FINAL

TACOMA-PIERCE COUNTY SOLID WASTE MANAGEMENT PLAN

Fall 2000

Pierce County

Pierce County Department of Public Works and Utilities
Environmental Services, Solid Waste Division
9116 Gravelly Lake Drive Southwest
Tacoma, Washington 98499-3190
(253) 798-4050

PIERCE COUNTY COUNCIL

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Fran McNair, Deputy County Executive

Public Works & Utilities Department

John Trent, Director
Karen Goon, Deputy Director
Stephen C. Wamback, Administrator, Solid Waste Division
Sally Sharrard, Senior Planner, Solid Waste Division

SOLID WASTE ADVISORY COMMITTEE

(4/1/2000)

Citizens	Business	Waste Management Industry
Joyce Alvarez	Gregory Jacoby	Charlie Maxwell
William Christie	Keith Warner	

Local Governments	Public Interest Groups	Tacoma
William Larkin	Jim Akers	Terry Morrow
	Viki Steiner	

Ex-officio representation

Pierce County Council, Carolyn Pendle
Tacoma-Pierce County Health Department, John Sherman
Land Recovery, Inc., Jody Snyder

(For a complete list of all who served on the SWAC during the update of the Plan, please refer to Appendix I.)

Consulting Firm – R.W. Beck, Inc.

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CHAPTER 1

INTRODUCTION

This chapter describes the Plan's purpose and planning authority, overall goals, format, history, relationship to other plans, and the planning process. Additional goals, policies, and recommendations specific to various components of the three waste management systems in the county are found in other chapters.

1.1 Purpose and Authority of the Plan

Purpose: This Solid Waste Management Plan is intended to be the planning tool for the management of solid waste activities in Pierce County for the next twenty (20) years. The Plan's goals, policies, and recommendations provide elected officials with guidelines for the development of programs, capital facilities, and annual budgets. The Plan provides a legal basis for Tacoma, Pierce County, the Tacoma-Pierce County Health Department, other jurisdictions, and government agencies to make permitting decisions on solid waste or recycling facilities. Private industry can use this Plan to coordinate with municipalities in the planning and delivery of collection, disposal, and recycling services.

This 1998 document updates and replaces the 1992 amended Plan. (Except for the waste reduction and recycling chapters, the 1992 Plan contained the same information as originally adopted in 1989.) This is not an entirely new plan because it builds upon the established solid waste management system developed from the goals and policies first adopted in 1989 and, since then, the actions directed by the Pierce County Council, Tacoma, and Fort Lewis/McChord Air Force Base to implement the Plan and the State's goals. The emphasis of this document is on what is called "an integrated management system" which addresses all issues relating to the collection, processing, and disposal of solid waste, including waste reduction and recycling. It also emphasizes the public-private partnership developed in Pierce County for the delivery of services to residents and businesses.

Plan participants: The plan addresses solid waste management in all unincorporated and incorporated areas of Pierce County. The cities and towns have chosen to be in this plan and to continue the coordinated management system developed through interlocal agreements with the County. The Plan also incorporates by reference the solid waste management plan for Fort Lewis, which serves as the planning tool for disposal for the Fort and for McChord Air Force Base. It summarizes Tacoma's waste reduction and recycling programs.

Three systems - Pierce County waste stream: There are three separate collection and disposal systems in Pierce County. The areas served by each management system are illustrated on Map 1.1.

The unincorporated areas of the County and 19 cities and towns use Pierce County's disposal system. The Pierce County Department of Public Works and Utilities, Solid Waste Division, is the County government agency charged with planning for the unincorporated areas and those cities using the County's disposal system. Participating cities and towns in this disposal system are:

• Bonney Lake • Buckley • Carbonado
• DuPont • Eatonville • Edgewood
• Fife • Fircrest • Gig Harbor • Lakewood

• Milton • Orting • Puyallup • Roy
• Sumner • South Prairie • Steilacoom
• University Place • Wilkeson

Tacoma/Ruston waste stream: Tacoma has elected to prepare a joint plan with Pierce County and has its own collection utility and disposal system. The Town of Ruston operates its own collection utility but has an interlocal agreement with Tacoma for disposal and an interlocal agreement with the County to adopt and implement the Plan. The Tacoma Solid Waste Utility administers solid waste management services under the direction of the Tacoma City Council. Ruston's collection system is directed by the Ruston Town Council.

Fort Lewis/McChord Air Force Base waste stream: Fort Lewis and McChord Air Force Base jointly use the Fort Lewis disposal system with separate but coordinated collection systems for solid waste and recycling. Fort Lewis has adopted the *Solid Waste Management Plan for the Fort Lewis Military Reservation*. This document describes the military system in more detail. This Plan summarizes the information about the military system in appropriate chapters.

(More detailed descriptions about the management components of each of the three systems are found in other plan chapters.)

Legal requirements: Responsibility for managing the Pierce County solid waste system is shared by individual residents and businesses, service providers, city and town governments, Pierce County government, Washington State government, and the Federal Government. In Washington, local governments have lead responsibility for solid waste management. However, they must manage and handle waste according to comprehensive state regulations which include specific mandates for management handling, and disposal systems. Federal regulations provide "umbrella" authority for waste regulations which are ultimately implemented by local governments. The State is delegated the authority to implement the Federal Resource Conservation and Recovery Act (RCRA). Subtitle F states that all federal, state, and interstate local requirements are applicable to federal facilities that have any jurisdiction over a solid waste management facility or disposal site or that engage in any activity that results in the disposal of solid or hazardous waste. This is important because it means Fort Lewis and McChord AFB must meet State facility requirements. Their activities are summarized in this plan.

Washington Department of Ecology: The State's Solid Waste Management --- Reduction and Recycling Act, RCW 70.95, designates the Washington Department of Ecology (DOE or "Ecology") as the State department responsible for overseeing solid waste regulations. The administrative codes which implement the law's requirements are WAC 173-304 Minimum Functional Standards, WAC 173-351 Criteria for Municipal Solid Waste Landfills, and WAC 173-306 Special Incinerator Ash Management Standards. The State has obtained "approved status" from the Federal government to administer these regulations. These codes provide standards and criteria for the location, design, operation, and maintenance of solid waste facilities. The WACs require a solid waste facility to have a solid waste permit. The permit processes are administered by the Tacoma-Pierce County Health Department with final review by Ecology.

State law requires counties, in coordination with their cities, to adopt comprehensive solid waste plans for the management,

Insert Map 1.1

handling, and disposal of solid waste for twenty (20) years and to update them every five years, if necessary. Cities may choose to be joint participants in the plan, delegate planning to the County, or choose to do their own plan. The cities and towns of Pierce County have signed an Interlocal Agreement with the County, which spells out the responsibilities of each jurisdiction. The County has responsibility for overall planning, disposal, and waste reduction and recycling education. Cities are responsible for refuse collection and the development of any recycling program specific to their jurisdiction. Tacoma has elected to be a joint plan participant --- planning, managing, and financing its own programs, which are summarized in this document.

Cities and towns may also reach interlocal agreements with other local jurisdictions to provide or contract for municipal services. Interlocal agreements have been implemented for these services in the past and will continue to be used in the future.

State regulations (RCW 70.95.090 and the DOE Guidelines for Local Solid Waste Management Plans) detail: what is required within comprehensive plans; priorities; criteria for an integrated handling system; programs that must be implemented; the criteria for siting, design, and operation of solid waste facilities; and the process for review and adoption of plans. State priorities for waste management are:

1. Waste reduction
2. Recycling, with source separation of recyclable materials as the preferred method;
3. Energy recovery, incineration, or landfilling of separated wastes; and
4. Energy recovery, incineration, or landfilling of mixed wastes.

Counties and cities must implement a number of waste reduction and recycling (WRR) programs, which include: residential recycling collection for urban and rural areas and for single-family and multi-family residents; yardwaste collection; public information and educational programs on waste reduction and recycling; programs to monitor collection of recyclables from businesses and industries; procurement plans; and "in-house" recycling collection programs. Counties must also adopt urban/ rural boundaries for recycling collection programs and implement special waste collection programs, if necessary.

In their solid waste management plans, counties must also maintain an inventory of all existing solid waste handling facilities; identify potential disposal and recycling facility needs; and assess disposal capacity needs based on twenty (20) years of population growth for all participating jurisdictions. Counties must also review potential areas that meet siting criteria for disposal facilities.

Also, counties must plan for financing capital and operation costs; have a six-year capital improvement program; and an assessment of the plan's impact on the costs of solid waste collection prepared in conformance with guidelines from the Washington Utilities and Transportation Commission (WUTC). A discussion about a program for surveillance and control should be included within the plan. (These requirements are delineated in RCW 70.95.090.)

Washington Utilities and Transportation Commission (WUTC): The WUTC grants certificates (franchises) authorizing solid waste collection in designated franchise districts for unincorporated areas. Solid waste collection certificates authorize the collection of garbage and refuse from all residential and non-residential generators and recyclable materials from residential

sources by private firms. Service in the unincorporated areas is provided to residents or businesses, upon request. Rates requested by collection companies must reflect the State's solid waste management priorities. The County does not control collection rates but does work with the WUTC to implement solid waste programs and minimum service levels for recycling. The WUTC does not govern the collection rates of city utilities or city contracts with private haulers. (Chapter 5 provides a more detailed discussion.)

Tacoma-Pierce County Health Department: The role of the Health Department, a separate agency from the County, is to implement programs to ensure solid waste handling complies with state and local solid waste codes and ordinances. This includes the permitting process and enforcement of the solid waste permit regulations in WAC 173-304 and WAC 173-351; monitoring; and coordination with the County and the cities on all aspects of special collections and public information programs. (A more detailed discussion about the Health Department's role is found within Chapter 10.)

SWAC role: The State requires that counties establish a Solid Waste Advisory Committee (SWAC) "to assist in the development of programs and policies concerning solid waste handling and disposal…" By law, the SWAC is established to report to the Pierce County Council. The SWAC members must be representatives from "public interest groups, citizens, business, waste management industry, and local elected officials" (RCW 70.95). The Pierce County SWAC meets on a regular basis to review solid waste management programs sent to them by the Council. SWAC meetings provide regular opportunities for public comment. Some cities in the county and Fort Lewis have established their own SWACs to look at issues particular to their jurisdiction and issues which they might want to bring to the attention of the County SWAC.

1.2 Plan Format

Approach--- how to interpret this document: Goals, policies, and recommendations take precedence over the written text. The text is only intended to be descriptive of the three solid waste management systems as they exist when this document is written. It is also intended to provide sufficient information, although in summary form, about future needs and alternatives which the public and decision-makers may wish to consider to adopt and implement the goals and policies.

As is the case with County's integrated waste management system, no one paragraph or chapter of this plan can be understood outside the context of the whole.

Federal and State regulations may change during the time this plan is in effect. For future interpretation, it is intended that descriptive text referencing a WAC be superseded by the new WAC when it is adopted by the appropriate agency. A question of priority should only arise when a specific goal or policy recommendation appears to directly conflict with the new, state-adopted regulations. The following terms have specific meanings in this Plan:

Goal: A broad statement of what ought to exist or what is desired to be achieved in the future.

Policy: A statement, more specific than a goal, which describes a particular course of action to accomplish the purposes of the plan.

Policy recommendation: A new policy recommended by the SWAC to the County Council to be adopted by the Council.

Implementation actions: These are the detailed actions to implement the plan. They are in the form of specific programs adopted by ordinance, or are studies completed at the direction of plan policies. The ordinances are more detailed than the plan policies and may be amended outside the plan amendment process.

Relationship to other plans: The Plan must also be viewed in context of the overall planning process within all jurisdictions in Pierce County. As such it must function in conjunction with various other plans, policy documents, and studies. Included among these are the comprehensive land use plans of each jurisdiction, the *Tacoma-Pierce County Hazardous Waste Management Plan*, the development codes (zoning), Shoreline Management Regulations, and groundwater plans. Of specific importance are the groundwater or watershed management plans adopted by the County and other jurisdictions which contain specific recommendations for coordinated educational efforts about solid waste, groundwater pollution, and utility support systems.

The solid waste plan's goals and policies must be in compliance with and coordinated with the goals and policies of the *Pierce County Comprehensive Land Use Plan* and coordinated with the goals and policies of other jurisdictions. Pierce County's land use plan summarizes the solid waste plan in its utilities element and includes the County's six-year capital facilities plan, which is updated annually. The land use plans of other cities and towns either summarize the solid waste plan or reference it.

(Appropriate goals and policies from land use plans are included in the Appendix.)

Chapter organization: This Plan updates the 1989 / 1992 Plan documents and uses the same basic format and content as the earlier documents. The following explains any differences between the documents:

• Chapter 1: This chapter has been rewritten but it remains an introductory chapter summarizing legislative requirements, goals, plan participants, role of the SWAC, solid waste planning history, and the planning process established in Pierce County.

• Chapter 2: This chapter continues to describe the required background including environment, land use, and landfill siting considerations. As required by RCW 70.95.165, it has been updated to review potential areas that meet siting criteria for disposal facilities, by summarizing and incorporating *Pierce County's Phase I Landfill Siting Study*. This Phase I Study was based on the requirements of WAC 173-351 Criteria for Municipal Solid Waste Landfills.

• Chapter 3: The waste analysis section, which was in chapter 2, has been given its own chapter and substantially expanded. The chapter now presents new disposal projections based on twenty year population projections, describes the effects of waste reduction and recycling programs since 1990, and summarizes the results of the 1995 Waste Characterization Audit.

• Chapter 4: Waste reduction, formerly in chapter 3, has been combined with recycling in this chapter to recognize the inter-dependent nature of waste reduction and recycling activities. For the most part, this chapter is an updated version of the information provided in the 1992 Plan with the addition of a summary of Tacoma's programs and those of Fort Lewis and McChord Air Force Base.

• Chapter 5: Information on solid waste collection systems has been updated. The chapter remains much the same, with a description of the three waste management systems.

• Chapter 6: As in the previous document, this chapter describes processing technologies and facilities related to waste-to-energy and recycling. It is substantially updated with information about composting, includes an inventory of facilities, both public and private, and summarizes all the studies completed by the County since 1990.

• Chapter 7: Transfer facilities and systems are still the focus of this chapter but it has been rewritten to focus on long-term in-county transfer facility needs. The disposal discussion about long-haul (or "waste export") which was in this chapter has been moved to chapter 8 and combined with the discussion of landfilling disposal options.

• Chapter 8: This chapter has been completely rewritten. It reviews the status of existing landfills and the in-county and out-of-county landfilling alternatives. It also summarizes the results of the County's *Phase II Landfill Siting Study*.

• Chapter 9: In the 1989/92 documents, the discussion about special waste streams was in chapter 11. The discussion has been updated and moved to this chapter. The focus has shifted to acknowledge the substantial number of private businesses and other related planning studies or regulations, which provide collection and treatment systems for those special wastes which don't, generally, enter the municipal solid waste stream management system.

• Chapter 10: Information about enforcement issues, permitting, administration, and financing has been updated. This information was originally in chapter 9 but has been bumped to chapter 10. An expanded discussion about illegal dumping has been added.

• Chapter 11: This chapter serves the same purposes as its original (chapter 10) to provide a coordinated, overall view of the management system and to focus on new goals and policies. It has been completely rewritten.

Each chapter follows a general format that includes an introduction; a summary review of definitions, past actions, and goals; the status of existing programs; identified needs and alternatives; criteria to evaluate the alternatives; and recommendations. In some chapters a section about issues that might arise has also been added.

1.3 Goals and Policies

The following are the main, overall goals for solid waste management in Pierce County. They follow in no particular priority. Additional, secondary goals and policies about specific components of the three waste management systems can be found in other chapters. These support and complement the main goals.

Goal: In recognition of the priorities set forth by the Washington State Legislature in RCW 70.95.010, it shall be the goal of Pierce County Solid Waste Management Plan to implement, to the fullest extent possible and in descending order of priority, solid waste management processes that reduce the waste stream, promote recycling, and provide for the separation of waste prior to incineration or landfilling.

Goal: To develop a solid waste program that promotes and maintains the highest practical level of public health and safety; and which protects the natural and human environment of Pierce County.

Goal: To promote input, ensure the representation of the public in the planning process, and address the concerns of all county citizens.

Goal To promote the conservation of energy.

Goal: To develop economically responsible means of solid waste management that recognizes the cost and need for environmental protection and service to the citizens of the County.

Goal: To promote the use of private industry expertise to carry out the components of the Solid Waste Management Plan. This does not mandate the use of private industry, nor does it preclude the involvement of Pierce County in implementing the Plan. The participants in this plan should competitively bid solid waste services when practical.

Goal: To coordinate and strive to be consistent with applicable resource management plans.

1.4 Solid Waste Planning History

The development of a solid waste management plan often takes a long time. In the case of Pierce County, it took seven years to complete the 1989 plan, another two years to complete waste reduction and recycling (WRR) amendments and another year to get final approval from the Washington Department of Ecology in 1993.

1983-1989 period: The Tacoma-Pierce County Health Department and the Solid Waste Advisory Committee began writing the plan in 1983. A first draft was published in 1987. It was intended to replace an older 1973 document, the *Multi-Jurisdictional Solid Management Planning Study*, which was never fully implemented.

During the public comment period on the 1987 draft, the County Council reappointed the SWAC with direction to make recommendations to the Council and also appointed four additional Solid Waste Advisory Groups (SWAGs) to assist the SWAC. The Public Works Department hired a Solid Waste Manager in 1987 to manage the public review process and develop programs. Between 1987 and adoption in 1989, fifty-six citizens on the SWAC and SWAGs held public meetings and drafted recommendations to the Council. The County Executive also appointed a 20-member Recycling Roundtable made up of members of the recycling business community and public works agencies to advise the Executive about recycling programs.

The SWAC's recommendations and a Draft Environmental Impact Statement (DEIS) were published in February and in March, 1989. The County Council and the SWAC then began a widely-publicized series of public meetings between February and June of 1989 to hear public comment on the draft

Solid Waste Plan, the Final EIS, and the SWAC's recommendations. Cities and towns were included in the review process. The Council adopted the Plan with amendments resulting from the public comments on August 2, 1989 (Ord. # 87-196). Cities and towns then began their formal review and adoption process and signed interlocal agreements with the County. After all cities and towns had adopted the Plan, the Department of Ecology gave final approval in August 1990 with the proviso that the County begin the amendment process to address new 1989 waste reduction and recycling legislation.

1989-1992 period: Fundamental changes occurred between 1989 and 1992 in Pierce County's solid waste management system. These changes resulted directly from the County's aggressive approach to implement the Plan's 120 goals and policies. During a short three year period, the County and its cities, with Fort Lewis/McChord AFB, completed or initiated action on 70% of the 1989 policy and action recommendations. By 1995, 95% had been completed.

While the 1989 Plan was in the public hearing stage, the State passed legislation amending the waste reduction and recycling requirements. Certain large counties (Pierce, King, Kitsap, Snohomish, and Spokane) were required to begin amending their waste reduction and recycling plan elements by July 1991. The County modified the 1989 Plan and the EIS during the final hearing process in 1989 to incorporate most of the State requirements in order to direct staff to begin the waste reduction and recycling programs and to complete studies on disposal options.

The County Council held extensive hearings on draft WRR amendments in 1991 and 1992, and adopted them in December 1992 (Ord. # 92-130). The cities and towns adopted the plan amendments in early 1993 and signed new interlocal agreements with the County. In September 1993, Ecology approved the Plan as being "current."

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1990-1995 Actions to implement Solid Waste Plan policies: Besides waste reduction and recycling chapters, the 1992 amendments included an *Annotated Summary* and a *WUTC Cost Assessment* appendix. Rather than rewrite the Plan to bring it up-to-date while the system was so rapidly evolving, the County prepared the *Annotated Summary*, in agreement with Ecology, to serve as an update of all other chapters of the 1989 Plan. The Summary contained a chronology of actions taken by the County and its cities and towns to implement the Plan. The cost assessment was based on the format of the WUTC Cost Assessment Guidelines.

The following are updated excerpts from the *Annotated Summary*. Activities have been grouped into five related subject areas. Individual programs are discussed in more detail in later chapters. All actions were completed at the direction of more than 120 specific plan policy recommendations.

#1 Administration, coordination, and oversight: In **1990**, the County created a Solid Waste Division within the Pierce County Department of Public Works and Utilities charged with overseeing the planning, coordination, and management of a solid waste system in Pierce County. To expand "opportunities for cooperation and communication among all jurisdictions" as directed in the Plan, the Solid Waste Division: worked with the municipalities during **1990** and **1992** to assist them to adopt the Plan; signed interlocal agreements in **1991** with the municipalities designating

County/City responsibilities; developed model residential recycling programs with the haulers; and designed, paid for, and implemented a countywide public information / outreach program.

The County began coordinating a number of special waste collection programs with individual communities, private businesses, and fire districts such as the Christmas Treecycling program and household hazardous waste collection events. The County also worked with the Tacoma-Pierce County Health Department and Tacoma to develop used tire and oil collection, solve hazardous waste management issues, and to coordinate grant programs.

In the summer of **1992,** the County began to work with the municipalities on a long-term Interlocal Agreement for solid waste management and disposal. The County took steps to communicate regularly with the mayors and recycling coordinators of each community about recycling issues and available informational and educational services provided by the County.

Another management service the County fully implemented in **1990** was a Data Collection Program to track recycled tonnage and the countywide recycling rate. The County began issuing Annual Reports about the County's progress. To assist local businesses, the County filled out the State's yearly recycling report forms for those businesses who participated regularly in the County's surveys and the County coordinated this yearly reporting with the Department of Ecology.

The Solid Waste Division began staffing the Solid Waste Advisory Committee (SWAC), which advises the County Council on solid waste management issues, in **1987**. It also staffed the Recycling Roundtable, which was discontinued at the recommendation of the membership who felt that, once the programs were up and running, SWAC public meeting review was sufficient. The County also established a process, as required in Ecology's planning guidelines, for the development, review, and adoption of waste reduction and recycling programs which includes annual review and yearly goal setting.

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#2 Enforcement: In **January 1990**, the County Council adopted a Solid Waste Handling Ordinance, providing for the designation of solid waste handling facilities and making unlawful the handling of solid waste at facilities other than those designated by the County (Ord. #90-4). The purpose of this ordinance was to provide the ability to make long-term and cost-effective disposal decisions and to coordinate with the Health Department's solid waste permit process. Designations are made annually after staff has reviewed solid waste permits to ensure they are up-to-date, and then the list is published for public comment.

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#3 Studies, contracts, and RFP proposals about disposal alternatives: In **1987** the County commissioned a Waste-To-Energy Report which included a review of current technologies, institutional and legal arrangements, and procurement and financial options. Based on the report's review, the County proceeded to consider the viability of incineration through a negotiated contract which identified disposal costs and annual average capital and operating costs. This negotiated contract was completed in early **1990** but not implemented.

In response to the 1989 Plan's policy that the County "pursue development of information gathering for alternative processing technologies in order to provide

performance and economic data roughly comparable to the waste-to-energy project," the Solid Waste Division commissioned a report in **1990** reviewing other energy recovery alternative technologies. Following up on that report in **1991**, the County began an RFP process for mixed municipal solid waste composting with landfilling of the remaining uncompostable waste and an RFP process for short- and /or long- term waste export. These studies were needed to answer both the short-range and long-range policy questions of the 1989 Plan.

In **January 1991**, the County renegotiated a five-year contract for landfill disposal at the Hidden Valley Landfill with Land Recovery Inc., which extended the contract to January 1996. Since then, the County has extended the disposal contract with LRI to 2011.

After completion of the RFP processes in the Spring of **1991** and with the results of the negotiated waste-to-energy contract, the Public Works and Utilities Department reported to the County Executive about the advantages, disadvantages, costs per ton, and environmental compliance issues of all options, which included: a) MSW composting combined with both waste export or with landfilling; b) waste export for the short and/or for the long term; c) waste-to-energy with in-county landfilling of the remaining waste; d) waste-to-energy combined with waste export; e) in-county landfilling; and f) in-county landfilling coupled with a County-owned yardwaste composting facility. The cost for adding the yardwaste composting facility to all alternatives were also identified.

In **August 1991**, after careful evaluation of the disadvantages, advantages, and costs of all alternatives, the Pierce County Council selected in-county landfilling as the disposal option combined with continuing development of waste reduction and source-separation recycling programs. This option included the development of a County-owned yardwaste composting facility. In the implementing ordinance (Ord. #91-126), the Council directed annual evaluation of alternative technologies. Waste export to an out-of-county disposal site was identified as the back-up alternative if siting of an in-county landfill, either public or private, was not completed.

The Solid Waste Division commissioned a Compostable Waste Diversion Report that was issued in **1991**. The report evaluated existing conditions, needs and opportunities, and alternative public and /or private management methods for yardwaste, woodwaste, foodwaste, land clearing debris, sewage sludge and septage, and other selected compostable wastes.

In **August 1992**, in response to direction from the County Executive and the County Council, the Solid Waste Division began a three-phase landfill siting study to identify if an in-county landfill could be sited in Pierce County.

In **1992**, the Public Works and Utilities Department assigned staff to work with the County's Planning and Land Service Department (PALS) to coordinate with the development of comprehensive land use plans and ordinances in relationship to solid waste and other public works essential public facilities, as required by the State's Growth Management laws (RCW 36.70A).

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***#4 Waste reduction and recycling (WRR) programs*:** Beginning in **1990**, the County began planning, development, and implementation of waste reduction and recycling programs. As directed by the Council and the Plan, this process required coordination of planning and service delivery with the solid waste collection

companies, private recycling processors, and the Washington Utilities and Transportation Commission, with the emphasis on a public / private partnership. These programs implement the State's requirements for source-separation and collection of recyclables. Annual Reports evaluate the programs.

1995 50% goal: The residents of Pierce County achieved their goal of a **50% waste reduction and recycling rate in 1995**. In recognition, Governor Lowry proclaimed **November 11, 1995** as **Pierce County Recycling Achievement Day**.

The following is an inventory of when waste reduction and recycling programs were first implemented:

• *Residential collection programs:*

- Minimum Services Levels ordinance for curbside recycling collection for single-family households (Ord. #90-14) in **March 1990.**

- Minimum Service Levels ordinance for recycling collection from multi-family complexes, condominiums, and mobile home parks (Ord. #91-86) in **August 1991**.

- Minimum Service Levels ordinance for yardwaste collection for single-family households (Ord. #92-22) in **April 1992**.

• *Yardwaste:*

- Pilot yardwaste collection program in **1990.**

- Yardwaste Composting Facility at the Purdy Transfer Station in **May 1992**.

• *Classroom education programs:* The County provides a full range of classroom presentations on solid waste, recycling, and clean water issues for all educational levels.

- The County began contracting with a teacher in **1988.**

- A full-time teacher was added to the staff in **1990** and a second teacher in **1991**.

- A third teacher was added in **1995** when the program was expanded to include water issues.

• *Public information and outreach:*

- Public opinion survey and newspaper tabloids in **1988.**

- In **1990**, the program was expanded with extensive public information campaign for curbside recycling and printed materials and newsletters about recycling, composting, and precycling.

- **Environmental Education Exhibit**, **1991.**

- **BagHunger** program in **1992.**

- **GreenHouse Exhibit** in **1993.**

- Twenty-four hour **recorded information line** in October **1994.**

• *In-House and Procurement Policy programs:*

- Employee **deskside collection** in **1988.**

- **Procurement Policy** (Ord.#90-19s) in December **1990.**

• *Special waste collection programs:*

- In **1990** the County began coordinating with other cities, the Health Department, and private businesses on various yearly collection programs for special wastes, such as Christmas Treecycling, used-oil collection, and household hazardous waste collection events.

- In **1995,** joint agreements with Tacoma on use of the City's hazardous waste facility by all county residents.

• *Plastics drop-off sites:*

- In **November 1995**, Pierce County and the haulers initiated a drop-off collection program for the collection of PETE and HDPE.

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#5 Activities related to other general plan recommendations or specific to other jurisdictions:

• The Purdy Landfill was closed and the Purdy Transfer Station was built at the site in **1989** to con7tinue to provide residents of the Peninsula with self-haul capabilities and recycling opportunities, as recommended in the Plan, and for the transfer of waste collected by the haulers on the Peninsula to the Hidden Valley Landfill.

• The McNeil Island Landfill was closed by the Department of Corrections in **1990,** and solid waste began to be transferred off-site to the Hidden Valley Landfill.

• Land Recovery Inc. completed the Health Department's permit process for a new cell extension at the Hidden Valley Landfill, and began operation in the new cell in early **1992**.

• Land Recovery Inc. began the process to site a new, privately owned landfill late in **1988**. LRI obtained the Conditional Land Use Permit from the County and received approval from the Health Department and Ecology but did not obtain a Corps of Engineers Wetlands Permit. The need for a Corps wetland permit was appealed to the courts.

• At the County's request, Land Recovery Inc. placed multi-material recycling collection containers at all the transfer/drop-box stations. LRI sited a small, recycling processing facility at the Hidden Valley Landfill.

• The four solid waste haulers established more than 120 multi-material drop-off sites for the collection of recyclables around the County and at their respective business locations.

• The Health Department began coordinating programs with the State and within the County to divert used tires to the appropriate disposal/recycling system in **1989**; began tire collection events in **1990** and tire pile cleanups in **1991** and **1992**. The last and largest tire pile was removed in **1995**.

• The **City of Tacoma** proceeded with the renovation and permitting of the steam plant, which began full operation in **1991,** and with the landfill cleanup and closure according to the requirements of the Consent Decree. Tacoma began a number of recycling programs similar to the County's including: curbside recycling for single-family and multi-family households in **1990**; yardwaste collection, **1990**; used oil collection, **1991**; technical assistance program to commercial businesses and some curbside recycling service, **1991**; employee in-house collection program, **1991**; special collection programs from businesses including plate glass and cardboard, **1990**, and produce waste, **1991**; establishment of a recycling center at the landfill, **1990**; establishment of a household hazardous waste center at the landfill, **1991**; educational programs---TRASH, **1988**, and A Way with Waste, **1991**; and joint funding of the development of an Environmental Curriculum for the Tacoma School District, **1992**. Tacoma adopted a procurement ordinance in **1991**. In addition, Tacoma began separating a number of recyclable materials from the municipal waste stream at the RDF Plant, which resumed full operation in **1990**.

• **Fort Lewis** sited a new landfill designed to meet the State's Minimum Functional Standards in **1989/1990** and completed the Fort Lewis Incinerator in **1996.** The Fort adopted the Environmental Impact Statement for the incinerator and the *Fort Lewis Solid Waste Management Plan* in **1995**. The incinerator, however, could not

meet emission standards, never became fully operational, and will not be reopened. The Fort expanded its recycle center in **1996**. The Fort has expended considerable time, energy, and money to cleanup waste dumped illegally on the base's reservation with major cleanups occurring in early each year.

• In **1995**, **McChord AFB** began curbside recycling; exceeded its goal to reach 50% recycling; adopted a procurement program, and completed a new recycling center. It is pursuing further solid waste initiatives.

• During this five year period, a number of private businesses expanded their existing facilities to handle recyclable materials, yardwaste, woodwaste, land clearing debris, concrete and asphalt, roofing, sheetrock, and septage waste.

(Information about activities that have occurred since 1995 is found in the following chapters.)

1.5 Planning Process

Implementation --- Interlocal Agreements: Programs to implement plan policies are developed by solid waste staff under direction of the Pierce County Executive. Those that are ongoing, such as educational or public outreach, do not need annual approval from the County Council. The County's annual budget process, approved by the Council, provides for implementation of these programs. The Solid Waste Division publishes annual reports which evaluate the implementation of all programs and the countywide recycling rates. Through the annual budget process, the County establishes new goals and objectives for the next year.

New collection programs are adopted through ordinance by the County Council. Reports or studies completed in response to a plan policy or direction of the Council are sent to the Council for review. The Council sends all new programs, ordinances, or studies to the SWAC for review in their public meetings. If applicable, programs are sent to the cities and towns as a model for their programs.

Under the Interlocal Agreements, cities and towns who use the County's disposal system are responsible for collection within their jurisdiction, implementation of residential collection programs, and coordination with the County on public outreach programs. Cities and towns implement new programs by resolution, ordinance, or through their annual budgets. Except for Tacoma and the two military bases, the County provides support and technical assistance to cities and towns which establish recycling programs compatible with the County's. The County maintains a data collection system, develops educational materials suitable for countywide distribution, and provides educational services to all school districts.

Under state law, cities and towns may also reach interlocal agreements with other local jurisdictions to provide or contract for municipal services, including solid waste collection and other services identified in this plan. Interlocal agreements have been used for these services in past planning periods and will continue to be used in future planning periods.

Tacoma, Ruston, and the two military bases have their own programs, although the County coordinates educational activities and special collections with both.

Plan update, review and approval --- public participation: Through the Interlocal Agreements, Pierce County is responsible

for preparation of revisions to the Plan for both the unincorporated county and for the cities and towns. The Solid Waste Division is charged with managing this planning process. The County coordinates with Tacoma, which has elected to be a joint-participant, to include descriptions of Tacoma's and Ruston's programs and to reference any applicable plan adopted by Tacoma in the Plan. This document also summarizes the military programs and plans. A plan update is required every five years (RCW 70.95), if necessary. It may range from a complete rewrite of the document to more limited amendments.

The following summarizes the major steps for a plan update:

#1. Under the direction of the Pierce County Executive, staff prepares a **scope of work,** which is reviewed by the County Council, cities and towns, Ecology, the SWAC, and other interested parties. Depending upon the amount and type of work, a consultant may write some or all of the revisions.

#2. **Meetings and data collection** --- The staff collects information and meets informally with the SWAC, haulers, recyclers, and interested others about waste reduction and recycling. The topics of the SWAC meetings are publicized in advance, as are all of its public meetings. The staff reviews annual disposal and recycling data, and, if necessary, contracts for a waste audit. The staff meets with the Environmental Designate about SEPA documentation.

#3. The staff and consultants prepare a **discussion draft** for review by the SWAC and work with the SWAC on drafting some early recommendations. Informally, the staff works with Ecology on technical assistance. Revisions are made to the draft as necessary, and a preliminary draft is prepared along with SEPA documentation.

