834	893	902	1,098	1,184	957	11,704
Commingles	269	210	236	205	225	225	219	209	225	208	187	212	2,630
Leaves/Trees	400	0	0	0	0	0	0	0	0	200	4,700	5,200	10,500
Marine Operations	0	13	31	20	16	24	19	21	13	5	5	56	223
Community Clean-ups	259	232	268	110	364	542	334	225	296	245	155	185	3,215
Fire Debris	110	130	87	94	142	187	63	27	25	30	69	99	1,063
Evictions	158	139	143	176	269	248	232	257	202	239	153	134	2,350

3.3.3 Recycling Collection

Collection of Household Recycling

The Bureau of Solid Waste provides residential recycling collection service for the City of Baltimore out of its

WASTE GENERATION, COLLECTION AND DISPOSAL

Franklintown Road facility (see Figure 3-1). Items collected are mixed paper and mixed containers (or commingles). Mixed paper includes newspapers, magazines, cardboard boxes, advertising mail, computer paper and other such items (excluding carbon paper, waxed paper, and milk or juice cartons). Commingles accepted when placed in translucent blue plastic bags include glass containers; aluminum, tin and steel cans; and polyethylene terephthalate (PET) and/or high-density polyethylene (HDPE) containers. The kinds of materials collected by the City are tabulated in Table 3-4.

Recycling is collected four times a month from each eligible household in the City. Commingles are collected in the City on the second and fourth Monday of each month. Save for the Mount Vernon area of the City, mixed paper is collected from each household on the second and fourth Tuesday, Wednesday, Thursday or Friday of each month, depending on the collection area schedule (see Figure 3-5).

**TABLE 3-4
RECYCLING MATERIALS COLLECTED IN REGULAR HOUSEHOLD SERVICE**

Mixed Paper Collection	Mixed Container Collection
<ol style="list-style-type: none">1. Newspaper2. Magazines3. Cardboard Boxes4. Paper Board5. Ad Mail6. Computer Paper	<ol style="list-style-type: none">1. All Colored Glass2. Aluminum3. Tin and Steel Cans4. Aerosol Cans5. Plastic Soda Bottles and Milk Jugs (SPI Code 1, SPI Code 2)

FIGURE 3-5



RESIDENTIAL MIXED PAPER RECYCLING COLLECTION DAYS

R

Drop-off Recycling Centers

WASTE GENERATION, COLLECTION AND DISPOSAL

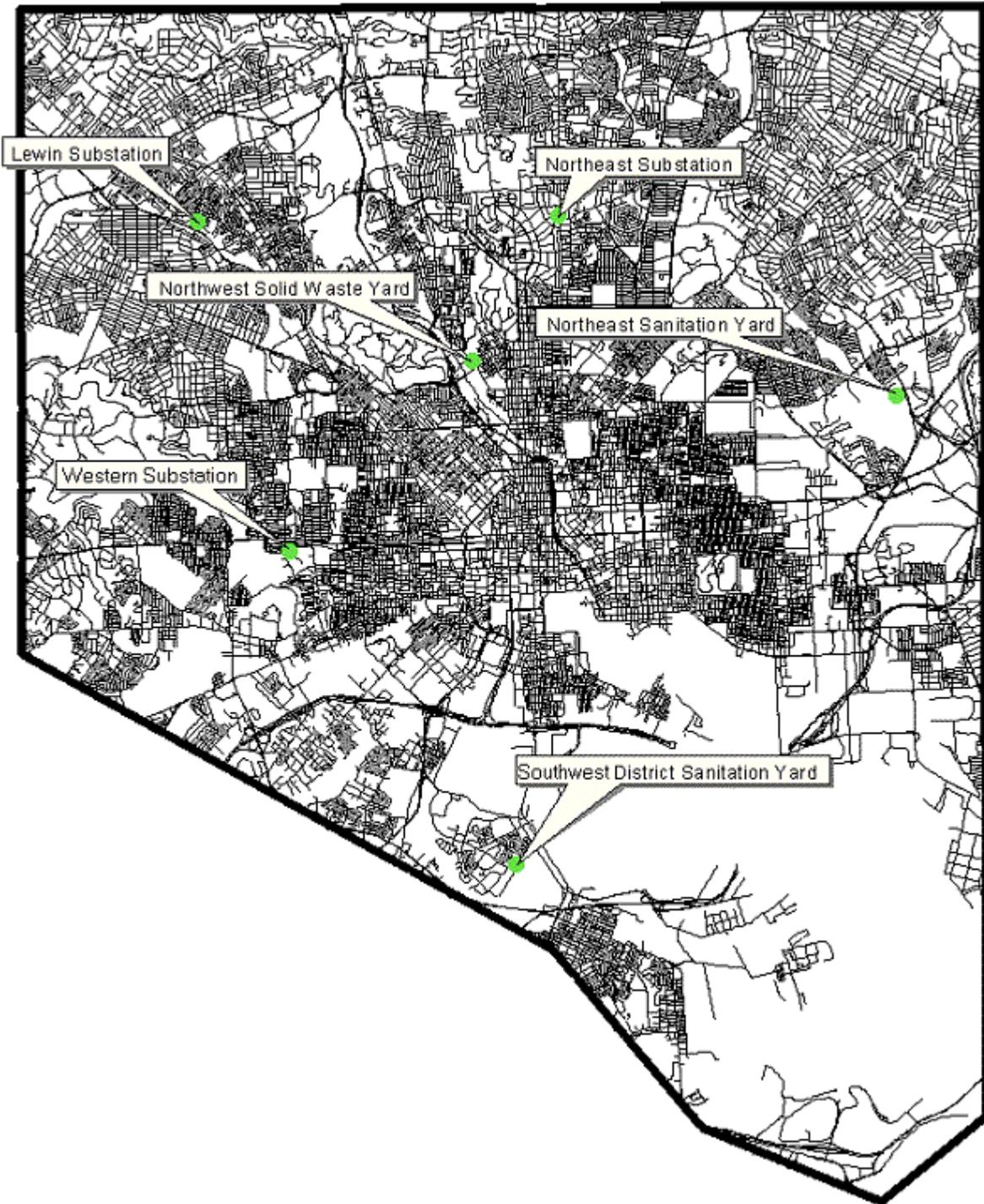
Before the City implemented citywide recycling collection, it supported several community drop-off centers. Now, the City operates drop-off recycling centers at six locations throughout the City, at each of the City's three sanitation yards and at three substations of the Bureau of General Services. The locations of these centers are shown on Figure 3-6. Residents can deposit mixed paper and commingled bottles and cans at these centers. They service the needs of apartment dwellers and other citizens who are not served by the City's regular collection system.

White Goods Collection

White goods are collected from residents' homes as part of the bulk trash collection program described previously in Section 3.3.2. These white goods are separated at sanitation yards, the Northwest Transfer Station (NWTS) and the QRSL, where they are placed in trailers for recycling. Trailers for recycling appliances are also placed at public housing renovation sites to facilitate collections. The Bureau of Solid Waste delivers directly to the David Joseph Company. Chlorofluorocarbons and hydrochlorofluorocarbons (CFCs) and polychlorinated biphenyls (PCBs) are removed at the David Joseph Company location prior to scrapping the metal.

Collection of Leaves

The City collects leaves by vacuum units, mechanical sweepers, and loadpackers each fall. The leaves are taken to mulch sites operated by the Department of Recreation and Parks. The principal mulch site is located at Camp Small (3.1.9). At the mulch sites, the Department, in its horticultural program, composts leaves for use.



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**FIGURE 3-6
RECYCLING DROP-OFF CENTERS**

Metal Recovered at BRESKO

As discussed in Section 3.4.1, the BRESKO facility is equipped to remove ferrous and non-ferrous scrap metal from the ash of the waste-to-energy operation. Since City-collected mixed refuse represents approximately 30 percent of the waste processed at BRESKO, about 30 percent of the metals recovered can be considered as part of the City's recycling program.

Institutional Recycling Programs

The City has implemented an institutional recycling program for the collection of white paper and mixed paper from 100 public schools and 22 City office buildings. The program also includes collection of aluminum cans from City office buildings.

A mixed paper recycling pilot program was conducted in seventeen schools for eight weeks in the spring of 1992. The pilot program proved to be successful, and it is being expanded to include all schools by 2001. This expansion was made possible through a grant from the Maryland Environmental Service.

The City is also expanding its office paper recycling program to include all city buildings and will collect mixed as well as white paper in these buildings by the end of 2002. Recycling bags and other materials are being provided for this program.

Recycling Program Achievements

The City collected 242,000 tons of recycling in its residential recycling program in 2001. This rate computes to approximately 34 percent of the City's waste stream. Table 3-5 shows the quantities of many recycled wastes for 2000 and 2001. All recycling waste categories and quantities are reflected in Appendix C.

Public Education, Monitoring and Feedback

The Bureau of Solid Waste's Education and Enforcement Division oversees all recycling programs, coordinates education programs for the public and manages recycling programs and contracts. In its Recycling Block Captain Program, the City currently has approximately 1,000 Block Captains who help promote recycling efforts in their neighborhoods.

In addition to the Block Captain program, the City has provided new public information that emphasizes expanded areas of the recycling program. This information includes a Household Hazardous Waste collection day that is held for City residents twice a year, in two locations. A Household Hazardous Waste Brochure is available, which contains information on the safe disposal of hazardous waste and household hazardous waste alternates.

The Bureau of Solid Waste's Education and Enforcement Division has spring and fall back yard composting workshops. These workshops are held at Cylburn Arboretum with Master Compost instructors provided by Cooperative Extension Services. They are free and open to the public. Residents are taught how to compost yard waste and are provided with an informational package on recycling and composting.

The City's education program includes an office paper recycling program. The program encourages office personnel in City buildings to recycle all office paper. City employees are given a short instructional presentation on a floor-by-floor basis. They are provided bins for the placement of their paper, and each floor has a once a week collection.

TABLE 3-5
ELIGIBLE WASTE COLLECTED AND RECYCLED
IN BALTIMORE CITY IN 2000 and 2001
(Tons)

Recycled	2000	2001
Mixed Paper	25,695	25,661
Commingled Bottle & Cans	2,833	2,647
White Goods	1,442	3,586
Leaves	15,000	10,510
Wood Waste	1,193	164
Christmas Trees	55	69
Animal Manure	713	233
Tires	7,236	801
Ash	105,500	113,198
Metal Recovered at BRESKO	10,896	9,960
Other Eligible Recycled Waste	64,532	75,432
Total Eligible Waste Recycled	235,095	242,261
Not Recycled		
Mixed Refuse Delivered to BRESKO	498,871	380,586
Mixed Refuse Delivered to QRSL	123,229	98,564
Total Eligible Waste Not Recycled	622,100	479,150
Total Recycled	235,095	242,261
Total Eligible Waste	857,195	721,411
Percent Eligible Waste Recycled	27.43%	33.58%

3.4 WASTE DISPOSAL

State regulations require that Chapter 3 of comprehensive solid waste management plans include information on each existing public or private solid waste acceptance facility in the subdivision. According to the regulations, solid waste acceptance facilities are “incinerators, transfer stations, major composting sites, sanitary and rubble landfills,

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major resource recovery facilities, controlled hazardous substances facilities, injection wells and industrial waste liquid holding impoundments.”

In compliance with this requirement, information is presented in this section on the public and private waste acceptance facilities located in Baltimore City. Private facility information is primarily obtained for MDE records. Geographic coordinates for each facility are indicated below the facility name.

Currently, the City disposes the majority of the solid waste it collects at BRESCO pursuant to a contract with the Northeast Maryland Waste Disposal Authority. In turn, this facility has contracted with the City to dispose of their ash residue at QRSL.

Following the descriptions of the waste acceptance facilities, various contractual arrangements are summarized in Table 3-11, which includes major existing recycling companies.

3.4.1 Baltimore Refuse Energy Systems Company (BRESCO) (N 523,500; E 905,000)

The BRESCO plant is located at 1801 Annapolis Road on 15 acres of land owned by the Mayor and City Council of Baltimore. The plant itself is privately owned by the Connecticut Bank and Trust Company, National Association, as trustee, and leased back for operation by BRESCO, an indirect subsidiary of Waste Management Inc. It was constructed in 1984 and became fully operational in 1985.

The BRESCO plant is structured around three mass-burning, water wall furnaces. These furnaces can burn up to 2,250 tons of refuse per day at temperatures between 2400 and 2800 degrees Fahrenheit, reducing the volume of waste by up to 90 percent.

This combustion process generates heat that is used to convert water into steam. Operating at full capacity, BRESCO can produce as much as 500,000 pounds of steam per hour. Part of the steam is used to drive turbines and generate electricity. The rest is sold to the district heating and cooling system operated by the Trigen Company in downtown Baltimore.

During optimal conditioning, approximately 10 percent of the waste by volume and 27 percent by weight remains in the form of ash residue after combustion, and ferrous and non-ferrous materials are removed. Ferrous and non-ferrous metals are removed from this ash and sold to a scrap dealer. The ash is delivered to QRSL where it is used for daily cover.

According to its audited records for 2001, BRESCO accepted approximately 736,000 tons of debris per year from Baltimore City, Baltimore County and other parties. Approximately 10,000 tons of scrap metal is recovered from the ash, and 183,000 tons of ash is left for disposal.

In 1997 BRESCO expanded its permit to allow waste to be transferred to another facility for disposal. This debris, currently averaging approximately 200 tons per day, is disposed of at a landfill in Pennsylvania.

BRESCO's air scrubbing system, which prevents pollutants from being released into the atmosphere, needed to be rehabilitated by December 2000 in order to be in compliance with the Clean Air Act Amendments of 1990. Thus the Northeast Maryland Waste Disposal Authority, in conjunction with Baltimore City and Baltimore County, negotiated an extension of the agreement that the City has with BRESCO, set to expire in 2002, to 2011. Under this agreement, the City contributed \$17.5 Million to the rehabilitation project in exchange for substantially lower tipping fees over the life of the agreement.

BRESCO has obtained and operates in compliance with necessary City, State and Federal permits. Emissions from the electrostatic-precipitator-equipped smokestacks are monitored by the Maryland Department of the Environment.

3.4.2 Quarantine Road Sanitary Landfill

(N 500,000; E 925,000)

The Quarantine Road Sanitary Landfill (QRSL) is located at 6100 Quarantine Road on a 157-acre site in Hawkins Point¹, 125 acres of which will be utilized as a landfill. It is owned by the Mayor and City Council of Baltimore and operated by the City's Department of Public Works, Bureau of Solid Waste.

The first cell of the landfill was constructed and began accepting waste in August, 1985. Originally, the landfill was designed as six cells surrounding a central core that was to remain in place. The design capacity was approximately

WASTE GENERATION, COLLECTION AND DISPOSAL

11.2 million cubic yards with an expected 9.1 million cubic yards or approximately 5.4 million tons allocated for waste. The remaining volume was allocated for cover material. These calculations were based on an industry standard factor of 1 ton of mixed refuse and bulk material occupies 1.67 cubic yard of landfill space. In 1989 QRSL was redesigned to remove the central core and raise the overall landfill elevation. The capacity was thereby enlarged to approximately 18.3 million cubic yards. Using the same industry standard of 1.67 cubic yard/ton, it was anticipated that 15.8 million cubic yards or 9.4 million tons of solid waste could be placed. At the time of re-design, it was thought that QRSL would reach capacity between 2001 and 2004.

In August of 1994, the City utilized aerial photography and consultant services to upgrade the life expectancy estimate of the landfill. Using this information, it was learned that the industry standard of 1.67 cubic yard/ton should not be applied at QRSL due to the high percentage of ash. (Ash is much denser than the predicted industry standard of 1.67 that was used in the original life projections.) Actual operations indicated that 1 ton of QRSL debris was occupying 1.12 cubic yards of volume.

In October 1996, aerial photography was again performed. Actual operations indicated that 1 ton of debris was occupying 1.08 cubic yards of volume. The estimated life of the landfill was revised to 2019 +/- a year.