#4. The **Preliminary Draft** is used as the public review draft. It is distributed to the SWAC, to the public, cities and towns, other agencies, the two military bases, the Pierce County Planning Commission, and the County Council. At the same time, SEPA documents are submitted, and the SEPA public review process may occur simultaneously with public review of the draft. When they receive the Preliminary Draft, Ecology and the WUTC begin their agencies' maximum 120-day formal review. Cities and towns are asked to review the draft and to provide their comments directly to the SWAC in order to incorporate their comments with the SWAC's recommendations prior to the beginning of the County Council's public hearings. The Planning Commission is requested to review the draft for compliance with the Pierce County Comprehensive Land Use Plan. The SWAC reviews the document in public meetings, makes revisions as necessary; and develops or drafts new policy recommendations.

A minimum 30-day comment period is required, but, for all practical purposes, the comment period usually extends over many months.

#5. Upon completion of the review period, the Solid Waste staff prepares reports on the **SWAC recommendations** which are sent to Ecology / WUTC, the County Council, cities and towns, and other interested parties.

#6. After **Ecology and the WUTC complete their review**, the County Council establishes a schedule for public hearings. The Council reviews the SWAC's recommendations and Ecology's comments, and takes additional public testimony. The cities and towns and the public also have the opportunity to attend the public hearings or to send any additional comments to the Council. When the hearings are completed, the Council adopts, or amends and adopts,

the Plan, and directs the County Executive to sign new Interlocal Agreements with the cities and towns. Once adopted, the document becomes the Final Plan.

#7. The **Final Plan** is sent to the cities and towns for their formal adoption and signing of new **Interlocal Agreements**. The County and the cities have established a maximum 90-day adoption period in the interlocal agreement process for city adoptions of a full plan update.

#8. Once adopted by all municipalities, the Plan and required documents are sent to Ecology for its **final review and approval.** A plan is considered approved if Ecology does not disapprove it within 45 days upon receipt of all documents.

Plan amendments: From time-to-time amendments are needed which do not entail complete update of the Plan. Usually, these amendments are done to update technical information, correct citations to laws, update a policy recommendation, if a study completed by the Plan indicates a conflict exists with the policy, or in response to a state legislative change. Either the County Council or a city or town may propose an amendment. Proposed amendments are introduced at a County Council meeting. The Council then schedules a public hearing date and sends proposed amendments to the SWAC and the Planning Commission for review and comment. The proposed amendments are sent to each municipality and other agencies who are notified of the public hearing dates. The Council holds public hearings and then makes a decision. If adopted, such plan amendments only need to be approved by the affected jurisdictions, unless the adopting ordinance states otherwise. Plan amendments must be approved by the Department of Ecology.

1.6 Recommendations

Non-economic concerns are important

#1-1 In order to be truly comprehensive in addressing the concerns of all county citizens, the Solid Waste Management Plan should specifically state that non-economic factors will be considered when the County deems it necessary and appropriate to make decisions concerning its solid waste management system.

Establish a long-range view

#1-2 Pierce County should articulate a vision of what condition Pierce County desires to be in 50 years from now regarding the waste management system inside the county, and its influence on the quality of life.

CHAPTER 2

BACKGROUND OF THE PLANNING AREA

This chapter identifies and summarizes locational criteria for the siting of solid waste disposal facilities. It also reviews the areas of Pierce County which potentially meet the criteria of WAC 173-351 as analyzed for the siting of a county-owned municipal solid waste landfill.

The first three sections describe the characteristics of the county pertinent to siting disposal facilities, summarize the State's locational criteria found in WAC 173-304 and WAC 173-351, and identify zoning requirements for these facilities.

The fourth section summarizes the process and results of the *Pierce County Landfill Siting - Phase I: Countywide Screening Study*, published in April 1995. The Phase I study identified broad general areas with the potential for meeting the State's criteria. It included additional conservative parameters considered appropriate for a facility that was to be County-owned. The status of the Phase II study, which evaluates potential specific sites, is described in Chapter 8.

2.1 Characteristics of Pierce County

Location and geography: Pierce County is located in western Washington state, in the south Puget Sound area (see Map 2.1). Kitsap and King Counties border it to the north, Mason County and Puget Sound to the west, the Cascade Mountain Range and Yakima County to the east, and Lewis and Thurston Counties to the south.

The county's almost 1,800 square miles varies from Puget Sound lowlands in the western half of the county, to the Cascade foothills and the 14,411 foot summit of Mount Rainier in the eastern half.

Population, land use, and transportation: Pierce County is the second most populous county in Washington State, with a population close to 700,000. A little over half (56%) live in incorporated cities and towns, with the rest living in unincorporated areas.

Most residents live in the central third of the county, along the Interstate-5 corridor, in urban areas such as Tacoma, University Place, Lakewood, and Fircrest; and to the east, Puyallup, Sumner, and Bonney Lake. In addition to residences, urban areas include a variety of commercial businesses and industry, with a major port facility in Tacoma on Commencement Bay.

The western third of the county, on the Key and Gig Harbor Peninsulas along Puget Sound, is growing in population and is more suburban, with less intense commercial or heavy industry.

The eastern third and southern parts of the county are sparsely populated, with small, rural towns and communities and federally owned lands (e.g., Mount Rainier National Park). Commercial enterprises include agriculture, recreational facilities, and timber production.

Two large military bases are located in the County, Fort Lewis Army Base and McChord Air Force Base, which are adjacent to the cities of DuPont and Lakewood.

Climate and air quality: Pierce County has a west coast marine climate. Temperatures,

humidity, and winds all tend to be moderate, with cooler temperatures found in the higher elevations (above 5,500 feet). Average summer high temperatures in the lower elevations range from the upper 70's to the lower 80's (degrees F), while summer high temperatures at higher elevations average 58 degrees. Winter average temperatures at lower elevations are in the 40's, but range from the mid-30's to well below freezing at higher elevations.

Precipitation in the county varies widely, with precipitation generally increasing with elevation. In the lower elevations, average annual precipitation is about 40 inches, while at Paradise, near Mount Rainier (5,500 feet), the average is 105 inches. Most of the annual precipitation occurs between October and March, with seasonal dry spells often occurring in July and August.

In Pierce County, the U.S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (DOE), and the Puget Sound Air Pollution Control Agency (PSAPCA) all regulate acceptable levels of air pollutants and emissions of contaminants.

DOE and PSAPCA maintain a network of air quality monitoring stations throughout the county which track pollutants such as particulate matter, ozone, carbon monoxide, and sulfur dioxide. Since 1970, air quality has improved significantly in Pierce County as a result of federal, state, and local efforts.

Geology and soils: Glacial activities produced much of Pierce County's geology. Glacial sediment covers the western and central portions of the county, except for steep slopes along the Puget Sound and rivers, and isolated mud flow deposits and peat bogs. The eastern Cascade foothills are bedrock covered with a thin layer of rock fragments and water borne materials.

Pierce County soils are similar to other soils found in the Puget Sound area, formed mostly of glacial till, outwash, and alluvium deposits.

Glacial till is a fine clay containing pebbles and rocks which was left behind after the melting of glaciers. It is generally highly compacted and exhibits low permeability, which affords a natural protection to groundwater from surface infiltration.

Outwash is sand and gravel that has been transported by streams of water from glaciers. It typically occurs near the surface and can be 60 feet or more in thickness, but typically less than 20 feet. It is highly permeable.

Alluvium deposits consist of sedimentary material deposited by flowing water. It consists of mud, sand, and gravel.

The central and western parts of the county have generally shallow drained soils on top of glacial till. The eastern upland soils are generally shallow and poorly drained, based on bedrock, glacial till, and outwash. County river valleys generally have the most productive soils, formed from the deepest and best drained varieties of alluvium.

Hydrology: Ground water is the sole-source of drinking water for about two-thirds of Pierce County's population. The City of Tacoma, however, gets most of its drinking water from the Green River.

The county has a number of areas where permeable soils (glacial outwash) overlay shallow aquifers which provide drinkable water for large portions of the county's population. Spills or mismanagement of wastes in these areas could result in contamination of water supplies.

Pierce County has identified nearly 2,000 wetland sites in unincorporated areas which are larger than one-quarter acre. These are

usually areas where the underlying geologic unit is of low permeability (glacial till), which is also the type of soil that Federal and State criteria favor for the siting of landfills because impervious hardpan conditions associated with glacial till inhibit drainage into underlying aquifers. Another function of wetlands, which is very important to surface water quality, is to detoxify or filter certain types of contaminants from the water.

Since wetland sites often function as groundwater recharge areas, contamination of wetlands could result in contaminated ground water. However, depending on the particular hydrogeologic conditions of an area, a specific wetland may or may not contribute to the recharge or otherwise affect major aquifer systems in the area. For this reason, areas containing wetlands are not automatically excluded from consideration for landfill siting. The specific characteristics of individual wetlands must be assessed for determining the impacts to ground and surface water.

In 1993, EPA approved designation of the Central Pierce Aquifer System as a sole-source aquifer. In this particular area, the designation is a recognition that there is a *system* of aquifers that may or may not be interconnected, as opposed to just one aquifer. For local consideration, it is an indication that site assessments need to be made for each individual project that may impact aquifers in the area. Site-specific assessments are required for landfills through the Solid Waste Permit administered by the Tacoma-Pierce County Health Department. Sole-Source Designation only provides limited Federal protection and it means only that federal financially-assisted projects proposed over the aquifer area are subject to EPA review to ensure that they do not create a significant hazard to public health.

The boundaries for the area designated by EPA extend significantly beyond the Clover-Chambers Creek (CCC) Basin originally proposed by the Tacoma Pierce County Health Department for aquifer designation. Studies have identified the CCC Basin, which is just one basin within the area, as the important aquifer within the whole area that is particularly vulnerable. As explained in the designation report, the whole designated area is geologically quite complex. The 1992 Solid Waste Plan discussed the aquifer designation and the inadvisability of siting a new landfill within the original CCC Basin boundary. For areas outside of the CCC Basin, but within the area designated by EPA, individual site characteristics -- such as soil, groundwater movement, etc. -- must be evaluated to determine potential impacts.

Map 2.1 depicts Pierce County and its cities.

Map 2.2 depicts the Clover-Chambers Creek Basin and the EPA designated area for the Central Pierce Aquifer System.

[INSERT MAP 2.1 OF PIERCE COUNTY WITH CITIES]

COUNTY MAP SHOWING PLANNING AREA AND KEY FEATURES

[INSERT MAP 2.2 CLOVER - CHAMBERS CREEK BASIN AND THE EPA DESIGNATED AQUIFER]

2.2 State Location Criteria

Two of the State's regulations apply locational criteria for solid waste disposal facilities -- WAC 173-351 for municipal solid waste landfills (MSW) and WAC 173-304 for all other landfills and solid waste handling facilities.

MSW landfills - WAC 173-351: The State of Washington's regulations governing the design and operation of landfills were revised in 1993 by WAC 173-351, *Criteria for Municipal Solid Waste Landfills*. These revised regulations supersede MSW requirements in WAC 173-304, *Minimum Functional Standards for Solid Waste Handling* (MFS). The new WAC 173-351 revisions are based on federal requirements to conform with the U.S. Environmental Protection Agency (EPA) Final Rule for Subtitle D of the Resource Conservation and Recovery Act (RCRA), *Solid Waste Disposal Facility Criteria* (40 CFR, Parts 257 and 258), and on generally accepted engineering practice.

Demonstration factors: The new rules contained in WAC 173-351 handle the variance process much differently than the MFS regulations in WAC 173-304. Demonstration factors and procedures are now clearly specified as a substantive part of the criteria, within the text of WAC 173-351.

Under the MFS regulations in WAC 173-304, landfill owners or operators could apply to the jurisdictional health department, such as the Tacoma-Pierce County Health Department, for a variance from any section of the regulations. The owner or operator could submit an application accompanied by information required by the Health Department. The Health Department would review and hold hearings on this application separate from the general landfill permit process. Criteria for variances are not included in WAC 173-304, but are maintained in a separate document, as Technical Information Memorandum 88-1, prepared by the Department of Ecology.

The revisions in WAC 173-351, incorporate a demonstration process (as opposed to a variance) as developed by the EPA in the promulgation of the Final Rules for RCRA Subtitle D (40 CFR, Part 258). WAC 173-351-100 defines a demonstration as a "showing by the [landfill] owner or operator that human health and the environment can be protected as equally as a given requirement in the regulation."

For each locational restriction (for example, siting of a landfill within the boundaries of a designated sole-source aquifer), WAC 173-351 lists relevant demonstration performance criteria rather than blanket prohibitions. These performance criteria establish an objective basis on which to determine whether the human health and environment are being preserved to the level intended by the regulation. Unlike the variance procedures, in the new demonstration performance the landfill owner or operator offers the demonstrations during the solid waste permitting process, rather than at a separate variance hearing. If during permitting, the owner or operator successfully shows how the landfill complies with the demonstration performance criteria, WAC 173-351 enables the Health Department to issue the landfill permit.

In permitting a landfill in Pierce County, the regulatory demonstration factors most likely concerned would involve wetlands and the sole-source aquifer.

Locational restrictions: RCW 70.95.165 specifies items that a municipality must consider in siting a disposal facility. The two WACs specify the standards for these criteria. The following is a summary list of

physical location restrictions as defined in WAC 173-351 for which specific demonstration performance factors must be applied. There are additional restrictions relating to design and operation, such as air emissions, cover material, capacity, climatic factors, and availability of natural soils for cover, which impact location. Please refer to WAC 173-351 or any subsequent WAC which is adopted to supersede WAC 173-351 since the following does not attempt to define all of the standards or how they are to be applied.

- Airport safety areas
- Flood plains
- Wetlands
- Critical habitat for endangered or threatened species
- Holocene fault
- Seismic impact zone
- Unstable areas
- Groundwater
- Sole-source aquifer
- Drinking water supply wells
- Surface water
- Land use
- State and National Parks

Other landfills -- WAC 173-304: The 1993 revisions to the WACs were only concerned with municipal solid waste landfills. All other types of landfills, such as inert, woodwaste, ash, or limited-purpose landfills, still must meet the criteria of WAC 173-304, *Minimum Functional Standards*. Those landspreading disposal sites, piles, or surface impoundments which are to be closed as landfills and are not used for storage or recycling also must meet these requirements. Instead of the demonstration factors process used in WAC 173-351, the variance process still applies for these facilities. It allows applicants to submit a variance request to the jurisdictional health department.

Locational standards: The following is a brief summary list of the physical locational standards as defined in WAC 173-304-130 for landfills other than municipal solid waste landfills. This list does not attempt to define or summarize all of the standards or how they are to be applied. Please refer to WAC 173-304 or any subsequent WAC which is adopted to supersede the *Minimum Functional Standards*. There are also substantial design and operating criteria which effect the locational standards.

Inert and demolition waste landfills:

- Unstable slopes

Woodwaste landfills:

- Surface water
- Down-gradient drinking water supply wells

All other landfills or facilities to be closed as landfills:

- Holocene faults
- Groundwater
- Sole-source aquifer
- Down-gradient drinking water supply wells
- Flood plains
- Surface waters
- Slope
- Cover material
- Climatic factors
- Land use
- Airport runways

- Critical habitat for endangered or threatened species of plants, fish or wildlife
- Locally-adopted comprehensive plans or zoning requirements and solid waste management plans
- Toxic air emissions

Waste-to-energy facilities: There are no specific locational criteria in WAC 173-304 for the siting of waste-to-energy facilities other than they must be in compliance with comprehensive land use plans, zoning, and comprehensive solid waste management plans. There are substantial requirements for the design and operation of these facilities. Like all solid waste facilities, they must meet state and federal air emission control requirements or other pollution prevention requirements. The locational criteria most likely to apply in Pierce County would be zoning.

2.3 Pierce County Zoning and Permitting

Both sets of locational criteria, WAC 173-304 and WAC 173-351, require compliance with land use comprehensive plans and zoning as well as the solid waste plan. Before the Tacoma-Pierce County Health Department and the Washington Department of Ecology (DOE) can issue final approval of a solid waste permit for a disposal facility, the proposed facility must be found to be in compliance with the jurisdiction's zoning code.

Because of the nature of landfills, their size, and capacity needs, it is unlikely that new landfills can be sited within incorporated cities and still meet the residential set-back requirements of the two WACs. Therefore, Table 2.3 illustrates only the zones in which disposal facilities are allowed to be located in Pierce County under Chapter 18 of the Pierce County Code. (Permitting, zoning, and enforcement is discussed in more detail in Chapter 10.)

Table 2.3 Pierce County Zoning (as of January 1999)		
Disposal Facility	**Urban Zone Classifications**	**Land Use Permit Processes**
Inert Landfills	Employment Center (commercial/industrial area)	Permitted outright[1] or as an accessory use to mineral extraction sites
	Residential - Moderate Density Single Family	As an accessory use to a mineral extraction site, it requires a Conditional Use Permit[2]. It is not allowed otherwise. If it is a publicly-owned facility, it requires a Public Facility Permit[3].
Woodwaste or demolition landfills	Employment Center	Privately-owned facilities are permitted outright. A publicly-owned facility would require a Public Facility Permit.
MSW (municipal solid waste), ash, or limited purpose landfills	Employment Center	Requires a Public Facility Permit.
Special Waste-to-Energy Facilities[4]	Employment Center	Permitted outright. Small-scale facilities under 12 tons are allowed as an accessory use.
MSW Waste-to-Energy Facilities[5]	Employment Center	Requires a Public Facility Permit
Rural Zone Classifications		
Inert Landfills	All rural residential zones, Forest Lands zone, and Agriculture Zone. Not allowed in rural commercial zones.	Conditional Use Permit required for a privately-owned facility. A Public Facility Permit required for a publicly-owned facility
Woodwaste or demolition landfills	All rural residential zones, Forest Lands zone, and Agriculture Zone. Not allowed in rural commercial zones.	Conditional Use Permit required for a privately-owned facility. A Public Facility Permit required for a publicly-owned facility
MSW, ash, or limited purpose landfills	All rural residential zones, Forest Lands zone, and Agriculture Zone. Not allowed in rural commercial zones.	Conditional Use Permit required for a privately-owned facility. A Public Facility Permit required for a publicly-owned facility
Special Waste-to-Energy Facilities	Not allowed.	A Waste-to-Energy Facility that burns under 12 tons per day and does not handle municipal solid waste can be allowed as an accessory use.
MSW Waste-to-Energy Facilities	All rural residential zones, Forest Lands zone, and Agriculture Zone. Not allowed in rural commercial zones.	Conditional Use Permit required for a privately-owned facility. A Public Facility Permit required for a publicly-owned facility

[1] A facility that is permitted outright does not require a public hearing permit review, although it must meet all other permitting requirements.
[2] A Conditional Use Permit requires a public hearing review process.
[3] A Public Facility Permit is similar to a Conditional Use Permit. It requires a public hearing review process and there are additional factors to be considered related to public ownership of the facility.
[4] As defined in zoning code, a Special Waste-to-Energy Facility is one that burns over 12 tons per day of any one material, but not municipal solid waste.
[5] As defined in zoning code, an MSW Waste-to-Energy Facility burns municipal solid waste.

2.4 Summary of the *Pierce County Landfill Siting Study - Phase I: Countywide Screening* (1995)

Purpose: The purpose of the *Landfill Siting Study, Phase I* was to determine whether a new county-owned MSW landfill site could be located in Pierce County. Under RCW 70.95.165, "each county or city siting a solid waste disposal facility shall review each potential site for conformance with the standards as set by the department [Ecology]..." The decision to move ahead on the siting process was made to comply with recommendations 8-6 and 10-1 adopted in the 1989/1992 Solid Waste Management Plan:

8-6: County Government should immediately begin the public siting process for a landfill.

10-1: The County should begin preliminary siting efforts to identify locations in the county that may be suitable for a landfill. A landfill site will be required in any solid waste management strategy the County chooses.

The siting study was also done to comply with the County Council's adoption of Ordinance #91-126 titled "*An Ordinance Reaffirming Waste Reduction and Recycling as a County Priority; Selecting a Local Landfill Option as part of an Integrated System for the Disposal of Pierce County Solid Waste and Requiring Annual Reports.*"

In order to evaluate individual sites (Phase II, described in Chapter 8), the County first had to narrow the scope of the search area. Phase I applied specific criteria in WAC 173-351 and additional conservative parameters that took into account urban growth areas, transportation problems, and political issues. It also selected larger areas for buffering than required by State or Federal governments. These additional parameters were applied because County government must be both fiscally responsible to the entire electorate and sensitive to political issues. This often results in choosing stricter criteria than those required of a private applicant under State or Federal law.

The study's process and results are summarized in this section; for further information and detailed full-color maps, please review the original document, available through Pierce County Public Works and Utilities Department, Solid Waste Division.

Process: The landfill siting study defined five phases for developing a new landfill. The first phase, summarized in this chapter, established the landfill parameters and applied countywide screening criteria to identify general areas where a suitable location might be found.

The next phase identified sites and reviewed their feasibility through a progressive screening process. If the Council chooses to pursue landfilling in-county, the final phases would be to prepare an Environmental Impact Statement, obtain permits, and then to design and construct the landfill. (For more information on the site specific screening process, see Chapter 8.)

Study parameters: Ideally a sanitary landfill sited through this study would have the following properties:

- It would conform with land use planning of the area.
- It would be easily accessible in any weather conditions to vehicles expected during the operation of the landfill.
- It would have safeguards against uncontrolled gas movement originating from the disposed solid waste.

- It would have an adequate quantity of earth cover material that is easily handled and compacted.
- It would be located in an area where the landfill's operation will not detrimentally impact environmentally sensitive resources.
- It would be large enough to accommodate the community wastes for a reasonable time interval of at least 20 years.
- It would be the most economic site available commensurate with the ultimate requirements for solid waste disposal.

Pierce County's landfill siting consultants, other County agencies, and the general public, recommended that the County's siting process for a County-owned MSW landfill include defining several engineering variables. These include such things as waste stream projections, landfill design and operation regulations, and basic design criteria. The following were used for Pierce County's siting study for a county-owned landfill. These are in addition to the State's requirements and should not be interpreted as requirements for a siting study by a private entity. Municipal project proponents, in this case Pierce County, often elect a more conservative stand on project management than required by law.

The County's landfill siting study began with determining the projected amount of waste that would be generated for disposal in Pierce County using two scenarios: 1) a landfill with a twenty-year life span for all waste in Pierce County including Tacoma, Ruston, Fort Lewis and McChord AFB, and 2) a landfill with a longer life span providing disposal capacity for waste only from Pierce County and the cities and towns using the County's system. The projections used waste disposal records and population forecasts which assumed an average annual growth rate of 2 percent. It was determined that a new landfill would need to have a total life capacity of 16.2 million tons. The figures used were conservatively high in order to identify the maximum capacity needed to serve for twenty years. Over time, the actual total tonnage will change depending upon changes in consumption patterns, recycling habits, and population growth rates. For example, the average population growth rate over twenty years could range from 1.9% to 2.3% or higher.

Using these projections, the County decided that to provide capacity for an adequate useful life, the landfill footprint (that area where garbage is disposed) would need to be approximately 260 acres.

For the initial screening of general areas for Phase I, 610 acres was used based on providing for support facilities and buffers double the size required by law.

Countywide screening criteria: The study's next step considered all the regulatory location restrictions in the WAC 173-351 (Sections 130 and 140) in developing the countywide screening and site selection criteria. It used a Geographic Information System (GIS), with data supplied by Pierce County's Information Services, the Department of Planning and Land Services, and other state and federal sources, to implement the screening criteria.

Two general types of countywide screening criteria were employed: exclusionary and suitability. First, exclusionary criteria were used to eliminate areas where landfill siting is prohibited under regulatory location restrictions or because of other development constraints. The second set of criteria, suitability indicators, illustrate both positive and negative features that describe how compatible an area may be for landfill development. Selected suitability indicators

were overlaid to guide the identification of potential site areas using a process as shown in Figure 2.4.

Figure 2.4 Overlay Process

The following section further discusses the differences between prescriptive exclusionary criteria and suitability indicators.

Exclusionary criteria: The initial objective of the countywide screening in Phase I was to eliminate unsuitable areas. Countywide regulatory exclusionary criteria were developed to implement the location restrictions specified in WAC 173-351. The exclusionary criteria used more restrictive requirements than found in State law. For instance, the County excluded areas within the 500-year flood plain. State and federal law require demonstrations only within the 100-year flood plain.

Areas meeting these exclusionary criteria were mapped, using GIS analysis, to produce a composite map.

Regulatory exclusionary criteria included:

- Airport safety areas (10,000-foot radius for jet airport runways; 5,000-foot runways for piston type)
- State and National Parks (1,000-foot buffer)
- Major surface water bodies: rivers and lakes in the Shoreline Management Plan (200-foot buffer)
- Geology in sole-source aquifer area: Vashon Outwash Gravel (Steilacoom Gravel)
- Public water supply system watersheds (200-foot buffer from land areas used as controlled watersheds for drinking water systems serving the public)
- Flood plains/volcanic hazard areas (associated with mudflows from Mt. Rainier) based on 500-year flood plains of major drainages
- Holocene fault areas (200-foot buffer; no Holocene faults identified within study area)
- Unstable areas: Severe landslide hazard (soils with steep slopes >45%)

Non-regulatory criteria: Other non-regulatory exclusionary criteria were developed based on requirements specific to, and only applicable to, the Pierce County *Landfill Siting Study* to site a County-owned landfill. These additional criteria were

developed to screen out additional areas where the County government would not consider siting an MSW landfill because of perceived political or economic impediments. These non-regulating criteria are not found within the body of state or local law. The County's consultants and others, however, recommended that as the proponent the County should take a conservative stance in screening out sites, thus reducing the number of sites and acreage which would be carried forward in the Phase II Study, and for environmental review.

The net impact of applying regulatory and non-regulatory exclusionary criteria, coupled with the Study's conservative approach, is that some potentially suitable sites that would have met the4 letter of the law were screened out of the County's study.

These criteria included:

- County boundary (study area limited to the jurisdiction of Pierce County, Washington)
- Incorporated areas (siting excluded areas within municipal boundaries)
- Urban growth area: Growth Management Act (GMA) urban growth areas and other areas planned for urban density residential development
- Cross-sound transportation (areas west of Puget Sound on the Key and Gig Harbor Peninsulas were excluded because of traffic impacts to the Narrows Bridge)
- Precipitation (siting excluded areas with high annual precipitation)
- Areas far from the central part of the County requiring long and costly waste haul.

These criteria were individually mapped and used to create Map 2.5. The shaded areas on the map were excluded from further study.

Suitability indicators: The study's countywide suitability indicators are features important to consider when siting a new landfill. Suitability indicators were based on non-exclusionary location restrictions in WAC 173-351 and other factors considered important for safe and effective landfill operation. The suitability indicators include both positive and negative factors.

The study defined such features as *regulatory demonstration factors,* and treated them as a special type of suitability criteria. For example, groundwater protection within EPA's designated sole-source aquifer boundaries was considered a regulatory demonstration factor.

Other suitability indicators - not related to regulatory requirements - were defined as descriptive. For example, soils with slopes between 30-45% would generally be undesirable for landfill development.

Both types of suitability indicators are listed below, followed by indications of whether they are positive or negative. (Please see the *Siting Study - Phase I* for further discussion of suitability indicators.)

Regulatory demonstration factors

- Wetlands: National Wetlands Inventory (NWI) wetlands. It is preferred that wetlands be avoided, however if wetlands are impacted, mitigation would be required.

  Wetland sites often occur in areas with low permeability soils (glacial till) which is the preferred hydrogeologic setting for landfill siting in Pierce County. Depending on the specific hydrogeologic conditions in a given area, wetland sites may or may not contribute to recharge or otherwise affect major aquifer systems. For this reason, areas containing wetlands

are not automatically excluded. However, if landfill development disturbs wetland sites this disturbance must be mitigated in a manner consistent with local and state requirements.

- Geologic units: Suitability related to protection of groundwater within the EPA-designated sole-source aquifer boundaries.

  Within the designated sole-source aquifer system boundaries, the physical characteristics of the geologic units were used to determine the likelihood that a site area would afford the required degree of natural groundwater protection. Locations composed primarily of the very porous Vashon Outwash (Steilacoom Gravel) would be highly vulnerable and would not likely pass the regulatory demonstration criteria. Steilacoom Gravel also composes the principal geologic unit within the Clover-Chambers Creek Basin which pinpoints the need to continue to protect this area.

  Positive suitability was indicated if the geologic unit was composed of the highly compacted Vashon Till, which contains low permeability soils compacted from the weight of the overriding glacial ice sheets. The average thickness of this unit is reported to be between 5 and 30 feet in south central Pierce County, and may locally be much thicker. Its low permeability would afford a high degree of natural groundwater protection, making potential landfill suitability high.

- Critical Habitats: State or Federally listed animal species and associated habitat (*avoidance preferred*).

- Land Cover: 1,000-foot buffer around low density developed areas (*negative suitability indicator).*

Descriptive suitability indicators

- Landslide and erosion hazard: Soils with slopes 30-45% (*negative suitability indicator).*

- Existing land use types (by 40-acre 1/16th section) (*more negative as density increases).*

- Priority habitat study areas and critical fishery rivers. The priority habitats were mapped from the Washington Department of Fish and Wildlife's Habitat Study. A 1/2 mile buffer was mapped around any known threatened or endangered species habitat and 200-foot buffer identified around streams with anadramous or listed priority fish species. These distances are considered to be moderately conservative. During the siting of a landfill, the actual buffer size needed would have to be considered on a case-by-case basis.

The Phase I study used the analytic capabilities of GIS, to identify the most important features. These features were then overlaid on a combination map of exclusionary areas and select ed suitability indicators to guide the identification of potential site areas. The most likely areas for siting a municipal landfill are those which do not fall within the exclusionary areas, have glacial or Vashon till, and have the lowest density. Phase II, which looks at specific individual sites within these areas, is described in Chapter 8.

[INSERT MAP 2.5]

CHAPTER 3

WASTE STREAM ANALYSIS

This chapter describes the amount of solid waste recycled, diverted, or disposed in the three collection and disposal systems in Pierce County and projects disposal needs for 20 years. It also evaluates the amount and type of waste disposed to: 1) assess the effectiveness of the waste reduction and recycling programs; and 2) identify remaining needs and opportunities for diversion or recycling.

3.1 Definitions and Measurements

The following definitions are used throughout this chapter:

Waste Generated: The sum of all waste disposed in mixed municipal waste (MSW) landfills, diverted for energy recovery or composting, and materials collected and recycled by both public and private entities. It does not include special wastes that are generally handled outside the municipal waste stream collection system of transfer stations, MSW landfills, and municipally or federally owned waste-to-energy facilities. Special wastes are those which are disposed in privately owned, limited purpose inert landfills, soil bio-remediation facilities, or used to produce industrial hog-fuel.

Waste Recycled: Materials collected for recycling or diverted from disposal by composting to public and private facilities. Materials not included are pre-consumer recyclables or those specialty wastes that would not generally, or only incidentally, enter the municipal waste stream collection system.

Waste Disposed: All waste disposed at in-county MSW landfills, diverted to municipally or federally owned MSW waste-to-energy facilities, or exported under contract to out-of-county MSW landfills.

Pounds per Capita per Day: Disposal, recycling, or generation rates reflecting the number of pounds disposed, recycled, or generated per person per day.

Measurement Methods: There are three, separate management systems in Pierce County: the Pierce County system serving the unincorporated areas and 19 cities and towns; the Tacoma system which also provides disposal for the Town of Ruston; and the Fort Lewis/McChord Air Force Base military system. The three management agencies use multiple measurement methods to evaluate their systems and to project the need for disposal or other facilities. They do not rely solely upon either the recycling rate or disposed tonnages. The jurisdictions look at a number of measured trends and compare them over time. The key question to be answered is whether the measurements show similar trends.

The measurement methods used by the jurisdictions include: 1) countywide disposal and recycling tonnage, recycling rates, and pounds per capita per day (pcd) disposed and recycled; 2) disposed tonnages for the three individual systems along with the pcd rate, broken down by generator sectors, if possible; and 3) changes in waste characterization determined by audits.

In Pierce County, the recycling rate is computed on a countywide basis rather than individually for the three systems. This is because the complexities of the combined municipal and private recycling systems which cross-jurisdictional lines make it nearly impossible to accurately allocate recyclables as coming from specific jurisdictions.

Waste reduction: Pierce County does not attempt to measure waste reduction by projecting total generated waste for the next year and then measuring the results the following year. There are too many yearly variables beyond the County's ability to control or influence, or even measure, to project total generated waste (disposal and recycling tonnage). Waste generation is affected by the local, regional and national economies, population growth, one-time events (such as floods and storms), individual business decisions, increases in disposal costs, and, even societal shifts. When the County looks at waste reduction, it assumes that decreases in disposed tonnages in certain sectors, may indicate, in part, waste reduction activities.

The most useful measurement of waste reduction efforts over time is to periodically conduct waste audits and compare the differences and tonnages of materials from various sectors with the previous audit. The resulting trends indicate how well various sectors respond to public outreach messages or take advantage of new opportunities and programs for diverting specific materials from disposal.

3.2 Historical Waste Stream Data

Beginning in 1990, the County began collecting disposal and recycling data for all three management systems in a consistent manner from year to year. The following four sub-sections look at what has occurred since 1990 for:

- ✓ Countywide disposal and recycling
- ✓ The disposed waste stream for the Pierce County management system with its 19 cities and towns
- ✓ Disposed tonnage for the Tacoma management system, which includes the Town of Ruston; and
- ✓ The disposed waste stream for Fort Lewis and McChord Air Force Base

(For historical disposal and recycling information prior to 1990, please see the 1989/1992 Plan documents.)

Countywide disposal and recycling - 1990 - 1998: The cooperative efforts by all jurisdictions working with private businesses to implement recycling and waste reduction programs resulted in a peak countywide recycling rate of 52 percent in 1996. While the amount of waste disposed has not increased appreciably since then, and in fact declined from 1997 to 1998, the overall percentage of the waste stream being recycled has dropped to 45 - 46 percent. Figure 3-1 portrays a snapshot of the countywide solid waste management system for 1998.

As illustrated in Figure 3-2, the total disposed waste stream for all three jurisdictions was approximately 620,000 tons in 1998. Since 1993, when waste disposal peaked at 638,000 tons, the total amount of waste requiring disposal has dropped by two percent despite 7.2 percent population growth over the same time period.

More indicative than gross tonnage calculations, are calculations of the per capita per day (pcd) rates, as illustrated in Figure 3-3. When evaluated over time, these rates incorporate both population and business growth and changes in the economy. Countywide, the disposed pcd rate peaked in 1993 at 5.45 and has since declined to 4.94, a ten percent decline.

The recycling pcd rate climbed steadily from 1.99 in 1990 to 5.25 in 1996. The rate dropped slightly in 1997 and fell to 4 pcd in 1998. The reader, however, should be cautious in interpreting this steady incline as solely the result of increased recycling and the drop off as an indicator that recycling has fallen out of favor. Much of the early increase, particularly in the period from 1990 to 1993 should be attributed to better record keeping. Increases which occurred between 1994 and 1996 are best explained by the fact that this was the time period in which most county recycling programs spread countywide and reached their "maturity."

In this same time period, in response to record high marked prices for recycled commodities, a number of entrepreneurs started recycling programs targeting the business waste stream, particularly office paper and construction and demolition debris.

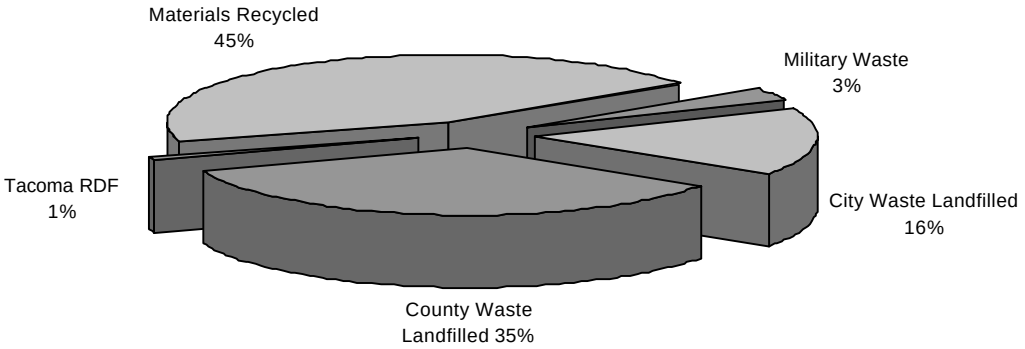
The decline in the per capita per day recycling rate over the past two years also has many causes. One hypothesis is that recycling issues are not receiving the same focus they received in years past and therefore, without constant reinforcement, people are not recycling. This explanation is belied by the fact that residential recycling continues to increase.

Another hypothesis is that some of the recycling ventures started in the mid-1990s folded as commodity market prices declined. This hypothesis is partially proven by the decline in companies providing recycling services to Pierce County businesses.

One other explanation for the drop in the gross tonnage and pcd recycling rate is that a few large recyclers are no longer able to desegregate, by county, their data on what is being recycled.

For evaluation purposes, what is important are the consistent and complimentary trends of an increasing recycling pcd rate and a decreasing disposal pcd. These trends have occurred at a time with substantial population growth and represent a strong impact from recycling collection programs. The disposal rate trend and the population trend are illustrated in Figure 3-3.

Figure 3-1
Waste Disposal, Recycling, and Energy Recovery in 1998



RDF = **R**efuse **D**erived **F**uel for energy recovery at the Tacoma Steam Plant

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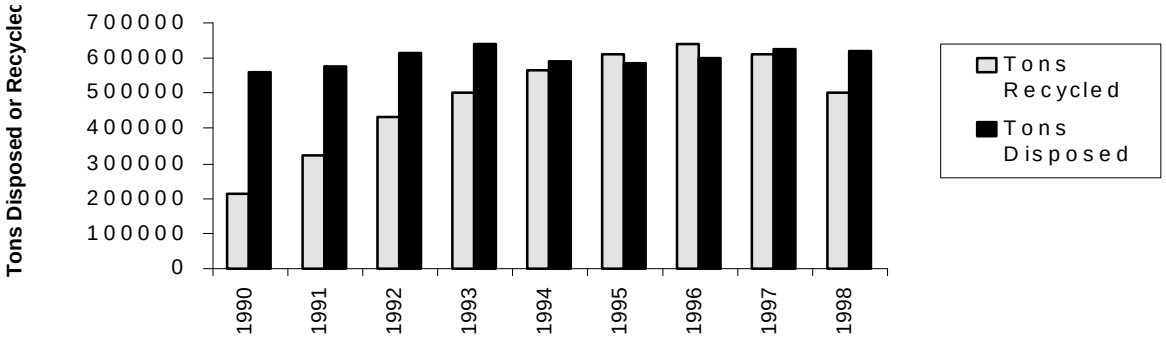
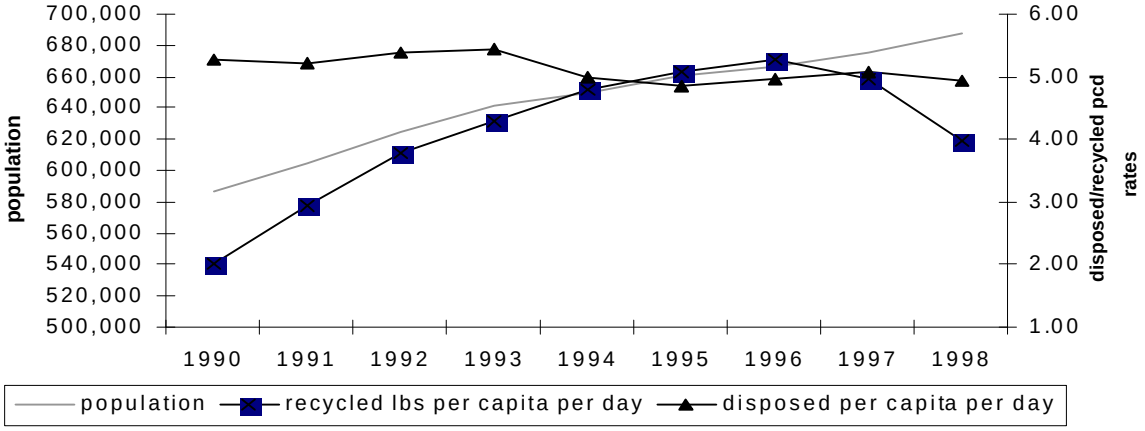
Figure 3-2
Waste Disposal and Recycling, 1990-1998



includes waste generated and disposed countywide

Figure 3-3
Poplation and Per Capita Recycling & Disposal Rates



Pierce County waste stream: The Pierce County wasteshed includes the population served in the unincorporated county and the 19 cities and towns which use the County's disposal system. Figures 3-4, 3-5, and 3-7 illustrate the trends discussed in the following paragraphs. Table 3-6 includes actual tonnages, pcd rates, and population from 1992 to 1998.

After peaking at 403,000 tons in 1993, disposed tonnage dropped in 1994 and 1995 and rose in 1996, 1997, and 1998, but is still below the peak. During the years since 1993, however, population grew by 7.6%.

The total disposed pcd rate, which includes all municipal solid waste (hauler-collected and residential self-haul) and commercial self-haul, peaked at 5.02 in 1993, declined to 4.37 in 1996, and has risen to 4.55 in 1998, which is below the countywide rate of 4.94. The pcd rate for municipal solid waste was 2.93 in 1998. This is a low rate when compared to other areas. It is indicative of the amount of recycling and diversion activities occurring in the county.

Trends: A number of interesting trends show up in an evaluation of the 1992-1998 Pierce County waste stream when three broad components are compared: 1) hauler-collected mixed residential and commercial waste; 2) residential waste self-hauled by the general public; and 3) commercial waste self-hauled by businesses, contractors, and industry. (A more standardized reporting format was begun in 1992, so comparable data was not available from 1990 and 1991.)

Both the commercial and residential self-haul waste streams have decreased since 1993 while the hauler collected waste stream has increased. The commercial self-haul waste stream was 16% less in 1998 than it was in the peak year of 1993. The residential self-haul waste stream was 36% less than in 1993. Hauler-collected waste has increased 18%.

Figure 3-4
Disposal in the Pierce County Wasteshed

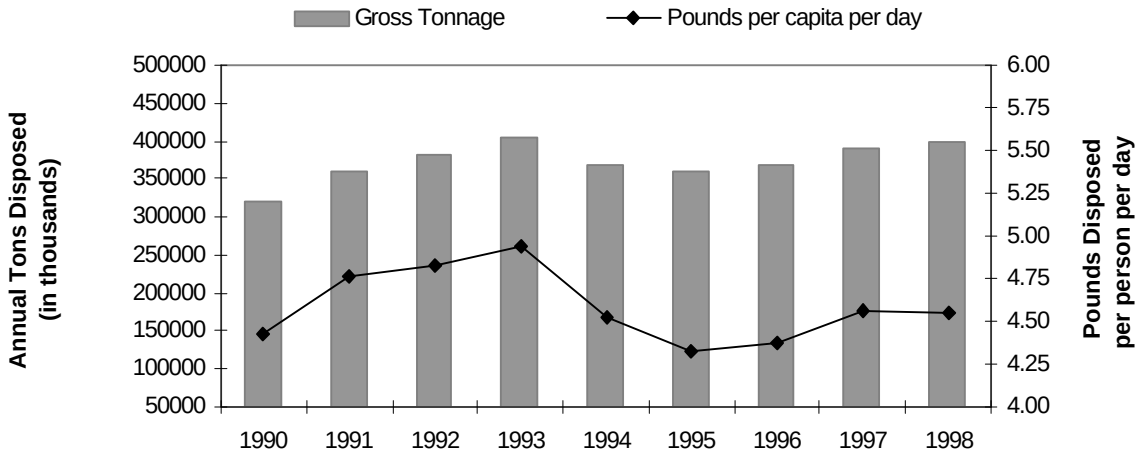


Figure 3-5
Disposed in the Pierce County Wasteshed by Broad Component

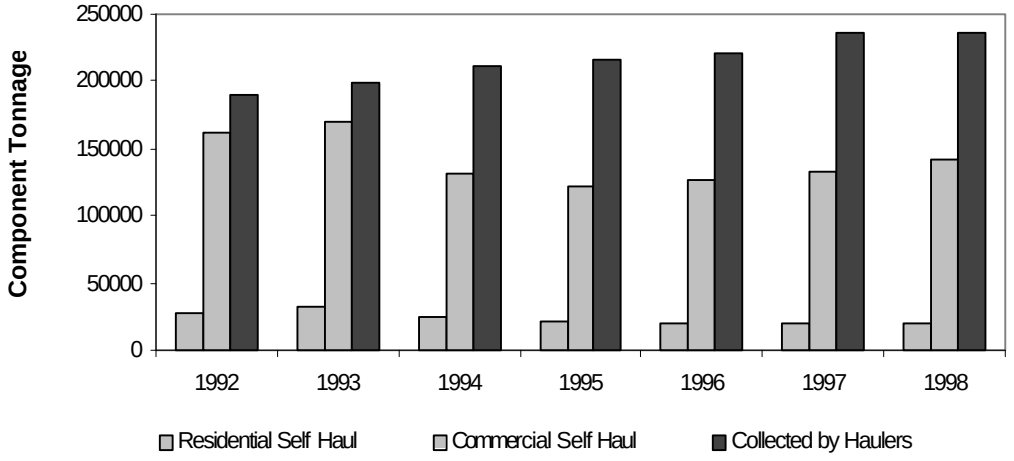


Table 3-6 Pierce County Disposed Tonnage and Population, 1992 to 1998

	1992	1993	1994	1995	1996	1997	1998
Pierce County Wasteshed	381,650	403,177	368,522	360,396	368,043	390,243	399,415
Percent Change	+6.2%	+5.6%	-8.6%	-2.2%	+2.1%	+6.0%	+2.4%
• **Municipal Solid Waste - Total**	**220,075**	**234,166**	**237,938**	**238,462**	**241,623**	**257,278**	**256,812**
-Residential Self-Haul–sub total	**27,361**	**31,642**	**25,290**	**21,856**	**19,654**	**20,485**	**20,392**
-Hauler-Collected Solid Waste–sub total	**192,714**	**202,524**	**212,648**	**216,606**	**221,969**	**236,893**	**236,419**
Route Collection (Res. & Comm.)	189,672	199,627	211,680	215,936	221,174	235,894	235,342
Cleanups	2,152	1,965	351	152	241	330	195
State Roadside	176	148	96	59	53	72	59
County Roadside	714	784	521	460	500	591	823
• **Commercial Self-haul - Total**	**161,575**	**169,010**	**130,584**	**121,934**	**126,421**	**132,865**	**142,603**
Large Commercial/Industrial	65,603	62,198	43,768	34,694	35,631	34,367	40,792
Heavy Demolition [1]	818	164	90	127	1,266	74	56
Sheetrock	6,972	4,107	2,972	2,042	1,742	1,358	1,755
Roofing	23,799	18,595	10,206	8,763	7,298	8,112	7,758
Fluff [2]	54,169	61,470	66,254	73,223	79,528	88,009	91,333
Ash	8,887	20,842	4,547	1	3	8	10
Sludge [3]	895	1,444	2,631	2,905	880	856	832
Asbestos	228	99	51	104	17	49	25
Tires	202	110	65	75	56	32	42
Hauler-Collected pcd	**2.44**	**2.48**	**2.61**	**2.60**	**2.64**	**2.77**	**2.69**
Municipal Solid Waste pcd	**2.79**	**2.87**	**2.92**	**2.86**	**2.87**	**3.01**	**2.93**
Commercial Self Haul pcd	**2.05**	**2.07**	**1.60**	**1.46**	**1.50**	**1.55**	**1.62**
Total Disposed pcd	**4.84**	**5.02**	**4.53**	**4.33**	**4.37**	**4.56**	**4.55**
Service Area Population	**432,510**	**447,055**	**446,811**	**456,458**	**460,765**	**468,805**	**480,915**
Percent Change		+3.4%	-0.05% [4]	+2.2%	+0.9%	+1.7%	+2.6%

[1] For 1996, heavy demolition tonnage includes debris accepted by the County which resulted from the extensive flood and storm damage.
[2] Automobile fluff is used for daily landfill cover. Because it is included in disposal figures, it reduces the countywide recycling rate.
[3] The sludge category refers to industrial sludge. Biosolids from wastewater treatment plants are not included.
[4] The decrease is because of a recalculation of the population on the military bases.

Reasons for trends: Part of the trend decreases and increases can be attributed to population growth and a shift in collection as franchised haulers began collecting waste that used to be self-hauled by either the commercial or residential self-haul sectors. This is likely due to the increased density of development in the suburban and urban areas that occurred during these years. Residents of new subdivisions automatically signed up for collection services or were required to if they were within incorporated cities. Also, more residential collection services were available, such as yardwaste, which made self-hauling less necessary.

Part of the decrease, however, is because a portion of the self-hauled commercial waste stream left the disposal system. Since 1992, the amount of sheetrock, roofing, and heavy demolition materials has substantially dropped.

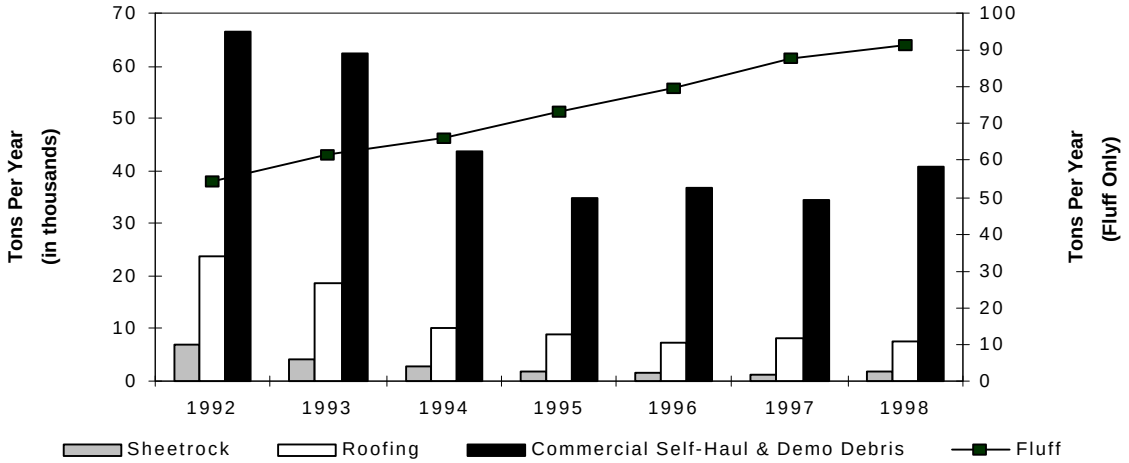
During this time period a number of new and expanded businesses began offering recycling services for demolition, roofing, and sheetrock materials while at the same time disposal costs rose. At the same time, the population growth slowed which probably resulted in less waste generated from development projects as compared to the 1991-1993 years.

The biggest change in the commercial self-haul category is due to increases in the amount of automobile fluff handled by LRI. Fluff is the non-metallic fraction that results from the shredding of cars and the separation of the recyclable metal scrap. Prior to its closure in late 1998, LRI used fluff as an approved alternative daily cover at the Hidden Valley Landfill.

Focusing on the general commercial self-haul of construction and demolition debris (and subtracting fluff) the commercial self-haul sector of the waste stream experienced a 41% drop between 1993 and 1998. These trends are illustrated in Figure 3-7 and in the tonnage pcd rates in Table 3-6.

This decline in disposal, however, does not result in a parallel rise in the County's recycling rate because some of the reduction can be attributed to “waste reduction” (i.e. the waste was never generated in the first place) and, of the material generated and recycled, not all of the tonnage was recycled within the County (and therefore not included within the County’s data)

Figure 3-7
CDL and Special Wastes, 1992 to 1998



Tacoma/Ruston waste stream: In 1998, most waste disposed in Tacoma's system was exported to the Hidden Valley Landfill or Roosevelt Regional Landfill. A smaller portion was processed into refuse derived fuel (RDF) for the Steam Plant or disposed at the City's landfill which is undergoing closure. Figure 3-8 illustrates disposed tonnage from 1990 through 1997.

Tacoma has not completed a recent waste characterization audit. Instead, the City has been re-evaluating its collection and processing methods to increase efficiency and improve data management systems. In addition, the City implemented a new curbside recycling program in 1998, as described in Chapter 4.

Figure 3-9 provides data for Tacoma's Household Hazardous Waste (HHW) Facility for the years 1993 through 1998. The data includes the number of users and tonnages of HHW generated at the Tacoma facility as well as the gallons of waste oil collected for recycling each year.

Since 1994, there has been a general trend in the tonnage and the use data for the Tacoma HHW Facility. The increases are directly related to the participation by Pierce County citizens. Through an interlocal agreement, residents of Pierce County and all of the incorporated cities have been able to use the services of Tacoma's HHW Facility. The use of the facility by Tacoma residents has remained stable. In 1998, over 2500 Pierce County customers used the services of Tacoma's HHW Facility.

The waste oil collected is a result of Tacoma's ongoing waste oil collection efforts. Tacoma has placed self-serve tanks at various locations throughout the City, including some Schuck's Auto supply stores, selected Texaco gasoline stations, and the Tacoma Landfill. Since 1994 there has been a steady decline in the amount of waste oil collected as a result of this program. It is generally believed that the decline is a result of two factors. First, in the period of 1994 to 1998, many more locations besides the City tanks started to collect waste oil from do-it-yourself oil changers. Second, it appears that there are less people performing oil changes at home. The proliferation of the quick lube type businesses and the fairly low prices for this service are likely a contributing factor.

Figure 3-8
Tacoma Waste Disposed (including Ruston)

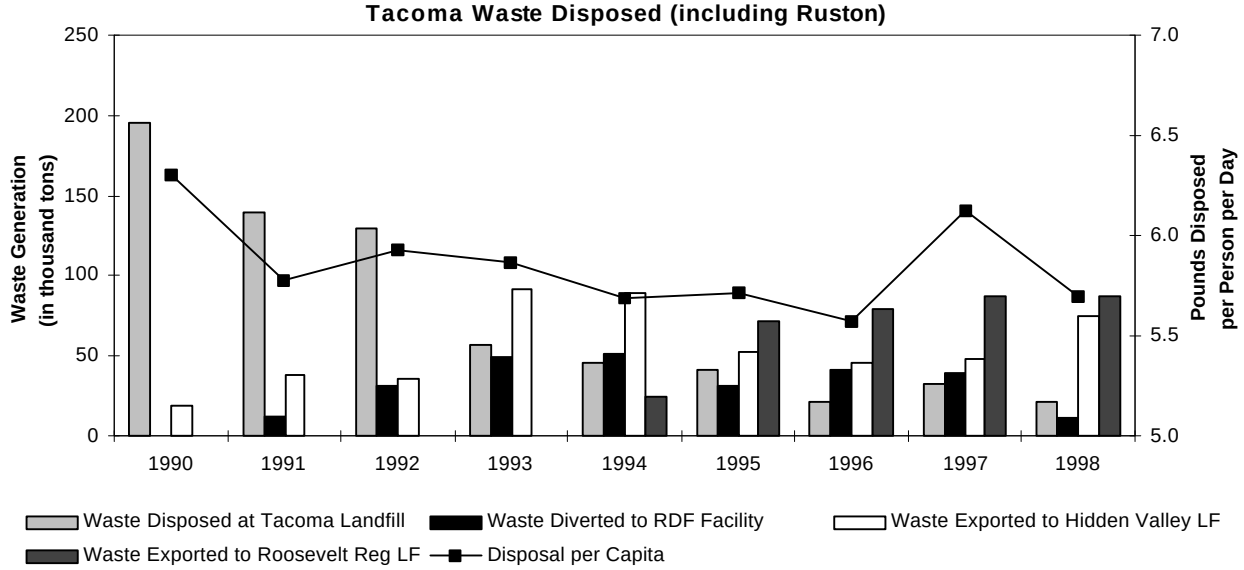
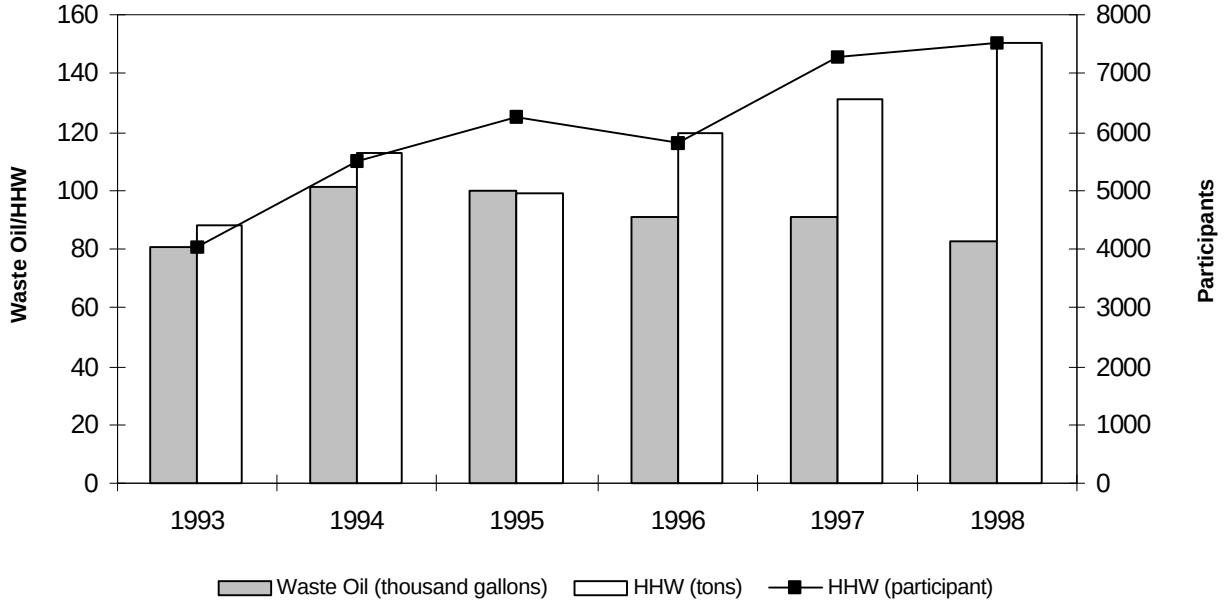


Figure 3-9
Tacoma Household Hazardous Waste Facility 1993-1998



Fort Lewis/McChord Air Force Base: The Fort Lewis system handles waste generated at Fort Lewis and McChord Air Force Base. Historical solid waste data for the military bases is summarized in this chapter and found in more detail in the 1995 Fort Lewis Solid Waste Management Plan. The Plan's 20-year planning period extends to 2015. The Fort is working on an update to the Plan. Waste quantity data was generated from landfill summary reports completed from 1992 through 1994 as reported in the Fort Lewis Plan. The information is illustrated in Figure 3-10.

Generation and composition: The total amount of solid waste generated in the Fort Lewis system increased by more than 300 percent from 1992 to 1994, primarily as a result of construction and demolition activity. The remainder of the Fort Lewis waste stream increased by 60 percent during that same period. The increase in demolition material and in the waste stream was mostly the result of base expansion. Residential population is expected to grow 11.6% from 1994 to 1999, along with an increase in civilian workers; all of which is expected to generate more waste.

The amount of solid waste generated at McChord Air Force Base between 1992 and 1994 remained essentially constant.

McChord AFB, 1995: McChord embarked on an extensive waste reduction and recycling program in 1995; setting ambitious goals and tackling a number of activities to achieve the goals. The result was that McChord achieved a 38% reduction in disposed tonnage as of December 1998. In one year, McChord's recycling rate went from 8% in 1994 to 57% in 1995. This is illustrated in Figure 3-12 which includes 1998 tonnages.

The military waste reduction and recycling programs are described in more detail in Chapter 4.

In 1994, Fort Lewis conducted a waste stream analysis to evaluate the composition of non-CDL waste generated at Fort Lewis and McChord Air Force Base. Over 23,000 pounds of municipal solid waste intended for landfilling was sampled. Results of the 1994 Fort Lewis Waste Stream Analysis are shown in Figure 3-11.

The 1996 total tonnage was 99,538 tons, which included 58,831 tons of CDL from the now completed demolition/expansion projects. Demolition/expansion projects are mostly complete.

Figure 3-10
Fort Lewis & McChord AFB
Waste Generation

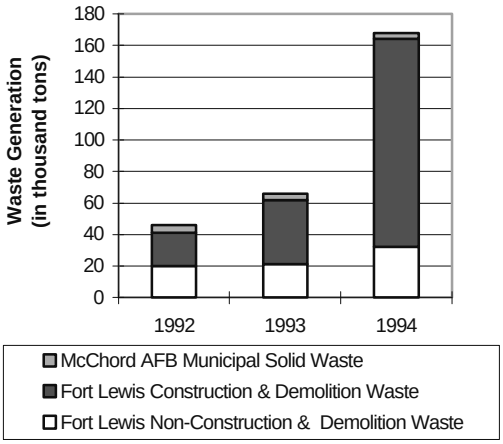


Figure 3-11
Fort Lewis Waste Stream Composition, 1994 Audit

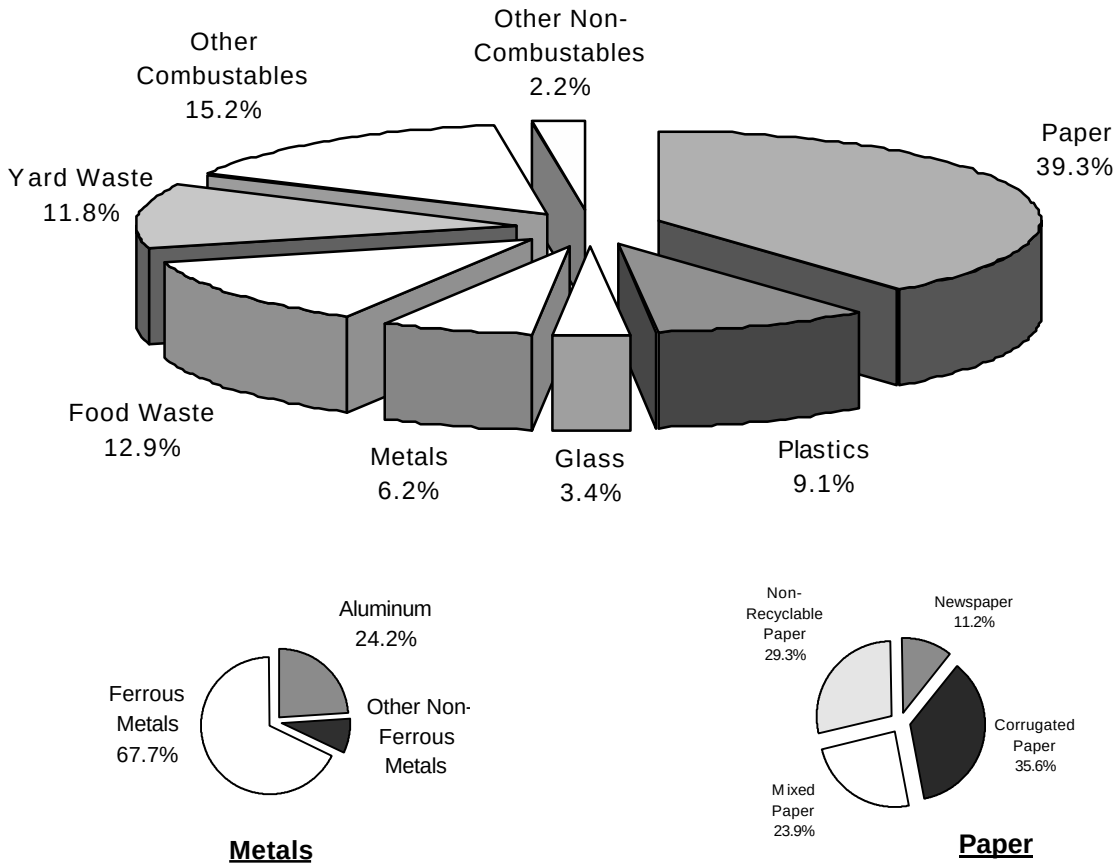


Figure 3-12
McChord AFB Waste Stream Disposal and Recycling
1994 to 1998

3.3 Projected Disposal Waste Stream

The County maintains 20-year solid waste forecasts for the entire Pierce County geographic area and for Pierce County's system using historical waste disposal data and population projections. The forecasts represent long-term trends but do not include projections of short-term or seasonal patterns.

The high range for long-term waste stream projections for the forecast period were developed using the following conservative assumptions:

- ✓ A constant per capita waste disposal rate of 4.5 pounds per day;
- ✓ A constant population growth rate of approximately 2.3 percent annually based on historical growth of the solid waste service area; and
- ✓ A 50-percent recycling rate.

Waste generation is also influenced by other demographic and economic factors, such as changes in the levels of employment and personal income, the value of recycled materials, and the price of disposal services. These factors can be interrelated or difficult to measure over time and, therefore, were not included in the long-term forecasts. The high range conservative assumptions provide leeway for planning if the recycling rate falls below 50%, population grows faster than projected, or a boom in the economy generates more waste. In order to more accurately monitor, evaluate, and refine existing disposal and recycling programs and implement new ones, the projections are updated annually based on population changes and yearly disposal and recycling data.

Disposal projections for Pierce County's system are presented in Table 3-13. Projections for the entire County, including Tacoma, Ruston, Fort Lewis, and McChord Air Force Base, are shown in Table 3-14.

Table 3-13	Pierce County Disposal Waste Stream Projections (tons/year) (Does not include Tacoma and Ruston, or Fort Lewis/McChord Air Force Base)			
	Population[1]		Waste Disposed (tons)[2, 3]	
Year	Low	High	Low	High
1997	467,560 --- 471,400		372,890 --- 387,100	
1998	476,250 --- 482,240		379,820 --- 396,040	
1999	485,100 --- 493,332		386,880 --- 405,150	
2000	494,122 --- 504,680		394,075 --- 414,470	
2001	503,300 ---516,290		401,400 --- 424,000	
2002	512,660 --- 528,165		408,860 --- 433,755	
2003	522,227 --- 540,300		416,489 --- 443,700	
2004	532,000 --- 552,730		424,283 --- 453,930	
2005	541,900 --- 565,443		432,180 --- 464,370	
2006	552,000 --- 578,550		440,234 --- 475,134	
2007	562,250 --- 600,857		448,408 --- 493,454	
2008	572,700 --- 614,700		456,743 --- 504,822	
2009	583,300 --- 628,900		465,196 --- 516,484	
2010	594,250 --- 643,365		473,930 --- 528,364	
2011	605,250 --- 648,165		482,702 ---532,305	
2012	616,500 --- 663,100		491,674 --- 544,571	
2013	628,000 --- 678,350		500,846 --- 557,095	
2014	639,650 --- 694,000		510,137 --- 569,948	
2015	651,600 --- 710,000		566,243 --- 583,088	
2016	663,700 --- 726,000		529,317 --- 596,228	
2017	678,000 --- 742,800		540,722 --- 610,024	
2018	690,600 --- 759,885		550,770 --- 624,055	
2019	703,445 --- 777,360		561,000 --- 638,407	
2020	716,530 --- 795,230		571,540 --- 653,083	

[1] Pierce County population is based on the 1996 solid waste service area population. The lower range uses the service area population and OFM projections for land use planning (1.86% average growth per year). The higher range uses a rate of 2.3% which reflects long-range historical growth of the solid waste service area population

[2] Pierce County population and projected waste disposal tonnage will be updated annually

[3] Waste disposal projections for the low range use the 1996 per capita rate of 4.37 pounds/person/day. The high rate assumes a constant per capita waste disposal rate of 4.5 pounds/person/day

Table 3-14 Countywide Disposed Waste Stream Projections (tons/year) (Includes Tacoma/Ruston and Fort Lewis/McChord Air Force Base)			
Year	**Population[1]**	**Waste Disposed[2]**	
		Low[3]	**High[4]**
1997	673,900	553,440 --- 594,026	
1998	686,000	563,378--- 604,692	
1999	699,000	574,054 --- 616,151	
2000	711,000	583,908 --- 626,729	
2001	724,000	594,585 --- 638,188	
2002	736,500	604,851 --- 649,206	
2003	749,191	615,273 --- 660,393	
2004	760,878	624,871 --- 670,695	
2005	772,747	634,618 --- 681,157	
2006	784,802	644,519 --- 691,783	
2007	797,044	654,572 --- 702,574	
2008	809,478	664,784 --- 713,535	
2009	822,105	675,754 --- 724,665	
2010	834,930	685,686 --- 735,970	
2011	847,954	696,382 --- 747,450	
2012	861,182	707,246 --- 759,110	
2013	874,616	718,278 --- 770,952	
2014	888,260	729,483 --- 782,979	
2015	902,117	740,863 --- 795,194	
2016	916,190	752,421 --- 807,599	
2017	924,870	759,550 --- 815,250	
2018	939,200	771,318 --- 827,881	
2019	953,800	783,308 --- 840,751	
2020	968,600	795,463 --- 853,797	

[1] Countywide population based on adopted OFM projections for land use planning.