In March 1999, another aerial photography of the landfill was performed that indicated that one ton of debris was occupying 0.8 cubic yard of volume, which would extend the life of the landfill to sometime around 2032.

However, subsequent aerial photography in 2001 showed the landfill filling at its most rapid pace since its opening, especially with the addition of more building debris from City demolitions. It is now estimated that the landfill could reach capacity as early as 2014.

In 2001, QRSL accepted approximately 580,000 tons of waste. The amounts and kinds of waste that comprised this total are shown in Table 3-8. It can be seen that the majority of waste accepted is non-organic material; ash, rubble and bulk. The largest single category of waste accepted at the landfill was incinerator ash, accounting for approximately 37% by weight and 35% by volume.

City and State permits have been obtained for the entire QRSL site. A leachate collection system and a groundwater monitoring system are in place.

**TABLE 3-6
SOLID WASTE ACCEPTED AT QUARANTINE LANDFILL IN 2001**

¹The Baltimore City Composting facility occupies 8 acres of this site (see Section 3.4.6).

TYPE	TONS	% BY WEIGHT
BRESCO Ash	216,100	37%
Patapsco WWTP Ash & Grit	7,800	1%
City Rubble	12,500	2%
Private Rubble	2,400	0%
City Mixed Refuse	68,100	12%
Charities Bulk Debris	19,500	3%
Industrial Sludge-Grace	23,600	4%
Industrial Waste-Grace	3,100	1%
Private Haulers	180,400	31%
Public Agencies Bulk Debris	44,000	8%
Total	577,500	100%

3.4.3 Baltimore Regional Medical Waste Facility

(N 498,500; E 926,000)

Baltimore Regional Medical Waste Facility, formerly Medical Waste Associates, is located on a 4 acre site at 3200 Hawkins Point Road. This facility is a medical waste incinerator, which is privately owned by Phoenix Services Limited Partnership. The facility has a permitted capacity of 150 tons per day. Last available numbers indicate that 44 percent of this amount came from medical facilities within the City, while 56 percent was imported. The ash residue remaining after incineration (approximately ten percent of the original volume and approximately 35 percent of the original weight) is disposed of at an out-of-state facility.

3.4.4 Stericycle Inc. Incinerator

(N 500,000; E 921,500)

Stericycle Inc., formerly Med Net and MEDEX, is a privately owned incinerator located on a 2.4 acre site at 5901 Chemical Road. The facility has a capacity of 14.4 tons per day, and operates 24 hours a day, 365 days a year. Only infectious and pathological ("red bag") wastes in approved containers are accepted at the incinerator, with special provisions made for collection, handling, storage and monitoring of wastes. Approximately 30 percent of the

waste accepted at this facility is imported from outside the Baltimore region. The ash remaining after incineration is disposed of at an out-of-state facility.

3.4.5 Patapsco WWTP Incinerator
(N 510,000; E 922,500)

The Patapsco Wastewater Treatment Plant Incinerator is located at 3501 Asiatic Avenue, on the 66-acre treatment plant site. This facility was closed in February 1996. Sludge from this location is currently pelletized on site.

3.4.6 Baltimore City Composting Facility
(N 501,000; E 928,000)

The Baltimore City Composting Facility is located at 5800 Quarantine Road on eight acres of the 157-acre QRSL site. The plant itself is privately owned by Baltimore City Composting Partners. Only sewage sludge generated at the City's Back River Wastewater Treatment Plant is accepted at the composting facility, which has a design capacity of approximately 175 wet tons per day. The sludge is mixed with wood chips and aerated to produce compost that is marketed locally for landscaping purposes.

3.4.7 Northwest Transfer Station
(N 549,500; E 890,000)

The 9.8-acre Northwest Transfer Station (NWTS) at 5030 Reisterstown Road is owned and operated by the City. The station's design capacity is 600 tons of mixed refuse per day. Currently, approximately 300 tons of mixed refuse and maintenance debris per day are transferred at this station from collection trucks to trailers for hauling to BRESCO.

In 1985 two areas were added to the station, for transferring street dirt and bulk wastes from collection trucks to trailers for hauling to QRSL. The transfer station also has roll-off containers for disposal of excess mixed refuse or bulk items brought to the station by City. In 2000 the transfer station had an outdoor facility designed and installed to accommodate mechanical sweepers for the transfer of street sweeping debris. Also in 2000 design began for the rehabilitation of the transfer station, with construction originally scheduled to begin in 2001.

However, the City of Baltimore was entertaining the possibility of either selling or leasing the NWTS to a private entity for continued use as a transfer station, which suspended the construction. With the City's decision to keep the NWTS, this construction is now scheduled for early 2003.

3.4.8 Stericycle Inc.
(N 518,500; E 904,000)

Stericycle Inc., formerly Waste Management, Inc., owns and operates a private transfer station and processing facility for medical waste at 2510 Erick Street. Its maximum capacity is 24.6 tons per day. Fifteen percent of the total volume is generated within Baltimore City.

3.4.9 Clean Harbors of Baltimore, Inc. Treatment Facility
(N 524,000; E 903,500)

Clean Harbors of Baltimore, Inc., owns and operates a major waste treatment facility on a 5.5 acre site at 1910 Russell Street. Hazardous and non-hazardous liquid wastes are treated on site, with non-hazardous wastewater discharged into City sewers, while the sludge remaining after processing is being exported to out-of-state landfills. The company also handles or "brokers" oil, oily debris, non-hazardous industrial solids and hazardous solids generated both inside and outside the City and the State, exporting them for disposal out-of-state.

3.4.10 Baltimore Processing Center
(N 500,000; E 920,500)

Baltimore Processing Center, formerly FERST for Baltimore, Inc. is located at 5800 Chemical Road. An enclosed composting and recycling facility designed to process 700 tons per day of residential and commercial solid waste went into start-up in mid-January, 1993. MSW was to be supplied to the facility under a private contract. The facility is owned by BFI/Allied Waste.

Material arriving at the plant passes along four recycling conveyors where glass, plastics, aluminum cans, paper and scrap metal are removed for recycling. The organic fraction then passes through shredders and is composted for 12 to 18 days. The compost is cured for an additional 25 to 30 days. Finished compost will be screened prior to marketing. The facility accepts selected types of waste for processing and excludes discarded appliances and wastes from generators such as gas stations and dry cleaners.

On April 13, 1998, a permit was issued to Browning Ferris Industry Waste Systems of North America, Inc. (BFI). BFI must operate within the parameters of the FERST permit.

3.4.11 Millennium Inorganic Chemicals, Inc. Landfill

(N 498,250; E 927,500)

Millennium Inorganic Chemicals Inc., formerly SCM Chemicals, Inc., owns and operates an industrial landfill in the Curtis Bay area. Millennium Inorganic Chemicals headquarters is located at 3901 Fort Armistead Road.

At the headquarters site, 57 acres are utilized as a landfill. It accepts approximately 350,000 tons annually of non-toxic, non-hazardous solid waste, primarily gypsum material for disposal.

Millennium Inorganic Chemicals also owns and uses another landfill in the Hawkins Point area of Baltimore City. (N 508,000, E 932,000) The material disposed of at this site is also generated from Millenium's Hawkins Point Plant. There is no permit information available on this site.

3.4.12 Sanifill of Maryland, Inc.

(N 525,000; E 903,000)

This processing facility is located at 1401 West Hamburg Street and is owned and operated by the Sanifill of Maryland Inc. It was formerly owned by Baltimore Environmental Recovery Group; and was transferred in February 1998. This site received a Maryland Department of the Environment Refuse Disposal Permit in September 1997, to construct and operate a processing facility. This facility may accept up to 200,000 cubic yards of non-hazardous commercial waste and up to 1,000,000 cubic yards of demolition and construction debris annually. This facility may accept a maximum of 4,059 cubic yards of debris per day. According to State records, 75 percent of the waste is from the City; 24 percent from other parts of Maryland, and 1 percent from out of the State.

3.4.13 Edison Processing Facility

(N 535,000; E 920,000)

The Edison Processing Facility is located on the western side of the former Armco Steel Property at 1030 Edison Highway. The facility is owned by Edison Associates LLC, and operated by Baltimore Aggregate Recycling LLC. Currently at this 12.5-acre site, aggregates such as asphalt, clean concrete, dirt, gravel, and sand are processed for recycling. A permit was issued in 2001 for the construction and operation of a 500-ton per day construction and

demolition processing facility. This permit will allow items such as drywall, lumber, and masonry to be processed for recycling. Materials that can not be recycled will be reloaded and transported to one of several MDE permitted landfills.

3.4.14 Certified Storage and Disposal Inc.

This privately owned and operated cosmetic processing facility is located at 1100 Wicomico Street. This facility accepts off-specification, non-flammable cosmetics generated by Noxell, a manufacturer who produces cosmetics, for processing and disposal off site. The facility is open from 7:00 a.m. to 7:00 p.m., and accepts primarily shampoos, conditioners, liquid make-ups and skin care lotions. The maximum amount of materials is not to exceed 6 tons daily.

3.4.15 Recycling Companies and Facilities

State regulations do not require that recycling facilities be included under the category of waste acceptance facilities.

However information available to us, pertaining to major recyclers such as Emanuel Tire Company, Potts and Callahan, and Chesapeake Paperboard Company has been included in Table 3-9 and Appendix B. A list of recycling companies including wastepaper, scrap and multiple materials businesses in the greater Baltimore area is provided for reference in Appendix B. This list is not intended to be all-inclusive and is included for informational purposes only.

3.4.16 Summary of Waste Acceptance Facilities for Waste Categories

An overall index to waste acceptance facilities in Baltimore is presented in Table 3-10. In this table, the waste categories discussed in Section 3.1 are listed with the corresponding waste acceptance facilities or types of facilities discussed above in Section 3.4. In effect, this table summarizes the solid waste acceptance facilities in Baltimore.

**TABLE 3-7
SUMMARY OF CITY'S WASTE DISPOSAL AGREEMENTS**

WASTE GENERATION, COLLECTION AND DISPOSAL

Other Parties	Term	Description	Comments
1. Northeast Maryland Waste Disposal Authority	1982-2011	City contracted for incineration capacity at 281,250 tons per year at BRESCO; with the ability to modify 3% each year.	Tipping fee set by formula in 1999-\$30.88 per ton. In 1997 the City delivered 280,000 tons. Similar agreement exists with Baltimore County for 93,750 tons.
2. Northeast Maryland Waste Disposal Authority	1982-2011	City obligated to accept as much as 150,000 tons of ash at the Quarantine Road Sanitary Landfill from BRESCO.	Tipping fee set by formula in 1999- \$12.84 per ton . In 1997 BRESCO delivered 180,000 of ash. The Authority has reserved the capacity in the landfill for future disposal.
5. David Joseph Co.	1997 – 2001	Annual renewable contract for processing and recycling “white goods”.	Company removes CFCs and PCBs and then scrapes the metal content for recycling. Company compensates the City at a quarterly market rate.
7. Vangel	1997-1999	Two year renewable contract for processing of white paper.	Company removes white paper from City Buildings, price is based on monthly market index.

**TABLE 3-8
WASTE ACCEPTANCE FACILITIES FOR WASTE CATEGORIES**

Waste Category	Acceptance Facilities	Reference Section
Mixed Refuse (Residential, Commercial, and Institutional)	BRESCO	3.4.1
	Quarantine Road Sanitary Landfill	3.4.2
	Northwest Transfer Station	3.4.7
	Baltimore Processing Center	3.4.10
	Sanifill of Maryland	3.4.12
Recycling Facilities	Recycling Facilities	Appendix B
Special Hospital Waste	Baltimore Medical Waste Facility	3.4.3
	Stericycle Incinerator	3.4.4
	Stericycle Inc,	3.4.8
Industrial Non-Hazardous Waste	Quarantine Road Sanitary Landfill	3.4.2
	Baltimore Processing Center	3.4.10
	Millennium Inorganic Chemicals, Inc.	3.4.11
	Sanifill of Maryland Inc.	3.4.12
	Certified Storage and Disposal, Inc.	3.4.14
Land Clearing & Demolition Debris	Quarantine Road Sanitary Landfill	3.4.2
	Sanifill of Maryland Inc.	3.4.12
	Edison Processing Facility	3.4.13
Bulky or Special Waste	Quarantine Road Sanitary Landfill	3.4.3
	Recycling Facilities	Appendix B
Liquid Waste	Clean Harbors of Baltimore	3.4.9
Treatment Plant Sludges	Patapsco WWTP Incinerator	3.4.5
	Baltimore City Composting Facility	3.4.6

**CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF SOLID WASTE**

**TEN YEAR SOLID WASTE MANAGEMENT PLAN
JULY 2002**



***CHAPTER 4
ASSESSMENT***

4.0 ASSESSMENT

State regulations for the development of comprehensive solid waste management plans require that Chapter 4 assesses the jurisdiction's needs to alter, extend, modify or add to existing solid waste disposal systems during the next ten years. "Solid waste disposal systems" are defined in the regulations as including the collection of waste, the transport of waste to acceptance facilities, and the treatment or disposal of waste at the acceptance facilities. The assessment is to evaluate the use of recycling and resource recovery to reduce land disposal needs, among other aspects of solid waste management.

The required assessment of the City's solid waste disposal system is presented below. The assessment is organized by focusing on the City's current key concerns one at a time, although it is recognized that these concerns are all interrelated and must be addressed simultaneously to have an effective Plan of Action. The following areas will be assessed:

- 4.1 Solid Waste Disposal System
- 4.2 QRSL Assessment
- 4.3 NWTS Assessment
- 4.4 Eastside Transfer Station
- 4.5 Regional Approach
- 4.6 Source Separation & Reduction
- 4.7 Emergency Response System

To assist the City in the continual self-assessment of our services, the City has implemented CITISTAT, which is a performance measurement program used to evaluate the City's efficiency of operation. CITISTAT's utilization in the Bureau of Solid Waste involves the regular reporting and review of all aspects of its operation, concentrating primarily on customer service, budget, and personnel concerns. This program helps the City to distribute its resources more effectively as well as to alert the City of any areas that need additional attention. Continued use of this tool, as well as continued feedback from citizens and employees is essential in developing a proper assessment of the solid waste management needs of the City now and in the period covered by this Plan.

4.1 SOLID WASTE DISPOSAL SYSTEM

4.1.1 Public Waste Collection and Transport System Assessment

The overall effectiveness of the City's solid waste collection system is highly rated in surveys completed by communities. This effectiveness is attributed to very reliable City collection services tailored in many respects to the convenience of residents (to encourage residents' cooperation). For example, waste is collected at the rear of many homes, allowing residents to store and use garbage cans without having to carry cans out to the front curb on mixed refuse days. Any problems with collections are usually responded to within 24 hours, 7 days a week.

Sanitation, in some neighborhood locations, occasionally falls below a satisfactory level. These instances usually result from littering, illegal dumping or residents' failures to set out refuse properly (for example, setting out garbage in bags which can be torn open by stray animals). The City's experience in implementing the regular recycling collection program suggests that occasional deficiencies can be addressed through public education, monitoring and feedback programs that extend beyond recycling. Such an extension, along with efforts to improve overall efficiency in collections has become increasingly important as the City continues to move toward making the City as clean as possible in the most cost effective way.

In order to address these concerns, the City created a Sanitation Enforcement Section in 1998 within the DPW, Bureau of Transportation, whose sanitation enforcement officers have been trained in sanitation related issues, and who have the authority to issue violations when necessary. Sanitation Enforcement Officers also distribute educational materials outlining the waste collection services provided by the City.

As part of a reorganization strategy within DPW, sanitation enforcement became a section within the Bureau of Solid Waste's Education and Enforcement Division in October 2000. The purpose was to consolidate trash collection services and code enforcement within the entity of the Bureau of Solid Waste.

Along with the increased attention directed toward sanitation citations, the City has also created an Environmental Control Board. The Board became active in October 1998. It is governed by five city Agency Department Heads, (Fire Department, Police Department, Housing and Community Development, Health Department and the Department of Public Works). There are thirteen members of the Board, who review zoning, building and housing violations. If an individual receives a citation, he or she may either pay or request a trial by the Board. Approximately 156 citations are being issued daily, with the majority being paid.