[2] Countywide population and disposal data will be updated annually

[3] The low projection is based on a constant 4.5 lbs. per capita per day disposal rate

[4] The high projection is based on the 1996 countywide per capita disposal rate of 4.83

3.4 1995 Waste Characterization Study of Pierce County System Waste Stream

In 1995, the County conducted a detailed study of the disposal waste stream for the unincorporated area and the 19 cities and towns using the County's waste management system. (This did not include Tacoma or the military disposal systems.) The study had two primary goals:

- ✓ To identify how much and what types of recyclables remain in the disposed waste stream to evaluate the effectiveness of existing collection, recycling, and disposal programs.
- ✓ To establish baseline data from which to monitor the County's continuing waste reduction efforts and evaluate the effectiveness of the County's transfer stations and other facilities in meeting future solid waste disposal needs.

To achieve these goals, the County established the following objectives for the Waste Characterization Study (the 1995 Study).

- ✓ Determine the composition of the disposed waste stream in five geographic areas within the Pierce County system.
- ✓ Determine the composition of the disposed waste stream from the following generators:

- Single-family residential
- Multi-family residential
- Self-hauled residential
- Commercial
- Self-hauled commercial

- ✓ Determine how the composition of disposed waste varies from season to season.

Methodology: The 1995 Study consisted of two primary elements: a solid waste composition audit and a gate survey of vehicles at Hidden Valley Landfill and the Purdy Transfer Station. It included field sorting of residential and commercial solid waste and self-hauled residential solid waste; and visual examinations of commercial self-hauled solid waste.

The Study's sampling periods were selected based on seasonal highs and lows, the peak of lawn-trimmings disposal, and the fall foliage season. Specifically, the 1995 Study was conducted in June, October, and December (representative of the summer, fall, and winter seasons, respectively). The auditors selected random samples from vehicles disposing waste from various geographic areas in the County and sorted the samples by hand into solid waste categories based on the category list contained in the 1992 Solid Waste Plan and the 1992 Ecology characterization study.

The purpose of the gate survey was to gain an overall understanding of the disposed waste stream and better characterize the self-hauled waste stream. In addition, the gate survey was used to determine the relative percentages of waste generated by various generator types and to characterize other elements of the waste stream not included in self-hauled residential and commercial solid waste.

Results and Implications: The data obtained from the Study will be used to help guide the County's implementation of waste reduction and recycling programs to divert as much material from the disposed waste stream as is cost-effectively possible. More specifically, the 1995 Study will help the County to:

- ✓ Determine which material types have the greatest potential for diversion from the waste stream.
- ✓ Determine which geographic areas to target for diversion of certain materials.
- ✓ Determine progress in reaching diversion goals.
- ✓ Compare the County's disposed MSW composition to that of other geographic areas.

Table 3-15 is a summary of the composition results obtained from the 1995 Study. The second column of the table represents the composition for refuse that is regularly collected by route collection trucks from residential and commercial generators. Based on other studies conducted for municipalities around the United States, the County's percentages for paper, yardwaste, and foodwaste are indicative of systems with aggressive material diversion programs.

The data presented in the third column represents all other disposed waste except for automobile fluff, ash, sludge, and unknown materials. This solid waste is predominantly made up of construction and demolition debris (typically self-hauled commercial waste) and self-hauled residential waste.

Table 3-15 Solid Waste Composition Data Summary[1]			
Material Categories	**Disposed MSW**	**Disposed Other**	**Total Disposed**
PAPER	**32.7%**	**8.6%**	**26.9%**
Newspaper	4.6%	0.9%	3.7%
Corrugated and Kraft Paper	7.1%	3.2%	6.2%
Uncoated Paperboard	3.4%	0.7%	2.7%
Computer Paper	0.2%	0.0%	0.1%
High Grade Office Paper	2.5%	0.3%	1.9%
Magazines/Catalogs	2.3%	0.3%	1.8%
Telephone Books	0.4%	0.1%	0.3%
Bleached Poly Coated Paper	1.3%	1.2%	1.0%
Aseptic Packaging	0.1%	0.0%	0.1%
Other Recyclable/Compostable Paper	8.8%	2.2%	7.2%
Non-Recyclable/Compostable Paper	2.0%	0.8%	1.7%
PLASTICS	**10.9%**	**5.3%**	**9.6%**
PET - Soft Drink Bottles (#1)	0.4%	0.1%	0.3%
PET - Other (#1)	0.3%	0.1%	0.2%
HDPE - Milk Jugs and Juice Bottles (#2)	0.4%	0.1%	0.3%
HDPE - Other (#2)	1.0%	0.6%	0.9%
Polystyrene	0.7%	0.5%	0.7%
Other Plastic Containers	0.7%	0.2%	0.6%
Film Plastic	4.7%	2.6%	4.2%
Other Plastic Packaging	0.9%	0.2%	0.7%
Other Plastics	1.9%	0.9%	1.7%
GLASS	**4.8%**	**2.3%**	**4.2%**
Clear Glass Containers	3.1%	0.8%	1.3%
Brown Glass Containers	0.7%	0.6%	0.7%
Green Glass Containers	0.6%	0.2%	0.5%
Fluorescent Light Bulbs	0.0%	0.1%	0.0%
Other Glass	0.4%	0.7%	0.5%
FERROUS METALS	**3.8%**	**7.2%**	**4.6%**
Tin Cans	1.5%	0.5%	1.3%
Aerosol Cans (Non-HHW)	0.2%	0.1%	0.2%
White Goods (Appliances)	0.1%	0.5%	0.2%
Other Ferrous Metals	1.9%	6.2%	2.9%
NON-FERROUS METALS	**1.3%**	**1.2%**	**1.3%**
Aluminum Beverage Cans	0.7%	0.2%	0.5%
Other Aluminum	0.3%	0.6%	0.3%
Other Non-Ferrous Metal	0.4%	0.5%	0.4%

[1] The Pierce County Waste Characterization Study was conducted in 1995 by R. W. Beck, Inc.

Table 3-15 (continued) Solid Waste Composition Data Summary			
Material Categories	**Disposed MSW**	**Disposed Other**	**Total Disposed**
ORGANIC	**28.8%**	**5.4%**	**23.2%**
Food Waste	19.2%	3.1%	15.3%
Textiles/Leather	2.8%	0.7%	2.3%
Disposable Diapers	4.0%	0.7%	3.2%
Miscellaneous Organics	2.8%	1.0%	2.4%
YARD WASTE	**3.7%**	**6.4%**	**4.4%**
Leaves and Grass	1.1%	1.8%	1.3%
Shrub/Tree/Bush Prunings	2.6%	4.6%	3.1%
CONSTRUCTION DEBRIS	**7.5%**	**60.4%**	**20.2%**
Land Clearing Debris	0.0%	0.9%	0.2%
Drywall (Sheetrock)	0.5%	5.8%	1.7%
Concrete	0.4%	1.6%	0.7%
Furniture	0.2%	3.8%	1.1%
Insulation	0.2%	0.7%	0.3%
Carpeting	1.9%	3.1%	2.2%
Untreated Lumber	2.6%	30.9%	9.4%
Treated/Painted Lumber	1.0%	7.0%	2.4%
Other Construction Debris	0.7%	6.7%	2.2%
OTHER	**5.7%**	**2.8%**	**5.0%**
Tires	0.2%	0.2%	0.2%
Rubber Products	0.6%	0.2%	0.5%
Mixed Materials	1.8%	0.4%	1.5%
Miscellaneous Non-Combustables	3.1%	1.9%	2.8%
HAZARDOUS	**0.8%**	**0.3%**	**0.6%**
Paint	0.2%	0.0%	0.2%
Adhesives/Solvents	0.0%	0.0%	0.0%
Cleaners	0.0%	0.0%	0.0%
Oil-Based Paints, Solvents	0.0%	0.0%	0.0%
Pesticides/Herbicides	0.0%	0.0%	0.0%
Car Batteries	0.0%	0.0%	0.0%
Ni-Cad/Button Batteries	0.0%	0.0%	0.0%
Alkaline Batteries	0.1%	0.0%	0.1%
Gasoline	0.0%	0.0%	0.0%
Motor Oil	0.1%	0.0%	0.1%
Asbestos	0.0%	0.2%	0.0%
Explosives	0.0%	0.0%	0.0%
Medical Waste	0.0%	0.0%	0.0%
Other Chemicals	0.2%	0.0%	0.2%
TOTAL MUNICIPAL SOLID WASTE	**100.0%**	**100.0%**	**100.0%**

Audit Conclusions: Table 3-16 shows, by material type, the program initiatives undertaken at the time the 1992 Solid Waste Plan was developed, as well as recommendations for future diversion efforts as stated in the Plan. Also included are observations on how the County is progressing in diverting solid waste by category, based on results of the 1995 Study.

Residential: Conclusions from the consultant concerning how much progress the County has made in diverting residential solid waste were made by comparing the 1995 composition data to previous County data. The solid waste characterization study conducted in 1992 by the Washington State Department of Ecology is the most relevant comparable study in terms of previous disposed solid waste composition data.

The 1992 Ecology Study contains composition data for disposed single-family and multi-family residential waste streams for the Central Puget Sound region (the City of Seattle and King, Pierce, and Snohomish counties). A comparison of the composition data contained in the 1992 Ecology Study to data contained in the 1995 Study is presented in Table 3-17. Although the composition data for each study represents different geographical areas, some notable observations can be made. These are:

- ✓ Based on the percentage data, it appears that since 1992, the County has significantly reduced yardwaste in the single-family residential generator type compared to the Central Puget Sound region.
- ✓ The percentages of the County's disposed single-family and multi-family residential foodwaste is significantly higher than that shown for the Central Puget Sound region.
- ✓ The County's residential foodwaste disposal is approximately 0.3 pounds per capita per day (pcd), compared to approximately 0.2 pcd for the Central Puget Sound region. Nationally, the total residential foodwaste disposal rate ranges from roughly 0.2 pcd to 0.3 pcd.
- ✓ The County's multi-family yardwaste disposal percentage is significantly higher than that shown for the Central Puget Sound region.
- ✓ It appears that, since 1992, the County has made some progress in diverting newspaper in both residential generator types and corrugated paper in the single-family generator type. It appears based on the 1995 data that considerable opportunity still remains for diverting both paper grades.
- ✓ It appears significant progress has been achieved in recent years in removing yardwaste from the single-family waste stream, although there is still progress to be made in removing yardwaste from the multi-family residential waste stream.
- ✓ Foodwaste percentages in the County are comparatively high for both residential generator types.
- ✓ There is opportunity for significant progress in recycling newspaper in the multi-family residential waste stream.

Commercial: Aggregated commercial composition data were not developed for the 1992 Ecology Study. However, conclusions by the consultant concerning the County's 1995 commercial MSW composition were made based on other studies conducted in the last several years. These are:

- ✓ There remain large tonnages of corrugated paper to recycle in specific geographic areas of the County.

There is a considerable tonnage (roughly 15,300 tons) of foodwaste being disposed annually.

- ✓ The low commercial yardwaste percentage for the County (roughly 2 percent) is evidence of the success of yardwaste diversion programs.
- ✓ There is opportunity to reduce film plastics disposal from the commercial waste stream, in which roughly 6,500 tons are currently being disposed annually.

Table 3-16 Evaluation of Waste Characterization Audit Data in Context of County Goals [1][2]			
Material Type	**Program Status — 1992**	**1992 County Recommendations**	**Observations**
Newspaper	Single-family, multi-family curbside service, buy-back centers for businesses	Additional recycling alternatives for multi-family units, such as added convenience of containers, additional "pre-cycling," educational efforts	Percentage improvement could be made in multi-family residential generator type
Mixed Paper Grades	Some residential single-family and multi-family curbside collection; some magazines collected as early as 1990	More aggressive curbside collection of mixed paper grades recommended, including magazines.	More promotion may be warranted for magazines; additional opportunity for both residential generator types in other mixed paper grades for residential generator types; opportunity for commercial generator type in uncoated paper board and high grade office paper categories
Corrugated Kraft Paper	Some being collected at buy-back centers	County recommended expanding recycling opportunities	Significant tonnages are available for diversion in single-family residential and commercial generator types
Other Recyclable/Compostable Paper	None being collected	Mixed waste processing facilities discussed	Almost 10 percent of the disposed MSW waste stream consists of this grade of paper; however, it would need to be diverted in special programs
Glass, "Tin" Cans, Aluminum Cans	Collected curbside for multi-family and single-family residences, buy-back centers for businesses	Additional recycling opportunities for multi-family units, such as added convenience of containers; additional "pre-cycling," educational efforts	Some opportunity exists to divert both residential and commercial tonnages; however, tonnage contributions by individual materials will be relatively small
Plastics	Small quantities accepted at buy-back centers	Considered recycling more plastics	Significant overall tonnages, although markets still a problem; film plastics a significant commercial tonnage

Table 3-16 Evaluation of Waste Characterization Audit Data in Context of County Goals [1][2]

Material Type	Program Status — 1992	1992 County Recommendations	Observations
Yardwaste	Extensive dropoff, curbside programs in effect; yardwaste processing facility in place, 1993	Consideration of landfill bans; expanded educational programs targeted at backyard composting	Although roughly 73 percent of the total yardwaste in the County is being diverted, over 12,000 tons per year are still being disposed, particularly by the single-family and self-haul residential generator types
Foodwaste	No program in place	Discussed in 1992 CSWMP with no specific recommendations	Represents over 19 percent of disposed MSW waste stream, but diversion offers logistical, environmental, and technical concerns
Household Hazardous Waste	In the early stages of program development, including the collection of used oil	More aggressive program recommended for used oil; programs for other household hazardous wastes to be developed in the future	HHW percentages for County roughly in line with rest of country, but County HHW program (through City of Tacoma) one of the most aggressive in the country[3]
Woodwaste	No program in place	Discussed in 1992 CSWMP with no specific recommendations	Considerable tonnages of untreated, treated, and roofing materials being disposed

Footnotes:

[1] Based on *Tacoma-Pierce County Solid Waste Management Plan, Volume I*, December 15, 1992, by the Pierce County Department of Utilities.

[2] The numbers shown in the brackets following the comments under "R. W. Beck Observations" indicate the sources of information used in making the observations. The numbers in the brackets are keyed to the footnotes below.

[3] Even though the County and the City of Tacoma have implemented aggressive household hazardous waste collection efforts, the impacts of household hazardous waste programs on solid waste composition are difficult to determine due to the small quantities of household hazardous waste in the waste stream.

Table 3-17 Comparison of 1995 Waste Characterization Audit Data to that of the Central Puget Sound Region as shown in the 1992 Ecology Study [1] [2]

Material Type	Single-Family Residential		Multi-Family Residential	
	1995 Study	1992 Ecology Study	1995 Study	1992 Ecology Study
Newspaper	4.9	5.3	8.0	9.4
Corrugated Paper	4.8	5.7	7.0	7.0
Other Paper	22.8	21.5	19.6	20.1
Plastic	10.0	9.7	8.7	10.2
Glass	5.1	5.1	6.9	8.8
Ferrous Metals	3.7	4.0	4.1	3.6
Non-Ferrous Metals	1.4	0.9	1.7	1.3
Foodwaste	21.6	14.4	15.0	10.1
Woodwaste	0.6	1.5	2.4	1.7
Yardwaste	4.9	10.9	4.8	1.7
Other Construction Debris	0.9	3.5	2.7	2.7
Other Wastes[3]	19.3	17.5	19.1	23.4
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**

Footnotes:

[1] Washington State Department of Ecology, *1992 Washington State Waste Characterization Study, July 1993*, By R. W. Beck and Associates, Gilmore Research Group, Sharp Research, Gambrell Urban, Inc., and Social and Economic Science Research Center.

[2] 1992 Ecology Study included sorts in the City of Seattle, as well King, Snohomish, and Pierce counties.

[3] Includes disposable diapers, textiles, rubber products, large bulky items, household hazardous wastes, and special wastes, such as used oil and tires.

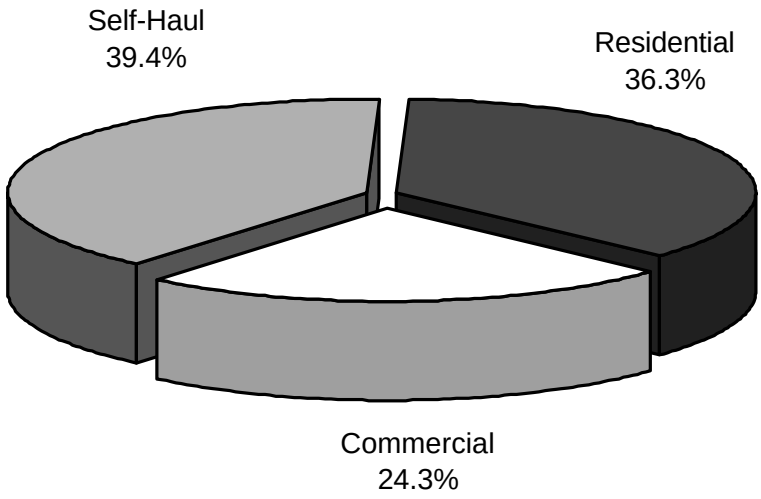
Waste Characterization by Sector: The total amount of solid waste disposed in the County's waste stream system in 1995 was 360,396 tons (MSW and self-hauled waste). Although the study characterized all categories of solid waste being disposed, its primary focus was on hauler-collected waste because it represented roughly 66 percent of the total waste disposed in 1995.

Furthermore, many materials in this waste stream represent significant opportunities to divert additional quantities of solid waste.

Based on a 1995 population of roughly 450,000 (the audit was completed six months before actual population figures were available. There are slight discrepancies between populations used for the audit and as finalized in Table 3-7) served by the Pierce County system, approximately 2.9 pounds per capita per day (pcd) of MSW were disposed in 1995, which is significantly lower than MSW per capita disposal rates for other parts of the country (4.0 to 5.0 pcd). This is a clear indication that significant amounts of materials are being diverted from the County's waste stream.

Figure 3-18 illustrates the total waste stream generated in the County by generator type. The following are observations related to the composition results for each generator. Figure 3-19 provides a map of the County showing Waste Audit geographic areas.

Figure 3-18
Total Disposed Waste Stream by Generator

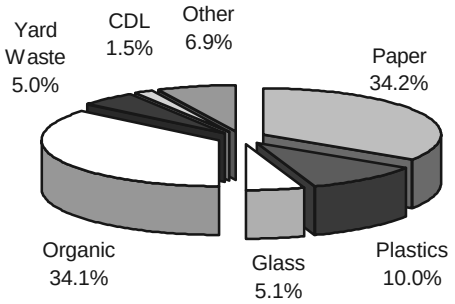


Insert Map (Figure 3-19)

Single-family residential: Figure 3-20 shows single-family residential waste composition results for the major material categories. Detailed composition results, with composition by geographic area and actual tonnages disposed, are included in Table 3-21. Based on these results, the single-family residential waste stream exhibits the following:

- ✓ A low percentage of newspaper (4.8 percent) relative to the Central Puget Sound region (5.3 percent).
- ✓ A relatively low percentage of yardwaste compared to regions outside the County and in parts of the country that do not have developed yardwaste diversion programs.
- ✓ Consistently high organics percentages, especially foodwaste, in all geographic areas of the County. (This has become a larger percentage partially because the County's programs have diverted yardwaste and other recyclables).
- ✓ Invariable percentages for the other categories from one area to the next, with the exception of disposable diapers.

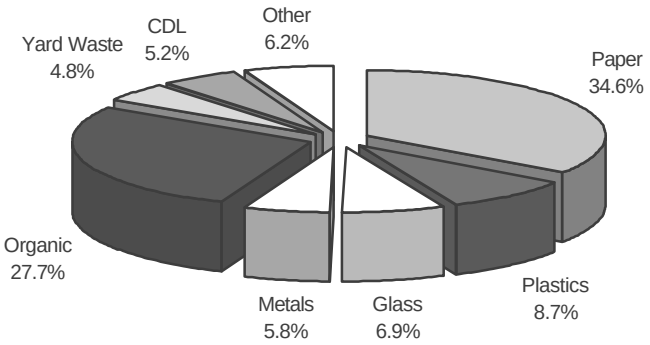
Figure 3-20
Single Family Residential
Waste Composition



Multi-family residential: Figure 3-22 shows multi-family residential waste composition results for the major material categories. Detailed composition results are included in Table 3-23. Based on these results, the multi-family residential waste stream exhibits the following:

- ✓ Similar waste compositions for each geographic area for each category, with the exception of organics (specifically foodwaste).
- ✓ Opportunities in all geographic areas to divert newspaper and corrugated and craft paper.

Figure 3-22
Multi-Family Residential
Waste Composition



Insert Table 3-21

Insert Table 3-21

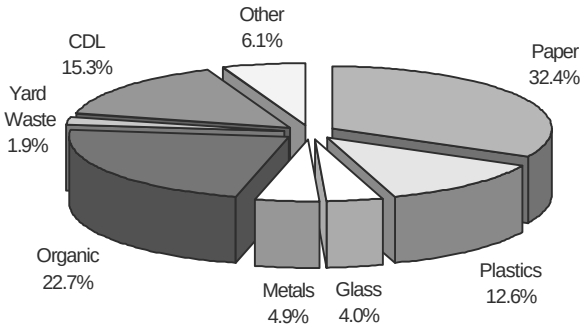
Insert Table 3-21

Insert Table 3-21

Commercial: Figure 3-24 shows commercial waste stream composition results for the major material categories. Detailed composition results, with composition by geographic area and actual tonnages disposed, are included in Table 3-25. Based on these results, the commercial waste stream exhibits the following:

- ✓ A lower percentage of commercial MSW paper (32 percent) than that observed in other parts of the country (35 to 40 percent). However, large quantities of corrugated paper were found in certain geographic areas.
- ✓ A higher percentage of foodwaste (17 percent) than in most of the country.
- ✓ A lower yardwaste percentage (roughly 2 percent) relative to other parts of the country (5 to 8 percent).
- ✓ A high disposal rate for commercial film plastics for most geographic areas in the County.

Figure 3-24
Commercial Waste Composition



Self-hauled waste: Figures 3-26 and 3-27 show the composition of residential and commercial self-hauled waste, respectively. Detailed composition results for both generator types are included in Tables 3-28 and 3-29

Typically, residential self-hauled yardwaste is significantly higher than that experienced for the residential sector served by yardwaste collection. Currently, the County provides residents incentives to divert yardwaste.

The commercial self-hauled waste stream is made up principally of construction and demolition debris (about 72 percent), of which lumber makes up roughly 44 percent.

Figure 3-26
Residential Self-Haul

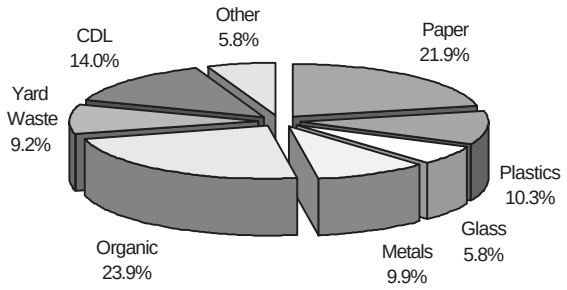
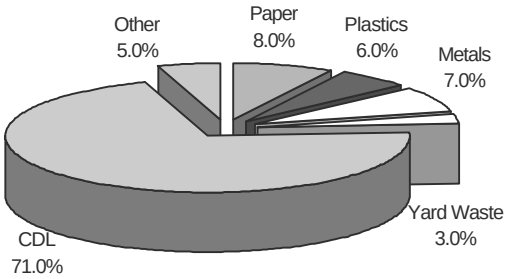


Figure 3-27
Commercial Self-Haul



Gate survey results: Although the gate survey results fluctuated on a seasonal basis, when annualized, the results were almost identical to the 1995 County data. Based on the gate survey results, the greatest contributors to the County's disposed solid waste stream are refuse collected by the franchise haulers, self-hauled waste, and automobile fluff (used for daily landfill cover).

Due to its very high variability, the 1995 Study characterized residential self-hauled solid waste based on both sort data and gate survey data. Table 3-30 shows the aggregated sort data, gate survey data, and combined sort and gate survey data for the residential self-hauled generator type. Although unable to characterize "cleanups" (one component of roadside litter) and heavy demolition waste, over 99 percent of the waste stream disposed by the County and 19 cities and towns was characterized.

Insert Table 3-25

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CHAPTER 4

WASTE REDUCTION AND RECYCLING

This chapter describes the existing waste reduction and recycling programs for the three separately managed waste disposal systems in Pierce County. The chapter provides self-contained discussions about each of the three system's programs, needs and alternatives, and recommendations. It begins, however, with information about the cooperative aspects shared by all jurisdictions.

4.1 Definitions, Legislative Requirements, Goals and Policies, and Recycling Achievements

Definitions: The following definitions are used throughout this chapter. (Additional definitions are included within the Appendices.)

Composting: This term means the controlled aerobic degradation of organic waste materials to make a product for use as a soil amendment, conditioner or mulch. Natural decay of organic wastes under uncontrolled conditions is not composting. Organic materials include, but are not limited to, such things as yardwaste, foodwaste, woodwaste, biosolids, paper, or any of the bio-degradable portion of mixed municipal solid waste.

Post-consumer/Pre-consumer waste: Post-consumer refers to a product made from collected recycled materials. Pre-consumer means a product made from materials recovered at the manufacturing plant.

Recycling: The collection of recyclable materials in order to transform or remanufacture the materials into usable or marketable products. In the Pierce County management system, the adopted residential and yardwaste collection ordinances specify the minimum types of materials to be collected. The haulers may add other materials to their collection programs.

Source-Separation Recycling Programs: These are recycling programs which collect a variety of recyclable materials at the place where the recyclable waste is first generated, such as a residence or a business. The materials may be collected either in separate bins or in a co-mingled recyclables bin. The separated bin system reduces the need for processing by relying on the generator to sort the materials where the co-mingled bin system requires additional processing at a material recovery facility.

Waste Reduction: Sometimes referred to as "source" reduction, this term means reducing the amount or toxicity of waste that is generated or reusing materials. Waste reduction can be accomplished by "precycling" which means considering the type of products or packaging before it is bought, such as buying products in bulk or with little or recyclable packing, or products made of concentrated solutions or materials.

Yardwaste: Organic yard debris that can be composted or ground-up for mulch, such as grass clippings, brush, leaves, and tree limbs.

State legislation: Counties and cities are required to provide collection of source separated recyclable materials from single and multi-family residences; drop-off or alternative systems for rural residents; yardwaste collection; educational and public outreach programs; programs to monitor the collection of recyclables from commercial sources; in-house recycling and procurement programs; and any other programs the municipalities determine are necessary to achieve State and local waste reduction and recycling goals. (RCW 70.95.090)

Fort Lewis and McChord Air Force Base implement their waste reduction and recycling programs in compliance with a Department of Defense Directive (DOD 4165.60) which states that "the military is committed to a rigorous schedule of minimizing waste and reducing solid waste materials at the sources whenever possible." The bases have "elected to plan and design their programs in general accordance with Washington State laws" as stated in the *Solid Waste Management Plan for the Fort Lewis Military Reservation*.

The State adopted legislation in 1989 that required Pierce County (and other large urban counties) to complete waste reduction and recycling plan amendments and fully implement collection programs within two years of the amendments. Pierce County municipalities began planning and operating the required programs before the State legislation was fully adopted. By 1993, collection programs were implemented countywide. In 1999, collection services are available to more than 680,000 residents, including residents of McChord Air Force Base. The County, Tacoma, and the military bases have won a number of awards for their waste reduction and recycling programs.

Goals and policies: The following are the waste reduction and recycling goals and policies for Pierce County established by the SWAC and the County Council:

***Waste Reduction*:**

Goal: To reduce per capita waste generation.

Goal: To promote relevant local, state, and national waste reduction measures.

Goal: To promote waste reduction through the use of strong, coordinated educational and public outreach programs.

Goal: To reduce the amount of waste materials discarded by County and other municipal governments.

Recycling:

Goal: To maintain and improve upon Pierce County's recycling rate.

Goal: To provide appropriate levels of collection and recycling opportunities so that the greatest number of citizens can participate and the fullest practical recycling potential for each material can be realized.

Goal: To continue and expand the local recycling program.

Goal: To establish model programs for Pierce County communities to adopt or modify to suit their needs and to support the communities in this effort.

Goal: To maintain a data collection and analysis program as a service to the County and its municipalities.

Goal: To foster a sense of personal responsibility among residents for solid waste management, particularly in accomplishing waste reduction and recycling goals.

To support these goals, Pierce County has identified the following policies:

***Recycling policies*:**

#1: Source separation of waste at the place where the waste originates should remain a fundamental strategy of solid waste management, pursuant to RCW 70.95.010.

#2: Evaluate and pursue each recycling effort based on ease of participation, consideration of waste stream contribution, maximum diversion potential, market opportunities, and environmental impacts.

#3: Environmental benefit and avoided cost of disposal should be factors in evaluating the success of recycling programs.

#4: Governments and the private sector should cooperate to carry out recommended recycling programs.

#5: The County should use financial subsidies that recognize avoided cost of transportation and disposal to encourage a higher level of participation.

Recycling achievements ---- 50% recycling rate: Together, Pierce County, its cities and towns, Tacoma and the two military bases achieved their joint goal of a 50% recycling rate by 1995, by recycling 590,000 tons. The goal was achieved through the aggressive efforts of the combined public/ private partnership of solid waste haulers, recycling businesses, cities and towns, military bases, the County, and, most importantly, the residents and businesses. The recycling efforts extended the life of the landfill serving the County's system by more than two years.

In recognition of being the first county in the State to achieve the goal, Governor Lowry proclaimed November 11, 1995 as **Pierce County Recycling Achievement Day**. At the *Many Happy Returns* event on that day the County provided recognition of all participants who worked to make the 50% rate possible. Each city and the two bases received a picnic table made from plastics collected in and made by a business in Pierce County with a commemorative plaque acknowledging residents' and businesses' efforts.

As indicated in Chapter 3, recycling efforts have had a significant effect on the County's disposal tonnage, the per capita disposal rate, and the character of the waste stream.

4.2 Cooperative Programs - Data Measurement, Special Collections, and Private Sector Marketing

All jurisdictions and the private sector cooperate on data measurement and certain public information or special collection programs. In Pierce County, the private sector has the major role for processing and marketing of collected recyclables; neither the County nor Tacoma have a marketing role.

The following briefly describes the cooperative aspects of recycling activities between the municipalities and with the private sector.

Data measurement: Pierce County Solid Waste Division maintains a database for measuring countywide recycling activities and monitoring the waste stream. The Data Collection Program gathers data on a monthly basis from franchised collection companies, buy-back centers, Tacoma, Ruston, McChord AFB, Fort Lewis, and other public, private, and non-profit recyclers. Recycling data is then compared with monthly disposal data to gauge how much of the waste stream is being recycled.

The majority of the hauling and recycling businesses participate. Because some do not, recycled tonnage is probably understated.

Participating recyclers complete and submit questionnaires to the County on a monthly basis. The questionnaires ask for information on the amount of each commodity received for recycling, how it was received (curbside, multi-family or commercial collection; drop-off or buy-back), and to which processor or end-user the commodity was sent. All data received by the Solid Waste Division is held to be proprietary and confidential and is not released to anyone without the permission of the recycler.

Pierce County's measurement program is unique among Washington counties. Other jurisdictions rely in large part on the Washington State Recycling Survey maintained by the Department of Ecology. Large and small recyclers throughout the State annually submit data on commodities collected, tonnage, and processors/end-users to Ecology. Because of a substantial time lag with Ecology's reports, Pierce County worked with recyclers to develop a local program.

In exchange for providing data to Pierce County, recyclers do not need to also report to Ecology. Once the County has received all twelve months of data from recyclers, staff forwards it to Ecology for inclusion in statewide tallies. This transmittal only happens upon the approval of each recycler. Because of the timeliness of local reporting, the County knows within one or two months about the latest trends in recycling/disposal rate activity and can compare this with information about recycling markets on the broad scale. This helps staff to tailor public outreach and educational programs and to remain flexible to the needs of the private sector, who provide the collection and marketing services.

The benefit to the County of providing this service is not only in receiving timely data to monitor programs but also in maintaining regular communication with local recycling businesses. Staff is kept informed about local commodity problems, the ups and downs of markets, new services, or the collection of additional recyclables by these companies. This two-way communication reinforces the public-private partnership forged between the County, cities and towns, haulers, and recyclers.

System changes: Pierce County's data collection program has evolved over the past five years with changes to the forms to make them more user-friendly and a new data base to tally the information to reduce the possibility of double- and triple-counting.

Analysis has also changed with the times. From 1990-1993, the County spent much time trying to determine how much of the recycle-stream was generated by residents rather than businesses, and how much came from Tacoma, versus the rest of Pierce County. Beginning with 1994 data, the County took the approach that recyclables cannot be so easily pigeonholed. While certain commodities (e.g. curbside recyclables) can easily be identified as coming from the residential waste stream,

many, especially those handled through unstaffed drop-off locations and staffed buy-back centers, cannot be attributed to either the commercial or residential sector. Likewise, while items collected through Tacoma's curbside programs are known to be generated by Tacoma residents, it is unknown how much non-Tacoma recycling takes place at the City's landfill or how many city residents patronize private drop-off boxes and buy-back centers. Further, the change was initiated because recyclers admitted that earlier responses to the questionnaire about residential versus commercial and city versus County were guesses, at best.

Objectives: The Solid Waste Division uses the data collected through this program to evaluate specific recycling programs and the countywide (including all cities, towns and the two military bases) success in reaching goals.