More attention is being given to educating the public about its responsibilities concerning the City's cleanliness and the importance of recycling. Brochures on various aspects of sanitation and recycling are prepared and distributed in neighborhoods, schools, and at fairs and events. Additionally, public information messages are being presented on the City's cable television station and messages are sent by e-mail and posted through the City's web site (www.baltimorecity.gov) to educate more citizens.

The residential collection system is based on fixed routes which crews follow on Monday/Thursday, Tuesday/Friday and Wednesday/Saturday. Each crew (consisting of one driver and two laborers) is assigned a route for each day worked. Individuals are scheduled to work five days per week; days off are on a rotated schedule. The crew collects all mixed refuse set out on the route for that day. The collection crew works on the "task system", where they get paid for a full 8-hour day even if they complete their routes in less than 8 hours.

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When the crew finishes collecting waste on the route (or before, if the truck is full), the crew delivers its load to the assigned waste acceptance facility. Routes are designed to allow for the necessary travel time to an assigned facility.

The number of workers employed and the number of trucks purchased are based on the number of routes. The Bureau of Solid Waste strives to employ and equip a sufficient number of crews to collect all of the refuse set out on any given collection day within 8 hours. Hours for collection crews are typically from 7:00 a.m. to 3:00 p.m.

The amount of waste set out for collection varies from season to season. However, since the work force is composed of permanent full-time employees and temporary seasonal employees, adjustments can be made in work assignments to reflect these variations.

The Chief of the Collections Division has some flexibility in assigning work to improve efficiency. Through the implementation of the Geographical Information System (GIS) and the Satellite Tracking System that is explained in the action plan in Chapter 5, the Bureau's staff will have the ability to collect real-time data and design computer models that will make a dramatic impact on how efficient the Bureau's Collection Division operates. Currently, the Division Chief may adjust collection routes as long as adjustments do not change the day of the week on which a given household's refuse is collected. They can also adjust destinations and/or delivery routes used by the crews to transport collected waste to acceptance facilities. If a crew's normal disposal destination is overloaded or out of operation on a certain day, or access via the normal route is interrupted, the crew can be directed to deliver its load to a different disposal facility and/or use a different route in traveling to the facility.

Another area that will be addressed is accessibility to waste acceptance facilities. Allowances must be made for traveling from routes to these facilities. Adjusting routes is more difficult when long trips have to be taken into account.

For the southwest, central and southeast sectors of the City, the Baltimore Refuse Energy Systems Company (BRESKO) is centrally located for mixed refuse disposal. Quarantine Road Sanitary Landfill (QRSL) is reasonably accessible for disposal of bulk items. The Northwest Transfer Station (NWTS) serves northeast and north central sectors as well as the northwest. This facility permits the transfer of waste from loadpackers into trailers for hauling to BRESKO and QRSL.

In trips to waste acceptance facilities alone, the NWTS has been estimated to save more than 11,000 hours of travel time per year in transport of debris to BRESKO and to QRSL. For example, past data indicate that crews in Borough 14 collected an average of 3.8 tons more per day than crews in Borough 23 (17.8 tons versus 14.0). The crews in Borough 14 worked only an average of 15 more minutes per day (6.35 hours versus 6.1 hours) to collect 27 percent more waste. Part of the imbalance in time between the workloads in these two boroughs is attributed to the location of Borough 14 in relation to the NWTS. Mixed refuse collected in Borough 23 must be transported longer

distances to BRESCO. Routes in Borough 14 can be longer and include more trips to the transfer station, while routes in Borough 23 must be shorter and tailored to accommodate fewer, longer trips to BRESCO.

Possibilities to further improve the efficiency of the collection system are being explored. Considering that it costs \$140,000 per year to employ and equip a single collection crew, there is the potential for significant savings in annual operating costs. Moreover, reducing the amount of travel time required to provide collection services could permit the City to increase its investment in work, providing more public benefits.

In Fall of 2000, the City began utilizing slightly larger collection vehicles (load packers) primarily in the Northern portion of the City so that fewer trips would need to be made to disposal locations, thus increasing the amount of waste that can be collected each day. Use of these vehicles also reduces the number of crews needed to perform collection services.

Given the complexity of the collection/transport system, the previously mentioned Geographical Information System (GIS) and the Satellite Tracking System will allow real-time data to be utilized to streamline the collection routes. It is expected that this system will be in use no later than 2005.

The City's curbside collection system has yet to include provisions for collecting "household hazardous wastes." This issue has been identified as a regional need and is being pursued on a regional basis. The City sponsored a regional seminar on this subject in 1993 to generate more regional thinking and planning with regard to household hazardous wastes. In the past, the City has studied alternative approaches to the management of these waste materials in Montgomery County (mobile collection), Lancaster County, PA (permanent facility), and Fairfax City, VA (curbside collection). While such wastes are not defined as hazardous for regulatory purposes, their chemical composition may present an environmental health concern if they are handled improperly. These wastes include household cleaners, batteries, paints, oil, pesticides, and solvents. Some residents have expressed a need for City collection of household hazardous wastes. A regional solid waste work group has identified household hazardous waste as one area with potential for regional program development.

The City has expanded its household hazardous waste collection day to be held twice a year, during spring and fall, at the Poly/Western High School Complex. This was a result of surveying participants on the number of times they felt the event should be held. Eighty-six percent of those responding to the survey felt the event should be held twice a year, and as a result the City complied.

With cooperation from local merchants, the City instituted a "button battery" collection and recycling program. Convenient drop-off centers have been established to collect button batteries in numerous locations throughout the City. The batteries collected are recycled in an effort to reduce the amount of lead and mercury entering the waste stream. BRESCO is providing assistance to the City by paying for the shipping and processing costs of the button

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batteries. In 1994 the City also began to collect latex paint for re-use at sanitation yards throughout the City. The paints are mixed and given to the Loading Dock, a non-profit organization, which provides the paint to low income residents for their home improvement.

An area of concern to the City is the collection of yard waste. Several alternatives are being evaluated in conjunction with recycling route analyses, including collection by City forces on a regular schedule, on-call collection, and resident drop-off to strategically located yard waste collection centers. Coordination of yard waste collection centers with transfer stations and recycling drop-off centers is part of the ongoing analysis.

4.1.2 Public Waste Disposal

In March 1999, the remaining capacity of QRSL (with development of the core and Cell #6) was estimated at just over 9 million tons of waste and cover material (see Table 4-1). This capacity should be sufficient to meet the current level of demand for the ten-year planning period (2002-2011). Further discussion of QRSL takes place in Section 4.2 below.

**TABLE 4-1
OPTIMISTIC LANDFILL LIFE PROJECTION**

Landfill Capacity (cubic yards): 18,320,622

Volume 1 Ton debris occupies as of 1999 (cubic yards): 1.3

Year	Tonnage	Cubic Yards	% Utilized (in-place)
1985	142,514	154,770	1%
1986	591,196	642,039	4%
1987	554,581	602,275	3%
1988	616,452	669,467	4%
1989	604,058	656,007	4%
1990	586,880	637,352	3%
1991	558,144	606,144	3%
1992	522,036	566,931	3%
1993	489,600	531,706	3%
1994	509,806	553,649	3%
1995	439,609	477,415	3%
1996	383,785	416,791	2%
1997	397,774	431,983	2%
1998	461,802	501,517	3%
1999	492,450	393,960	2%
2000	410,039	533,051	3%

2001	577,793	751,131	4%
TOTAL	8,338,519	9,126,188	50%

Remaining life in years: 19.4

The projected date which the landfill will reach capacity is 2019.

The City has identified two issues concerning waste disposal. First, there is a need to encourage the use of waste acceptance facilities and discourage illegal dumping of solid waste. Second, there is a need to plan for landfill capacity in the long term (beyond the ten-year planning period). These issues are addressed in Sections 4.1.2.1 and 4.1.2.2.

4.1.2.1 Small Load Disposal

In 1993, the City introduced a program allowing small haulers, vehicles with a ¾ ton or less capacity who were permitted by the City Health Department, to dispose of their loads of debris at the QRSL, the NWTS and three Solid Waste Yards (2840 Sisson Street, 701 Reedbird Ave., and 6101 Bowleys Lane) for \$5.00 per load. This program has been well received by its users and appears to have reduced illegal dumping in some areas.

The two most used facilities have been the QRSL and the NWTS. The QRSL averages 3,450 small haulers or approximately 1,700 tons per month. The NWTS averages 2,280 small haulers or approximately 1,140 tons per month. Because of the large number of vehicles coming to the NWTS and to better monitor waste flow into the City’s facilities, the City now accepts small haulers only at QRSL.

4.1.2.2 Land Disposal Capacity Needs

Among possible needs to "alter, extend, modify or add to" the City's solid waste disposal system, arguably the most important relate to sanitary landfill capacity. As was discussed in Section 3.4.2, the City's only sanitary landfill at QRSL is expected to provide sufficient capacity for the period covered by this Plan. However, since its life expectancy may not extend much beyond that time, a feasibility study is being proposed to identify landfill capacity within the City, the surrounding region and outside the region.

4.1.2.3 Future Disposal Options

A realistic assessment of changes in landfill usage requires comparing the costs of these changes (in the form of lost revenues) with the costs of possible alternatives. Since the City will have a continuing need for land disposal of solid waste, an alternative disposal site to QRSL will have to be available when the landfill is depleted.

One alternative would be to develop a City owned facility either inside or outside of the City. No suitable location for a new landfill has yet been identified and identifying a site will likely be difficult. Large tracts of undeveloped land are very scarce within the City, and any that are possible for a landfill would likely be desirable for industrial uses. If a site could be found, the acquisition and development costs for a new landfill would be very high. For example, the costs for QRSL are estimated to total \$500,000 an acre by the time Cell #6 is complete.

Exportation of waste is another alternative that will be explored. Many of the City's neighboring counties have implemented out of county transfer of waste. However, the City is under contract to deliver the majority of its waste to BRESCO for the period covered by this plan, thus making this option somewhat remote.

Since Baltimore is conveniently located at a port, a possible, yet remote alternative for solid waste disposal could be exporting baled wastes to another country. If another country sets a national policy of importing waste to enhance its economic development, such an alternative could possibly prove more reliable than exporting wastes within the United States.

The QRSL site can be considered a non-renewable resource. Several suggestions have been advanced for extending the life of QRSL without restricting its usage. These include redesigning the landfill to raise its finished elevation as was done in Montgomery County. Another suggestion is reusing landfill space through "landfill mining" and/or biochemical treatment. The opening of a one of the seven previously closed landfills owned by Baltimore City is also being explored.

4.2 QUARANTINE ROAD SANITARY LANDFILL ASSESSMENT

4.2.1 Landfill Usage Prior to BRESCO

In 1983, the City utilized three waste disposal facilities: Bowley's Lane Landfill, Woodberry Quarry Landfill, and the Pulaski Incinerator. These facilities accepted the 560,000 tons of waste material generated annually by the citizens of Baltimore.

With the two functioning landfills nearing capacity and the incinerator functioning inefficiently, long term solutions for the City's solid waste problems were needed. These solutions were the construction of the QRSL and the opening of the waste-to-energy facility known as BRESCO.

4.2.2 Impact of BRESCO on Landfill Usage

In 1982, the City entered into agreements with the Authority to support construction of a resource recovery facility in southwest Baltimore. The purpose of the BRESCO project was to reduce the amount of solid waste that would have to be landfilled in the future in the Baltimore region. It has been determined that the utilization of BRESCO reduces the volume of landfill space that the debris occupies by up to 90 percent. The high percentage of ash being accepted at the landfill and the dense compaction of the ash has increased the life of the landfill.

The QRSL accepted approximately 578,000 tons of debris in 2001. Until 1998, the amount of debris landfilled annually at QRSL had been generally decreasing since the 1991 amount of 570,000 tons. The landfill accepts primarily inorganic material, specifically BRESCO ash, Water and Wastewater ash and grit, industrial debris, and City collected construction and demolition debris.

The preceding discussion indicates that when landfill capacity in the City was increased by the development of QRSL, land disposal of solid waste in the City increased also. Accepting large amounts of ash residue and other wastes at the landfill generated substantial revenues from tipping fees, offsetting much of the City's capital and operating expenditures for the landfill. At the same time, however, accepting large amounts of waste reduced the landfill's capacity more quickly than had been expected. This trend has been more readily apparent since 1998.

4.2.3 Costs of Quarantine Road Acquisition and Development

The continuing expansion of QRSL requires a substantial capital investment by the City. Since debt service on funds borrowed to acquire and develop the landfill requires ongoing expenditures, it is useful to review the financing and costs of this facility to date.

The site for the landfill was acquired by the City in 1984, at a price of \$9.3 million. State grants were received for half of this cost. The balance was funded through the 5th Solid Waste Disposal Loan of 1980; \$1.9 million in general obligation bonds and \$2.75 million from the Northeast Maryland Waste Disposal Authority, representing proceeds of the sale of the former Pyrolysis Plant.

Other costs related to acquisition, design of the landfill and construction of the first cell, totaled \$4.1 million. A portion of the necessary funding came from current City revenues (general fund and "other" funds). The balance of

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the initial development cost (\$3.5 million) was financed through a conditional purchase agreement. The first cell was completed in 1985 (see Figure 4-1 for location of cells).

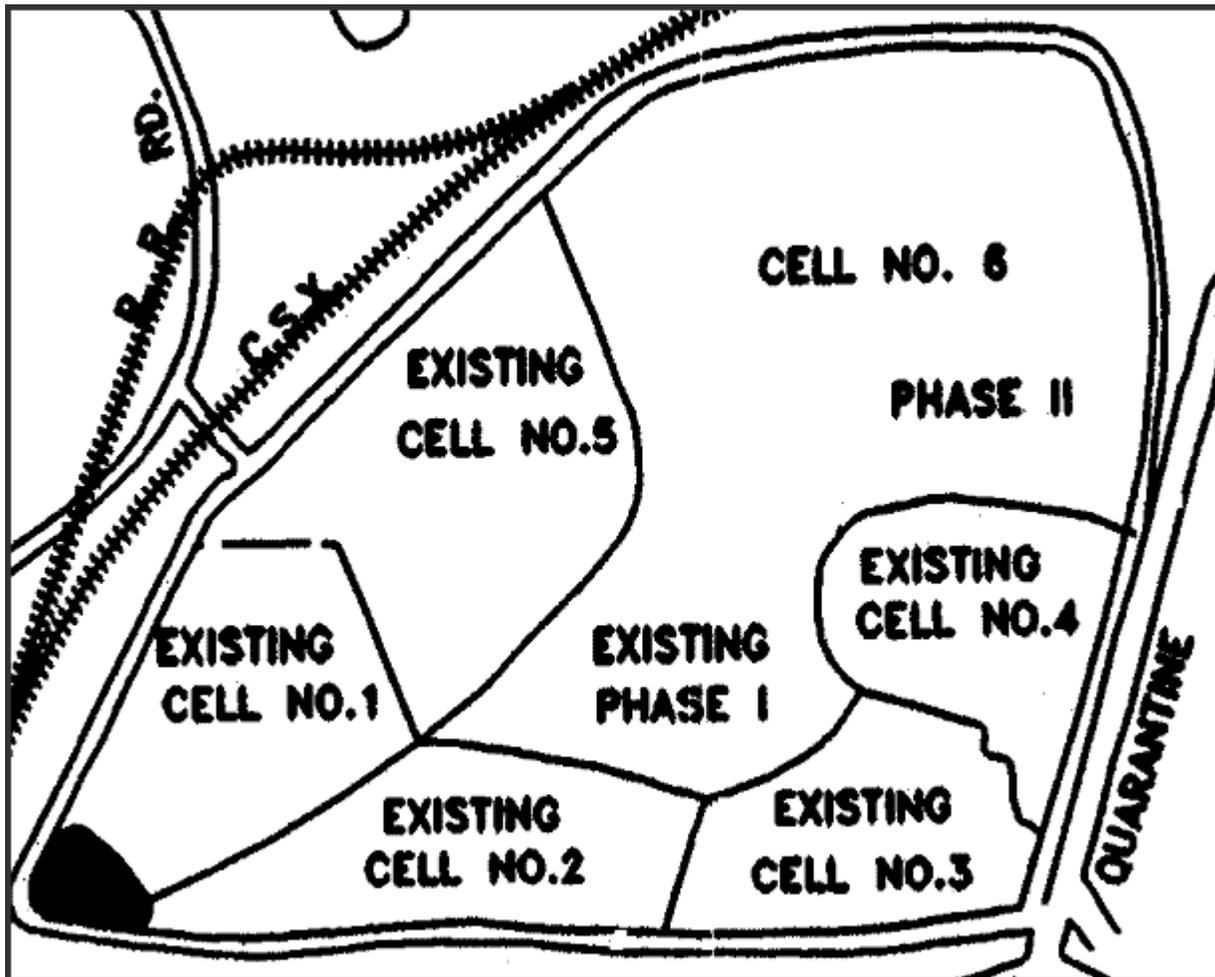
Construction of the second cell began in 1986; it extended into 1987. Construction contract and inspection costs for the second cell totaled \$2.4 million. Current revenues were used to fund the construction of Cell #2 (general fund and "other" funds).