The results of the waste characterization audit, as described in Chapter 3, presents the County with a commodity-specific picture of the County's portion of the waste disposal stream. Comparing this information regularly with the recycling data allows the County to identify what programs need improvement and to focus on those commodities around which new programs could be designed. For long-term comparison purposes, the importance of this system is in maintaining consistency in measurement over time complemented with regular audits of the disposed waste stream in order to identify trends.

As indicated in Chapter 3, the County does not attempt to measure waste reduction in any detailed manner, other than to monitor changes in the per capita disposal rate. Some communities determine waste reduction by projecting estimates of waste to be generated in the next year and then comparing the results with the estimates. Pierce County does not do this because there are too many variables which occur in a given year that influence waste generation for the County to accurately project waste generation for the next year, measure disposal and recycling tonnage against the projections, and then determine that the result is "waste reduction." The variables include the economy, the start-up of new businesses, population growth, floods, and storms. Also, there is no good method to monitor the many decisions made by businesses to reduce the waste produced at the source.

Table 4.1 illustrates commodity tonnages recycled in1996, 1997 and 1998. Some commodity totals are not included to protect proprietary information. Also note that not all recycling businesses choose to report on their activities in Pierce County.

Table 4.1 Tonnages recycled in Pierce County by major commodity categories.

Commodity	Tons		
	1996	1997	1998
CDL Wastes	238,702	135,819	69,476
Glass	7,867	6,020	4,502
Metal	171,834	174,124	185,773
Paper	89,436	148,089	109,385
Plastic	735	2,079	1,887
Yard & Garden Debris	64,160	80,753	65,910
Other	67,032	62,805	57,649
TOTAL	**639,766**	**609,689**	**498,474**

Special Collections: Pierce County, Tacoma, and the Tacoma-Pierce County Health Department coordinate on many special waste collections and the public outreach activities to support these programs. The following are an example of some examples of these activities.

• *Christmas tree recycling:* All jurisdictions provide curbside yardwaste collection which includes pick-up of Christmas trees. The haulers also work with local scout troops and other youth groups to provide drop-off sites and with various municipal programs for special pick-up activities. The County works with all jurisdictions to promote the collection and drop-off programs and with the tree growers association to promote recycling of trees through flyers at Christmas tree lots and advertising.

• *Used oil collection:* Tacoma and the Tacoma-Pierce County Health Department have developed a system with local auto supply businesses to develop collection sites for used oil and antifreeze. The Health Department maintains an up-to-date list and the County helps to promote the sites.

• *Household hazardous waste collection:* Since 1988, Tacoma, Pierce County, the Health Department, and other cities have jointly sponsored collection events, which occurred about twice a year. All types of pesticides, household cleaners, and oil base paints have been accepted along with waste oil, antifreeze, and auto batteries.

In 1995, the County signed agreements with Tacoma to allow all county residents to drop-off household hazardous waste to Tacoma's permanent collection facility. The Health Department maintains a Hazardous Waste Hotline and produces public outreach materials. All three jurisdictions work to distribute information about hazardous waste collection, proper use of household products, and substitutes for cleaning products which are less hazardous and which will produce less waste.

During 1998, 103,640 pounds of hazardous materials were collected from 2,591 county residents at the Tacoma facility. (For more detailed information, consult the *Tacoma-Pierce County Hazardous Waste Plan*.)

Recyclables, local markets, and the private marketing system: The private sector handles all of the marketing aspects of the materials collected for recycling in Pierce County. As a result they also bear the brunt of depressed markets for recyclables which are very volatile and cyclical. Since the second half of 1995, national commodity markets have dropped, forcing a number of the larger national companies to readjust and cutback on recycling collection programs and municipalities to look for cost-cutting alternatives.

Despite the depressed market situation, the Pierce County private sector continues to market just about any material that can be collected in the county. Nothing that is being collected through source-separation programs is disposed.

Many materials are marketed to the Pacific Rim countries. When compared to many other states or counties in eastern Washington, Pierce County has an enviable recycling market location, with port facilities and other transportation infrastructure. This has encouraged the start up in the county of many businesses handling recyclables.

Another local benefit to marketing of recyclables collected in the county is the proximity to the growing Northwest regional markets which, in some cases, are developing more stability than the national or international markets. For instance, mill capacity for waste paper and newspaper has substantially increased in the region within

the last few years. Other State and regional government efforts, as well as private efforts, to promote recycling and recyclable products have reinforced regional support of collection programs by the public which, in turn, have encouraged more businesses to incorporate recycled feedstock into their operations. The premise to this regional approach is that the more businesses that develop, the more collection programs can expand, the more marketable the products, the more cost-effective to collect.

Some examples of regional promotional activity are:

- The Recycling Technology Assistance Partnership (ReTAP) which was a cooperative venture between the State's Clean Washington Center and the National Recycling Coalition. ReTAP offered hands-on technical assistance to companies in Washington State on how to use recycled materials for cost and performance advantage in manufacturing and construction. The program funded model programs such as job-site recycling and waste reduction on construction projects and research and assistance to individual businesses.

- King County's Buy-Recycled Campaign.

- The Washington Department of Transportation amendment of its specifications to allow the use of recycled glass aggregate as backfill, sand drainage, and bedding materials.

In Pierce County, a number of new businesses specializing in collecting, recycling, and marketing of specific materials have opened and many older businesses have expanded since 1989. In the process, some of the smaller buy-back centers closed because they were unable to keep up competitively.

Table 4.2 lists most of the businesses providing collection, processing, and marketing services in Pierce County as of 1998. The Solid Waste staff regularly updates this information.

In this free market arena, Pierce County and Tacoma's roles has been to ensure that residents have access to collection opportunities and to promote collection, source reduction, and the buying of recycled products.

Table 4.2 PIERCE COUNTY RECYCLERS [1]		6/99
COMPANY	**RECYCLER TYPES**	**COMMODITIES PROCESSED**
ARCOM	Commercial Collection Processing	Used motor oil, used oil filters
Auto Supply Stores--- More than 50 stations (See Appendices)	Drop-off Sites	Used oil, antifreeze
Budget Batteries	Recycling Center	Automobile batteries
Darling-Delaware Company	Commercial Collection Processing	Food and rendering wastes
Emerald Fibers	Processing	Paper grades
Fort Lewis	Recycling Center	Glass, newspaper, cardboard, computer paper, higrade paper, mixed paper, aluminum cans, other aluminum, tin cans, ferrous metal, non-ferrous metal, PETE plastic, HDPE plastic
Lakewood Refuse Service (LeMay Enterprises)	Residential Collection ------- Commercial Collection ------- Recycling Center ----- Drop-off Sites	Glass, newspaper, cardboard, mixed paper, magazines, aluminum cans, tin cans, yardwaste ---------- Glass, cardboard, mixed paper, aluminum cans, office pack paper ---------- Glass, newspaper, cardboard, mixed paper, magazines, aluminum cans, tin cans, PETE plastic, HDPE plastic -------- Newspaper, aluminum cans, cardboard
Land Recovery Recycling Center (at landfill site) and Organic Recycling Center (Sales Road Facility)	Recycling Center Processing -------- Organic Recycling Center Processing Drop-off Site	Refillable bottles, glass, newspaper, cardboard, mixed paper, magazines, aluminum cans, other aluminum, tin cans, ferrous metal, non-ferrous metal, auto batteries, PETE plastic, HDPE plastic, white goods, yardwaste, land clearing debris, Christmas trees ---------- Yardwaste, woodwaste, land clearing debris. Drop- off for cans, paper, glass, plastics, bottles
McChord Air Force Base	On-Base Collection Recycling Center	Newspaper, mixed paper, cardboard, magazines, aluminum, tin, glass, PETE plastic, HDPE plastic, yardwaste, used oil

[1] Other facilities which specialize in a particular type of processing, such as composting or soil remediation, or a specific waste stream, but are not primarily recycling businesses, are listed in Chapter 6 Processing Technologies and Chapter 9 Special Waste Streams.

Table 4.2 PIERCE COUNTY RECYCLERS [1]		6/99
COMPANY	**RECYCLER TYPES**	**COMMODITIES PROCESSED**
Murrey's Disposal American Disposal D.M. Recycling	Residential Collection ------- Commercial Collection ------- Drop-off Sites	Glass, newspaper, cardboard, mixed paper, magazines, aluminum, cans, tin cans, yardwaste, PETE and HDPE plastics (in some places) ------ Cardboard ------- Glass, newspaper, aluminum cans, tin cans, PETE plastic, HDPE plastic, white goods (through special drop-off events)
New West Gypsum	Commercial Collection Recycling Center Processing	Drywall reclaimed from construction projects. Waste drywall from gypsum manufacturing process. Paper and metal byproducts processed as well.
Pierce County Refuse (LeMay Enterprises)	Residential Collection ----- Commercial Collection ----- Drop-off Sites	Glass, newspaper, cardboard, mixed paper, magazines, aluminum cans, tin cans, yardwaste ----- Cardboard, mixed paper, office pack paper ----- Newspaper, aluminum cans, PETE plastic, HDPE plastic
Purdy Topsoil and Gravel (Randles Sand & Gravel)	Recycling Center Processing	"Woody" yardwaste, land clearing debris, demolition debris, concrete
Rainier School	Commercial Collection Processing	Newspaper, newspaper rolls, cardboard, mixed paper, aluminum cans, aluminum foil, ferrous metal (iron), non-ferrous metal (copper and brass), electric motors
Randles Sand & Gravel	Processing	Concrete, asphalt, landclearing debris
Recovery I	Recycling Center Processing	Demolition debris, stumps and brush, pallets
Reynolds Recycling	Recycling Center Processing	Aluminum cans, aluminum foil, other aluminum, non-ferrous metal
Rhine W., Inc. Recycling	Recycling Processing	Construction, concrete, asphalt, brick, masonry, demolition materials.
Schnitzer Steel Industries Inc. (Was General Metals)	Commercial Collection Recycling Center Processing	Ferrous metals (such as auto bodies)
Simon, Joseph and Sons	Commercial Collection Recycling Center Processing	Non-ferrous metals
Smurfit Recycling Company	Commercial Collection Recycling Center Processing	Glass, newspaper, cardboard, mixed paper, office pack (paper), magazines, aluminum cans, tin cans, PETE and HDPE plastic
Sonoco	Drop-off Center Processing	Cardboard and newspaper

Table 4.2 PIERCE COUNTY RECYCLERS [1]		6/99
COMPANY	**RECYCLER TYPES**	**COMMODITIES PROCESSED**
Tacoma Recycling Company Inc.	Commercial Collection Recycling Center Processing	Computer paper, white ledger, colored ledger, mixed paper, newspaper, cardboard, glass, aluminum cans, tin, foil, other aluminum, phone books, woodwaste, laser cartridges, PETE plastic, HDPE plastic
Tacoma Solid Waste Utility	Residential Collection ------- Commercial Collection ------- Recycling Center	Glass, magazines, phone books, household batteries, aluminum cans, tin cans, aerosol cans, newspaper, mixed waste paper, yardwaste, some plastics, cardboard ----- Glass, magazines, phone books, household batteries, aluminum cans, tin cans, aerosol cans, newspaper, yardwaste ----- Container glass, magazines, phone books, household batteries, aluminum cans, tin cans, aerosol cans, newspapers, #1 and #2 plastic, aluminum foil and trays, mixed waste paper, cardboard, plate glass, scrap metal, polyurethane foam, mattresses
Tacoma Metals	Commercial Collection Recycling Center Processing	Non-ferrous metals
Tacoma Goodwill Industries [2]	Commercial Collection Processing	Newspaper, ferrous metal, non-ferrous metal, textiles
Tomra Pacific	Recycling Center Processing	Aluminum cans, aluminum foil, other aluminum, non-ferrous metal
University Place Refuse	Residential Collection ------ Recycling Center	Newspaper, mixed paper, cardboard, magazines, aluminum, tin, glass, yardwaste ----- Newspaper, mixed paper, cardboard, magazines, aluminum, tin, glass, PETE plastic, HDPE plastic
Walrath's Trucking	Recycling Center	Clean concrete and asphalt
Wetzel Recycling	Recycling Center	Aluminum cans, other aluminum, aluminum foil, non-ferrous metal
Weyerhaeuser Co.	Commercial Collection Processing --- Recycling and Disposal	Newspaper, cardboard, computer paper, higrade paper, mixed paper, magazines ---- Industrial/construction woodwastes, CDL
Woodworth	Recycling Center Processing	Concrete, asphalt, asphalt roofing, cedar shingles, sand blasting, foundry by-products

[2] There are many charity organizations that collect textiles and other products for re-use but they are not listed. In addition, there are many businesses which automatically collect items for reuse for distribution to charity programs as a regular business practice. Old mattresses are an example since many businesses pickup an old mattress when they deliver a new one.

4.3 Pierce County / Cities and Towns

Coordination and jurisdictional roles: Pierce County and the cities and towns have Interlocal Agreements for solid waste management. Collectively, they act together to implement the Plan with the County being the lead for 19 of the 21 cities. The agreements state the general obligations of each jurisdiction and provide for review, renewal, and amendment processes. For those cities using Pierce County's disposal system and the unincorporated areas, the County is responsible for public outreach and education; the creation of model recycling collection programs suitable for the cities to adapt; and data monitoring. The County provides these programs countywide and funds the programs through the County's Administrative Component of the tipping fee. Cities are responsible for implementing residential collection programs through their hauling contracts and coordinating with the County on countywide public outreach and education programs.

Beginning in 1990, the County and cities began phased development of curbside programs and supportive public outreach and educational programs. As directed by the 1989 Plan, the County planned the design of the system with the hauling companies, private recycling processors, and the Washington Utilities and Transportation Commission (WUTC), with overview by the Solid Waste Advisory Committee (SWAC). The direction from the County Council placed emphasis on building and maintaining a cost-effective public/private partnership.

Also involved early in the process was the Recycling Roundtable, composed of representatives of the recycling industry who were appointed to advise the County Executive. Once the programs were up and running the Roundtable disbanded.

Programs are countywide. All of the following programs serve all residents of the unincorporated County and 19 of its 21 cities and towns. Another town, Ruston, disposes of its waste in the Tacoma system, collects recyclables on its own, but takes advantage of many of the County's public outreach materials. (Tacoma and the two military bases have similar programs that are described later in this chapter.)

The fundamental strategy underlying the design of all programs is source-separation, which relies heavily on the willingness of residents to be active participants to separate recyclables from refuse. To engender citizen participation and support, the County developed and maintains strong, award-winning public outreach and educational programs. This strategy is based on the idea that effective management of separation costs begins at the curb. Therefore, programs that require sorting of solid wastes from recyclables, while still maintaining the lowest contamination levels possible, will result in a lower processing cost as materials are marketed as resources to industry to become new products.

Funding: Residents and businesses pay for the cost of recycling through their respective collection fees. The costs for the County to plan, administer, and produce public outreach and education programs are funded as a portion of the tipping disposal fee and with grants. (For additional information about financing, consult Chapters 5 and 10 and the WUTC Cost Assessment in the Appendices.)

Urban and rural boundaries: The designation of urban and rural boundaries for the purposes of establishing minimum service levels for recycling as required by law no longer serves any purpose in Pierce County. Experience has demonstrated that programs that support the needs of both urban and rural residents can be designed

with complementary aspects to provide cost-effective, countywide services.

While the County adopted urban and rural boundaries in 1990 for the purposes of implementing curbside recycling collection, the boundaries proved unnecessary. At the request of rural residents, haulers extended curbside services to all areas and the program became countywide within months. The original design of the system, the economies of scale created by having all four haulers offer the same program, the County's role in funding public education and promotion, and support by the WUTC for rate incentives allowed this to occur.

Cities and towns have implemented nearly identical curbside programs which also helped to make, and continues to keep, the whole system cost-effective. Subsequent service levels for multi-family complexes, condominiums, and mobile home parks were designed in the same manner and are also offered countywide.

Service boundaries for the yardwaste collection program were based on resident's access to other alternatives rather than just the urban/rural nature of residential areas. The yardwaste program incorporated a number of options. As a result, all urban single-family residents and a large proportion of the rural residents have access to curbside yardwaste pickup if they choose. Drop-off services are provided for self-haulers.

Because the collection systems are countywide, there is no need to modify boundaries to match the County and cities' urban growth boundaries, as was previously recommended in the 1992 Plan.

Waste reduction: The 1992 Plan had separate chapters on waste reduction and recycling which created duplicative information. In this Plan the two have been combined. Where appropriate, the following program descriptions identify those programs which are primarily waste reduction activities and the waste reduction aspects of recycling programs.

Waste or "source" reduction is Washington State's and the County's priority method for managing waste (RCW 70.95). Simply put, waste reduction is the adoption of practices by everyone that generate less waste. By decreasing the amount of waste that must be disposed, society needs less disposal capacity, which helps to limit system costs. This has become particularly more evident as disposal facility costs have risen because of the need to meet design requirements for long-term environmental protection.

The four basic waste reduction methods are:

- decrease the amount of material used with each product or alter packaging to reduce the quality of raw materials or resources used to produce each product;
- increase the lifetime of products through better quality construction and selective purchasing;
- reuse products for their original compatible purposes;
- reduce consumption ("precycle") by using product alternatives that generate less waste.

The first two waste reduction methods require substantial support through national and state policies. They also require substantial private sector support. The 1992 Plan recommended that the County monitor and support state and national activities on packaging and lobby state and federal

officials when appropriate. The 1992 Plan also recommended encouraging private sector waste reduction activities.

The main emphasis of the 1992 Plan's recommendations was on the County providing public outreach and education programs to support reuse, precycling, and the buying of products made from recycled materials.

Since the adoption of the Plan in 1989, there have been a number of activities on the national and regional levels aimed at waste reduction within the business community.

Some examples are:

- The U.S. Environmental Protection Agency (EPA) has developed *Wa$te Wi$e*, a voluntary program for reducing business waste generation. Participating businesses are provided with guides for reducing waste, tip sheets, case studies, and other assistance. During 1995, participating organizations reduced 344,000 tons of waste and recycled an additional 4.2 millions tons.

- EPA and the U.S. Postal Service (USPS) have developed a recycling hotline, 1-800/CLEAN-UP, and an internet site which allows callers to access information on where to recycle certain materials in their areas and about source reduction and reuse.

- The National Recycling Coalition (NRC) has developed a manual detailing how source reduction program can be successfully implemented at the local level and gives "negative awards" to direct mail advertisers who use material that is not recyclable or excessive.

- The Washington Retail Association has drawn up Preferred Packaging Procurement Guidelines which challenges retailers to achieve targeted goals; one of which is to reduce packaging by 25 percent within 48 months. The Association's reduction priorities are: 1) eliminate packaging, whenever possible; 2) minimize the amount of material in packaging; 3) design packages that are either consumable, refillable, or reusable; and 4) produce packages that are recyclable and/or contain recycled content.

- The Green Hotels Association is trying to make recycling and waste reduction become a larger part of the hotel industry by putting together a Hotel Green Buying Guide.

There are many more examples. Basically, what has been happening over the last few years is that industries, always looking for ways to use less raw materials to make their products to improve their bottom line, are now beginning to recognize that waste reduction is one way to reduce overhead costs.

Everyone is agreed, however, that measuring reduction involves "quantifying the unknown" as one writer for the *Recycling Times* put it (Chaz Miller).

(Chapter 3 discusses measurement methods in more detail.)

Toxicity reduction: A fifth waste reduction method is to reduce the toxicity of waste that is generated and disposed in landfills. It is a primary goal of the State's Model Toxics Control Act (RCW 70.105D) which provides funding for Coordinated Prevention Grants (CPG) to local governments for waste reduction, recycling, and "moderate risk" (household hazardous) waste programs. The grants support local programs which: provide for the recycling and reuse of materials such as antifreeze, paint, oil, and pesticides; promote safer alternatives; or

promote proper use and disposal of the containers or any remaining waste.

Guidance for implementing hazardous waste programs is provided in the Tacoma-Pierce County Local Hazardous Waste Management Plan adopted by the County, the Tacoma-Pierce County Health Department, and the cities and towns. The Tacoma-Pierce County Health Department is the coordinating agency for this particular Plan and works with the City of Tacoma and Pierce County to implement the programs.

As previously indicated in this chapter, the three jurisdictions have provided a number of household hazardous waste collection events. The County contracts with Tacoma to allow county residents to drop-off household hazardous waste at Tacoma's MRW facility, and will be contracting for approximately six satellite collection events in rural areas per year. In addition to the private oil drop-off sites, the County, in coordination with the Health Department, has also established two additional oil collection sites at the County-owned Thun Field Airport and Prairie Ridge Transfer Station.

For more detail about business technical assistance programs for handling MRW, please review the Hazardous Waste Plan.

The County, Tacoma, and the Health Department prepare annual reports of the amount and types of materials collected through the events and at the MRW facility. The 1995 Waste Characterization Audit shows that household hazardous waste only makes up approximately six-tenths of a percent of the disposed tonnage in the County's waste stream.

Pierce County incorporates the toxicity reduction message into its public outreach programs by distributing a variety of brochures about household hazardous waste oil collection sites, and "green" cleaning alternatives. The messages are also promoted throughout the year through the County's special public outreach programs and exhibits. The County's school education program includes presentations for grades 4-12 which focus on hazardous products and safer alternatives. Coordinating with other County departments, the solid waste educators provide presentations to all grades about watershed dynamics, pollution prevention, water quality monitoring, and salmon habitat issues. (Public outreach programs are discussed in more detail in the following pages.)

4.3.1 Existing Programs

- ***Curbside recycling collection*:** Instead of contracting for residential recycling collection, the County elected to adopt Minimum Service Levels and to work with the Washington Utilities and Transportation Commission (WUTC) to implement the services through the franchised haulers' rates. (Chapter 5 discusses the County's and cities' collection options.)

The programs were phased in and each service level was built to mesh with the previously implemented service. The County was the first county to work with the WUTC on implementing solid waste plan service levels and, as a result, some of the unique aspects became models for other counties in the State.

Single-family curbside collection:
Ordinance #90-14, Minimum Service Levels for Single-Family Residents, was adopted in March 1990 and implementation in the unincorporated areas began shortly thereafter with approval of the haulers' rates. To fund the program, all single-family customers' rates rose about $2 per month. Incentives, which reduce the collection rate for refuse collection, are built into the program to encourage customers to choose recycling collection.

Franchised haulers provide three, stacking bins to customers who choose the service and pick-up the materials bi-weekly. Materials collected are newspaper, aluminum, "tin"/steel cans, all colors of glass, and mixed waste paper. Catalogs, magazines and other mixed wastepaper are collected in a paper sack placed with the bins. The haulers also collect cardboard.

Unique aspects of the program are included within the following discussion.

- All franchised hauling companies offer the same program to residents countywide.
- The haulers were required to offer the same program to cities. The cities could use the County's program as a model to implement or adapt to their needs. In accordance with the Interlocal Agreements, most of the cities adopted the same, or nearly similar, programs and implemented them through their contracts with the haulers.
- The County designs, produces, and pays for the promotional and education costs.
- Bins are bought in bulk for the program and provided free to the customers.
- There is an incentive rate system that provides a lower garbage can rate for customers who choose recycling collection.
- Haulers are required to offer a mini-can service (20-gallon) with recycling collection. Some customers with one 32-gallon garbage were able to decrease their disposal costs by choosing the mini-can with recycling.
- A sticker system was developed for garbage customers who wished to continue to take their recyclables to buy-back centers. The centers provide the sticker upon request and the customer applies the sticker to their bill in order to receive the lower rate.
- Haulers are required to participate in the data collection program.
- Haulers are responsible for marketing the materials collected.

The emphasis of the program is on source-separation. From the start, the County concluded that costs for the entire program could be kept low if customers separated their materials at the curb. Because drivers

further separate the material into containers on the trucks, the collected material has less contamination problems than some commingled systems and is, thus, more marketable. To ensure public participation and support for source-separation, the County picked up the costs to promote the program.

Multi-family curbside services: Service levels for multi-family complexes, condominiums, and mobile home parks (Ord. #91-86) are similar. This ordinance was adopted in 1991.

The program was tailored to offer many options to complex owners and managers because of the many different sizes of complexes. It includes:

- For complexes of less than 20 units and mobile home parks, curbside service similar to single-family residents.
- For complexes larger than 20 units, collection containers on site, or, where space was unavailable, collection container service on a weekly or monthly basis.
- Collection of newspaper, all colors of glass, aluminum, tin/steel cans, and mixed waste paper. The haulers also offer collection of cardboard and plastics.
- Incentive rates which reduce the cost of collecting refuse if the owner/manager offers recycling services to their tenants.
- Small recycling containers for each unit in the complex for storage of materials inside.
- Countywide public education and promotion.

Again, cities implemented similar programs through their hauling contracts.

Participation rates: The programs have kept pace with the rapid population growth experienced by all jurisdictions in the county. Haulers automatically offer new customers the curbside services. Approximately 80,000 single-family households throughout unincorporated Pierce County and its cities participate, which represents **84.3%** of the households with regular garbage collection service.

At the end of 1998, **91%** of the complexes had signed up for service. Anecdotal evidence reported by the haulers, however, indicates that participation by tenants, is less than what would be anticipated by such a high sign-up rate. Large "transient" and non-English speaking populations have posed special problems marketing this program to residents.

- ***Drop-off collection and buy-back recycling centers:*** Pierce County's haulers and recycling enterprises provide unstaffed, drop-off recycling sites and staffed buy-back businesses serving urban, suburban, and rural areas. Drop-off sites and buy-back recycling centers are an important part of the County's recycling strategy. These sites provide recycling alternatives for families that do not subscribe to garbage or recycling collection services. They supplement existing programs when subscribers have too many materials to fit in the curbside bins, and provide small businesses with alternatives to recycle. Also, they target specific materials not collected at curbside.

Drop-off sites are not funded through the tipping fee system. They are provided through recycling companies' private investment and the assistance of a property owner in allowing the containers to be placed on the property. Because of illegal dumping problems the number of drop-off sites has been decreasing.

Through its disposal contract the County has ensured that drop-off recycling sites have been added to all transfer stations throughout the County. To ensure their residents have access to additional drop-off sites, cities could provide sites on city-owned property and include the sites within their existing contracts.

The decrease in the number of drop-off sites has substantially affected the plastics drop-off collection program the haulers began in 1994 to collect #1 PETE and #2 HDPE plastics. Because of the increase of illegal dumping at the unstaffed sites, property owners have asked haulers to remove them. The cost of maintenance of the sites to remove the illegally dumped material outweighs any profit the haulers may make in marketing the materials. Citizens have complained about the loss of the sites and requested curbside pickup for plastics. Staff met with the haulers to discuss the problem and is monitoring the plastics recycling markets to determine if it will eventually be cost-effective to add plastics to the countywide curbside collection program provided by the hauling companies. Some cities have contracted for curbside pickup of selected plastics.

Private buy-back recycling centers also play a key role in ensuring that Pierce County residents and businesses have access to a comprehensive recycling system. For reasons of economy and efficiency, Pierce County's curbside and drop box recycling systems cannot collect every commodity that is potentially recyclable. Staffed private recycling centers fill that void, providing convenient opportunities to recycle commodities not accepted elsewhere.

The County's disposal contract with Land Recovery Inc. (LRI) requires LRI to maintain staffed recycling collection sites at transfer stations. This was implemented at the direction of the 1989 Plan. These sites which are either staffed or closely monitored (and open only during regular operating hours) provide a convenient recycling opportunity to those residents and businesses which self-haul waste.

- ***Yardwaste collection and composting:*** The County's yardwaste collection system is a complex mix of drop-off sites, private businesses which collect and compost, curbside pickup, and composting at a county-owned facility. As indicated in Chapter 3, the County has significantly reduced yardwaste from an estimated 20% of the disposed waste stream to **4.4%**

Pilot collection program: In 1990 the County began a pilot yardwaste collection program which allows residents to drop-off yardwaste at a reduced cost at the landfill and transfer stations. This drop-off system was built into the County's Minimum Service Levels for Yardwaste Collection (Ordinance #92-22) and continues to be a strong-component of the system, providing self-haulers with opportunities to recycle yardwaste.

A number of private businesses also accept yardwaste and other organic materials for composting, chipping, mulching, and recycling. The Solid Waste Division actively promotes these opportunities in promotional literature, at public events, and whenever residents call.

Pierce County Yardwaste Composting Facility: Taking an aggressive approach to remove yardwaste from the disposed waste stream, the County built a $2.1 million state-of-the art yardwaste composting facility on County-owned property adjacent to the Purdy Transfer Station and the closed Purdy Landfill. The facility is operated through a lease agreement with LRI. It was designed to compost 30,000 tons per year (80 tons per day) and began operation in May 1992.

The facility has garnered international attention for its award-winning design. A constant stream of visitors from all over the world have toured the facility. As a result, there are "sister" facilities being built in other countries. It is a "zero discharge" facility with three acres under roof. Its design includes:

- Collection systems for stormwater, which is channeled into an underground process storage tank for reuse in the composting process.
- A special air control system which alternatively blows air into the yardwaste windrows ("piles") for temperature control, and removes air by vacuum to control odors.
- A biofilter system to also control odors.

Because of its unique design, the facility produces compost and mulch of a consistently high quality. PREP Compost (*Pierce County Recycled Earth Products)* is the end result of the composting process. PREP continues to be a high quality soil amendment much in demand. LRI markets the compost to retail outlets.

The facility has been a good neighbor to nearby residential subdivisions with few odor complaints that have not been speedily resolved. In addition to the closed-loop design of the facility, the siting of the facility takes advantage of the previously unused backhaul capacity of the trucks hauling garbage from the Purdy Transfer Station on the Gig Harbor Peninsula to the landfill, south of Puyallup. Yardwaste collected in the County on the eastern side of Puget Sound is hauled by the solid waste companies to the landfill where it is shredded and then delivered to the facility in the trucks sent to the transfer station to pickup garbage from the Peninsula. In this way, the County is able to economize costs and, at the same time, prevent an increase in traffic over the Narrows Bridge.

The opening of the facility was perfectly timed to coincide with the implementation of a burn ban over much of the County's urban areas and the startup of the curbside collection programs. Because the facility and the collection programs were in place, the County was able to minimize the effects of the January 20, 1993 Inaugural Day Storm. The amount of debris that the storm caused presented residents with a severe problem for disposal. The County acted quickly to provide residents with alternatives to burning and material was collected and composted at the facility.

Within two years, the facility began operating at or over its capacity. In 1998, 42,343 tons of yardwaste was collected and diverted from the disposal stream. The busiest months are usually April, through July. In the two most recent years for which data is complete (1997 and 1998) the yardwaste system processed 120 tons per day, which is well over its 80 ton per day design capacity. Figures 4.3 and 4.4 illustrate the gross tons per months handled by the facility since 1992 and the average daily tonnage.

Curbside Minimum Service Levels (Ord.#92-22): Curbside pickup of yardwaste became available to county residents in May 1992. The County designed the program with the franchised solid waste haulers and recycling businesses with overview of the SWAC. The haulers implement the program through rates approved by the WUTC.

The service is available to single-family residents throughout the county and nearly every city and town. Service boundaries were originally based on the burn ban areas, but like other curbside programs, yardwaste collection has expanded to cover all of the designated urban areas. Cities adopted similar programs through their collection contracts. Only the more rural southern

portion of the County doesn't have curbside service. Eatonville, the farthest away from the facility, is the only city without the service and it is in the process of considering alternatives.

Customers sign-up for yardwaste collection as a separate service from other curbside collection services. Haulers provide customers who choose the service with a 90 gallon wheeled container that is serviced every two weeks throughout the year. The program accepts grass clippings, leaves, weeds, brush, branches, and Christmas trees in season.

For self-haulers and rural residents, the ordinance incorporated the drop-off system into the service levels. Self-haulers are provided service through drop-off at the landfill and transfer stations or at private businesses.

Like the other minimum service level programs, the County designed, produced and paid for the public information materials and continues to maintain public outreach support for the program.

About 96 percent of the Pierce County single-family households that subscribe to garbage collection are given the opportunity to subscribe to yardwaste collection. Of those, approximately 35 percent participate.

Continued growth in customers and in the amount of material is stretching the capacity of the system to compost.

The County also promotes home composting through brochures and workshops and promotes energy conservation landscaping with an emphasis on producing less yardwaste.

- ***Public outreach:*** The objectives of Pierce County's public outreach programs are twofold:

- to provide strong, clear support for recycling collection programs, and
- to focus on waste or "source" reduction and environmental education to encourage residents to generate less waste, dispose of waste in an environmentally sound manner, and to buy products made from recycled materials.

The County began the public information program in 1989 with public opinion surveys and tabloids about solid waste issues. In 1990, the Solid Waste Division expanded the program by producing an extensive, countywide public information campaign for the curbside programs including brochures, media advertising, billboards, and various events. The County continues to provide the support for curbside collection programs.

At the direction of the 1992 Plan, the County's approach has been to ensure all residents receive the same message. All of the promotional materials produced have a unifying theme and logo. The theme *No Time to Waste* and logo appear on bumper stickers, pencils, window stickers, grocery bags, banners, letterheads, and teaching materials. The theme and logo are also displayed on education vans, collection bins, and in slide or video shows. Many of the materials are available on a continuous or by request basis. Others are distributed at public events and workshops.

General outreach materials: The following are among the County's educational tools developed in conjunction with other agencies. Many of the cities and towns have complementary program materials which they distribute to their citizens, including newsletters, utility bill statements, and flyers.

Insert Figure 4.3

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BROCHURES AND FLYERS --- These include information about precycling, composting and composting bins, household hazardous waste, plastic collection sites, drop-off locations for used oil and anti-freeze, and Christmas Tree-Cycling. The County has also produced brochures and bin labels in other languages to support the curbside programs to reach the County's non-English speaking public. Brochures produced by other agencies are also distributed. Packets are made up for school programs or groups such as the Chamber of Commerce or cities. Solid Waste staff has found these brochure packets to be popular distribution items when they are speaking to citizen groups. Many individual requests for material are also made to the office. The County has display stands at County and city offices and the information is supplied to all public libraries and at events.

WASTE REDUCERS NEWSLETTER--- This newsletter, about curbside recycling and other events, is mailed two or three times a year to all single-family residents in the unincorporated County and to city residents upon approval of the individual city. Each newsletter reaches approximately 175,000 County homes. The effect of the newsletter is measured by the support of programs or events mentioned. Recent mailings have generated enthusiastic support for plastics collection drop-off sites, worm composting classes, other workshops, and compost. The effects of the newsletter are measured by the number of phone calls received about a newsletter topic and by participation in workshops or other events discussed in the newsletter.