Current revenues were used also to construct Cell #3. Construction contract and inspection costs for the third cell totaled \$860,000; with construction beginning in late 1987. It was completed in the summer of 1988. Other costs related to the design and construction of the second and third cells totaled \$190,000. These costs were funded through the 1st Solid Waste Loan of 1984 as well as current revenues.

Construction of the fourth cell began in the fall of 1988 and was completed 13 months later. The construction contract and inspection costs of \$3.2 million were funded with borrowed funds (a \$2.6 million conditional purchase agreement and approximately \$375,000 in general obligation bonds) and current revenues.

Construction of Cell #5 began in the spring of 1990, and was completed in the fall of the same year. Construction contract and inspection costs for the fifth cell totaled \$4.4 million. These costs were funded with a conditional purchase agreement.

FIGURE 4-1
QUARANTINE ROAD SANITARY LANDFILL DEVELOPMENT PLAN



Other costs for site preparation for Cell #5 and landfill design and construction incurred while Cell #4 and Cell #5 were under construction totaled approximately \$1.3 million. These costs were funded by conditional purchase agreement funds (\$390,000) as well as general obligation bonds and current revenue.

Construction of Cell #6, Phase I began in June of 1992 and was completed in November of 1993 at a cost of \$8.4 million. This was funded by general obligation bond proceeds.

In summary, capital expenditures for the acquisition and development of Cells #1 through #6 at QRSL have totaled \$34.6 million. A total of \$10.0 million in conditional purchase agreement funding has been used to meet these costs. These conditional purchase agreement funds were supplemented with a combination of State grants, "other funds", City general funds, and general obligation bonds.

4.3 NORTHWEST TRANSFER STATION ASSESSMENT

4.3.1 Northwest Transfer Station Usage

The Northwest Transfer Station (Figure 4-2) has been in operation since the late 1970s. The original design provided for a totally enclosed tipping floor with collection vehicles dumping into three (3) pits with hydraulic push plates used to compact the waste and push the waste into transfer trailers. The facility was originally designed for a maximum peak hourly capacity of 80 tons and a daily average of 400 tons.

In the mid 1980s, a two-position outdoor open top transfer addition to the transfer station was built north of the building. The facility is comprised of reinforced concrete faced retaining walls with an upper concrete paved apron that can accommodate up to seven (7) discharge vehicles. The original use for this facility was for bulky trash items, but it is now used primarily for the small hauler program (see § 4.1.2.1) while the bulky items are brought into the building and dumped into one of the three pits and compacted.

While the amount of tonnage brought to NWTs has generally remained the same throughout its existence, the types of vehicles and waste brought there have changed significantly. When originally opened, the transfer station was used primarily by residential waste collection loadpackers. Until recently, the push pits not only compacted residential waste, but also compacted heavier, bulky wastes, thus putting extra strain on the equipment.

With this in mind, the City had earmarked over \$1.5 million for the replacement of these compactors and to improve the flow of traffic within the facility. These improvements are now scheduled to be in place by late 2003. Also, a project to build a facility for the collection of street sweeping debris from the City's mechanical street sweeping vehicles was completed in Spring 2001.

4.3.2 Northwest Transfer Station Future

With the construction of the aforementioned improvements to the facility, combined with a projected minimal increase in trash generation over the period covered by this plan, the Northwest Transfer Station will be more than able to handle the projected tonnage over the next ten years (see Table 4-2). Projections of tonnage to be brought to the transfer station is based on the projected tonnage generated by the City as described in Chapter 3.

**TABLE 4-2
PROJECTED TONNAGE DELIVERED TO BRESKO**

YEAR	FROM NWTs	BRESKO	TOTALS
2001	30,166	241,119	271,285
2002	53,070	241,764	294,834
2003	52,874	240,869	293,743
2004	52,678	239,978	292,656
2005	67,062	93,303	291,573
2006	66,814	92,958	290,494
2007	66,566	92,614	289,420
2008	66,320	92,272	288,349
2009	66,075	91,930	287,282
2010	65,830	91,590	286,219
2011	65,585	91,252	285,155

* 2001 tonnage actual

4.4 REGIONAL APPROACH TO WASTE MANAGEMENT

Since the inception of the Northeast Maryland Waste Disposal Authority (NMWDA) in the mid 1980's, an effort has been made to explore regionalization for aspects of the waste disposal systems of the City and the surrounding counties (Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties). In January of 1993, members of the Baltimore Metropolitan Council (BMC), comprised of the elected Executives in Baltimore City and Anne Arundel, Baltimore, Carroll, Harford and Howard Counties, signed a Regional Solid Waste Compact which outlined goals for future disposal of solid waste. These goals were to recycle as much waste as possible while developing composting and waste-to-energy facilities for the remainder of the waste. The intent of the landfills of these Subdivisions would only be for disposal of wastes that did not fall into the above categories. Firm commitments were received for the implementation of these goals by the Spring of 1996 from each of the Subdivision members of the BMC.

In its study titled "Strategies for Developing Regional Solid Waste Management Programs" (September 1996), the NMWDA found that most jurisdictions will start running out of landfill space in Fiscal Year 2011, if they continued to use the currently planned waste disposal methods. This report was the result of a year of discussions and data analyses by the Regional Planning Work Group, consisting of solid waste directors and representatives from each of the Subdivision of the BMC, NMWDA (including Montgomery County) and the Maryland Environmental Services (MES). Table 4-3 shows the Regional Disposal Summary during Fiscal Year 1996.

**TABLE 4-3
REGIONAL DISPOSAL SUMMARY DURING FISCAL YEAR 1996 (TONS)**

County	In-County Landfilling	Waste-to-Energy	Out of County Landfilling
Anne Arundel	316	0	101
Baltimore City	281	434	130
Baltimore County	110	247	364
Carroll	104	0	0
Harford	58	89	0
Howard	177	0	0
TOTAL	1,046	770	595

Some of the 15 specific tasks of the Work Group coordinated by NMWDA included the following:

- Perform a comprehensive assessment of the region's waste generation and disposal issues through 2008.

- Identify and quantify current waste disposal capacity at the various private and county facilities within the region, including regional and state facilities and capacities in use.
- Identify the geography of the regional watershed, including import and export, for optimizing regional efforts.
- Update all waste management activities within the region, including the impact of recycling, reuse and waste reduction on the solid waste stream.
- Research what other similar regions may exist nationally, and determine if regional solutions are successfully being applied. If so, what are the complete components?

Of the 3.2 million tons of municipal solid waste being generated within the region, approximately 1.3 million tons of the waste is buried in sanitary landfills and 400,000 tons are being buried in construction and demolition landfills. Of the 1.7 million tons of waste that are being disposed of in landfills, only 450,000 tons are controllable by the counties and are not already committed under an existing disposal contract.

Since NMWDA's report has been written, Anne Arundel, Carroll and Howard County have all enacted plans to export most or all of the waste from their counties to prolong the life of their landfills.

The report also listed specific recommendations for the Subdivisions in strategies and methods of waste management. The intent of these recommendations was to help each of the Subdivisions attain the goals previously outlined in the Regional Solid Waste Compact. The Bureau will continue to cooperate with NMWDA and other Subdivisions in the implementation of the recommendations. These recommendations have been incorporated into Chapter 5, Plan of Action.

The City, through representation by NMWDA, participated in the Governor's Solid Waste Management Task Force, which was created in January of 1998. The scope of this task force was to assess local facility siting practices, assess the State permitting process, clarify local and State government responsibilities regarding solid waste management and examine other waste management issues within the State. The task force was charged with making recommendations to the Governor for the development, planning and implementation of a statewide, long-range solid waste management policy. The task force made recommendations in eight different categories, including Regionalization, Siting, Privatization and the Solid Waste Plan. To the fullest extent possible, the City has practiced many of these recommendations and will consider others in its waste management strategy.

4.5 REGIONAL WASTE DISPOSAL

Baltimore City's urban and densely populated environment presents challenges for waste disposal. Chapter 1 details the laws that restrict the construction of solid waste disposal facilities such as landfills and incinerators. Therefore, a comprehensive plan for solid waste management in the City must contain regional and cooperative components. While the City has the facilities to manage most of the waste streams discussed in this Plan, regional cooperation would be needed for those wastes the City is unable to properly manage.

4.5.1 Asbestos Disposal

Disposal of friable asbestos in the City of Baltimore is not permitted at this time, nor will it likely be allowed within the purview of this Plan. Private companies that remove asbestos in the City are required to transport this material out of the City for disposal. City government contracts any work dealing with the removal of asbestos to private companies.

4.5.2 Construction and Demolition Debris

There are no landfills in the City that are permitted for the disposal of construction and demolition debris (C&DD). The majority of this material is taken to recycling companies, which separate the useful material for resale. However, C&DD that is not recycled is taken to QRSL for disposal. Currently, the amount that is received is manageable, yet the continual demolition of buildings in the City may make the City more closely examine other options for the disposal of C&DD. If it is determined that the disposal of C&DD at the landfill is becoming a detriment to the long range disposal capacity of the landfill, the alternative of building a C&DD landfill would need to be considered. Since building this facility in the City is not feasible, the City would have to go into partnership with another jurisdiction.

4.5.3 Dead Animals

As of June 30, 2000, the City's contract with Valley Proteins, Inc. for the collection and disposal of dead animals was terminated with relatively short notice. Valley Proteins collected and disposed of these carcasses not only for Baltimore but for many of the surrounding counties. The only reasonable short-term solution for this problem was for the City to take these carcasses to the Phoenix Medical Waste Incinerator (see Section 3.2.5). However, this is a relatively expensive proposition since Valley Proteins recycled these animals in many instances which offset the cost of disposal of the carcasses. Incineration in a medical waste incinerator is a more involved operation and significantly more expensive.

The City is looking at many options for the disposal of these carcasses, including the construction of an animal crematorium. Since other jurisdictions are also exploring similar options, this would be a good opportunity for regional cooperation. A study conducted by the NMWDA indicated that while each jurisdiction would participate in the use of this facility none of them would want the facility located in their county. However, constructing a regional animal crematorium facility would be advantageous to the City.

4.6 WASTE PREVENTION, SEPARATION AND REDUCTION

In carrying out its solid waste management responsibilities, the City of Baltimore and other jurisdictions must set waste prevention and reduction as a high priority and develop an aggressive Plan of Action with realistic goals. Waste prevention and reduction is the most cost effective of all solid waste management strategies, topping the list over recycling, composting, incineration, and landfilling. Within the last five years, Baltimore City has increased the amount of attention given to waste prevention strategies. Some activities were demonstrations of carrying out the resolutions of the Regional Planning Council (precursor of the Baltimore Metropolitan Council) and local legislative bodies on this subject, but comprehensive and coordinated programs were lacking. Therefore, the City of Baltimore is actively promoting waste reduction within City government, among its citizens, and within the Baltimore region. In the same way that the American public has embraced the concepts of recycling and demanded of their governments and institutions that recycling programs be initiated, waste prevention and reduction are developing increased support.

Waste prevention and reduction in the broad marketplace is obviously beyond the control of Baltimore City government. Local government has however, exercised responsibility over its own waste stream and strongly encourages its citizens to act positively in this area. The City has initiated the use of electronic and computer technologies, such as E-Mail, CD-Rom, Diskettes, Cable Broadcasting, Electronic Faxing and Internet Access, to greatly reduce the amount of paper used in the City. The City's Internet web site at www.baltimorecity.gov gives useful information regarding City services and programs. Baltimore City has also adopted procurement policies within the Bureau of Purchases that underscore and actualize the commitment of the City to waste prevention and reduction. These policies are outlined in each contract that the Bureau of Purchases lets for bidding (see Figure 4-3). In addition, the City has encouraged double-sided printing of government documents and has begun to educate its citizens on the advantages of using mulching lawn mowers. In Chapter Five a Plan of Action is presented to maximize the potential for waste prevention and reduction in the City of Baltimore.

4.8 EMERGENCY RESPONSE SYSTEM

State regulations for the development of comprehensive solid waste management plans require that Chapter 4 of

such plans evaluate programs and procedures for responding to the unplanned (emergency) spillage or leaking of hazardous wastes within the local jurisdiction. In compliance with this requirement, the City's emergency response system for hazardous wastes is presented briefly below.

**FIGURE 4-3
BUREAU OF PURCHASES RECYCLING POLICY**

BALTIMORE RECYCLES

It is the policy of the City of Baltimore to purchase and use recycled and recyclable products whenever practicable. Potential bidders are encouraged to suggest innovative products to further this policy.

If this bid solicitation specifies a minimum recycled content, any bid failing to meet the specifications may be considered non-responsive.

All bids, proposals, and reports shall be submitted on recycled and recyclable paper printed on both sides, where practicable, with removable or reusable bindings or staples. Products delivered to the City must be packaged in recycled and recyclable materials, when practicable.

DEFINITION :

Pre-consumer material is waste generated during production, which cannot be returned to the same production process, nor used by another company to make a product similar to the original product, and includes all wastes generated during the intermediate steps in producing an end product by succeeding companies.

Post-consumer material means only those products generated by a business or a consumer which have served their intended end uses and which have served their intended end uses and which have been separated or diverted from waste; wastes generated.

Under the leadership of the Baltimore City Fire Department, which has the principle responsibility for responding to hazardous material emergencies in the City, a Hazardous Materials Action Plan has been developed by Baltimore's Local Emergency Planning Committee. The plan provides instructions for handling hazardous material emergencies, including sources of information, parties to be notified and the like. The City considers this plan to be quite satisfactory in that it establishes a complete and workable response system.

In general, the City's emergency response system is activated by telephone calls to 911. Callers are asked to provide as much information as possible about the nature of the hazardous material, impending danger, and location and extent of the incident. The facility where the incident occurred or the transporter is required to notify the National Response Center after calling 911.

The Fire Department responds to the 911 call by dispatching a hazardous material task force of fire engines/trucks and a rescue team. They notify other agencies and resources as required. At the site of the incident, an operations command post is established and the severity of the incident is determined based on the likelihood of public impact. Depending on the likelihood of public impact and its probable extent, the incident commander may initiate "secure premises," "public relocation" or "general information" procedures to protect the public until the hazard has been neutralized.

The entire response to the emergency is coordinated by the Fire Department, whose personnel are trained and equipped to handle hazardous material emergencies. Other agencies respond only at the direction of the Fire Department's incident commander, so that any duplication of efforts or confusion can be avoided.

The City's Hazardous Materials Action Plan is incorporated by reference into this solid waste plan. The plan is available for public review in the Maryland Room at the Enoch Pratt Central Library in downtown Baltimore. Also, copies of the plan may be obtained from the Fire Department.

**CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF SOLID WASTE**

**TEN YEAR SOLID WASTE MANAGEMENT PLAN
JULY 2002**



***CHAPTER 5
PLAN OF ACTION***

5.0 PLAN OF ACTION FOR SOLID WASTE MANAGEMENT

State regulations for the development of comprehensive solid waste management plans require that Chapter 5 contains a Plan of Action for the succeeding ten-year period with respect to all types of solid waste and all phases of solid waste management. This Plan of Action is to be based on the background information and assessment presented in the preceding chapters of the plan. The overall purpose of the entire Plan of Action is to demonstrate that the existing and/or planned solid waste management system in the jurisdiction is adequate to support proposed development or redevelopment.

In conformance with these requirements, the City's Ten-Year Solid Waste Management Plan of Action is presented in the following sections.

- | | | | |
|-----|------------------------------|-----|----------------------------------|
| 5.1 | Solid Waste Disposal Systems | 5.4 | Implementation Schedule |
| 5.2 | Solid Waste Facilities | 5.5 | Financing Waste Disposal Systems |
| 5.3 | Managing Wastes | 5.6 | Changes Due to Assessment |

In general, the City expects to retain the mixed public/private solid waste management system described in Chapter 3 and elsewhere in this plan for the next ten years. Since the City's primary concern is with the public component of the system, its Plan of Action focuses on this area in each section of this chapter. The private component of the system is addressed in each of these sections as well, but only in a more limited way.

Due to the fact that much of the City's solid waste disposal system is newly implemented, the Plan of Action for the City has, essentially, already been presented in the previous chapters. In this chapter, an attempt will be made to contrast the components of this present system with components in the previous system, giving the expectations that these changes present.

A reasonable assessment of the present solid waste disposal system is impossible at this point as well, due to the new and developing nature of the system. However, this chapter will detail as much as possible the tools it uses for the assessment of its solid waste disposal system.

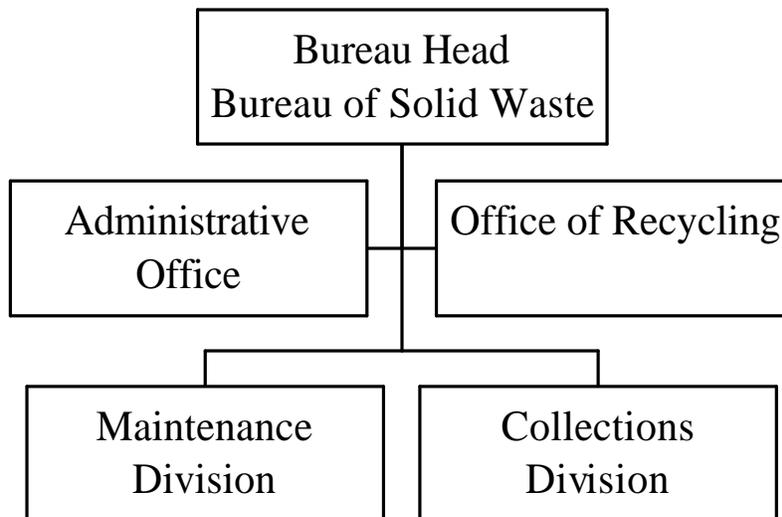
5.1 SOLID WASTE DISPOSAL SYSTEMS

5.1.1 Public Waste Disposal System History

From 1995 until Fall of 2000, the Bureau of Solid Waste generally operated in the manner reflected in the organizational chart presented in Figure 5-1. This bureau operated with two divisions, a Maintenance Division, and a Collections Division and had an administrative component. There also was an Office of Recycling that was under the auspices of the Director of Public Works and whose Coordinator was appointed by the Mayor, but operationally

worked within the framework of the Bureau of Solid Waste.

FIGURE 5-1
1999 BUREAU OF SOLID WASTE ORGANIZATIONAL CHART



The key functions of these Divisions and Offices were as follows:

I. Collections Division: This Division was responsible for regular collections of mixed refuse, recycling, corner cans, condominiums, and municipal office buildings and park properties, as well as the interception and removal of debris from the Baltimore Inner Harbor, and local waterways.

II. Maintenance Division: This Division was responsible for citywide cleaning, including park properties, mechanical sweeping, rat eradication, the removal of eviction chattel, fire debris, graffiti removal, special events cleaning and all cleaning services related to the “Mayor’s Monthly Clean-Up” program and the “Mayor’s Community Pitch-In” program. This program included the systematic cleaning of streets, alleys, lots, and removal of bulk trash on a monthly basis for every neighborhood of the City.

III. Office Of Recycling: This Office was responsible for the promotion and growth of Baltimore’s recycling program, overseeing the City’s recycling contracts, the education of citizens about sanitation responsibilities, and outreach programs to community groups, schools, churches and businesses.

IV. Administrative Office: This Office was responsible for budget, personnel, communications and customer service. Within this office was the responsibility for the operation of the City’s disposal facilities, including the Northwest Transfer Station (NWTS) and the Quarantine Road Sanitary Landfill (QRSL). It also administered all operations pertaining to the implementation of capital improvement projects and provided the technical support and

coordination of program planning, analysis and evaluation throughout the Bureau.

5.1.2 Public Waste Disposal System Future

The present organization of the Bureau of Solid Waste is expected to improve the efficiency of the City's solid waste disposal system by basically de-centralizing its collections operations. Bureau supervisors now are given resources to perform residential waste collection, bulk waste collection and street cleaning services rather than having different entities perform each function. A greater emphasis has been put on enforcing the City's regulations regarding citizens' disposal of waste, giving the City a better handle on its efforts to make and keep the City clean. While there are no guarantees as far as maintaining this organizational structure over the period covered in this plan, the City will assuredly look to improve its solid waste management system in the most efficient and practical ways possible.

Any discussion of the future of the City's solid waste disposal system must deal with fiscal resources or the lack thereof. A well managed and cost effective system is the goal of the City and it will utilize many tools to do so.

The City plans to take the following actions in order to increase the collection of recycling and improve the efficiency of its mixed refuse collection/transport system.

1. The City will evaluate the possible adoption of a one-plus-one collection system: once a week trash collection and once a week recycling collection. One-plus-one may be phased in by districts as recycling participation increases.
2. The City plans to utilize computer technology to evaluate the existing system of collection routes, crew assignments and work assignments to determine whether the collection system can be made more efficient.
3. The City will continue to support legislative action to change the way in which eviction chattel is managed. It will become the responsibility of landlords to load eviction chattel on trucks and deliver it to a City solid waste facility. The City will no longer provide storage of eviction chattel. Landlords will not be charged a tipping fee for the disposal of eviction chattel.
4. The City will continue to educate citizens with regards to sanitation and recycling through outreach efforts.
5. The City will sponsor a promotion of Baltimore's Recycling Program through religious organizations. Under the banner of "Recycle Religiously", religious leaders will ask their congregations to increase their recycling efforts. Sample blue and brown bags will be distributed along with recycling information. Religious institutions will be offered free collection of their recycling on the regular City collection schedule.

6. The City will expand its collection of recycling to all public schools in the system by 2003. The educational component of the program will be similarly expanded to encourage possible inclusion in the school curriculum and student community service.
7. Based on the findings of studies completed in the next two years, the City will identify any additional actions that it needs to take in the following ten years to increase the collection of recycling and improve collection systems efficiency. If any such actions represent significant changes in the existing system, these changes will be reflected in the next update to the City's Ten Year Solid Waste Management Plan.

5.1.2.1 Technology

The largest areas for future development regarding the solid waste disposal system are technology and information systems. With the development of the City's geographical information system (GIS), a number of possibilities exist for the use of this technology to improve solid waste collection and disposal. One of which would be to place satellite-tracking devices in collection vehicles as a means of being cognizant of where the vehicles are in relation to the completion of their routes or tasks. Analysis of this information will improve efficiency and customer service for solid waste collection.

There are many companies that market software that is compatible with the City's Arc View GIS system that will establish or refine existing solid waste collection routes. The capabilities of these software packages are and will continue to be analyzed to see if they will be useful in our future waste collection operations.

5.1.2.2 Routing

There has not been a full scale re-routing of Baltimore City mixed refuse collection routes in over twenty years. In the last twenty years, there has been a significant change in the demographics of the City. In general, fewer people live in the City and those who do have moved into the Northern regions of the City from the center City areas. There has been a general reduction of the density of housing in the City, with the continuing demolition of high rise public housing and the erection of more single family homes. All of these changes affect the management of solid waste in the City, yet no drastic changes to the collection routes have been made.

With the addition of the technology tools listed in § 5.1.2.1, the City is prepared to undertake a significant revamping of waste collection routes. However, there are social barriers existing that make this a difficult undertaking. The first is that a complete re-routing of the City will assuredly change the present trash collection days of many homeowners. There is a segment of the population that will strongly resist a change in trash collection days that they may have kept for literally fifty years.

The second social barrier is related to a proposed reduction of trash collection services in certain parts of the City. While this approach is taken in surrounding cities such as Washington, DC and Philadelphia, PA, as well as every suburban jurisdiction of the City, there is a very strong perception that this approach would not work in the City and would endanger the cleanliness of the City. Additionally, the City Code mandates that the City collect solid waste from its citizens twice a week, thus erecting a legal barrier to the implementation of this plan, as well.

Generally, a more efficient waste collection system is dependent on the City's ability to make its collection routes as efficient as possible. Therefore, these barriers and issues must be addressed in order to implement a re-routing plan that will ensure the most proficient solid waste disposal system possible.

5.1.3 Private Solid Waste Disposal System

As discussed previously, the City has little control over the private component of the solid waste management system in the City. Its capacity for collection and disposal of mixed refuse, scrap tires, miscellaneous solid waste, medical waste and rubble/land-clearing debris appears to be adequate.

The City's role in the private collection and disposal system is limited. However, the City plans to continue working through the Northeast Maryland Waste Disposal Authority to ensure that private recycling is being maximized in the Baltimore region and that documentation continues to satisfy State requirements. The City also plans to encourage the continued recycling of materials and their conversion to useful products. And the City will continue to evaluate provisions for incineration of medical wastes based on overall City export/import policy and State assessment of on site hospital incinerators.

5.2 SOLID WASTE DISPOSAL FACILITIES

The assessments conducted of the City's solid waste disposal facilities indicate that they are more than adequate to accommodate the solid waste expected to be generated by the City over the period covered by this plan. Still, there are several modifications that are to be made to these facilities to improve and facilitate their operations.

5.2.1 Quarantine Road Sanitary Landfill

As discussed in Chapter 4 of this Plan, the City is responsible for disposing of approximately 577,000 tons of solid waste per year. Mixed refuse and its incinerated remains represent by far the largest category of solid waste that the City handles. In addition to mixed refuse, the City is responsible for disposing of all other debris in City right-of-

ways. QRSL's planned capacity is sufficient to accommodate these wastes, as well as the privately collected wastes at current levels of usage during the ten-year planning period.

The City is addressing its needs for landfill capacity in the new century. The need for such capacity is expected to continue for the foreseeable future and the complexity and cost involved in arranging for it is so great that ample lead-time is essential.

The final cell of QRSL, Phase II of Cell 6, will be opened during this period. Phase I of Cell 6 is operational at this point but is rapidly filling up. There is a consultant on board that is designing this cell in preparation for its construction in early 2003.

It is in the best interests of the City to extend and preserve the landfill capacity at QRSL. The following steps have been established to accomplish that goal.

1. The City will continue to divert building materials and reusable construction materials from the landfill to The Loading Dock, Inc. The Loading Dock is a non-profit organization providing these materials to housing rehabilitation groups and low-income families.
2. The City will continue to conduct regular flyovers of QRSL to monitor the capacity of the landfill.
3. The City will make every effort to coordinate with BRESCO the acceptance of charitable waste at no charge.
4. The City intends to continue to assess other alternatives for meeting disposal needs into the next century. Alternatives to be considered include developing a regional landfill in an adjacent county, exporting wastes, and maximizing the QRSL's life span.

With regard to Federal and State environmental laws and regulations governing landfills, the City has a good record of compliance at QRSL. In order to extend this record for the next ten years, the City intends to take the following actions:

1. The City plans to work closely with the Maryland Department of the Environment (MDE) to assure QRSL is operated in conformance with State and Federal regulations.
2. Based upon the consultant's updated report, the City has prepared a long-range financing plan to meet the costs of closure, groundwater monitoring and any other mandated improvements. This plan will be periodically reassessed.
3. The City acquired a National Pollution Discharge Elimination System (NPDES) permit and plans to implement any improvements relating to storm water runoff at QRSL that are required by State agencies to remain in

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compliance with the discharge permit for this facility.

4. The City plans to continue the performance of routine landfill inspections to assure quality control.
5. The City has begun a groundwater monitoring program at QRSL to replace MDE's former program. This monitoring program is to comply with Federal regulations.
6. The City, in partnership with the Northeast Maryland Waste Disposal Authority and BRESKO has participated in the air pollution rehabilitation of the BRESKO facility. The City will continue to work in this partnership to ensure the safety of the City's environment.
7. The City will continue the projected future incineration capacity needs of the Baltimore region, including the impact of the reversal of the Incinerator Moratorium and the impact of out of state transfer.
8. The City plans to utilize its shredder at the landfill to reduce the volume of bulky material being landfilled and to extend the life of the landfill.
9. The City will evaluate alternative intermediate and final cover materials at QRSL through approved pilot projects.
10. The City will entertain parties who are interested in the installation of a landfill gas extraction system at the landfill. This will allow for the safe emission of these gases into the environment or the marketing these gases to willing consumers.

5.2.2 Northwest Transfer Station

Construction on improvements to the Northwest Transfer Station (NWTS) will commence in early 2003. However, with consideration being given to selling or leasing the transfer station to a private entity, the future of the NWTS beyond that is unclear. What is clear is that the City plans on utilizing this facility as part of its solid waste disposal system over the next ten years.

5.2.3 Baltimore Refuse Energy Systems Company (BRESKO)

There are agreements between the City and BRESKO through the Northeast Maryland Waste Disposal Authority that carry throughout the period covered by this plan. BRESKO will continue to be the primary disposal facility for

solid waste collected by the City over the next ten years. Accordingly, QRSL will be the final destination for the ash residue that is produced through the incineration portion of the waste-to-energy process.

5.2.4 Other Private Disposal Facilities

The City expects to maintain its position of allowing private companies to initiate waste acceptance and transfer facility projects to serve the private sector based on the assessment of supply and demand. The City plans to continue to review such private projects on a case-by-case basis according to City, State and Federal laws, zoning requirements, community sentiment and conformity with the City's overall policies on import and export of solid waste.

5.3 MANAGING WASTES

As part of the Ten-Year Solid Waste Management Plan, the City has developed a plan of action for each of the waste streams it will encounter over the next ten years. The strategy for each waste stream is described below.

5.3.1 Residential Waste

The projections for the amount of residential waste to be managed over the ten year period covered in this plan is based primarily on the projected population in the City during this period (see Chapters 2 and 3). In general, it is expected that the residential population in the City will decrease over the next ten years, although the rate of decline will be less than in previous years. Thus, it is a reasonable assumption that residential waste generation will similarly decline. With these considerations in mind and the legal obligation of the City to supply residential waste collection, the City of Baltimore has and will continue to provide adequate residential waste management.

Outside of improving routing, the City will continue to introduce new collection and disposal equipment into the fleet of cleaning apparatuses used by the Bureau of Solid Waste to improve services. The City will also continue to utilize routine inspections and performance measurements to improve customer services. The City will especially use the CITISTAT performance review system to assess and improve its operations.

5.3.2 Commercial Waste

Commercial waste, which includes institutional and industrial (non-hazardous) wastes are generally managed by private entities in the City. Our projections show a steady decline in the generation of commercial waste throughout the next ten years. With over 500 private hauling operations currently permitted to collect and dispose of waste in

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the City and the existence of state-of-the-art disposal facilities in and near the City, the management of commercial waste is securely established for the next ten years.