TELEPHONE INFORMATION LINE : In October 1994, the Solid Waste Division implemented a recorded message information line to answer commonly asked questions from the general public. Residents can call the information line 24-hours a day, 365 days a year, to hear recorded messages about:

- Answers to commonly asked general recycling questions.
- Curbside and multi-family recycling information including on how to sign-up for services.
- Locations of drop-off sites for aluminum, cardboard, glass, ferrous and non-ferrous metals, newspaper, tin cans, and various grades of mixed waste paper.
- Information about plastics drop-off locations.
- Solid Waste Advisory Committee meeting schedule and agenda.
- Landfill disposal locations.
- Household hazardous waste disposal information.
- Christmas tree recycling (seasonal).
- Special environmental event announcements, such as Earth Day activities.
- A list of educational presentations and resources offered by the environmental educators.
- Special storm debris collection programs, if necessary.

The line was introduced to the public in December 1994 through advertisement about the Christmas Tree-Cycling program. It was publicized in various newspapers throughout the Christmas season. As a result, over 1,200 calls were received within the first two weeks of advertising the phone number.

The phone number is advertised throughout the year. The Solid Waste Division monitors the number of calls received weekly and this information is used to determine the success of the advertising.

During 1998, the information line received an average of 91 calls per week for a total of 4,724 calls. The busiest month is usually

January when residents seek information about Christmas tree recycling. The largest number of phone calls are about recycling programs followed by the information on disposal locations and where to take household hazardous waste. The December '96 storm generated 2,188 calls in the three weeks between January 3rd and the 26th, 1997.

INTERNET HOME PAGE: In 1996, information about Pierce County's solid waste management, recycling, and waste reduction activities was added to the County's homepage. Users can look up information on drop-off sites, references to hauling companies, information about composting, education curricula, the *GreenHouse*, and much more. Internet browsers can submit questions or order free brochures by e-mail.

Special programs and exhibits: By far the most popular of the public outreach programs are the events and award-winning exhibits developed by the County. Publicity about these activities has generated interest across the nation from others interested in developing similar programs to promote waste reduction and recycling.

THE GREENHOUSE EXHIBIT: In 1993 the County built the *GreenHouse*, a 875 square foot (43' x 27') modular home which displays contents created entirely from recycled, reused, and non-toxic materials. The materials used in the structure and displayed throughout demonstrate the end result of the recycling process to the public. In a real-life home setting people can learn how they can complete the recycling loop by buying products made from recycled materials.

The exhibit also demonstrates the use of environmentally responsible products and materials containing recycled content in home construction; provides examples of environmentally sound practices around the home; and informs the public on the variety of recycled products and where they can be purchased locally or in the State. Outside the exhibit are techniques demonstrating the composting of yardwaste and outdoor products from recycled material, including the yardwaste compost.

Reflecting a partnership between County government and a host of private companies, the *GreenHouse* showcases a united public-private message about the need to purchase items containing recycled content. More than half of the materials used in the construction of the *GreenHouse* and its display items were donated. Sixty-five percent of the costs paid by Pierce County were recovered through grant and remaining costs were financed through the Solid Waste Fund. Major sponsors support moving costs for the exhibit. The County regularly displays new products and produces a *Guide to the GreenHouse Suppliers.*

The *GreenHouse Exhibit* is displayed annually at the Fall Puyallup Fair and has been shown at the Tacoma Dome Home and Garden Show, the Washington Home Decorating & Remodeling Show, and in Portland, Oregon at the 1994 national conference of the National Recycling Coalition. Because the Puyallup Fair is the sixth largest in the country, a substantial number of people have visited the exhibit. Over 260,000 people visit the *GreenHouse* each year. A number of articles about the Exhibit and the products it displays have been printed in local, state, and national magazines and newspapers.

ENVIRONMENTAL EDUCATION EXHIBIT: In 1991, the County expanded its outreach programs with exhibits for the Spring Puyallup Fair and with small traveling exhibits which can be set-up in libraries or other special events, upon request. The County also has exhibits at the Pierce County Fair in August. The Spring Environmental Education Exhibit fills a 7,400 square foot building at the Puyallup fairgrounds with hands-on activities for kids and their parents. It has a little something for everyone. Some examples include: the award-winning *Environmental Shopping Game*; the Environmental Wheel; arts and crafts made from "waste" materials; and an *Eco-tainment Stage* which has included a recycling magician and plays. Sections of the exhibit also have included information about water conservation, composting, office recycling, air quality, a natural gas powered Pierce Transit bus, electric bicycles, and Salmon habitat. During 1996 and 1997 the Exhibit included an Environmental Quiz to test visitors' environmental knowledge and a landscaped area with water conservation plants.

BAGHUNGER: In cooperation with all solid waste haulers and the Emergency Food Network, the County and its cities sponsor a canned food drive to celebrate Earth Day in April. The program also promotes curbside recycling. The County pays for newspaper advertisements, postcards, and newsletter promotion. Printed grocery bags advertising the program are distributed to curbside residents. The haulers pick-up canned foods set-out by residents with their curbside recyclables and take them to the local food banks. In five years, this month-long, cooperative celebration of Earth Day has collected 135 tons of food for the Emergency Food Network, a nonprofit distributor of food to 60 emergency food banks. Thirty-eight tons were collected in 1997 and 38.5 tons in 1998.

■ ***Educational programs:***

Curricula: Education based on responsible waste management has been provided in Pierce County since the fall of 1988. With the exception of the Tacoma school district, the program is available to all public, private, and home schools in the county and is geared to all grade levels. The County also provides programs to Fort Lewis and McChord schools upon request. (Tacoma's educational programs are described in the section about Tacoma's recycling programs.)

The main component of the program is a classroom presentation called *There's No Time to Waste*. The presentation examines the problems associated with solid and hazardous waste disposal and presents waste reduction and recycling as the most effective management options. The relationship of these waste management techniques to environmental benefits is stressed as well. Each student is provided with a packet of information that includes brochures on precycling, composting, alternatives to household hazardous products, and an activity sheet that reinforces the message of the lesson. Teachers receive lesson plans and a resource list that helps them develop a unit on waste for their classroom.

Educators also work with schools and local recyclers to provide assistance for setting up systems for in-classroom recycling, waste reduction, and composting. In recent years, solid waste staff have coordinated with other Pierce County departments and agencies to provide a more interdisciplinary approach to waste education and environmental issues. The solid waste presentation *There's No Time to Waste* dovetails conceptually with presentations titled *Water We Doing? Watersheds and You*, and *Bite of the Finite*. these programs focus on water resources, pollution prevention, and wise resource use.

The Solid Waste Division has pioneered other environmental educational formats. The Division coordinates with agency educators from water and air programs to set up an "Enviro-Fair" in schools. This is a multi-disciplinary event that serves to excite teachers and students about environmental education activities. Staff educators are responsible for promoting, scheduling, setting up, and staffing activity stations that teach mini-lessons on waste to small groups of students. In 1997, the Division offered eight Enviro-Fairs for public and private schools. Activities include:

- an examination of the ecology of a worm bin and compost pile using magnifiers;
- the reuse potential of trash in art projects;
- a story telling session on reuse;
- an activity that gives students an opportunity to learn how to make consumer choices that reduce the volume and toxicity of waste; and
- the construction of a watershed model that illustrates the effects of improper waste disposal on water resources.

In addition to providing education to the schools during the academic year, Division educators have developed a full schedule of summer activities with the day camp program operated through the Pierce County Parks Department and provide presentations and activities for the local scout groups.

Lending library/referral center: The Division maintains a lending library of educational materials for educators. Videos, curricula, books, and educational materials are loaned to teachers, scout leaders, and homeschoolers. Activity kits used by the in-house educators are loaned out as well. An activity kit that enables groups to stencil storm drains to discourage dumping of hazardous materials also includes door-hangers with tips to encourage responsible waste management.

Methodology for developing new school curricula: Curricula is developed to conform to the goals and objectives outlined in the Plan. The main, broad goal is to instruct people with the knowledge and motivation to reduce waste by practicing responsible consumer choices and by recycling.

To ensure that the message is effectively delivered and received by the community, evaluation is an integral part of the program. An evaluation is left with each teacher that receives a presentation or that participates in other educational events. The evaluations encourage educators to provide feedback to enable us to refine the program to fit their needs. Because of the success and longevity of the program, Division educators have recourse to a network of educators, youth group leaders, and school administrators that are receptive to trying new activities. Before curricula is mainstreamed, it is piloted with those educators that can be relied on to provide constructive feedback.

Adult Education: The Division also sponsors events and programs to educate adults on responsible waste management. Teacher workshops have been held on topics ranging from waste curricula to how to use the Internet to obtain environmental education resources. Workshops on composting and worm bins have been provided for local community garden groups and through the community college system. Workshops on developing and operating mid-size composting facilities have been coordinated for landscape professionals. Division staff also present information for speaking engagements and provide staff for exhibits at community events.

During 1997, the education program took solid waste and water education to over 15,000 people. As an example of activities that can occur in one quarter of the year: teachers made 97 presentations on solid

waste or water to 3,000 K-12 grade students; conducted four workshops on sustainable consumerism, worm composting, and Water Education and Aquatic Wild for teachers in the 4th quarter of 1996.

■ ***In-house recycling and procurement:*** Pierce County has had an in-house recycling collection program and a procurement policy since 1989/1990.

In-House Recycling: The County contracts for deskside collection of recyclable materials to employees in more than seventy offices. Each County employee has a desk-side system of bins which encourages recycling of waste paper and other items. Central collection systems for items such as newspaper, aluminum and tin cans, glass, plastics and laser cartridges are located for each office. Where possible, larger containers for other material such as cardboard and glass are placed outside. More than 21 different recyclable materials are diverted from the County's waste stream.

Waste reduction and recycling information is supplied to each new employee. Solid waste staff have produced and distributed information on duplex printing, print size reduction, paper reuse, etc.

In 1998, more than 415 tons of recyclable materials were diverted away from disposal.

The following Table 4.5 details the materials and tonnage recycled by County employees.

Table 4.5 In-House Recycling Materials and Tonnage
Pierce County's Deskside Recycling Program

Commodity	1995	1996	1997	1998
Mixed Paper	138.25	137.28	140.62	182.64
Cardboard	69.62	55.08	43.10	49.84
White Ledger Paper	67.39	63.13	65.82	55.31
Computer Paper	32.59	35.57	37.29	31.76
Newspaper	31.50	33.22	14.04	5.18
Colored Ledger Paper	4.62	49.23	82.54	81.57
Phone Books	2.45	2.46	.13	2.54
Tin	5.29	5.28	5.22	5.06
Aluminum Cans	0.64	0.68	.64	.81
Glass	0.41	0.46	.30	.33
Woodwaste	0.15	-0-	-0-	-0-
Plastic	0.12	.04	.03	.10
Laser Cartridges	0.01	.01	.01	.02
TOTAL TONS	**353**	**382.45**	**389.73**	**415.15**

Procurement: Pierce County Ordinance #90-129S was adopted in December 1990 to set guidelines for the procurement of recycled paper and paper products by the County. In 1992, the County sponsored workshops for other governments about procurement policies and the availability of products. The 1995 goal was to have 60% of the paper purchased by the County to have recycled content. An estimate of the County's recycled paper purchases is not available. Formerly, a large proportion of paper was purchased through a central print shop by staff who were knowledgeable about paper with recycled content. Tracking the quantities with recycled content was fairly easy through this centralized purchasing system. Purchases are now made from several departments and tracking them is more complicated. However, it is believed that paper with recycled content has become the standard.

The County uses PREP compost from the Purdy Yardwaste Composting facility for landscaping projects for County facilities and parks. PREP is made from yardwaste collected through the County recycling program and processed at the facility.

Other departments have found innovative ways to recycle materials. In the Public Works and Utilities Department, the Transportation Division sends old, damaged signs to Walla Walla State Prison to be refurbished or made into new highway signs; recycles or retrofits old broken four-by-four sign posts; and recycles right-of-way material removed by utility companies. The County collects antifreeze for recycling and buys back recycled antifreeze for use in all vehicles. By 1992, 75% of the tire purchases for the vehicles maintained by the County consisted of retread tires. As of January 1997, re-refined oil is used in all County-owned vehicles.

Information is not available about procurement actions of other cities and towns or how effective the State's programs have been. (Both Fort Lewis and McChord Air Force Base have implemented substantial, award-winning programs which are discussed later in this chapter.)

In late 1996, the Federal government substantially stepped up its approach to procurement. EPA revised its *Comprehensive Guidelines for Procurement of Products Containing Recovered Materials* which designates 19 recycled content products that government agencies are required to purchase. The Guidelines are a result of President Clinton's 1993 Executive Order #12873 to increase the government's use of recycled content paper by 30% by 1999. The federal government represents the single, largest purchaser of paper products in the nation.

The idea behind federal, state, and local government taking the lead in using products with recycled content is to use their joint purchasing power to support the growth of businesses producing products from recycled materials.

Commercial recycling: While State law requires local government to establish and oversee residential recycling programs, it prohibits counties from regulating recycling services provided by the commercial sector. In January 1995, the federal government preempted the authority of the Washington Utilities and Transportation Commission (WUTC) to set rates and define service territories for carriers of general commodities, including commercial recycling. Although the WUTC no longer regulates rates or service areas, commercial recycle haulers must possess a common carrier permit issued by the WUTC and must show proof of insurance to operate in the state.

Given this free market arena, the 1992 Plan recommended that the role of the County in commercial recycling be one of education, information, and coordination with the private sector as already described in other sections of this chapter. Pierce County has long held that the regulation of commercial recyclers is unnecessary. Unlike a residence, many commercial establishments can generate large volumes of recyclable materials at one location. As a result it is becoming cost-effective for a recycling collector to work with a business to set up collection programs tailored for the particular company's needs.

Staff in the Solid Waste Division have monitored the growth of commercial recycling collection over the last six years. Upon request, staff provides information to businesses about what commodities are recycled in the County and who are the businesses to contact for services. The Solid Waste staff has met with a number of large corporations that have moved to the County to provide them with information about recycling collection opportunities in the county. It is a very competitive market. The number of tons of recyclable commercial solid waste requiring disposal has decreased since 1993 which indicates, in part, that commercial waste generators are taking advantage of the many private sector recycling opportunities now available. At the end of 1995, more than **1,000 Pierce County businesses received recycling services** from the local haulers. According to the 1995 Waste Characterization Audit, the commercial sector **disposed of 6.6 percent less tonnage** in 1995 as compared to 1994.

Over the last few years as residential collection programs and recycling education programs have grown, national and local industry associations have taken on the role of promoting waste reduction and recycling within their industries. This is particularly true for large businesses where waste reduction and recycling provide opportunities to reduce overhead costs and where disposal costs have risen substantially.

In Pierce County it appears that smaller businesses may lack the information about opportunities or the role waste reduction and recycling might play in reducing or, at least, preventing serious increases in disposal costs. It is likely that substantial increases in disposal costs will impact these businesses.

■ ***Awards:*** Recognition of leadership comes in many ways. The County has received a number of awards for its waste reduction and recycling programs including:

- **1990: Washington Waste Management Association's** Solid Waste Management Program Innovation Award (Presented to acknowledge Pierce County's innovation and leadership which led to the first countywide recycling program in Washington State.)

- **1991: Washington State Recycling Association's Annual Award**

- **1992: Washington Department of Ecology's** *Best Large Government Program Award*

- **1992: Solid Waste Association of North America's** *Meritorious Achievement Award for Pierce County Environmental Education Exhibit*

- **1993: City and State Magazine's Environmental Achievement Award** *for Pierce County's leadership in recycling, particularly state-of-the art Yardwaste Composting Facility at Purdy*

- **1994: Washington Department of Ecology's Solid Waste Education and Recycling Award** *Best Western Washington Government Program.*

- **1994: National Association of County Information Officer's Meritorious Achievement** *Citizen Education Projects--the GreenHouse*

- **1994: National Recycling Coalition's** *Public Education Award for the GreenHouse*.

- **1996: American Planning Association and the Planning Association of Washington** *Honor Award for the Pierce County Landfill Siting Project, Phases 1 and 2* (In conjunction with Parametrix, Inc.)

- **1998: National Association of County Information Officers (NACIO) Awards of Excellence** *Meritorious Award for the Bag Hunger/Curb Hunger Food Drive.*

4.3.2 Cities and Towns

The following table summarizes city and town recycling and waste reduction programs.

Table 4.6 (4/98) **CITY OR TOWN**	**RESIDENTIAL RECYCLING PROGRAMS** **Curbside collection programs**			**OTHER WASTE REDUCTION AND RECYCLING PROGRAMS** Such as: special spring or fall clean-up collections,[3] procurement policies; in-house recycling collection from city employees.
	Single Family - three bins for glass, cans, and newspaper; mixed waste paper[4] and cardboard	**Multi-Family**[5]	**Yardwaste** Includes a 90 gallon, wheeled container	
Bonney Lake	Biweekly	✓	Biweekly	• Spring cleaning pickup • In-house recycling
Buckley	Biweekly	✓	Biweekly	• Spring cleaning pickup • In-house recycling
Carbonado	Biweekly	✓	Biweekly	• In-house recycling
DuPont	Biweekly	✓	Biweekly	• Spring cleaning pickup
Eatonville	Biweekly	✓		
Edgewood	Biweekly	✓	Biweekly	• In-house recycling
Fife	Biweekly	✓	Biweekly	• In-house recycling

[3] Spring or fall special collections often include pickup of appliances and other metals or recyclable materials for recycling.

[4] Mixed waste paper includes magazines, catalogs, phone books, "junk mail," and unlined cereal and soap boxes. They are placed in a paper grocery bag along with the bins. Corrugated cardboard is flattened and set underneath the bins for collection.

[5] Multi-family recycling systems vary by types of containers, size of complexes, timing of pickup, and differences in hauling company programs. The service is provided to complexes, condominiums, and mobile home parks.

Table 4.6 (continued) **CITY OR TOWN**	**RESIDENTIAL RECYCLING PROGRAMS** **Curbside collection programs**			**OTHER WASTE REDUCTION AND RECYCLING PROGRAMS**
	Single Family	**Multi-Family**	**Yardwaste**	
Fircrest	Weekly	✓	Biweekly	• Spring cleaning pickup • In-house recycling similar to MF system with some desk collection bins.
Gig Harbor	Biweekly	✓	Biweekly	• In-house recycling
Lakewood	Biweekly	✓	Biweekly	• Spring cleaning pickup
Milton	Biweekly	✓	Biweekly	• Spring cleaning pickup • In-house recycling
Orting	Biweekly	✓	Biweekly	• Spring cleaning pickup • In-house recycling • Curbside pickup of #1 PETE and #2 HDPE plastic.
Puyallup	Biweekly	✓	Biweekly	• The City uses a single, large container with removable, interior bins for source-separation. • Spring cleaning pickup includes extra recyclables, yardwaste, appliances. • Procurement Policy • In-House Recycling
Roy	Biweekly	✓	Biweekly	
Ruston[6]	Weekly	Weekly	Weekly	• All curbside recycling and yardwaste programs are also provided to commercial customers. • In-house recycling
South Prairie	Biweekly	✓	Biweekly	

[6] The small Town of Ruston has its own collection utility and has an Interlocal Agreement with Tacoma for disposal in Tacoma's waste management system.

Table 4.6 CITY OR TOWN	RESIDENTIAL RECYCLING PROGRAMS Curbside collection programs			OTHER WASTE REDUCTION AND RECYCLING PROGRAMS
	Single-Family	Multi-Family	Yardwaste	
Steilacoom	Biweekly	✓	Biweekly	• Spring cleaning pickup, which includes appliances, metals, household goods, for charities and yard trimmings. • Two additional pickups for yard trimmings with one in the fall. • In-house recycling • Christmas tree recycling
Sumner	Biweekly	✓	Biweekly	• Biweekly curbside collection of #1 PETE and #2 HDPE plastic. • Spring cleaning pickup • In-house recycling
University Place	Biweekly	✓	Biweekly	
Wilkeson	Biweekly	✓	Biweekly	• In-house recycling
Tacoma	Biweekly	✓	Biweekly	(See section 4.4 for details about all Tacoma's programs.)

4.3.3 Needs, Alternatives, and Evaluation Criteria

Pierce County has nine years of experience in building a solid, public-private partnership to meet the requirements of RCW 70.95 and all required programs have been successfully implemented. The hauling and recycling companies have become very good at collecting, processing, and marketing recyclables despite downturns in the price of recyclable commodities. The County successfully implements strong, interactive public education and outreach programs which are used as models in other jurisdictions. Cities and towns, citizens, and businesses have responded with public support and participation to reach and surpass the 50% recycling goal.

The County and its cities and towns have not had to rely upon mandatory recycling collection or landfill bans to achieve this success. Instead they have relied upon the economies of scale resulting from public outreach programs coordinated with all jurisdictions and private companies and upon a program emphasis on source-separation. Private industry has provided the processing capacity.

This approach has kept the programs comparatively low-cost, efficient, and flexible to meet needs expressed by residents. The cost for collection has remained roughly $2 per month per household since inception in 1990. Funding from the tipping fee for the County's administration of the entire solid waste management program remained at $5.83 per ton for seven years with an increase to $7 in the fall of 1998. The only processing capacity cost has been the $3.28 per ton for the Purdy Yardwaste Composting Facility with the scheduled payoff of the bonds for the facility to occur in 2001.

While the system has grown substantially and effectively, it still has not reached maturity. There are still plenty of opportunities for continued growth.

For the next stage, the five-year strategy should focus on:

- How to maintain the achieved successes while keeping programs low-cost, efficient, and flexible.
- How to improve and enhance existing programs to increase diversion.
- How to target those recyclable commodities which offer opportunities to increase maximum diversion.
- How to reduce the amount of waste generated per person.
- Determining new goals to strive to achieve during the next five years

Commodities: The 1995 Waste Characterization Audit was completed to determine new directions for the County's programs after all the required programs were in place. It identified **paper** of all kinds (26.9%), **organics** (foodwaste, yardwaste, and compostable material-27.6%), and **construction debris** (20.2%) as contributing to the largest percentage of the County's remaining disposal waste stream. In 1995, these materials made up nearly 75% of the waste being disposed. Of course, not all of these materials are recoverable for recycling but there are opportunities in all sectors -- residential, commercial, and self–haul -- to increase diversion. If one-third of the total 1995 tonnage of these materials had been recycled or diverted or composted the waste stream would have been reduced by about 19%.

The Audit also identified that there are opportunities for improved diversion in all the other materials (glass, steel and aluminum cans) picked up at the curb, although the lower percentages indicate that tonnage contributions by individual materials would be relatively small.

Plastics (9.6%) offer opportunities for significant tonnage diversion, particularly film plastics from the commercial sector, if markets improve.

Programs: The major overall programs needs are:

#1. To maintain the successes of the existing collection programs, and

#2. To continue the public outreach and educational support of the source-separation system.

The following needs have been identified to enhance and improve the County's recycling and waste reduction programs. No need has been identified to completely change the existing approach.

■ *Residential curbside and yardwaste collection, single-family and multi-family:*

- To maintain effectiveness of single-family programs and increase diversion of recyclables while contending with growth in the use of larger, automated garbage containers.
- To increase resident's participation and reduce contamination in multi-family recycling collection programs, particularly in areas with "transient" populations and "transient" managers.
- To increase composting capacity for yardwaste and compostable organics to enable existing collection programs to expand and new programs to develop.
- To add curbside pickup of plastics to residential collection, when cost-effective.
- To increase source-separation of recyclables in the residential self-haul sector.

■ *Drop-off/buy-back collection:*

- To enhance maintenance and reduce illegal dumping and contamination at recycling drop-off collection sites.

■ *Education programs:*

- To find ways to continue support for teacher certification workshops in the face of loss of State funding and curricula support.
- To develop alternative incentives to replace the loss of State school awards for waste reduction and recycling programs.
- To cost-effectively increase adult education programs on waste reduction, recycling, and pollution prevention.

■ *In-house recycling and procurement*:

- To improve tracking of procurement of recycled products and to set new goals for the County's procurement program.
- To improve coordination and sharing of information with other cities and towns to encourage them to establish and achieve procurement goals.
- To promote the use of compost in city and town landscaping, highway, and erosion control projects.
- To identify problems and work with the State to resolve the mixed messages from State and the new Federal levels on procurement, and to encourage improvement in the State's leadership and coordination.

■ *Public outreach and waste reduction:*

- To maintain effectiveness of existing programs focusing on recycled products and

waste reduction efforts and to develop new outreach activities.

- To support additional adult education programs on waste reduction, recycling, home composting, and pollution prevention.

- To maintain and improve the effectiveness of existing support of recycling collection programs.

- To recognize the waste reduction and recycling efforts of local businesses and to create incentives for other businesses to have their efforts recognized.

- To maintain support, coordination, and promotion of special collection programs, such as Christmas Tree recycling, used oil collection, Bag Hunger, and household hazardous waste.

- To evaluate the potential of the Federal Government's relatively new product labeling guidelines and the State's procurement initiatives, and to determine the County's role to support, promote, or explain these to the general public and other local governments.

- To develop new educational messages to promote source reduction to achieve a decrease in the amount of waste being generated in the County.

■ *Commercial recycling collection:*

- To develop cost-effective methods to encourage and assist the commercial self-haul sector to source separate CDL (construction, land clearing, and demolition debris) at the job site and to divert these materials from the disposed waste stream.

- To encourage businesses to avail themselves of private sector recycling collection opportunities.

- To encourage businesses to put into practice waste reduction techniques.

- To encourage and support increases in private sector capacity for processing recyclables and to develop capacity for composting of organic waste from commercial and institutional sectors.

- To promote the State code requirements for outdoor container space for multi-family and commercial/industrial development.

■ *Marketing:* The County's role in marketing has been to promote collection, source reduction, and the use of recycled products directly to the consumer, leaving to the State the role of regional market development and research. Low-cost opportunities identified to continue this consumer-oriented role are:

- To continue public outreach promotion of the use of recycled products, particularly products available in Washington and locally in Pierce County.

- To provide the developers of the County's long-range economic plan with information about the types of recycling businesses in Pierce County, their economic role and potential for growth, and the supportive structure in Pierce County which attracts, and which can be used to continue to attract, these businesses.

- To identify roadblocks (other than depressed commodity markets) to the siting of new or expanding of existing recycling businesses and to encourage continued economic policy support for the growth and siting of these businesses in Pierce County.

■ *Data Measurement:*

- To continue to maintain the data collection system and to conduct waste characterization audits regularly to continue to monitor the effectiveness of the programs.

Action alternatives: The following Table 4.7 illustrates three alternative approaches and action items. Each alternative is progressively more aggressive towards removing recyclables from the waste stream. They range from: 1) a low-key, predominantly public outreach approach which concentrates on diverting materials within existing collection systems; to 2) a moderate, slightly more costly approach which will require additional costs for capital facilities and staff but still mostly focuses on diversion; and 3) a more expensive capital-intensive approach which concentrates on removal of all recyclables from the disposed waste stream. The facilities do not necessarily have to be built and owned by the County or other municipality. Facility capacity could be developed by private businesses as in the past. The alternatives are grouped by programs but the commodities that would be targeted as priorities are listed within each alternative and they correspond with the waste audit recommendations. Table 4.8 and 4.9 provide evaluative criteria.

Table 4.7	WASTE REDUCTION AND RECYCLING PROGRAM ALTERNATIVES	
PROGRAMS	**ALTERNATIVES** [7]	**ACTIONS TO IMPLEMENT**
1) Residential Collection Programs • Single-Family Curbside Collection • Multi-Family Curbside Collection • Yardwaste Curbside Collection • Residential Self-Haul	**1A) Low-Key, Low-Technology Approach** • Increase diversion of all commodities through existing curbside programs. • Increase diversion of yardwaste and expand public or private composting capacity. • Increase diversion of all commodities through self-haul and drop-off sites. **Commodities targeted:** • Glass, tin and aluminum cans, newspapers, mixed-waste paper, cardboard, yardwaste. • New focus on self-haul CDL and woodwaste	**In addition to established activities:** ✓ <u>Public outreach to residential customers and residential self-haulers:</u> • Use focus groups to survey needs and direction for programs. • Re-energize/revise public outreach efforts targeting haulers' single-family and yardwaste customers. Consider using targeted mailings for specific geographic areas. Consider using multiple mailings throughout the year to single-family customers focusing on different, specific commodities each time. • Work with the haulers to revise promotional and collection efforts targeting multi-family residents and complex managers. Aim at increasing diversion and decreasing contamination. Devise a system to better deal with "transient" residents and managers. • Develop new outreach programs to encourage more self-haulers to source-separate recyclables. • Increase the number of drop-off sites for all materials. ✓ <u>Expand composting capacity for yardwaste:</u> • Increase through-put at Purdy facility through support of Green Mulch program and other activities or facility modifications. • Explore the potential for public or private facility co-composting of yardwaste with biosolids. • Encourage siting of new privately-owned composting facilities and/or add modular capability to other transfer stations. • Encourage self-haulers to home compost yardwaste and to use mulching mowers. ✓ <u>New program:</u> Complete and implement public outreach program aimed at encouraging developers of new multi-family complexes and commercial buildings to meet State Building Code requirements for adequate outdoor storage space for garbage and recycling containers. ✓ <u>New self-haul program:</u> • Modify transfer stations to encourage source-separation of CDL from residential and commercial self-haulers. • Consider a rate deferential for self-haul residents to encourage source-separated CDL and woodwaste.

[7] ▲ **Low-Key, Low Technology Approach:** The theme of this approach is maintaining the existing system with additional, or more aggressive public education and outreach programs. It relies upon the incremental growth of the private sector in collecting and marketing recyclables. It includes developing additional capacity to compost.
▲ **Moderate Approach:** This approach would include most of the public outreach activities listed under the low-key approach but would have additional and more aggressive public outreach programs which would require more staff and some capital facility costs. It would include new programs with the commercial and development community.
▲ **Aggressive, Capital -Intensive Approach:** This approach is more technological, focusing on removal of all recyclables from the waste disposal stream through developing a publicly or privately-owned recycling facility to sort commingled recyclables or a "dirty MRF" to sort recyclables from the municipal waste stream; building additional composting capacity; and implementing more expensive public outreach activities.

Table 4.7	WASTE REDUCTION AND RECYCLING PROGRAM ALTERNATIVES	
PROGRAMS	**ALTERNATIVES**	**ACTIONS TO IMPLEMENT**
1) Residential Collection (continued) • Single-Family Curbside Collection • Multi-Family curbside collection • Yardwaste curbside collection • Residential Self-Haul	**1B) Moderate Approach** • Add commodities to curbside collection for single-family and multi-family households. • Divert foodwaste/ compostable paper from residential waste stream. • Encourage self-haulers to divert more material or to source-separate. **Commodities targeted:** • Same as listed in the Low-Key Approach. • New emphasis on plastics, foodwaste, compostable paper. - **1C) Aggressive Capital-Intensive Approach** • Move to a commingled recyclables and commingled organics collection program. (wet/dry system) **Commodities targeted:** • Same materials as in Low-Key and Moderate Approach.	**In addition to the items listed under the low-key approach:** ✓ New program: Develop a countywide collection program for curbside pickup of plastics. This may require an additional curbside bin or even a change in types of bins. Requires a change to Minimum Service Levels ordinances. ✓ New program: Develop a new countywide collection program for foodwaste and compostable paper. Requires a change to Minimum Service Levels ordinances. Consider revising the yardwaste collection system in terms of when materials are collected and the bin system needed to accommodate additional organics collection. ✓ New program: • Provide low-cost compost bins (yardwaste and/or worm) to single-family residents and self-haulers. • Develop staff-assisted home composting program with a focus on both yardwaste and foodwaste. ✓ Public outreach to customers: Expand public outreach activities to promote new programs listed above. ✓ New composting facilities: Site a new County-owned facility or a jointly-sponsored County/Tacoma/Fort Lewis Composting Facility if no new privately-owned facility develops. ✓ New, small-scale CDL MRF: Site a county-owned or privately-owned, small-scale CDL MRF at transfer stations. -

Table 4.7	WASTE REDUCTION AND RECYCLING PROGRAM ALTERNATIVES	
PROGRAMS	**ALTERNATIVES**	**ACTIONS TO IMPLEMENT**
2) Drop-Off/Buy-Back Collection Programs	**2A) Low-Key, Low-Technology Approach** • Work with the recyclers to resolve maintenance/ contamination problems of drop-off sites. • Promote more use of buy-back centers to the public. **Commodities targeted:** • Glass, tin and aluminum cans, newspapers, mixed-waste paper, plastics, and cardboard.	✓ Public Outreach: • The County could work with the buy-back businesses on more coordinated public outreach activities. Perhaps a promotional campaign using advertising, billboards, etc. could focus on one commodity each three months, in coordination with recycling businesses' promotions. The County could work with businesses to establish similar road signage, coordinated advertising, etc. • The County could work with the buy-back businesses to increase their visibility to the general public. Maybe the businesses could be a focus of the Spring Fair or other exhibits. ✓ Drop-off system improvements: • The County would work with the recyclers/haulers to improve drop-off sites, location of sites, bin capacities, types of materials collected, and service frequency. The County would develop an aggressive public outreach campaign to discourage inappropriate use of drop-off sites and coordinate this with a campaign to discourage illegal dumping and improper storage of waste. • The County could develop a mailer aimed at small businesses to encourage them to use drop-off sites for recyclables and including other waste reduction tips.
3) Data Measurement Programs	**3A) Low-Key, Low-Technology Approach** • Continue maintenance of countywide data collection system. • Conduct more frequent waste characterization audits. • Conduct audits of specific waste generation sectors. **Commodities targeted:** • All commodities	**In addition** to gathering commodity data, working with recycling businesses on annual state data, and Annual Reports, the County would: ✓ Plan the frequency for waste characterization audits of the full waste disposal stream and budget accordingly. Identify when audits need to be done on specific generation sectors, such as the self-haul sector.