5.3.3 Land Clearing and Demolition Debris (Rubble)

An overall increase in land clearing and demolition debris is projected over the next ten years. A huge increase is expected over the first five years after which it is expected to level off and decline over the next five years. This is based on a projected increase in building demolitions within the next several years. It is expected that private recycling companies that use rubble in their recycling processes will continue to thrive and be the first disposal option of many businesses that will be disposing of this debris. Otherwise, QRSL has the capacity and ability to handle the increase rubble.

5.3.4 Controlled Hazardous Substances

Those who generate controlled hazardous substances are required by State law to properly handle and dispose of this waste. This waste is shipped out of Maryland for final disposal. There are no facilities in the City or State that handles these wastes, nor are there any places that are projected to handle these wastes in the period covered by this plan.

The Bureau of Solid Waste will continue its successful recycling programs and add others as needed. The City will continue to hold its Household Hazardous Waste Collection Day twice a year. Citizens will drop off selected household hazardous waste at the designated location. Long-term planning for a comprehensive regional program will continue at the regional level. Educational efforts to encourage the reduction and alternatives to household hazardous waste will be intensified.

5.3.5 Dead Animals

The disposal of dead animals is the one area where there is not a firm plan of action in place for the next ten years. The City is currently considering long range alternatives for the disposal of animal carcasses. The cost of utilizing private incinerators is prohibitively expensive over a long period of time in comparison with the costs incurred in contracts with Valley Protein.

The most likely scenario is that the City, possibly in partnership with other members of the Northeast Maryland Waste Disposal Authority, will construct a crematorium for the dead animals. However, building this facility in the

City may be difficult due to a moratorium that exists on the building of incinerators. It is likely that an agreement will be reached to allow the construction of this facility in the near future.

5.3.6 Bulky or Special Wastes

In discussing large appliances and scrapped automobiles, the assumption is that the generated waste stream will remain relatively constant over the period covered by the plan. Automobiles are scrapped by private concerns and the City does not have hard evidence regarding the numbers these companies are capable of handling. However, with the market for scrap steel and aluminum continuing to thrive, it is reasonable to believe the ability to handle these automobiles will remain constant throughout the next ten years.

Appliances are primarily collected by the City and given to recyclers for the re-use of the material. Inquiries by private companies into acquiring a contract to have the City deliver appliances to them indicate that there is and will continue to be a strong market for this material.

5.3.7 Vehicle Tires

The City recognizes that private recyclers of scrap tires currently operate in the City. It is also recognized that a statewide system for scrap tire processing has been developed. The City expects that continued development and refinement of the State authorized scrap tire processing industry will take place over the next ten years. The City will evaluate the renewal or re-bidding of its scrap tire contract accordingly.

5.3.8 Treatment Plant Sludges and Septage

The City expects that at least half the 182,000 wet tons of sludge generated annually at the Back River Wastewater Treatment Plant will be treated and stabilized at the on site heat/drying pelletization plant. Of the remaining sludge approximately 25 percent is processed at the Baltimore Composting Facility and converted to compost and 25 percent is land applied on agricultural land. It is expected that the 80,000 tons of sludge generated at the Patapsco Wastewater Treatment Plant will continue to be heat dried on site prior to distribution and marketing.

The City plans to complete several Capital Improvement Projects that will optimize water treatment plant process residual (sludge) collection and conveyance to wastewater treatment plants for processing and subsequent disposal.

5.3.9 Leaves

The City will continue to collect leaves through the use of vacuum units and mechanical sweepers, while also providing seasonal residential collection of bagged leaves. The municipal mulch site at Camp Small will continue to

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be the end destination for these leaves, so that they may be converted into mulch and compost. Leaf generation should increase throughout the period covered by this plan due to the City's streetscape and Main Streets programs.

The City will assess the need for an additional or expanded composting and wood-chipping facility should the need arise. At present, Camp Small is able to handle the compost and wood-chip material that is collected and delivered by Solid Waste and Transportation crews.

5.3.10 Christmas Trees

Similarly to leaf collection, the City will continue the seasonal collection of Christmas trees. The City will continue its popular program of mulching Christmas trees in January at central locations in the City, providing residents who bring their trees bags of mulch in return. As population in the City is projected to decline, so should the number of Christmas trees.

5.3.11 Marine Debris

The City will continue to provide cleaning services for the inner harbor and surrounding waterways through the use of watercraft. It is hoped that the number of boats used can be increased so that these waterways may be more thoroughly cleaned.

It is difficult to predict the future generation of marine debris, since it is typically independent of population projections. It is assumed, however that it will remain relatively constant throughout the period covered by this plan.

5.3.12 Parks

The City will continue to provide park services as an important part of an integrated urban landscape. Therefore, the City is obligated to provide waste collection and cleaning services at the five major parks and at other designated parks in the City. Park waste generation is also largely independent of population fluctuations. However, it is assumed that the waste generated will remain constant throughout the next ten years.

5.3.13 Street Sweeping

The City will continue to provide street and alley sweeping services, likely utilizing significantly updated equipment to do so. Tonnage from street sweeping should remain constant throughout the period covered by this plan.

5.3.14 Animal Manure

While the City will continue to collect animal manure from the Baltimore Zoo, it may be used as compost or fertilizer in the future, rather than just as alternative cover at QRSL. Obviously, the amount of manure to be generated at the zoo over the next ten years cannot be precisely estimated, but the City will continue to provide collection and disposal services, as needed.

5.3.15 Waste Prevention and Reduction

A significant platform of the City's Ten-Year Solid Waste Management Plan involves the reduction of waste. The City of Baltimore plans to take the following actions to maximize waste prevention and reduction:

1. Poll City businesses to identify current waste reduction activities being practiced and publicize the strategies.
2. Incorporate waste prevention and reduction in all educational and outreach materials and activities of the Education and Enforcement Division of the Bureau of Solid Waste.
3. Continue to develop with regional partners public service ads and educational messages about waste prevention and reduction. Seek corporate sponsors to broadcast these messages as widely as possible.
4. Work with the Northeast Maryland Waste Disposal Authority to promote waste reduction strategies in the commercial sector through support of the business recycling forum, performance of waste audits, and providing training programs to businesses.
5. Expand the diversion of reusable items from the city's waste stream to charitable, non-profit organizations. Promote citizen donations to non-profit organizations.
6. Encourage owners/managers of multi-family dwellings and apartment complexes to provide recycling facilities (bins, dumpsters, etc.) for their tenants.
7. Investigate the need for a waste prevention/waste reduction committee, possibly as a part of the City's newly appointed Recycling Committee.

5.3.16 Recycling

To process the recycling it is collecting, the City has generally relied on the private sector. It intends to continue this

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approach over the next ten years.

The City has executed contracts with private recycling firms to process the mixed paper and mixed containers, which represent most of the recycling tonnage the City is collecting. Similarly, contracts are in place for the smaller quantities of white goods and mixed paper the City is recycling. As the amount of all recycling collected is expected to increase in the next ten years, the City anticipates that the processing capacity in the private sector will increase proportionately, although the cost of processing to the City has varied, depending on the market for recovered materials.

To provide for processing of the increasing amounts of recycling that it will collect in the next ten years, and to expand recycling, the City plans to take the following actions:

1. The City plans to continue monitoring the market for recovered materials and adjust its budget for recycling processing accordingly. The City plans to actively support regional and State efforts to reduce tipping fees for recycling materials through improved marketing of recovered materials.
2. The City plans to expand its solicitation of business support for recycling and modify its procurement practices to increase the use of supplies containing recycled materials. These actions will be sustained for the next ten years.
3. The Baltimore Development Corporation, the Baltimore City Planning Commission, Empower Baltimore and the Bureau of Solid Waste will continue to pursue a recycling business strategy for the City of Baltimore.
4. During the next ten years, the City will execute additional contracts with private recycling companies as required to process the increasing amounts of mixed paper, mixed containers, white goods and office paper it will collect. The City may execute new contracts for processing additional recycling as the collection program expands to a wider range of materials.
5. The City will seek to work cooperatively with its neighboring counties to assess the need for and feasibility of developing a publicly sponsored system of materials recovery facilities in the Baltimore region. Such regional facilities may be privately operated under contract or may be public.

5.4 IMPLEMENTATION SCHEDULE

Table 5-1 below shows the proposed implementation schedule of significant projects and events during the period covered by this plan. This schedule is purely a projection and does not guarantee that these events will take place at their specified times, if at all. It does not include projects that may become necessary as time passes and events develop. It should be considered a “best case” scenario of the City’s plan of action over the next ten years.

**TABLE 5-1
PROPOSED SOLID WASTE IMPLEMENTATION SCHEDULE: 2002 THROUGH 2011**

DATE	PROJECT	IMPACT
March 2003	Conduct Fly-over of QRSL	Will be used to better estimate the remaining capacity at QRSL
April 2003	Cell 6, Phase II of QRSL Completed	Will ensure that QRSL will be able to continue to accept waste for disposal
June 2003	New Routing Plan for City Implemented	Will significantly change the way trash is collected in the City; may involve 1 + 1 collection in certain areas of the City
December 2003	Completion of Facility Improvements at QRSL	Will enable the City to better perform its duties at QRSL
March 2004	Conduct Fly-over of QRSL	Will be used to better estimate the remaining capacity at QRSL
March 2005	Conduct Fly-over of QRSL	Will be used to better estimate the remaining capacity at QRSL
March 2006	Conduct Fly-over of QRSL	Will be used to better estimate the remaining capacity at QRSL
March 2007	Conduct Fly-over of QRSL	Will be used to better estimate the remaining capacity at QRSL
March 2008	Conduct Fly-over of QRSL	Will be used to better estimate the remaining capacity at QRSL
June 2008	Re-open a yet-to-be determined closed Cell at QRSL	Part of overall plan to increase disposal capacity at QRSL
March 2009	Conduct Fly-over of QRSL	Will be used to better estimate the remaining capacity at QRSL
March 2010	Conduct Fly-over of QRSL	Will be used to better estimate the remaining capacity at QRSL

5.5 FINANCING WASTE DISPOSAL SYSTEMS

The financial resources of Baltimore City are severely limited. It is essential that monetary costs and benefits will be addressed in describing and evaluating the City's solid waste management system, as well as in planning for the future.

5.5.1 Costs of Solid Waste Management

In Fiscal Year 2001 the City spent a total of \$63.9 million to collect and dispose of solid waste. As shown in Table 5-2, \$24.9 million of this was spent in the Special Services section. This consisted of street, alley, lot and park cleaning, business district cleaning, mechanical street cleaning, graffiti removal and eviction and fire debris removal. An additional \$39.0 million was spent on residential waste collection and disposal including \$16.2 million for waste collection and transport, \$18.1 million for disposal, \$2.0 million for administration, engineering, office and field support; and \$2.7 million for other costs which include Sanitation Enforcement and Recycling Education. These expenditures were funded through the City's operating budget and are considered as an annual operating cost.

In addition to these operating costs, the City spent a total of \$1,095,838 in Fiscal Year 2001 for solid waste capital projects. As shown in Table 5-3, these costs consisted mainly of payments for the development of Cell #6 Phase II at QRSL, Sweeper Pad Construction at the Northwest Transfer Station, and maintenance of the Monument Street Landfill. The amount of current City revenues spent on solid waste capital projects to date at QRSL is \$37.3 million.

Past use of borrowed funds to acquire and develop the landfill and implement other solid waste capital projects has resulted in ongoing debt service obligations. As shown in Table 5-4, Fiscal Year 2001 debt service payments totaled \$456,238.

Total solid waste management expenditures for Fiscal Year 2001 using current City general fund revenues were approximately \$34.2 million. For Fiscal Year 2002, the City budgeted \$30.9 million in general funds to collect and dispose of solid waste.

**TABLE 5-2
CITY'S SOLID WASTE MANAGEMENT EXPENDITURES (DOLLARS)**

	Actual Fiscal 2001	Budgeted Fiscal 2002
Maintenance/ Street & Alley Cleaning		
Graffiti Removal	311,633	224,439
Removal of Eviction Chattels	745,161	495,919
Removal of Fire Debris	458,605	445,348
Business District Cleaning	2,832,403	2,227,097
Street, Alley, Lot and Park Cleaning	17,092,185	18,292,633
Mechanical Sweeping Operations	2,363,016	2,292,793
Seasonal Operations	706,604	805,225
Rat Rub-out	359,452	335,201
SUBTOTAL: Maintenance	24,869,059	25,118,655
Collection/ Transport		
Mixed Refuse (rear loaders) Collection	14,354,469	14,344,742
Marine Operations	498,754	641,392
Northwest Transfer Station Operations	1,333,079	877,804
SUBTOTAL: Collection / Transport	16,186,302	15,863,938
Disposal		
Landfill Operations	3,458,715	970,391
BRESCO Tipping Fees	14,665,596	14,482,000
SUBTOTAL: Disposal	18,124,311	15,452,391
Other:		
Sanitation Enforcement	1,131,691	1,193,521
Landfill Trust Fund	800,000	800,000
NE MD Waste Disposal Authority	-	5,000
Recycling Education	770,852	798,027
SUBTOTAL: Other	2,702,543	2,796,548
Administration		
Bureau Administration *	1,971,862	2,375,999
SUBTOTAL: Administration	1,971,862	2,375,999
GRAND TOTAL:	63,854,077	61,607,531

* Includes Administrative Support, Garage, Personnel, Engineering Support

**TABLE 5-3
CITY'S CAPITAL EXPENDITURES FOR SOLID WASTE MANAGEMENT
(Dollars)**

	Actual Fiscal 01	Budgeted Fiscal 02
Quarantine Landfill Development		
Cell #5 (517-029) Conditional Purchase Agreement Funds	-	71,458
Cell #6 (517-030) General Obligation Bond Proceeds	57,585	1,607,920
Cell #6 (517-042) General Obligation Bond Proceeds	438,144	108,029
Quarantine Road Sanitary Sewer (517-078) Mayor and City Council and Other Funds	-	199,038
Other Solid Waste Capital Projects		
Bowley's Lane Landfill (517-063) Other Funds	35,370	82,032
Monument Street Landfill (517-064) Mayor and City Council and Other Funds	266,537	-
Sweeper Pad Construction (517-068) Mayor and City Council and Other Funds	250,262	-
Street Run-off Mitigation - Marine Terminal (517-079) Mayor and City Council and Other Funds	902	410,695
Western District Yard Improvements Mayor and City Council and Other Funds	45,503	387,423
Street Cleaning Facility (517-353) Mayor and City Council and Other Funds	1,535	798,465
Street Cleaning Transfer Station Eastside (517-082) Mayor and City Council and Other Funds	-	400,000
TOTALS	1,095,838	4,065,060

**TABLE 5-4
ANNUAL DEBT SERVICE COSTS FOR SOLID WASTE CAPITAL PROJECTS**

Debt Instrument	Project	Actual Fiscal 99	Budgeted Fiscal 00
General Obligation Bonds			
1st Incinerator Solid Waste Disposal Loan (bonds of 1980)		\$258,447	\$88,988
1st Incinerator Solid Waste Disposal Loan (bonds of 1995A)	Pulaski Incinerator # 4	\$0	\$0
1st Solid Waste Disposal Loan Disposal Loan (bonds of 1989 Series)	Various Projects & Landfills	\$48,444	\$91,506
1st Solid Waste Disposal Loan Disposal Loan (bonds of 1995A)	Various Projects & Landfills	\$17,259	\$5,943
Conditional Purchase Agreements (IDA)			
G.E. Capital - Addendum # 1 (Caterpillar)		\$132,088	\$0
TOTALS:		\$456,238	\$186,437

The City's future capital investment in solid waste management is dependent upon the availability of funds and funding sources for projects. Table 5-5 outlines the City's approved allocation for solid waste management capital funding through fiscal year 2008. The City's Department of Planning is responsible for the allocation of capital funds to City agencies based on agency needs and the availability of funds. The fiscal year 2003 request for the Bureau of Solid Waste reflects no allocation of funds for the three projects proposed. However, the lack of funding for these projects will not profoundly impact the City's ability to provide waste management services at its current level of efficiency.