Table 4.7 WASTE REDUCTION AND RECYCLING PROGRAM ALTERNATIVES		
PROGRAMS	**ALTERNATIVES**	**ACTIONS TO IMPLEMENT**
4) Commercial and Industrial Businesses Waste Reduction and Recycling Programs	**4A) Low-Key, Low - Technology Approach** • Increase diversion of all commodities by encouraging use of commercial collection programs, such as curbside pickup, one-time pickups, and drop-off programs. • Increase diversion of CDL, woodwaste, paper, film plastics from commercial self-haulers. • Increase diversion of foodwaste, yardwaste, compostable paper from commercial-industrial sector. **Commodities targeted** • Glass, tin and aluminum cans, newspapers, mixed-waste paper, and cardboard. • Increased focus on self-hauled CDL, woodwaste, paper, and film plastics. • Increased focus on commercial/industrial sector foodwaste, yardwaste, and compostable paper.	✓ <u>New public outreach program:</u> • Use focus groups to survey commercial/industrial sector to establish issues, interests, and knowledge about waste reduction and recycling. Use focus groups to survey association of general contractors about knowledge of source-separation of CDL and woodwaste at the job-site. • Develop a new public outreach program for the business community about waste reduction and recycling and availability of private recycling collection programs in Pierce County. • Bring to the attention of the local business community information about the new Federal procurement guidelines for Federal agencies, EPA actions on procurement, and EPA Wa$te Wi$e Program and potential benefits for participating in some of these programs. • Develop public outreach program for commercial self-haul sector with an aggressive focus on diverting CDL and woodwaste. • Develop a new public outreach program directed at businesses about the availability of in-county services to divert CDL and woodwastes. Coordinate promotion activities with existing service businesses to encourage recycling of these materials. • Work with "do-it-yourself" and other hardware/construction stores to promote waste reduction and recycling of CDL and woodwaste. • Work with other cities and County departments on source-separation of CDL and woodwaste on municipal projects. • Develop a public outreach program to work with development community on source-separation at the job site. • Promote any commercial yardwaste/foodwaste collection programs developed by private composting businesses. • Use an annual award program to encourage businesses to recognize their waste reduction and recycling efforts. • Work with the commercial/industrial development companies to meet State Building Code requirements for providing adequate outside storage containers for garbage and recycling. ✓ <u>Modify transfer stations</u> to allow for source-separation of CDL and woodwaste by self-haulers. ✓ <u>New program:</u> Encourage haulers to develop collection program for yardwaste or other compostable materials from commercial/industrial sector. This program will need additional composting facility capacity

Table 4.7 WASTE REDUCTION AND RECYCLING PROGRAM ALTERNATIVES		
PROGRAMS	**ALTERNATIVES**	**ACTIONS TO IMPLEMENT**
4) Commercial and Industrial Waste Reduction and Recycling Programs (continued)	**4B) Moderate Approach** • Develop a public outreach campaign aggressively promotes recycled products and waste reduction. • The County would aggressively encourage the commercial sector to source-separate CDL, woodwaste, film plastics, and paper. **Commodities targeted:** • Glass, tin and aluminum cans, newspapers, mixed-waste paper, and cardboard. • Increased focus on self-hauled CDL, woodwaste, paper, and film plastics. • Increased focus on commercial sector foodwaste, yardwaste, and compostable paper.	**In addition to programs listed under the Low-Key, Low Technology approach:** ✓ New program: Develop hands-on workshops about waste reduction techniques for small businesses. ✓ New program: Work with grocery stores on more aggressive buy-recycled campaigns. Utilize private or non-profit "green" rating services to identify and publicize products made from recycled material or which are less toxic. ✓ New program: Work with Economic Development Board/others to develop long-range economic plan to attract more recycling industries to Pierce County. Work with local industries to use recycled materials for feedstocks. ✓ New self-haul program: • Require commercial self-haulers to source-separate CDL and woodwaste at transfer stations. • Develop a rate deferential as an incentive. ✓ New, small-scale CDL MRF: Site a county-owned or privately owned small scale CDL MRF at transfer stations. ✓ Public Outreach: • Develop an aggressive, promotional campaign to promote programs listed above. • County could assist haulers and other recyclers in promoting their commercial collection programs. • Develop public outreach programs to encourage large commercial/industrial businesses to site small-scale, on-site facilities for handling their own compostable waste. This might conflict with the development of a new countywide commercial collection program.
	4C) Aggressive , Capital-Intensive Approach • Divert all recyclable commodities by sorting commingled, route-collected municipal solid waste.	✓ New facility: Site a County-owned or privately-owned material resource recovery ("dirty" MRF) facility that sorts recyclables from the municipal waste stream. ✓ New Program: Assign Solid Waste staff responsibility to work with individual members of the development community to design job-site source-separation systems for specific development projects. ✓ Enact landfill bans on certain commodities, such as CDL.

Table 4.7 WASTE REDUCTION AND RECYCLING PROGRAM ALTERNATIVES		
PROGRAMS	**ALTERNATIVES**	**ACTIONS TO IMPLEMENT**
5) Special Collection Programs Christmas trees, household hazardous waste, used oil, BagHunger	**5A) Low-Key, Low-Technology Approach** • Continue coordinated special collection programs. - **5B)Moderate Approach** • Develop a more aggressive public outreach campaign.	✓ Continue to plan and budget for public outreach promotion of collection programs. -

Table 4.7 WASTE REDUCTION AND RECYCLING PROGRAM ALTERNATIVES	
PROGRAMS	**ACTIONS TO IMPLEMENT**
7) Public Outreach Programs Since 1990, Pierce County has taken a very aggressive approach to designing and implementing public outreach and school education programs. Therefore, alternatives cannot be characterized as low, moderate, or aggressive. The issue is whether the County wants to reduce, maintain, or expand the public outreach programs by increasing the budget and the staff. **8) School Education Programs** The school education programs, as described in this chapter, experience high demand and are limited only by the number of educators available to meet demand, and associated material costs..	**The actions listed here would be in addition to all the existing implemented public outreach activities and the new support outreach activities listed above.** ✓ <u>Existing programs:</u> • Conduct countywide surveys to evaluate citizen attitudes and knowledge about waste reduction and recycling programs. Use the focus-group approach to evaluate program alternatives. • Develop a new unique and aggressive campaign about waste reduction and/or recycled products. • Expand waste reduction messages to include more promotion of mulching mowers efforts to promote energy conservation landscaping. • Develop a stronger, more coordinated effort with the Extension Service about composting education. • Conduct more workshops on foodwaste composting using home worm bin systems. • Use all existing promotional activities, such as the GreenHouse, newsletters, exhibits, to increase the public's focus on paper and buying recycled paper products. • Develop more mobile exhibits which can be used for promotion of activities in specific communities or geographic areas. ✓ <u>New programs:</u> • Develop public outreach activities and workshops targeting local landscaping and gardening businesses to encourage them to use more compost in their activities and how to compost on a small scale. • Create demand by working with the local development community on the use of yardwaste compost for erosion control projects and landscaping. Coordinate promotion with WORC activities. • Develop a more aggressive campaign to market PREP. • Develop an outreach program to work with local agricultural businesses to compost and to use Green Mulch. Work with the Conservation District to encourage and facilitate agricultural composting projects. • In coordination with the school educators, develop more adult workshops about waste reduction and workshops for the staff of special districts, cities, and towns about procurement, composting, and waste reduction. • Work with the Health Department and other agencies on a new campaign to discourage illegal dumping and improper storage of waste. ✓ <u>New Education Programs:</u> • Develop a method or budget system to replace loss of State support for teacher certification workshops. • Develop a school awards program as incentive to school districts to implement WRR programs and to replace loss of State award programs. • Explore opportunities to provide more adult workshops about waste reduction and recycling.

Table 4.8 Evaluation Criteria -Waste Reduction and Recycling	
Criteria	**Related Questions and Issues**
Technical Criteria	
1. Commercially proven technology	• Has a similar program proven commercially viable elsewhere? • Has a program of similar *scope* been successfully employed before? • What has been the record of success and failure? • Does the recycling program produce material that can be readily marketed?
2. Effectiveness/Reliability	• What is the diversion potential? • How well would proposed programs build on existing programs?
3. Customer Service	• Does the program provide adequate and reasonably equitable level of service to all residents and businesses?
4. Compatibility with existing and planned waste transfer and processing facilities	• Does the recycling program complement, and is it compatible with, waste transfer facilities? • Does the recycling program complement, and is it compatible with, waste processing facilities? • Is the program flexible enough to adapt to changing conditions?
5. Compatibility with disposal system	• Can the program be implemented with either an in-county landfill or waste-export based disposal system? • Would special provisions be necessary with one disposal option or another?
6. Provisions for future expansion	• Is the program flexible enough to adapt to changing demand or population? • Is the program flexible enough to adapt to changing market conditions?
Environmental Criteria	
1. Water	If a facility is called for: • what is the potential for leachate generation? • how much process water is required? • what are the potential for surface water runoff?
2. Air	If a facility is called for: • what is the potential for off-site odor impacts? How expensive and effective would odor controls be to implement? • what types of air pollutants would be generated? How effective are typical control technologies?
3. Earth	If a facility is called for: • how much clearing would be required? • what are the potential impacts to wetlands and other sensitive areas?

Table 4.8 Evaluation Criteria – Waste Reduction and Recycling	
Criteria	**Related Questions and Issues**
4. Land Use	• What are the transportation needs and impacts of proposed programs? • How would the proposed program mesh with existing facilities? If facility siting is necessary: • how noisy would such a facility be? • what are the relevant zoning/comprehensive plan requirements? • could there be aesthetic impacts? • what traffic impacts are probable?
5. Processing residue	What residues would result from the recycling program that would require further handling and disposal?
Economic Criteria	
1. Costs and Financial risks	• How well does the proposed program utilize resources already built, funded, or invested by the public sector? • How well does the proposed program utilize resources already built, funded, or invested by the private sector? • Could programs be funded through the solid waste system as presently configured? • What is the per ton cost and how does that compare to disposal costs? • How would the program impact disposal costs? • How capital intensive would the program be? • How likely is it that competing facilities or programs would draw waste away from the proposed program thereby reducing the need for the program? • How does market stability affect the proposed program? • For public procured facilities, what waste stream guarantees, if any, would be necessary?

Table 4.9	Overview of Waste Reduction and Recycling Program Alternatives		
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
1) Residential Collection Programs			
1A) Low-Technology Approach *(Overview of facilities described in more detail in Tables 6.7 and 7.5)*	• Existing programs have proven effective and reliable and provide service to all residents. • Revised outreach activities are compatible with existing collection, transfer, and disposal systems. • Diversion potential would be minimally incremental for most commodities but self-haul CDL and woodwaste offer opportunity to reduce residential self-haul waste stream by 14 %. • Proposed activities remain flexible to adapt to changing market conditions and materials collected are marketable. • Facilities are a proven technology. • Modifications of transfer stations compatible with existing systems. *(See Table 6.7, Alternative 1C and Table 7.5, Alternative 2A for detail.)* • Expanded yardwaste composting capacity compatible with existing and planned disposal system and planned private facility capacity.	<u>Transfer Station modifications:</u> • No processing would occur on site, thus no effects on water, air, or noise. • Traffic – little, if any incremental traffic impact expected since self-haul material would be delivered to landfill or transfer station anyway. • Minimal land use space needed. • Minimal CDL or woodwaste residuals expected for disposal. <u>Yardwaste composting facility</u> • Water- some water may be required for processing. Leachate control required. • Earth –approximately 5-20 acres required. • Air- dust and equipment exhaust controllable by ventilation. • Land use- potential for off-site odors would be primary facility siting issue. Odor impacts controllable through ventilation and bio-filter system and operating requirements. • Traffic – no impact expected for private facilities currently planned. A new County-owned stand-alone facility would generate substantial traffic and impacts would need to identified. • No residuals expected for disposal.	<u>Collection and public outreach</u> • Can be funded within existing operation costs. • No conflict with financial resources already spent. <u>Transfer Station modifications</u>: • Can be funded within existing operation costs. • Value of materials for re-use may increase over time. • Capital investment minimal. • Customer-sort reduces processing costs. <u>Compost facility:</u> • Funding sources not identified. • A publicly-owned facility would have to compete with private facilities. Private activities may draw waste away from a County-owned facility. • May not be necessary if sufficient private composting capacity develops.

Table 4.9	Overview of Waste Reduction and Recycling Program Alternatives		
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
1) Residential Recycling Collection Programs			
1B) Moderate Approach (This approach would include activities and composting facilities identified under the 1A Low-Technology Approach.) *(Overview of facilities described in more detail in Tables 6.7 and 7.5.)*	• Existing programs have proven effective and reliable and provide service to all residents. • Diversion potential for yardwaste/foodwaste through staff-assisted home-composting is limited---estimated at 1% of the residential waste stream. • Diversion of plastics through curbside pickup compatible with existing, collection, transfer and disposal systems. Diversion potential is 9 % of residential waste stream. • Diversion of foodwaste and compostable paper through curbside programs is compatible with collection systems and in-county or out-of-county landfill disposal. • Effectiveness/Reliability - Effectiveness of residential foodwaste diversion on a large-scale is unknown. Bin system/pickup schedules would need to be revised. • Foodwaste composting is a proven technology and would be compatible with planned private composting facility. *(See Table 6.7, Alternative 2A.)* • Small-scale CDL MRF compatible with existing programs and disposal systems. May compete with existing and future private sector businesses. Proven technology. Diversion potential for self-haul CDL is 20%. *(See Table 6.7, Alternatives 1A and 1B for detail)*	<u>Foodwaste collection</u> • Odor - potential for odor from at-home storage and potential for odor and leakage from collection vehicles en route to the facility. Bins/trucks/pickup schedules may need revision to reduce odor potential. • Traffic - additional collection traffic if separate vehicles/pickup schedules required. <u>Foodwaste Composting</u> *(See Table 6.7, Alternative 2A for more detail.)* • Water- some water may be required for processing. Leachate control required. • Air- dust and equipment exhaust controllable by ventilation. Odor impacts could be substantial and could require enclosed facility. • Land use - potential for off-site odors would be primary facility siting issue. Odor and leakage from collection vehicles could be an issue en route to the facility. • Traffic -- no impact expected for private facilities currently planned. A new County-owned stand-alone facility would generate substantial traffic and specific impacts would need to identified depending upon site location. • No residuals expected for disposal. <u>Small-scale CDL MRF</u> *(See Table 6.7, Alternatives 1A and 1B and Table 7.5, Alternative 2A for detail.)* • Potential impact for off-site noise if activities are not enclosed.	<u>Home-composting assistance</u> • There would be additional staffing and capital costs for promoting home composting and providing home yardwaste or worm bins to residents. • May require expansion of existing funding system. • May conflict with resources committed to centralized composting. <u>Foodwaste Composting</u> • Capital investment required for a facility. • Capital investment for additional/ replacement bins and collection fleet. • Funding sources not identified. • County-owned facility may compete with private facility and resources. <u>Small-scale CDL MRF</u> *(See Table 6.7, Alternatives 1A and B and Table 7.5, Alternative 2A)* • Capital costs for covered area and loaders. Costs would be higher if fully-enclosed facility required. • For a County-owned facility there would be some competition from private facilities. Extent of use would be very price sensitive. • Funding sources not identified.

Table 4.9	Overview of Waste Reduction and Recycling Program Alternatives.		
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
1) Residential Collection Programs			
1C) Capital-Intensive Approach (This approach would include activities and composting facilities identified in Alternatives 1A and 1B but would not include a small-scale CDL MRF. It would include a new "clean MRF"-recycling processing facility.)	• Commingled curbside collection is proven technology and compatible with source-separation approach but would require new bins, trucks, and pickup schedules. • Service would be available to all residents. • Existing public outreach activities could be adapted. • Commingled recyclables would not be compatible with current transfer or processing system. Would require additional facilities. • Effectiveness/reliability -- Diversion potential for commingled recyclables unknown. Wet-dry system would have more diversion potential, similar to Alternative 1B. • Proposed activities remain flexible to adapt to changing market conditions. Contamination may reduce marketability of recyclables. • Recycling processing facility is proven technology. Would need to be sited with a transfer station or landfill. *(See Table 6.7, Alternative 3 and Table 7.5, Alternative 2C for detail.)* • Requirements for source-separation by self-haulers not consistent with existing County program philosophy which uses incentives rather than bans or requirements.	Commingled Collection • Same impacts for the wet-dry curbside collection system as for foodwaste in Alternative 1B. Recycling Processing Facility *(See Table 6.7, Alternative 3 and Table 7.5, Alternative 2C for more detail.)* • Water - low potential for leachate within enclosed facility. • Earth - approximately 2-5 acres required if developed as integrated facility with a landfill or transfer station. • Air- Dust and loader exhaust, controllable by misting and ventilation. • Land Use - Noise similar to transfer station noise. • Traffic --Little, if any, incremental traffic impact expected if sited at existing transfer facilities. • Some residuals expected from recyclables system as a result of commingled collection.	• Capital investment for additional/ replacement bins and collection fleet. Recycling Processing Facility *(See Table 6.7, Alternative 3 and Table 7.5, Alternative 2C for more detail.)* • Capital investment required for a facility. • For a County-owned facility there are risks in a competitive environment for disposal services. Capital and operating costs, minus commodity revenue, may not compete favorably with traditional privatized processing in Pierce County. • Funding sources not identified. • May conflict with resources committed to source-separated recycling.
2) Drop-Off/Buy-Back Collection Programs			
2A) Low-Technology Approach	• Modifications compatible with existing system. • Public outreach complimentary with existing programs. • Effectiveness - diversion potential unknown. May reduce contamination issues. • Improved services to residents and businesses. • Remains flexible to adapt to changing market conditions.	• May reduce illegal dumping and improve aesthetics of drop-off sites. • May reduce contamination of recyclables.	• Could be funded within existing funding system. • Partnership between County and private companies would maximize use of resources.

Table 4.9	Overview of Waste Reduction and Recycling Program Alternatives		
Alternatives	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
3) Data Measurement Programs			
3A) Low-Technology Approach	• Existing data measurement program has served the County well. • Audits of waste stream are compatible with existing data measurement system. • Proven reliability to assist in future program designs and to maintain flexibility of all programs.	Not applicable	• Audits could be funded under existing system.
4) Commercial and Industrial Businesses Waste Reduction and Recycling Programs			
4A) Low-Key Technology Approach (This alternative would include the same composting facility and transfer station modifications as in Alternative 1A.) *(Overview of facilities described in Tables 6.7 and 7.5.)*	• Existing collection services have proven effective and reliable and provide service to most businesses who desire service. • Revised outreach activities are compatible with existing outreach programs and compatible with existing collection, transfer, and disposal systems. • Proposed activities remain flexible to adapt to changing market conditions and materials collected are marketable. • Diversion potential for CDL from commercial self-haul sector is substantial. It currently makes up 71% of commercial self-haul waste stream. • Diversion potential for film plastics from commercial self-haul waste stream is 6%. • Diversion potential for paper and yardwaste from commercial self-haul waste stream about 10%. • Modifications to transfer stations compatible with existing systems. *(See Table 6.7, Alternative 1C and Table 7.5, Alternative 2A for more detail.)* • Expanded yardwaste/foodwaste composting capacity compatible with existing and planned disposal system and planned private facility composting capacity.	• Same facilities as in Alternative 1A. *(Also see Table 6.7, Alternative 1C and Table 7.5, Alternative 2A for more facility overview detail.)* <u>Transfer Station modifications:</u> • No processing would occur on site, thus no effects on water, air, or noise. • Traffic - little, if any incremental traffic impact expected since self-haul material would be delivered to landfill or transfer station anyway. <u>Yardwaste/foodwaste composting facility</u> • Traffic - no impact expected for private facilities currently planned. A new County-owned stand-alone facility would generate substantial traffic and impacts would need to identified. • No residuals expected for disposal.	• Expanded public outreach programs could be funded under existing system. • Same facilities as in Alternative 1A *(See Table 6.7, Alternative 1C and Table 7.5, Alternative 2A for more facility overview detail.)* <u>Transfer Station modifications</u>: • Can be funded within existing operation costs. • Value of materials for re-use may increase over time. • Capital investment minimal. • Customer-sort reduces processing costs. <u>Compost facility:</u> • Funding sources not identified. • County-owned facility may compete with private resources. Private activities may draw away waste. • May not be necessary if sufficient private capacity develops.

Table 4.9	Overview of Waste Reduction and Recycling Program Alternatives		
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
4) Commercial and Industrial Businesses Waste Reduction and Recycling Programs			
4B) Moderate Approach (This approach would include activities in the 4 A Low-Technology Alternative and the same composting and CDL MRF facilities as in 1B.) *(Overview of facilities described in more detail in Tables 6.7 and 7.5.)*	• More aggressive public outreach programs would be compatible with existing outreach programs and existing collection, transfer, and disposal systems. • Requirements for source-separation by commercial self-haulers not consistent with existing County program philosophy which uses incentives, rather than bans. • Diversion of all commodities unknown but may be similar to or more than diversion rates as in Alternative 4A. • Effectiveness/Reliability ---Programs may encourage more waste reduction activities which would decrease the total waste stream to be disposed. • May provide increased customer services to business community. • May expand County's economic base. • Equitable promotion of all commercial/industrial recycling collection programs may prove a challenge to design of public outreach programs. • Small-scale CDL MRF compatible with existing programs and disposal systems. May compete with existing and future private sector businesses. Proven technology. Self-haul diversion potential of 20%. *(See Table 6.7, Alternatives 1A and 1B for more detail about facilities.*)	• Same facilities as in Alternative 1B. *(See Table 6.7, Alternative 1A and 1B and Table 7.5, Alternative 2A for facility overview detail.)* <u>Foodwaste Composting</u> • Water- some water may be required for processing. Leachate control required. • Air- dust and equipment exhaust controllable by ventilation. Odor impacts could be substantial and could require enclosed facility. • Land use - potential for off-site odors would be primary facility siting issue. Odor and leakage from collection vehicles could be an issue en route to the facility. • Traffic -- no impact expected for private facilities currently planned. A new County-owned stand-alone facility would generate substantial traffic and specific impacts would need to identified depending upon site location. • No residuals expected for disposal. <u>Small-scale CDL MRF</u> • Potential impact for off-site noise if activities are not enclosed.	• Expanded public outreach programs would require some expansion of existing funding system. • Same facilities as in Alternative 1A. *(See Table 6.7, Alternative 1A and 1B and Table 7.5, Alternative 2A for facility overview detail.)* <u>Foodwaste Composting</u> • Capital investment required for a facility. • Capital investment for additional/ replacement bins and collection fleet. • Funding sources not identified. • May compete with resources committed to source-separated recycling. <u>Small-scale CDL MRF</u> *(See Table 6.7, Alternatives 1A and B and Table 7.5, Alternative 2A)* • Capital costs for covered area and loaders. Costs would be higher if fully-enclosed facility required. • For a County-owned facility there would be some competition from private facilities. Extent of use would be very price sensitive. • Funding sources not identified. • May compete with resources committed to source-separated recycling. • Would not use resources already committed by private sector.

Table 4.9	Overview of Waste Reduction and Recycling Program Alternatives		
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
4) Commercial and Industrial Businesses Waste Reduction and Recycling Programs			
4C) Capital – Intensive Approach (This facility approach is similar to 1C except the new facility would be a "dirty MRF" to sort recyclables from municipal waste stream.)	• Commercially proven technology. • Compatible with existing source-separation WRR programs if designed to sort remaining fraction of recyclables from waste disposal stream. Otherwise it would conflict with existing source-separated approach. • Facility would have to be sited with or as a transfer station. • Diversion potential substantial. • Flexible to adapt to changed market conditions and technically compatible with any disposal choice. • Public outreach activities are compatible with existing outreach programs. • Landfill bans would be inconsistent with existing County program philosophy to achieve diversion with the use of incentives. Alternative capacity must be in place to ensure equitable customer service. Landfill bans of certain materials might lead to illegal dumping.	"Dirty" MRF Facility *(See Table 6.7, Alternative 3 and Table 7.5, Alternative 2 B for more detail of facility overview.)* • A "less stable" feedstock, potential impacts to waster (leachate protection), air (equipment exhaust and dust), land and traffic (similar to transfer stations). • May be difficult to find a suitable location that meets public approval. • Minimal impacts to earth, as siting would likely avoid impacts to wetlands and sensitive areas. • Traffic—Little, if any, incremental traffic impact expected if sited at existing transfer facilities.	• Capital investment for additional replacement bins and collection fleet. "Dirty" MRF Facility *(See Table 6.7, Alternative 3 and Table 7.5, Alternative 2B for more detail of facility overview.)* • Capital investment required. • For a County-owned facility there would be some competition from private facilities. Extent of use would be very price-sensitive. • Funding sources not identified. • Capital and operating costs for enclosed facility would need to be funded by tipping fee which might exceed the cost of other private alternatives.
5) Special Collection Programs			
5A) Low-Technology Approach	• Existing programs have proven effective and reliable and provide service to all residents. • Diversion remains the same as in existing system with small, incremental annual increases. • Programs remain compatible with any collection, transfer, or disposal system.	Not applicable	• Can be funded within existing resources.
5B) Moderate Approach (This approach would include activities in 5A.)	• Mobile collections of household hazardous waste may increase diversion and prevent groundwater pollution. • Residents would have increased collection services. • Voucher system/special cleanups may help to decrease or prevent illegal dumping but diversion potential is unknown.	• Traffic- There would be a slight, random increase in traffic for mobile collections. • Mobile collections would offer improved environmentally-secure transportation of household hazardous waste.	• May require expansion of existing funding resources. • Would build upon previous investment.

Table 4.9	Overview of Waste Reduction and Recycling Program Alternatives		
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
6) In-House Recycling and Procurement Programs			
6A) Low-Technology Approach	• Consistent and compatible with existing programs. • Improved customer service to employees. Diversion increase unknown. • Additional assistance to cities and towns.	Not applicable.	• Measurement can be funded through existing resources.
6B) Moderate Approach	• Consistent and compatible with existing programs. • Diversion potential unknown.	Not applicable	• Procurement activities may require financial commitment from municipalities' general fund. • Would not compete with other resources and would build upon previous investments.
7) Public Outreach Programs			
	• Consistent and compatible with existing approach towards aggressively promoting waste reduction and recycling. • New surveys and use of focus groups would be consistent with past activities. • Workshops have proved popular in the past. • Public outreach campaign coordinated with other agencies might help to reduce illegal dumping problems.	Not applicable	• May require expansion of existing funding sources. • Would build upon existing investment.
8) School Education Programs			
	• Consistent and compatible with existing approach towards promoting waste reduction and recycling through hands-on environmental education programs. • Adult workshops have proved popular in the past and may help to raise level of awareness about waste reduction activities.	Not applicable.	• Waste reduction education may reduce need for investment in recycling and composting facilities and programs.

4.3.4 Recommendations

County-City coordination and support

#4-1 For the cities and towns using the County's waste management system, the Pierce County Solid Waste Division should continue to serve as the agency responsible for promoting county-wide waste reduction and recycling activities; to provide educational resources and technical assistance; and to evaluate efforts of these activities. The County should continue to coordinate its public outreach efforts with the City of Tacoma, the Tacoma-Pierce County Health Department, and other agencies.

#4-2 Pierce County should continue to provide adequate funding and staffing to assist cities and towns in implementing waste reduction and recycling activities discussed in the Plan. The Pierce County Solid Waste Division should remain the coordinator of these programs for the County and those cities and towns using the County's waste management system.

#4-3 The County should continue to implement the existing and developing programs, as well as new waste reduction programs. Pierce County Public Works and Utilities Solid Waste Division should coordinate waste reduction and recycling activities in Pierce County. Municipalities that develop independent waste reduction and recycling programs should coordinate their efforts and explore areas of mutual concern with the County, whenever possible. The Pierce County waste reduction programs should include the projects described in this Plan.

Five-year focus

#4-4 During the next five years, Pierce County and its municipalities should reduce per capita waste generation and maintain and improve Pierce County's recycling rate by developing new programs, such as those listed in the low-key and moderate approach alternatives (Table 4.7), targeting diversion of materials identified in Pierce County's waste characterization audits.

Data collection

#4-5 Pierce County should maintain the Data Collection Program to monitor the quantities and types of wastes that are being collected and recycled throughout the county. To the extent possible, the program should measure waste reduction and evaluate the recycling efforts of each sector, such as residential, commercial, or self-haul. Results should be used to modify programs to achieve the greatest practical impacts and provide more accurate estimates of the effects waste reduction and recycling has on the waste stream to be disposed.

#4-6 Pierce County should maintain and refine the solid waste Data Collection Program, including the existing county-wide effort. Data collection about specific waste streams or generators shall be added as needed.

Waste characterization audits

#4-7 Pierce County should conduct a waste characterization audit to be scheduled and completed to provide necessary data for the Solid Waste Management Plan update. The frequency of the audit can be increased if alternative funding is found and if the population or waste generation trends shift significantly.

Continue public outreach programs

#4-8 Pierce County should continue to support and develop public education and outreach programs about waste reduction and recycling. The County, municipalities, and private sector should work together to provide coordinated programs and public messages so that the public is not confused by conflicting information. New programs should be integrated with existing outreach activities (which include newsletters, advertising, exhibits, workshops, brochures, and tabloids) to provide a comprehensive waste reduction and recycling message to the public. They should include:

- General public outreach activities which emphasize actions that individuals can do and which stress economic and environmental benefits.
- Educational materials, resources, or activities for commercial and industrial businesses which promote business waste reduction practices, encourage business recycling, and recognize, through awards or incentives, the individual company efforts to achieve their goals.
- Measurement methods to investigate the effects of education on public attitudes and behaviors.

#4-9 Continue active public and school outreach efforts regarding waste reduction and recycling. Emphasize pre-cycling. Evaluate effectiveness and revise as necessary.

#4-10 Develop a public outreach program for the business community about waste reduction and recycling and the availability of public and private recycling programs and assistance. Hands-on workshops for waste reduction techniques should be included.

#4-11 Develop a public outreach program for commercial self-haulers about waste reduction and recycling and the availability of public and private recycling programs and assistance. Hands-on workshops for waste reduction techniques should be included.

#4-12 Develop programs to encourage recycling at multi-family residences. Include programs to reduce the contamination at the recycling collection sites.

School education

#4-13 Pierce County should continue expansion of its school education curriculum program for all grades to include new waste reduction and recycling messages integrated with discussion of other environmental issues. County staff should work with interested school districts to assist them in implementing waste management plans and providing teacher education workshops.

Recycling collection – residential, yardwaste, commercial

#4-14 Pierce County, cities and towns, and the franchised collection companies should continue the single-family and multi-family curbside recycling collection programs which include curbside collection, a variety of container systems for multi-family residences, and drop-off collection sites.

#4-15 The County, cities and towns, and the collection companies should continue to review and revise residential collection programs considering strategies to keep participation rates high and making recycling easy. Strategies should include, but not be limited to:

- countywide promotional activities;
- incentive rates with reduced collection costs for residents and complexes who participate in recycling collection;
- a review of the bins system; and
- the expansion of the programs to collect additional materials

#4-16 Pierce County and the cities and towns should continue the comprehensive yardwaste management program which includes curbside collection, drop-off opportunities, and support for home composting. The County should work with the private sector to promote the use of composted yardwaste products to the general public to increase acceptance as a soil amendment or mulch.

#4-17 In conjunction with private haulers and recyclers, the County should promote collection and recycling programs aimed at commercial generators.

Drop-off collection

#4-18 Expand the number and capacity of environmentally sound in-county recycling facilities, drop-sites, and buy-back centers. Increase the number of self-haul drop-sites for all recyclable materials. Periodically audit to ensure that needed capacity exists.

#4-19 Pierce County should implement a coordinated public outreach program to promote proper use and maintenance of drop-off sites and to discourage dumping.

#4-20 Pierce County should implement a coordinated small business outreach program to promote proper use and maintenance of drop-off sites for use by small businesses.

Storage and collection locations

#4-21 Require developers of new multi-family complexes and commercial / industrial developments to meet state building code requirements and otherwise facilitate recycling by providing adequate, accessible storage and collection locations for source-separated recyclable materials.

Source-separation – plastics, batteries, CDL, and woodwaste

#4-22 Develop and evaluate a county-wide program to increase the recycling of plastics and household batteries. Consider curbside pickup, increase in drop-sites, capacity, and service frequency.

#4-23 Modify transfer stations to encourage self-separation of all recyclable materials, including CDL and woodwaste, from residential and commercial self-haulers.

Processing capacity

#4-24 Encourage the private sector to develop collection, recycling, and composting capacity for all recyclable materials. Support the expansion of the private sector to provide the processing capacity component of the Plan while ensuring that facilities are sited and operated to protect the environmental health of the community.

#4-25 Encourage development of adequate in-county capacity for composting.

Home composting

#4-26 Pierce County should continue promoting home composting of yardwaste and foodwaste through brochures, workshops, and other activities. The County should encourage WSU Extension Services to develop and offer a Master Composter program and encourage municipalities to support these activities.

#4-27 Develop an active public education program for home-composting of foodwaste and yardwaste. Provide low-cost compost bins for same.

Job-site source-separation program

#4-28 Develop a coordinated program on source separation of all recyclable materials at the job site with all cities and County departments.

In-house and procurement programs

#4-29 Pierce County should continue and expand its in-house employee waste reduction and recycling program to set an example and provide a model for cities and towns and businesses about the successes that can be achieved through in-house programs. The County should continue to look for new opportunities to increase recycling tonnage and to encourage employees and departments to adopt new waste reduction practices.

#4-30 Pierce County should revise the County's Procurement Policy to fully implement purchasing of manufactured products with recycled content by all departments. The County should incorporate Federal and State procurement guidelines, where possible, and promote procurement programs to the private sector and other municipalities, using the County's program as a model.

#4-31 Evaluate and expand, as needed, a coordinated long-range County procurement policy and in-house recycling program.

Rate incentives, funding support, and variable collection rates

#4-32 Pierce County should retain the use of rate-based incentives in promoting waste reduction and recycling. The County should work closely with private collection companies serving the County to identify equitable, implementable rate strategies that will be acceptable to the Washington Utilities and Transportation Commission. Pierce County should also continue to work directly with the Commission to identify and implement these types of alternatives.

#4-33 Pierce County should continue to provide adequate funding to support waste reduction programs, especially public and school education, and to ensure a continued high level of participation and the diversion of significant quantities of recyclable materials away from landfill disposal.