**TABLE 5-5
BUREAU OF SOLID WASTE CAPITAL FUNDS ALLOCATION: FY 2003-2008**

CITY OF BALTIMORE --- CAPITAL IMPROVEMENT PROGRAM
BOARD OF ESTIMATES RECOMMENDATIONS FOR DPW SOLID WASTE - CONST. PROGRAM **SIX-YEAR PROGRAM - IN THOUSANDS OF DOLLARS**

517-022 SOLID WASTE VEHICLE STORAGE/REPAIR FACILITY		Location - 3625 E. Monument Street							
FUND SOURCE #	SOURCE OF FUNDS	TO DATE	2003	2004	2005	2006	2007	2008	TOTAL
200	General Funds	200							200
800	All Other Debt	ZERO	ZERO	ZERO					ZERO
TOTAL		200							200

A new facility is to be constructed to house street sweepers, street cleaning equipment and supplies, as well as a repair shop for maintenance of street cleaning equipment. The existing storage/repair facility is in poor condition and is too small to accommodate much of the equipment.

517-353 RENOVATIONS TO FRANKLINTOWN RD STREET CLEANING FACILITY		Location - 201 N Franklinton Rd							
FUND SOURCE #	SOURCE OF FUNDS	TO DATE	2003	2004	2005	2006	2007	2008	TOTAL
200	General Funds	800							800
800	City Motor Vehicle Revenue Funds	ZERO	ZERO						ZERO
TOTAL		800							800

This facility houses the Bureau of Solid Waste recycling, bulk trash and rat eradication operations. Improvements would provide safer and more efficient operations as well as more storage and operational space.

517-500 SOLID WASTE FACILITY RENOVATIONS		Location - Citywide							
FUND SOURCE #	SOURCE OF FUNDS	TO DATE	2003	2004	2005	2006	2007	2008	TOTAL
200	General Funds	175	ZERO						175
800	City Motor Vehicle Revenue Funds	175							175
TOTAL		350							350

Renovations are to be made to various Solid Waste facilities including administrative areas, locker rooms and restrooms, stairways and walkways, landscaping and paved areas. These improvements would enhance safety and operations at the facilities.

5.5.2 Costs of Quarantine Road Acquisition and Development

The continuing expansion of QRSL requires a substantial capital investment by the City. Since debt service on funds borrowed to acquire and develop the landfill requires ongoing expenditures, it is useful to review the financing and costs of this facility to date.

The City acquired the site for the landfill in 1984, at a price of \$9.3 million. State grants were received for half of this cost. The balance was funded through the 5th Solid Waste Disposal Loan of 1980, \$1.9 million in general obligation bonds and \$2.75 million from the Northeast Maryland Waste Disposal Authority, representing proceeds of the sale of the former Pyrolysis Plant.

Other costs related to acquisition, design of the landfill and construction of the first cell, totaled \$4.1 million. A portion of the necessary funding came from current City revenues (general fund and "other" funds). The balance of the initial development cost (\$3.5 million) was financed through a conditional purchase agreement. The first cell was completed in 1985 (see Figure 4-1 for location of cells).

Construction of the second cell began in 1986; it extended into 1987. Construction contract and inspection costs for the second cell totaled \$2.4 million. Current revenues were used to fund the construction of Cell #2 (general fund and "other" funds).

Current revenues were used also to construct Cell #3. Construction contract and inspection costs for the third cell totaled \$860,000; with construction beginning in late 1987. It was completed in the summer of 1988. Other costs related to the design and construction of the second and third cells totaled \$190,000. These costs were funded through the 1st Solid Waste Loan of 1984 as well as current revenues.

Construction of the fourth cell began in the fall of 1988 and was completed 13 months later. The construction contract and inspection costs of \$3.2 million were funded with borrowed funds (a \$2.6 million conditional purchase agreement and approximately \$375,000 in general obligation bonds) and current revenues.

Construction of Cell #5 began in the spring of 1990, and was completed in the fall of the same year. Construction contract and inspection costs for the fifth cell totaled \$4.4 million. These costs were funded with a conditional purchase agreement.

Other costs for site preparation for Cell #5 and landfill design and construction incurred while Cell #4 and Cell #5 were under construction totaled approximately \$1.3 million. These costs were funded by conditional purchase agreement funds (\$390,000) as well as general obligation bonds and current revenue.

PLAN OF ACTION

Construction of Cell #6, Phase I began in June of 1992 and was completed in November of 1993 at a cost of \$8.4 million. This was funded by general obligation bond proceeds.

In summary, capital expenditures for the acquisition and development of cells #1 through #6 at QRSL have totaled \$34.6 million. A total of \$10.0 million in conditional purchase agreement funding has been used to meet these costs. These conditional purchase agreement funds were supplemented with a combination of State grants, "other funds", City general funds, and general obligation bonds.

5.5.3 Post-Closure Costs for QRSL

While QRSL is roughly twenty years removed from closure, Federal regulations require that the City provides proof that it is financially able to properly close the landfill and to provide post-closure care for the approximately 30 years needed afterward. The City hired a consultant to provide an estimate of this cost, so that the City could put the required money aside for this matter.

5.5.4 Revenues from Solid Waste Management

In Fiscal Year 2001, the City received a total of \$7.5 million in revenues derived from solid waste collection and disposal. As shown in Table 5-6, most of these revenues (89 percent) were generated at QRSL. Payments from BRESCO, including tipping fees for ash disposal, totaled \$3.5 million.

TABLE 5-6
CITY'S SOLID WASTE MANAGEMENT REVENUES
 (Thousands of Dollars)

	Actual Fiscal 2001	Budgeted Fiscal 2002
Landfill Disposal Tipping Fees	3,904	4,000
Solid Waste Surcharge	2,110	2,900
BRESCO Fees & Sale/Leaseback Rebate	938	1,020
BRESCO Rent	475	490
Environmental Permits-(Hauler Permits)	-	100
Landfill Royalties	-	-
Disposition of Eviction Chattel	2	3
Scrap Metal/White Goods (A)	28	15
(After CFC and PCB Removal)	-	-
Office Paper (B)	4	4
Total	7,461	8,532
Notes: A Scrap Metal Contract with The David Joseph Company B Office Paper Contract with Vangel Paper, Inc.		

Detailed information on landfill tipping fee revenue for Fiscal Year 2001 is presented in Table 5-7. Actual tonnages of wastes accepted are listed, together with charges that accrued for those tonnages. It can be seen that the greatest amounts of wastes accepted do not necessarily yield the greatest amount of revenue, because tipping fees vary for different users of the landfill. For example, the fees charged for BRESCO ash, industrial sludge and other waste were considerably lower than the standard \$67.50 per ton fee. No tipping fees are charged for disposal of wastes collected by the Bureau of Solid Waste or City agencies whose work is supported by the City's general fund. In summary, the QRSL generated \$3.9 million in Fiscal Year 2001.

5.6 CHANGES DUE TO ASSESSMENT

The assessment of the solid waste disposal systems performed in Chapter 4 has revealed a solid plan for the management of solid waste throughout the next ten years. With the implementation of the CITISTAT performance measuring and monitoring tool introduced in July 2000, the City has a powerful tool for the analysis and modification of the solid waste disposal system in the City.

There are two areas where changes may need to be considered in the present solid waste disposal system. The first area involves the moratorium on construction of incinerators in the City. While this ordinance was designed to help reduce the emitting of harmful air pollutants into the atmosphere, it may also prevent the City from constructing a needed crematorium for dead animals. The advantages and disadvantages of lifting this moratorium will need to be discussed in the near future.

Secondly, the efficient routing of the City's waste collection vehicles could be dependent on the public's willingness to change trash collection days and the possible relinquishment of one of their two mixed refuse collection days. As solid waste collection and disposal costs continue to rise, these and other options will be studied closely to see if their implementations will be feasible and worthwhile.

TABLE 5-7
LANDFILL TIPPING FEE REVENUE FOR FISCAL 2001
 (Thousands of Dollars)

Waste Category	Tonnage	Actual Revenue
Incinerator Ash from BRESKO	216,147	2,253
Medical Waste Incinerator Ash	-	-
Private Ash	-	-
Patapsco WWTP Incinerator Ash	-	-
Bulk Collected by Private Haulers	153,496	-
Bulk Collected by City	34,278	-
Bulk from Non-Profit Organizations	19,505	-
Fluff from Car/Appliance Dismantling	-	-
Industrial Sludge	22,091	15
Public Agency Charge	3,567	156
Other Industrial Waste	3,057	12
Street Dirt and Litter	725	-
Rubble/Construction Debris Collected by City	12,540	264
Rubble/Construction Debris Collected by Private Haulers	-	-
Soil	-	-
Scrap Metal/White Goods		120
Small Haulers	22,349	271
Mixed Refuse Collected by Private Haulers	153,496	356
Mixed Refuse Collected by City	22,449	-
Mixed Refuse from Medical Facilities	-	-
Grit/Screenings from Back River WWTP	7662	457
Tires Collected by City	0	-
Tires Collected by Private Haulers	0	-
TOTAL		3,904

**CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF SOLID WASTE**

**TEN YEAR SOLID WASTE MANAGEMENT PLAN
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***APPENDIX A
MIXED REFUSE GENERATION CALCULATIONS***

**TABLE A-1
STATISTICAL DATA USED TO ESTIMATE MIXED REFUSE GENERATION IN
BALTIMORE CITY
(Thousands of People)**

	2001	2006	2011
RESIDENTIAL*			
Household Population	625.7	627.0	628.5
Single Family Residence	475.5	476.5	477.7
Multi-family Residence	150.2	150.5	150.8
Group Quarter Population	25.9	26.9	28.3
INSTITUTIONAL**			
City Government Employees	33	31	31
State/Federal Employees	53	52	51
City School Students	97	98	99
Private School Students	21	21	21
COMMERCIAL***			
Manufacturing/Infrastructure Employees	67	64	62
All Others (non-manufacturing, non-governmental) Employees	307	316	322

*** Footnotes pertaining to Residential Numbers**

- Maryland Office of Planning (see Chapter 2)
- 2000 Census shows 76 percent of household population lives in single family residences
- College students included in group quarters population

**** Footnotes pertaining to Institutional**

- Baltimore Metropolitan Council (1990, 1995, 2000, 2005 projections and projected rates of change)
- Baltimore City Public Schools (1991, 1995 and 2000 projections)
- Maryland Office of Planning, Baltimore City projections (2000 estimate)

***** Footnotes pertaining to Commercial**

- Baltimore Metropolitan Council (1990, 1995, 2000, 2005 projections and projected rates of change)

FIGURE A-1

RESIDENTIAL MIXED REFUSE GENERATION WORKSHEET

1. Amount collected by City in 2001

73% of total from Single-family Residences (all collected by City)

3% of total from Multi-family Residences (some collected by City)

Amount from Single-family Residences = $0.73 \times (305,556) = 223,100$ tons per year

Amount from Multi-family Residences = $0.03 \times (305,556) = 9,200$ tons per year

2. Per Capita Generation Rate

Rate = Amount of Refuse (SF City) / Number of Single-family Residents

Rate = $223,100 \div 475,500 = 0.47$

3. Number of Multi-family Residents From Which the City Collects

MF Residents (City) = Amount (City) \div Generation Rate

MF Residents (City) = $9,200 \div 0.47 = 19,600$ people

4. Number of Multi-family Residents From Which Private Haulers Collect

MF Residents (Private) = Total MF Residents – MFR (City)

MF Residents (Private) = $150,200$ people – $19,600$ people = $130,600$ people

5. Amount Collected by Private Haulers in 2001

Amount (MF Private) = Number of MF Residents (private) \times Generation Rate

Amount (MF Private) = $130,600 \times 0.47 = 61,400$ tons per year

Amount (Group Quarters) = Number of Group Quarters Residents \times Generation Rate

Amount (Group Quarters) = $25,700 \times 0.47 = 12,100$ tons per year

FIGURE A-1 (continued)

RESIDENTIAL MIXED REFUSE GENERATION WORKSHEET

6. Total Residential Mixed Refuse Generated in 2001

Total = Amount (SF City) + Amount (MF City) + Amount (MF Private) + Amount (GQ Private)

Total = 223,100 + 9,200 + 61,400 + 12,100 = 305,800 tons

7. Total Residential Mixed Refuse to be Generated in 2006

Amount = Population (2006) x Generation Rate

Amount = 627,000 x 0.47 = 295,400 tons per year

8. Total Residential Mixed Refuse to be Generated in 2011

Amount = Population (2011) x Generation Rate

Amount = 628,500 x 0.47 = 295,400 tons per year

9. Total City Collected Mixed Refuse in 2006

Amount (SF City: 2001) + Amount (MF City: 2001) ÷ Total Amount (2001) = Estimated Amount City Collects (2006) ÷ Estimated Total Amount (2006)

$232,300 \div 305,800 = x \div 294,700$; $x = 223,900$ tons per year

10. Total City Collected Mixed Refuse in 2011

Amount (SF City: 2001) + Amount (MF City: 2001) ÷ Total Amount (2001) = Estimated Amount City Collects (2011) ÷ Estimated Total Amount (2011)

$232,300 \div 305,800 = x \div 314,820$; $x = 224,400$ tons per year

FIGURE A-2

INSTITUTIONAL MIXED REFUSE GENERATION WORKSHEET

1. Amount Collected by City in 2001

3.5% of total from City Government Offices (all collected by City)

2.0% of total from City Schools (all collected by City)

Amount from City Offices = $0.035 \times 305,556 = 10,700$ tons per year

Amount from City Schools = $0.02 \times 305,556 = 6,100$ tons per year

2. Per Capita Generation Rate

Rate (City Offices) = Amount of Refuse \div Number of City Employees

Rate (City Offices) = $10,700 \div 33,000 = 0.32$ tons per employee per year

Rate (City Schools) = Amount of Refuse \div Number of Students

Rate (City Schools) = $6,100 \div 97,000 = 0.063$ tons per student per year

3. Amount Collected by Private Haulers in 2001

Amount from State/Federal Offices = Number of Employees \times Generation Rate

Amount from State/Federal Offices = $53,000 \times 0.32 = 17,000$ tons per year

Amount from Private Schools = Number of Students \times Generation Rate

Amount from Private Schools = $21,000 \times 0.064 = 1,300$ tons per year

4. Total Institutional Mixed Refuse Generated in 2001

Total = Amount (City Offices) + Amount (State/Federal Offices) + Amount (City Schools) + Amount (Private Schools) + Amount (Hospitals)

Total = $10,700 + 17,000 + 6,100 + 1,300 + 16,000 = 51,100$ tons per year

FIGURE A-2 (continued)

INSTITUTIONAL MIXED REFUSE GENERATION WORKSHEET

5. Mixed Refuse to be Generated at Government Offices in 2006

Amount at Government Offices = Number of Employees x Generation Rate

Amount at Government Offices = 31,000 x 0.32 = 9,920 tons per year

6. Mixed Refuse to be Generated at State/Federal Offices in 2006

Amount at State/Federal Offices = Number of Students x Generation Rate

Amount at State/Federal Offices = 52,000 x 0.032 = 16,640 tons per year

7. Mixed Refuse to be Generated at Schools in 2006

Amount at Schools = Number of Students x Generation Rate

Amount at Schools = 119,000 x 0.063 = 7,500 tons per year

8. Total Institutional Mixed Refuse to be Generated in 2006

Total = Amount (Government Offices) + Amount (State/Federal Offices) + Amount (Schools) + Amount (Hospitals)

Total = 9,920 + 16,640 + 16,000 = 50,060 tons per year

9. Mixed Refuse to be Generated at Government Offices in 2011

Amount at Government Offices = Number of Employees x Generation Rate

Amount at Government Offices = 31,000 x 0.32 = 9,920 tons per year

10. Mixed Refuse to be Generated at State/Federal Offices in 2011

Amount at State/Federal Offices = Number of Employees x Generation Rate

Amount at State/Federal Offices = 51,000 x 0.032 = 16,320 tons per year

FIGURE A-2 (continued)

INSTITUTIONAL MIXED REFUSE GENERATION WORKSHEET

11. Mixed Refuse to be Generated at Schools in 2011

Amount at Schools = Number of Students x Generation Rate

Amount at Schools = 119,000 x 0.063 = 7,600 tons per year

12. Total Institutional Mixed Refuse to be Generated in 2011

Total = Amount (Government Offices) + Amount (State/Federal Offices) + Amount (Schools) + Amount (Hospitals)

Total = 9,920 + 16,320 + 7,600 + 16,000 = 49,840 tons per year

13. Total City Collected Institutional Mixed Refuse in 2006

Amount (City Offices: 2001) + Amount (City Schools: 2001) ÷ Total Amount (2001) = Estimated Amount City Collects (2006) ÷ Estimated Total Amount (2006)

16,800 ÷ 51,100 = x ÷ 50,060; x = 16,460 tons per year

14. Total City Collected Institutional Mixed Refuse in 2011

Amount (City Offices: 2001) + Amount (City Schools: 2001) ÷ Total Amount (2001) = Estimated Amount City Collects (2011) ÷ Estimated Total Amount (2011)

16,800 ÷ 51,100 = x ÷ 49,840; x = 16,390 tons per year

FIGURE A-3

COMMERCIAL MIXED REFUSE GENERATION WORKSHEET

1. Amount Collected by City in 2001

20.5% of total from Small Businesses

Amount from Small Businesses = $0.205 (305,556) = 62,600$ tons per year

2. Amount Collected by Private Haulers in 2001

Amount (Commercial Private) = Total (Private) – Amount from Residences (Private) – Amount from Institutions (Private)

Amount (Commercial Private) = $239,300 - 73,500 - 33,300 = 132,500$ tons per year

3. Amount Generated at Industries in 2001

Mixed refuse per capita generation rate assumed to be same as at government offices = 0.32 tons per employee per year (does not include amount of industrial waste generated from industrial processes)

Amount from Industries = Number of Employees x Generation Rate

Amount from Industries = $67,000 \times 0.32 = 21,400$ tons per year

4. Amount Generated at Other Businesses in 2001

Amount at Other Businesses = Amount (City) + Amount (Private) – Amount (Industries)

Amount at Other Businesses = $62,600 + 132,500 - 21,400 = 173,700$ tons per year

5. Per Capita Generation Rate at Other Businesses

Rate = Amount of Refuse ÷ Number of Employees

Rate = $173,700 \div 307,000 = 0.57$ tons per employee per year

FIGURE A-3 (continued)

COMMERCIAL MIXED REFUSE GENERATION WORKSHEET

6. Total Commercial Mixed Refuse Generated in 2001

Total = Amount (Industries Private) + Amount (Other Businesses Private) + Amount (Small Businesses City)

Total = 21,400 + 173,700 + 62,600 = 257,700 tons per year

7. Total Commercial Mixed Refuse to be Generated in 2006

Total = [Number of Industrial Employees x Generation Rate] + [Number of Employees at Other Industries x Generation Rate]

Total = [64,000 x 0.32] + [316,000 x 0.57] = 200,600 tons per year

8. Total Commercial Mixed Refuse to be Generated in 2011

Total = [Number of Industrial Employees x Generation Rate] + [Number of Employees at Other Industries x Generation Rate]

Total = [62,000 x 0.32] + [322,000 x 0.57] = 203,400 tons per year

9. Total City Collected Commercial Mixed Refuse in 2006

Amount (Small Businesses: 2001) ÷ Total Amount (2001) = Estimated Amount City Collects (2006) ÷ Estimated Total Amount (2006)

$62,600 \div 257,700 = x \div 200,600$; $x = 48,729$ tons per year

10. Total City Collected Commercial Mixed Refuse in 2011

Amount (Small Businesses: 2001) ÷ Total Amount (2001) = Estimated Amount City Collects (2011) ÷ Estimated Total Amount (2011)

$62,600 \div 257,700 = x \div 203,400$; $x = 49,410$ tons per year

**CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF SOLID WASTE**

**TEN YEAR SOLID WASTE MANAGEMENT PLAN
JULY 2002**



***APPENDIX B
RECYCLING COMPANIES AND FACILITIES***

RECYCLING COMPANIES AND FACILITIES

ABC Box Company
1135 Leadenhall Street
Baltimore, MD 21230

AMG Resources Corporation
2415 Grays Road
Baltimore, MD 21219

Asplundh Tree Expert Company
1900 Betspm Court
Odenton, MD 21113

Baltimore Scrap Corporation
1600 Carbon Avenue
Baltimore, MD 21226

Baltimore Recycling
725 Pittman Road
Baltimore, MD 21226

Browning-Ferris Inc.
P.O. Box 72059
Baltimore, MD 21237

Cambridge Iron & Metal Company
P.O. Box 38150
Baltimore, MD 21231

Canusa Corporation
1616 Shakespeare Street
Baltimore, MD 21231

Chesapeake Paperboard Company
Fort Avenue & Woodall Street
Baltimore, MD 21230

David Joseph Company
2545 Wilkens Avenue
Baltimore, MD 21223

D.C. Intercel
1401 Cherry Hill
Baltimore, MD 21225

Dext Company of Maryland
3220 Sun Street
Baltimore, MD 21226

Emanuel Tire Company
1300 Moreland Avenue
Baltimore, MD 21216

Fiber Processing Inc.
8004 Stansbury Road

Baltimore, MD 21222

Franks Pallet Services
8865 Kelso Drive
Baltimore, MD 21221

G&L Recycling Corporation
222 North Calverton Road
Baltimore, MD 21223

Loading Dock Inc.
2523 Gwynns Falls Parkway
Baltimore, MD 21216

Modern Junk and Salvage
1423 North Fremont Avenue
Baltimore, MD 21217

Row Clothing Enterprises, Inc.
P.O. Box 7020
Baltimore, MD 21216

Second Chance Chesapeake
P.O. Box 5665
Baltimore, MD 21210

Simkins Industries, Inc.
P.O. Box 3249
Catonsville, MD 21228

The Owl Corporation
1936 Rettman Lane
Baltimore, MD 21222

Valley Proteins, Inc.
1515 Open Street
Baltimore, MD 21226

Valleywood Industries, Inc.
6600 Landay Avenue
Baltimore, MD 21237

Vangel Paper Inc.
50 Alco Place
Baltimore, MD 21227

Waste Management of Maryland
6333 Macaw Court
Elkridge, MD 21227

Weststreet Industries
8910 Kelso Road
Baltimore, MD 21237

APPENDIX B

Weyerhaeuser Paper Company
7270 Park Circle Drive
Dorsey, MD 21076

**CITY OF BALTIMORE
DEPARTMENT OF PUBLIC WORKS
BUREAU OF SOLID WASTE**

**TEN YEAR SOLID WASTE MANAGEMENT PLAN
JULY 2002**



APPENDIX C
MARYLAND RECYCLING ACT TONNAGE REPORTING SYSTEM

APPENDIX C

FORM A

**MRA Tonnage Reporting System
County Solid Waste Accounting Form**

County: Baltimore City Solid Waste Contact Person: TIFFANY HALL
 Contact Telephone # _____
 Reporting Period: JAN-DEC 2001

Residential Tonnage		(0)	(0)	+ (-) (Y)
NAME AND LOCATION OF DISPOSAL FACILITY ACCEPTING WASTE COLLECTED IN YOUR COUNTY	TYPE OF FACILITY	TOTAL WASTE COLLECTED IN THE COUNTY FOR DISPOSAL	MRA WASTE* (TONS)	NON-MRA WASTE (TONS)
BRESCO	WTE	234,866.00	234,866.00	0.00
Quartrine Road Landfill	Landfill	70,690.00	45,815.88	25,074.12
FERST			0.00	0.00
		0.00	0.00	0.00
		0.00	0.00	0.00
				0.00
TOTAL		305,556.00	280,481.88	25,074.12

* MRA WASTE = Maryland Recycling Act Waste - waste that conforms to the Maryland Recycling Act Definition of "solid waste stream".

Please provide a brief explanation of how NON-MRA waste was determined

I certify, to the best of my knowledge, that the tonnage claimed on this form is accurate and based on actual records maintained by solid waste acceptance facilities. These tonnage records will be made available to MDE for auditing purposes, if requested.

 Signature

RECYCLING COORDINATOR
 Title

FORM B

**MRA Tonnage Reporting System
County Solid Waste Accounting Form**

SECTION 1**MRA Recyclables**

Baltimore City

JAN-DEC, 2001

(B)

	Maryland Recycling Act Recyclables	Residential Recycling (TONS)	Commercial Recycling (TONS)	MRA Tons Recycled (TONS)
METALS	Aluminum Cans	0.00	2.00	2.00
	Aluminum/Tin/Steel Cans	23.00	155.26	178.26
	Tin/Steel Cans	0.00	0.00	0.00
	White Goods	1,662.45	1,804.00	3,586.45
	Lead Acid Batteries (ex. auto)	449.00	328.83	777.83
	Other BRESCO/BCRRF Metals	6,064.19	3,675.73	9,959.92
	Ferrous Metals	0.00	109.50	109.50
	Other Metals	0.00	8,915.21	8,915.21
PAPER	Newspaper	0.00	4,453.17	4,453.17
	Old Corrugated Cardboard (OCC)	0.00	3,127.85	3,127.85
	Office/Computer Paper	0.00	29,502.00	29,502.00
	Telephone Directories	0.40	0.00	0.40
	Mixed Paper	10,444.73	15,216.08	25,660.81
	Other	0.00	13,605.01	13,605.01
	Grass	0.00	0.00	0.00
COMPOST/MULCH	Leaves	10,500.00	10.00	10,510.00
	Brush and Branches	0.00	1,426.00	1,426.00
	Mixed Yard Waste	0.00	0.00	0.00
	Wood Waste	0.00	164.00	164.00
	Solid Waste *	0.00	0.00	0.00
	Other Animal Manure	6,487.47	0.00	6,487.47
	Other Christmas Trees	68.79	0.00	68.79
	Mixed Plastic	0.00	0.00	0.00
PLASTIC	Plastic Code#	0.00	0.00	0.00
	Plastic Code#	0.00	0.00	0.00
	Plastic Code#	0.00	0.00	0.00
	Plastic Code#	0.00	0.00	0.00
GLASS	Mixed Glass	0.00	13.80	13.80
	Green Glass	0.00	0.00	0.00
	Brown Glass	0.00	0.00	0.00
	Clear Glass	0.00	0.00	0.00
OTHER MATERIALS	Corrugated Containers	2,607.76	38.84	2,646.60
	Textiles/Cloth	0.00	6,653.90	6,653.90
	Tires	527.52	273.60	801.12
	Other Baked Goods	0.00	0.00	0.00
	Recycled Ash	69,152.00	44,045.61	113,197.61
	Other Animal Protein	0.00	-413.00	-413.00
	TOTAL		108,027.33	134,233.59

* Report only that portion of compost which is marketed.

SECTION 2

Non-MRA Recyclables

Non-Maryland Recycling Act Material	Residential Recycling (TONS)	Commercial Recycling (TONS)	Total (TONS)
Scrap Metal	0	0	0.00
Scrap Automobiles	0	0	0.00
Antifreeze (8.8 lbs/gal)	0	0	0.00
Waste Oil (7 lbs/gal)	0	0	0.00
Asphalt/Concrete	0	0	0.00
	0	0	0.00
C&D Debris	0	0	0.00
Sewage Sludge	0	0	0.00
Landclearing Debris (stumps)	0	0	0.00
Tree Stumps	0	0	0.00
Other	0	0	0.00
Other	0	0	0.00
Other	0	0	0.00
Total Non-MRA Recycling	0.00	0.00	0.00

Maryland Recycling Act Recycling Rate

Residential Tonnage

	Total
A = MRA Waste (Form A, (X))	280,481.88
B = MRA Tons Recycled (Form B, Section 1, (B))	108,027.33
C = MSW Compost Facility Marketed Materials	0.00
Total MRA (A+B-C)	388,509.21
MRA Recycling Rate *	27.81%

* MRA Recycling Rate = B/(A+B-C)x100

I certify, to the best of my knowledge, that the tonnage claimed on this form is accurate and based on actual records maintained by solid waste acceptance facilities. These tonnage records will be made available to MDE for auditing purposes, if requested.

Signature

RECYCLING COORDINATOR

Title

FORM A

MRA Tonnage Reporting System
County Solid Waste Accounting Form

County: Baltimore City Solid Waste Contact Person: TIFFANY HALL
 Contact Telephone#: _____
 Reporting Period: JAN/DEC 2001

NAME AND LOCATION OF DISPOSAL FACILITY ACCEPTING WASTE COLLECTED IN YOUR COUNTY	TYPE OF FACILITY	(2) = TOTAL WASTE COLLECTED IN THE COUNTY FOR DISPOSAL	(3) MRA WASTE* (TONS)	(4) NON-MRA WASTE (TONS)
BIRESCO	WTE	145,720.24	145,720.24	0.00
Quarantine Road Landfill	Landfill	130,180.35	52,946.18	77,232.17
FERST	0	0.00	0.00	0.00
0	0	0.00	0.00	0.00
0	0	0.00	0.00	0.00
0	0	0.00	0.00	0.00
TOTAL		275,900.59	198,666.42	77,232.17

* MRA WASTE = Maryland Recycling Act Waste - waste that conforms to the Maryland Recycling Act Definition of "solid waste stream".

Please provide a brief explanation of how NON-MRA waste was determined.

I certify, to the best of my knowledge, that the tonnage claimed on this form is accurate and based on actual records maintained by solid waste acceptance facilities. These tonnage records will be made available to MDE for auditing purposes, if requested.

 Signature: RECYCLING COORDINATOR Title: _____ Date: _____

Maryland Recycling Act Recycling Rate
Commercial Tonnage

A = MRA Waste (Form A, (X))	198,668.42
B = MRA Tons Recycled (Form B, Section 1, (B))	134,233.58
C = MSW Compost Facility Marketed Materials	0.00
Total MRA (A+B+C)	332,902.01
MRA Recycling Rate*	40.32%

* MRA Recycling Rate = B/(A+B-C)x100

APPENDIX C

FORM A

**MRA Tonnage Reporting System
County Solid Waste Accounting Form**

County: Baltimore City Solid Waste Contact Person: TFFAMY/HALL
 Contact Telephone #: _____
 Reporting Period: JAN-DEC 2011

Total Tonnage		(C) =	(B)	+ (D)
NAME AND LOCATION OF DISPOSAL FACILITY ACCEPTING WASTE COLLECTED IN YOUR COUNTY	TYPE OF FACILITY	TOTAL WASTE COLLECTED IN THE COUNTY FOR DISPOSAL	MRA WASTE* (TONS)	NON-MRA WASTE (TONS)
BERSCO	WTE	380,586.00	380,586.00	0.00
Quarantine Road Landfill	Landfill	200,870.35	96,584.06	102,306.29
PERST		0.00	0.00	0.00
		0.00	0.00	0.00
		0.00	0.00	0.00
		0.00	0.00	0.00
TOTAL		581,456.35	479,150.06	102,306.29

* MRA WASTE = Maryland Recycling Act Waste - waste that conforms to the Maryland Recycling Act Definition of "solid waste stream"

Please provide a brief explanation of how NON-MRA waste was determined:

I certify, to the best of my knowledge, that the tonnage claimed on this form is accurate and based on actual records maintained by solid waste acceptance facilities. These tonnage records will be made available to MDE for auditing purposes, if requested.

Signature Title Date

Maryland Recycling Act Recycling Rate

Total Tonnage	Total
A = MRA Waste (Form A, (X))	479,150.06
B = MRA Tons Recycled (Form B, Section 1, (B))	342,280.92
C = MSW Compost Facility, Marketed Materials	0.00
Total MRA (A+B+C)	721,410.98
MRA Recycling Rate *	33.58%

* MRA Recycling Rate = B/(A+B-C)x100