#4-34 County government should continue to investigate and encourage throughout the planning area the design of equitable variable collection rate structures and disposal rates that encourage maximum waste reduction and recycling. In developing new rate structures, consideration should be given to the possible impacts of illegal dumping and littering. Pierce County, franchised collection companies, recyclers, and the WUTC should work together to develop specific recycling rate proposals. These rate proposals should address both residential and commercial waste sources.

#4-35 Evaluate the feasibility of using rate differentials to encourage self-haulers to source separate recyclable materials at transfer stations. Consider a rate differential to encourage same.

Development standards

#4-36 The Pierce County Solid Waste Division should work closely with the Planning and Land Services Department and other agencies, such as the Tacoma-Pierce County Health Department, to ensure development standards are adopted for composting facilities. The emphasis should be on ensuring that development codes incorporate design and siting requirements and provide permit procedures, coordinated with the State regulations, which ensure public health and environmental issues are addressed.

Economic growth

#4-37 Pierce County should work with local economic development groups to attract new businesses which use recyclables to make products or otherwise process recyclables. The agencies should work together to promote the existence of a strong collection and recycling infrastructure in Pierce County; to improve and coordinate permitting procedures for such facilities; and to develop incentives for recycling businesses to locate in Pierce County.

Evaluate impacts of landfill bans

#4-38 Evaluate the feasibility and likely impacts, including the impact on illegal dumping, of enacting landfill bans on certain recyclable materials.

Special collection programs

#4-39 Provide additional coordinated programs for special collections of recyclables, such as white goods, bulky household items, household hazardous waste, used oil, etc.

Foodwaste

#4-40 Develop and evaluate a county-wide program to increase diversion and recycling of foodwaste and compostable organics.

4.4 Tacoma Waste Reduction and Recycling Programs

4.4.1 Existing Practices

■ ***Residential curbside collection of recyclables:*** The City of Tacoma Solid Waste Utility collects recyclable material from its residential customers at the curb. Participation in the curbside recycling program is strictly voluntary. Tacoma's residential curbside recycling program collects recyclable material from households ranging from single-family to four-plexes. In 1998, the participating residents recycled 8,555 tons as a result of this program.

In early 1998, Tacoma revamped its recycling and garbage collection program by re-routing the entire city, offering additional refuse can sizes, and providing an expanded recycling collection program. Under this new program, customers no longer separate materials into three bins. Recyclables, except for glass, are collected in commingled, semi-automated bins.

Residents are given the choice of 30-, 60-, and 90-gallon containers for recycling. Glass is put out in a separate container. To provide this service, Tacoma was required to purchase new collection vehicles.

Material selected: For each participating customer, Tacoma provides every-other-week pickup of: aluminum, steel (tin) and aerosol cans, glass containers, newspapers, phone books, corrugated cardboard and cereal boxes, #1 and #2 plastic containers (milk jugs, pop, and detergent containers), and mixed waste paper such as magazines, catalogs, office paper, mail, etc. Household batteries can be placed in a sealed plastic bag and placed in the glass bin. Tacoma's curbside recycling vehicles utilize one-person crews. Tacoma contracts with a private recycler for processing.

Costs and financing: There is no additional charge to Tacoma customers for curbside recycling. The program is funded by the Solid Waste Utility revenue rates. Some costs are offset by revenue from the sale of material collected. Also, some equipment and public information costs are currently offset by Washington State Department of Ecology grant funds.

■ ***Curbside collection of yardwaste***: The City of Tacoma provides curbside service for yardwaste collection from residential customers. Solid Waste Utility trucks collect yardwaste from participating customers at the curb every other week. Participation is voluntary. Yardwaste pickups are made on the same day as curbside recycling collection, which also coincides with the customer's garbage day. Beginning in 1996, residents were required to place yardwaste in 32-gallon garbage cans. Tree branches that will not fit into a container are accepted if they are tied into bundles and are no more than three feet in length. At this time, Tacoma collects yardwaste manually, using two- or three-person crews, depending on the volume of material to be handled.

In 1998, Tacoma collected 8,394 tons of yardwaste through the curbside collection program. An additional 2,061 tons of yardwaste were accepted at the Tacoma Landfill for recycling from self-hauling customers in 1998. The yardwaste brought in by Tacoma curbside collection vehicles or self-hauling customers is consolidated into transfer trailers and trucked to a local composting company where it is ground and composted with other organic waste and marketed as a soil amendment.

Yardwaste collection service levels provided by Tacoma are adequate for the participation observed to date.

Material selected: An estimated 18-20% of the disposed waste stream is comprised of yardwaste. This is higher than the national average due to the Pacific Northwest's long-growing season and abundant foliage. Tacoma's efforts to capture compostable material diverts more material from landfill disposal than all of the other programs combined. Brush, limbs, leaves and grass clippings are accepted as yardwaste by Tacoma. Sod, dirt, and rocks are not considered yardwaste. Yardwaste is easily collected and does not require any special sorting or collection equipment.

Costs and financing: The costs for the yard-waste collection program are paid with Solid Waste Utility revenue. There is no additional charge to Tacoma residential refuse collection customers for this service.

■ ***Multi-family curbside recycling:*** The curbside collection of recyclable material is also provided for multi-family residential complexes in Tacoma. Duplexes, triplexes, and four-plexes in Tacoma have received residential curbside recycling service since the inception of the program in 1990. Due to the interest expressed by residents and/or managers of larger complexes, the Solid Waste Utility began to custom-design curbside collection services for apartment complexes and condominiums that requested the service. Complexes of any size are provided with this service. In 1992, Tacoma purchased a recycling truck designed to collect 60- and 90-gallon containers which allowed the expansion of multi-family and business sector recycling. Recyclable material collected are the same as the residential curbside program. Service levels for this program are adequate for the current participation levels.

Material selected: Material selection for multi-family curbside recycling is similar to the material selected for residential curbside, except collection of magazines and batteries are not included with this service.

■ ***Commercial customer curbside recycling:*** Tacoma collects recyclable material from commercial customers at the curb. Custom-designed commercial curbside recycling service is provided to businesses on a pickup-as-needed basis, ranging from one to two times per week. Recycling bins are provided for container glass, mixed cans, and newspapers. This service is provided to customers on a strictly voluntary basis. In 1998, 1,073 tons of recyclable material were collected from participating businesses as a result of this program

Many more businesses receive paper recycling service provided by several private recycling companies in the Tacoma area. All businesses are eligible to participate; however, restaurants, bars, and institutional kitchens have been targeted because of the high volume of cans and glass that they produce. Service levels for this program are adequate for the current participation levels.

Material selected: The material selected for this program is similar to the material selected in the residential curbside program, except collection of magazines and batteries are not included with this service.

Costs and financing: There is no additional charge to businesses for curbside collection of recyclable material. This program is funded with Solid Waste Utility revenues.

■ ***City of Tacoma in-house desk recycling:*** Tacoma contracts with a private recycling company to collect recyclable material from all of its offices. Recycling containers placed at City employees' desks and near copy machines are used for

collection of office waste paper. City employees generating computer paper, glass, or cans are given extra containers. Bins in common areas are provided for tin and aluminum cans, glass containers, cardboard, and newspapers. The contractor picks up the recyclable material by the desks at least once per week and takes it to their facility for further sorting and marketing. In 1998, 162 tons of material were recycled as a result of this program.

Material selected: The selected contractor was chosen on the basis of the lowest bid and was willing to accept a broad range of recyclable material and collect it desk side.

Costs and financing: The cost for this program is paid for with Solid Waste Utility and Tacoma Public Utilities revenues.

■ ***Produce waste recycling:*** Tacoma began collecting produce waste from commercial customers in 1991. This program is currently offered to grocery stores, florists, and certain restaurants that agree to separate plant waste from animal/ seafood waste. Collection of produce waste is made twice per week in the cold months and three times per week in the warm months, using semi-automated collection equipment. In 1998, 652 tons of commercial produce waste was recycled as a result of this program. Because the capacity of the composter under contract by Tacoma is limited, commercial produce waste recycling is still considered a "pilot" program.

Material selected: Produce waste was selected because the yardwaste composting program was already in operation and produce waste was also identified as a compostable portion of the waste stream.

Costs and financing: The produce and yard-waste mixture is delivered to the composting company under contract with Tacoma. The cost of the program is paid for with Solid Waste Utility revenues. Participating businesses are not charged for this service.

■ ***"Waste-Watchers" school program:*** The "Waste-Watchers" school program represents a cooperative recycling effort with the School District, a private recycling company, and the Solid Waste Utility. It was instituted in the fall of 1991 at all Tacoma public schools. Cardboard and file stock grade paper, such as white and colored bond, NCR paper, typing paper, letterhead/stationary, copy paper and computer paper are collected. The Solid Waste Utility designed special 6-cubic yard front-loading fork boxes for the collection of the paper. The Solid Waste Utility empties the boxes with School District equipment and delivers the paper to a private recycling company. In 1998, 248 tons of paper and cardboard were recycled by Tacoma public schools as a result of the "Waste-Watchers" Program.

Material selected: File stock grade paper was selected because it is the grade that captures the most recyclable paper and still generates positive revenue. Cardboard was selected because of the volume generated and its marketability.

Costs and financing: Tacoma funded the capital equipment and containers needed to initiate the program with Solid Waste Utility revenues. The Solid Waste Utility funds the collection and transporting costs to the recycling company.

■ ***Waste oil recycling program:*** Tacoma collects and recycles used motor oil at convenient locations throughout the City. Waste oil has been collected at the Tacoma

Landfill since 1988. The Solid Waste Utility is now promoting used oil recycling at collection tanks established at eight Texaco stations and two Schuck's Auto Supply stores within Tacoma. Residents are urged to bring waste oil from their automobiles, motorcycles, boats, and lawn mowers to the collection tanks if the oil is not mixed with other substances. (Used fleet oil is also collected at various Tacoma shops, i.e., Fleet Maintenance, Belt Line, Police Garage and Public Utility Fleet Maintenance.) The oil from this collection program is either being refined or reprocessed for use as a fuel. In 1998, Tacoma recycled over 82,700 gallons of waste oil as a result of this program. An additional 99,495 gallons of waste oil were recycled in 1995.

Material selected: Used motor oil was targeted because of its potential to contaminate groundwater and the Puget Sound ecosystem and because waste oil can be easily refined or reprocessed.

Costs and financing: Tacoma's Waste Oil Recycling Program is funded with Solid Waste Utility revenues.

■ ***Tacoma Landfill and Recycling Center Programs:***

Landfill Receiving Area: Several recyclable materials are identified at the Tacoma Landfill scale house by landfill workers. These materials are separated out for recycling at the landfill receiving area. Self-hauling customers are directed to specific bays to unload the following recyclable materials: ferrous scrap metal, nonferrous scrap metal, white goods (appliances), polyurethane foam, tires, and yardwaste. Nurseries and landscaping businesses are the primary customers self-hauling yardwaste to the Tacoma Landfill. All yardwaste self-hauling customers are directed to dump their loads into transfer trailers bound for local composting companies. In 1998, 1,357 tons of scrap metal and appliances and 2,061 tons of yardwaste were collected for recycling at the landfill receiving area.

Recycling center: Located at the Tacoma Landfill, the Center is operated by the Solid Waste Utility for the collection of aluminum cans, steel (tin) cans, aerosol cans, ferrous scrap metal, tin foil, glass containers, #1 PET plastic, #2 HDPE plastic (natural and colored), glossy magazines/catalogs, newspaper, cardboard, phone books, and mixed waste paper. The Recycling Center is open to the general public and commercial businesses seven days a week from 8:00 a.m. - 6:00 p.m. A full-time attendant assists the public and keeps the area clean. In 1998, 1,611 tons of material were collected for recycling at the Recycling Center.

Material selected at the *Landfill:* A stable market for ferrous metals from the Tacoma Landfill has existed in Tacoma since 1960 and has been used by the Solid Waste Utility since that time. White goods (appliances) are also accepted for recycling, because they are primarily made of ferrous metal. Chlorinated fluorocarbons (CFC's) are now removed from refrigerators before they are recycled. Polyurethane foam is shredded and used in the manufacturing of carpet pads. Recappable tires are recovered by a local company. Yardwaste from both the commercial and residential sectors was targeted because organic waste represents approximately 18% of the total waste stream in Tacoma.

Materials selected at the Recycling Center: In general, materials accepted at the Recycling Center were selected because they represent an identifiable percentage of the waste stream for which stable local markets exist. Plastics (other than #1 and

#2) are collected and processed into RDF fuel. In May 1994, Tacoma successfully used crushed glass as pipe bedding in a large construction project. Based on these results, we have seen renewed interest from construction companies for using crushed glass as an alternative to rock aggregates.

Costs and financing: In 1998, commercial self-hauling customers were charged $82.40/ton for yardwaste (the same as regular garbage), whereas residential customers were allowed to dump unlimited amounts of yardwaste at no charge. Tacoma delivers the yardwaste to a local commercial composter at a cost of $29.00/ton. The Recycling Center is funded with Solid Waste Utility revenues. Three full-time employees cover the seven day-a-week operation. Most materials are handled with existing equipment. Revenue generated from the program helps offset operating costs. The new Recycling Center was funded primarily from a Washington State DOE grant.

■ ***Waste reduction & recycling education:*** *Tacoma Public School Environmental Curriculum:* Up to 1992, Tacoma used the TRASH Program as its primary method to provide education on solid waste issues. In 1992, this program was re-evaluated and it was determined that the assembly- based program was not achieving the desired results. The focus was changed in an effort to reach all school-age levels. It was desired that solid waste issues and waste reduction methods become an integral part of the educational process. This goal was established to make waste reduction, recycling, and hazardous waste awareness a part of how children think and behave.

A formal partnership with the School District was established, and a job description was created within the School District to allow the hiring of full-time School District employees to develop and implement an environmental curriculum. The coordinator is funded equally by the Solid Waste Utility, Tacoma Sewer Utility, and Tacoma Public Utilities. The coordinator was hired in November 1993. Tacoma experts in recycling and hazardous waste meet regularly with the coordinator to provide technical information and assistance.

The coordinator has developed a framework curriculum for grades K-8. The curriculum is a broad-based environmental program that will address all aspects of the environment. One “module” each year will focus on waste reduction, recycling, solid waste processing, and disposal. The environmental framework is to be integrated into the overall curriculum of all of the Tacoma public schools. An environmental curriculum for Tacoma high schools is being developed. The coordinator also developed a resource library and coordinates all special projects related to environmental education.

As an element of its participation with the School District, the Solid Waste Utility provides tours for elementary school classes at the Tacoma solid waste handling facility. The tours stress environmental stewardship and prevention, include information on how Tacoma handles solid waste and discusses past landfill issues.

Public education and promotion: Tacoma utilizes many different avenues to promote its programs, including a heavy reliance on direct mail advertising. Much of the message provided to customers is in the form of simple instructions on how and when to participate in Tacoma’s programs. Some of the specific efforts include the following:

- A full page of program information in the EZ section of the Tacoma phone book.

- A yearly mailing of a recycling brochure to each single-family household in Tacoma.
- At least two newsletters per year with information on cleanup events, recycling and household hazardous waste disposal, and overall solid waste issues.
- Articles in *Earth News* for schools.
- Information in utility bill inserts.
- Periodic education pieces on the local Municipal Television station, which is aired on local cable access stations.
- The development of an education display at the Tacoma Landfill.
- Presentations to community and business groups, organizations, and students (elementary school to college level classes).
- Staff conducts tours for community and school groups.
- Miscellaneous brochures and pamphlets promoting waste reduction and recycling are produced and distributed.
- Staff is available during regular business hours to answer a phone line dedicated to recycling and waste reduction.
- Tacoma participates in fairs, shows and other events where staff can communicate with a significant number of people in a target audience.

Commercial education programs: Technical assistance regarding recycling and hazardous waste disposal is available to businesses. Upon request, a recycling expert from the Solid Waste Utility visits a business and helps determine which waste material currently produced can be recycled, which of the recycling methods would be the most cost effective and how to prevent excess waste being generated. The expert can also help the business get setup for recycling.

■ ***Awards and recognition:*** Tacoma has been recognized for it's recycling programs in the last seven year planning period. Some of the awards and recognition Tacoma has received for its recycling programs are listed below:

- **1998 – Washington State Department of Ecology Solid Waste Reduction and Recycling Award**, *Best Government Program in Western Washington*, City of Tacoma Solid Waste Utility
- **1995 - National Recycling Coalition** *Outstanding Urban Program*, City of Tacoma Recycling Program.
- **1994 - *James C. Howland Award for Urban Enrichment, Honorable Mention*,** City of Tacoma Community Waste Oil Recycling Program (sponsored by National League of Cities and CH2MHill).
- **1994 - Washington State Department of Ecology Solid Waste Reduction and Recycling Award**, *Best Government Program in Western Washington*, City of Tacoma Refuse Utility.
- **1994 - *Weyerhaeuser Company Foundation for Recycling***, Tacoma Public Schools/ Refuse Utility "Waste Watchers" Paper Recycling Program.
- **1993 - *Washington Ecological Commission Environmental Excellence Award, Best Public Agency***, City of Tacoma Refuse Utility Community Waste Oil Recycling Program.
- **1992 - National Environmental Achievement Award** (sponsored by City and State Magazine) *Best Mid-sized City Recycling Program in the Nation*, City of Tacoma Refuse Utility.

4.4.2 Needs and Opportunities

In 1998, the Tacoma Solid Waste Utility implemented the bulk of the recommendations identified in the 1995 Consultants study, "Solid Waste Utility Operation Performance Analysis; Analysis of Collection Practices and Recycling Incentives." The major changes to Tacoma's solid waste system to increase recycling and collection efficiency included:

- Reroute the City's collection routes to an area approach to concentrate collection equipment in specific areas and increase efficiency.
- Convert the existing curbside collection programs from source separated multi-bin to commingled collection to increase participation and collection efficiency.
- Reduce the minimum size solid waste collection container from 60-gallon to 30-gallon to provide incentives to customers to reduce and recycle as much waste as possible.
- Require participants in the curbside yard waste collection program to provide their own 32-gallon collection containers and eliminate the use of plastic bags.

The next major efforts to increase recycling opportunities will focus on the multi-family and commercial portions of the customer base. Studies are planned to help identify which type of containers, trucks, and mix of materials will result in the best participation and efficiency. Further efforts will focus on increasing participation in waste reduction and recycling activities by enhancing public education and community outreach programs.

4.4.3 Recommendations

Tacoma Land Use Management Plan

#4-41 Support the Tacoma Land Use Management Plan by seeking solutions for disposal problems, to develop means of recycling waste material in order to relieve the problems of waste disposal and reduce the strain on our natural resources.

Building and site design

#4-42 Encourage building and site design which accommodates and facilitates recycling by building residents.

School education programs

#4-43 Tacoma shall continue to fund, develop, and implement school education programs stressing waste reduction, recycling, proper waste disposal, and resource conservation.

Public outreach programs

#4-44 Tacoma shall continue to fund, develop, and implement public outreach programs to promote environmental programs. The program should include waste reduction, product stewardship, and resource conservation elements in addition to the recent recycling programs.

Waste reduction

#4-45 The City of Tacoma shall continue to fund and participate in programs that provide Tacoma residents incentive, equipment, or services that provide tangible waste reduction and product stewardship results. A past example of such a program is rebates provided to purchase mulching lawn mowers. Another incentive that should be explored is a 20 gallon automated collection container for garbage with a reduced monthly rate.

Curbside collection

#4-46 Tacoma shall continue to implement curbside collection of recyclable materials for single family residents, and explore improvements in multi-family and commercial curbside recycling programs. If economically feasible, the multi-family and commercial collection of recyclable materials should be expanded to maximize diversion of these materials.

Yardwaste collection

#4-47 Tacoma shall continue to implement curbside collection of yardwaste for single family residents. If necessary to improve collection efficiency, changes to the existing program should be implemented. Potential improvements include semi-automated collection or containers provided by the Utility.

4.5 Fort Lewis and McChord Air Force Base

The following two subsections, 4.5.1 and 4.5.2, contain brief summaries about the existing military waste reduction and recycling programs. These are only overviews. For more detail about the solid waste management system for the two military bases, please consult the *Solid Waste Management Plan for the Fort Lewis Military Reservation, 1995.*

Legislation: Fort Lewis and McChord Air Force Base implement their waste reduction and recycling programs in compliance with two federal mandates and a number of separate Air Force and Army regulations.

The two umbrella federal directives are:

■ *Department of Defense Directive 4165.60* which states that "the military is committed to a rigorous schedule of minimizing waste and reducing solid waste materials at the sources whenever possible," and

■ *Executive Order 12873 Federal Acquisition, Recycling and Waste Prevention* which requires federal agencies to establish reduction and recycling programs for all operations and also stipulates that recycled products be purchased whenever practical. The Environmental Protection Agency (EPA) has established procurement guidelines to implement this order.

Other guidance regulations upon which the two bases rely are *Army Regulation 200-1* and the *Air Force Instruction on Pollution Prevention, AFI32-7080*. These outline source reduction, recycling, and procurement methods.

4.5.1. Existing Programs --- McChord Air Force Base

■ ***Qualified Recycling Program (QRP):*** In 1995, McChord AFB began an aggressive approach to achieve a 1997 goal to reduce what goes into a landfill by 50%. The programs heavily emphasize source separation. By implementing the programs, McChord was able to raise its recycling rate from 8% in 1994 to 56% in 1995. In one year, base residents and employees changed their habits from throwing away 107 lbs. and recycling 8 lbs. per person to disposing 69 lbs. and recycling 77 lbs. By the end of 1995, McChord had reduced landfill tonnages by 33% since 1992.

In 1996, McChord was honored for its achievements with the *Hammer Award* which is the Vice President's special recognition to teams who have made significant contributions in setting new standards of excellence. The award was presented to McChord by Fran McPoland, the Federal Environmental Executive, of the Environmental Protection Agency in 1996.

■ ***Information outreach*:** To achieve these successes, McChord formed a QRP team which works with all base agencies to set monthly and quarterly goals, implement and promote the programs, and regularly assess achievements. The team sets yearly "trash reduction ceiling goals." In 1996, the goal was to reduce disposed tons from 291 tons to 263 tons per month. The ceiling goal for 1997 was 188 tons per month.

Promotion of the programs is extensive and includes: the bimonthly *McChord's Recycler* newsletter, flyers and booklets, special collection events, and coordinated programs with Pierce County. All employees and base residents receive information about waste reduction, procurement, schedules for curbside pickup and preparation of materials, quarterly and monthly goals, or

the addition of new recyclables to the collection system. Brochures include strong messages about illegal dumping and the penalties that will be imposed; proper use of garbage dumpsters; information about what items are not acceptable for disposal; and where specialty items can be taken on or off base.

As previously described in this chapter, McChord works with the County on data collection and on promoting special collection programs, such as Christmas tree recycling. In 1996, 1997, and 1998 McChord celebrated Earth Day by promoting school tours of the new recycling center, free giveaways for those who visited, and tested recycling household batteries and milk carton-drink boxes. The County's school education programs are made available to the McChord school system.

■ ***Recycling center:*** McChord built a 5,000 square foot recycling center equipped with 30 drop-off bins and 3 balers. Material taken to the facility, either through collection or drop-off, is baled and directly marketed. Any recycling proceeds generated from the direct sale of recyclables are returned to the QRP program to recover costs incurred for management and operation. Residents can drop off newspaper, mixed paper, magazines, brown paper and bags, cardboard, all colors of glass, aluminum/tin, scrap wood/metal, and all kinds of plastics, including PET, HDPE, Styrofoam and packing peanuts, and plastic bags. There are also bins for the drop-off of excess yardwaste.

■ ***Office recycling*:** All offices on base are served by deskside containers and a "collection point separation system" which requires recyclables to be separated into different containers. There are more than 130 collection locations which are picked up weekly and taken to the recycling center. Designated recyclables are white paper, newspaper, computer paper, magazines, mixed office paper, cardboard, aluminum/tin cans, Private Act Material, plastic, all colors of glass, and shredded paper. The Private Act Material has a special handling system. Toner cartridges can also be recycled.

■ ***Residential curbside and yardwaste recycling:*** McChord contracts with a private hauler for biweekly pickup of yardwaste, glass, tin/aluminum cans, newspaper, mixed paper, cardboard, and aerosol cans from all single-family housing.

■ ***Dormitory recycling:*** Room containers and collection stations are coordinated with dorm managers for all residents. Promotional information encourages participation.

■ ***Affirmative procurement program:*** In 1995, the QRP team began extensive research into establishing a procurement program for all designated EPA guidelines items and set up a regular system to revise its internal program within one year from the date EPA designates new items. The program aggressively ensures that all EPA-listed products that the base purchases has some amount of recycled content. The team has devised a matrix system which designates which offices are responsible for which procurement items. The program began with five categories: paper products, re-refined oil, retread tires, concrete/cement, and building insulation products. New categories added include engine coolants, a large number of construction products, traffic cones and barricades, playground surfaces and running tracks, hydraulic mulch, yard trimmings compost, and various non-paper office products.

McChord's procurement program has been honored as the benchmark program within the Department of Defense.

McChord is moving ahead on all fronts to fully implement the new Executive Order (EO1310, Greening the Government Through Waste Prevention, Recycling and Federal Acquisition).

■ ***Household hazardous waste:*** McChord sponsors household hazardous waste collection events for base residents and urges off-base residents to participate in County and city programs. For hazardous waste generated in offices on the base, there are proscribed handling methods and personnel are directed to report to designated hazardous waste monitors for each section of the base.

■ ***Awards:*** The following are some of the awards given to McChord Air Force Base.

- **1996: United States Environmental Protection Agency** *Hammer Award*
- **1996: White House** *Second Annual "Closing the Circle" Affirmative Procurement Category*
- **1996: Washington State** *Governor's Pollution Prevention Award Recipient*

In 1996, 1997, 1998, and 1999 McChord received seven U.S. Air Force awards and two Department of Defense awards.

4.5.2 Existing Programs and Identified Needs --- Fort Lewis

Collection and promotion: On Fort Lewis, the Directorate of Personnel and Community Activities (DPCA), is responsible for implementing recycling collection, operating the recycling center, and promoting waste reduction and recycling activities. Public Works is responsible for all other solid waste management including refuse collection, the landfill, wastewater treatment, management of waste hauling contracts, and implementing energy conservation measures.

DPCA collects recyclable paper and other recyclables from the base's commercial and industrial facilities on a daily, weekly, or on-call basis and maintains a drop-off center near the Commissary for residential recyclables. Source-separated materials and unsorted waste from the commercial areas are transported to the recycling center where they are sorted by hand.

The recycling center is located at the landfill where trucks unload waste collected on the base onto a tipping floor where a front-end loader pushes the waste onto a loading conveyer which moves material down a sorting line. After recyclables are sorted, non-recycled waste is transferred for disposal in the landfill or for long-haul disposal.

DPCA has a lecture program that is given during new unit and employee briefings. Recycling and tours of the recycling center are promoted through the base newsletter and at meetings of Boy and Girl Scouts and other organizations. Troop units receive bonus points for recycled goods delivered to the recycling center as part of the incentive energy conservation program.

■ ***Redistribution services:*** DRMO, Defense Reutilization and Marketing Office, provides a redistribution service for excess property for DOD installations throughout Washington, Oregon, and the Aleutian Islands in Alaska. This redistribution can be viewed as a waste reduction/recycling system which redistributes excess property throughout the world. Examples of excess property include non-tactical vehicles, clothing, office furniture and supplies, hardware, aircraft, mattresses, bedding, etc. The most abundant and marketable materials handled by DMRO is scrap metal.

■ ***Goals and policies:*** With the help of its own Solid Waste Advisory Committee (SWAC), the Fort adopted a solid waste management plan in 1995 and began implementation during 1996. In the plan, the Fort identified a number of needs and alternatives and adopted waste reduction and recycling goals "in concurrence with Tacoma and Pierce County's goals." These include:

Goal: To reduce the County's and the Fort's waste stream and achieve a 50% percent recycling rate by 1995.

Goal: To promote educational and public outreach programs to inform the citizenry of the desirability and benefits of waste reduction.

Goal: To implement programs that reduce the amount of waste generated.

Goal: To support national, state, and military waste reduction programs.

In the plan, Fort Lewis indicated there had been a three-year decline in the base's recycling rate from 25.6% in 1992 to 19.5% in 1994. The plan analyzed the likely impact of a number of recommended activities and, with full implementation, estimates the Fort could achieve a recycling rate of a 50% by 2002.

The following are some of the proposed recommended activities some of which began implementation in 1996:

■ ***Recycling center:*** Fort Lewis modified and expanded the recycling center to increase the amount of waste that could be handled and increase the quality of recyclable materials separated from the waste stream. The modifications included a finger screen to remove batteries, broken glass, and miscellaneous material; a magnetic separator to remove ferrous metals; an aluminum can crusher; a new sorting conveyor, and an expanded tipping floor

Recyclables sorted at the facility are cardboard, high-grade paper, waxed paper, mixed grades of paper, PET and HDPE plastics, aluminum cans, glass, and various metals. Paper, plastics, and aluminum cans are baled on the site and all recyclables are marketed by wholesalers. Any toxic or hazardous materials are removed and prepared for proper disposal off-base.

■ ***Residential:*** Fort Lewis should consider contracting with a private hauler to provide curbside pickup of recyclables to residential housing. The program would be similar to the programs offered in the County. Materials collected would include newspaper, all colors of glass, tin/aluminum cans, mixed waste paper, and cardboard.

■ ***Information Outreach:*** A 24-hour recycling hotline (253-966-2100) has been established to address the following issues:
- Location of and directions to recycling drop-off points.
– Description of what and how to recycle at Fort Lewis.
– Instructions on what to do with household hazardous wastes.

– Information on troop unit, housing, and office recycling.
– Updates on special events such as Earth Day and Christmas tree recycling.

The DPCA Marketing Department produces brochures on troop unit recycling, household recycling and office recycling. The post newspaper, Northwest Guardian, and other monthly publications print Recycler's Corner—an article that promotes Fort Lewis recycling activities.

■ ***Education program:*** The base identified that the success of waste reduction and recycling programs in the County and elsewhere rests with the education programs. The base intends to enhance and expands its educational program aimed at soldiers and civilians employed on the base and to take advantage of the informational brochures and pamphlets that Pierce County makes available to the base. Pierce County also provides school education programs, upon request, to the base school system. The Fort is considering developing a new recycling information program for families when they move into Fort Lewis family housing.

■ ***Drop-off centers:*** Another identified need was for locating additional drop-off centers to encourage more people to participate, including those who live off base. One site identified was in the commercial area between Madigan Hospital and the Logistic Center because of its visibility and access to a high level of off-base traffic.

■ ***Construction regulations/guidelines:*** The Plan recommended that new and renovated buildings and housing developments include features which encourage recycling, such as allocating space for drop-off containers. Enhanced recycling requirements could be included in updated guidance manuals.

■ ***Construction and demolition waste (C&D):*** Beginning in January 1996, all new demolition contracts require contractors to haul all C&D waste off-base. The C&D cell at the landfill was closed. It is expected that, because of the many available private C&D recycling businesses in Pierce County, that contractors will recycle the maximum possible amount

■ ***Yardwaste composting:*** The Plan identified a need to evaluate the availability of yardwaste composting facilities before implementing a residential or other types of yardwaste collection programs. Some of the recommendations include the potential for composting yardwaste with biosolids from the base's wastewater treatment plant and working with Pierce County on a joint solution.

■ ***Waste stream reduction:*** Another need identified by the base is to modify purchasing and procurement specifications to reflect a preference for goods which have a long lifetime and/or are easily repaired; to promote bulk purchasing to reduce packaging waste, and to require an evaluation on lowest life-cycle cost. The base will also investigate opportunities for the use of electronic media to replace paper and participate in a waste exchange.

CHAPTER 5

SOLID WASTE COLLECTION

This chapter describes refuse collection systems and provides criteria to evaluate the collection system of the three waste management systems in terms of their ability to meet existing and projected needs within the framework of the Plan's goals.

5.1 Goals

Pierce County and the SWAC established the following goals for refuse collection.

Goal:	To ensure that all residents of Pierce County have access to refuse collection services.
Goal:	To ensure the compatibility of collection service levels with the other elements of the solid waste system established by the Plan.

5.2 Legal Authority

Unincorporated Pierce County: Regulation of solid waste and recycling collection differs between incorporated and unincorporated communities, between residential and commercial sectors, and between the type of material handled. Tables 5.1, 5.2, and 5.3 illustrate the many options available and compare city and county legal authority. Table 5.1 depicts how waste collection is presently regulated within unincorporated areas by the Washington Utilities and Transportation Commission (WUTC).

In addition to basic collection regulations outlined in the matrix, State law allows counties to:

- author comprehensive solid waste management plans (RCW 70.95) which include service level policies;

- form solid waste collection districts in which garbage collection would be mandatory (RCW 36.58A);

- collect garbage within collection districts if WUTC-regulated haulers are unable or unwilling to provide that service (RCW 36.58A);

- form solid waste disposal districts through which counties (other than King County) may levy a tax on district residents and businesses to fund disposal activities (RCW 36.58.1110-.150);

- impose fees upon solid waste collection services to fund compliance with comprehensive solid waste management plans (RCW 36.58.045);

- formally submit comments on collection service matters to the WUTC. These comments "Shall become part of the record of any rate, compliance, or any other hearing" by the WUTC (RCW 81.77.120).

The WUTC Option--- Pierce County's Recycling Minimum Service Levels:
In 1989, the Plan set as one of its goals the "use of private industry expertise to carry out components of the solid waste management plan." Also in 1989, the County Council

Table 5.1 County Authority (unincorporated areas)	**Residential Collection Service**	**Non-residential Collection Service (commercial)**
Garbage	The County does not regulate the **collection** of garbage. The Washington Utilities and Transportation Commission (WUTC) regulates residential and non-residential garbage collection in unincorporated areas (RCW 81.80, WAC 480-70). In Pierce County, three companies hold five solid waste collection permits assigned by the WUTC. Murrey's Disposal holds two (Murrey's Disposal and American Disposal, subsidiaries of Waste Connections); Harold LeMay Enterprises holds two (Pierce County Refuse and Lakewood Refuse); and University Place Refuse has one. These permits (commonly referred to as franchises) are a property right, which may be bought or sold but are otherwise held in perpetuity. Franchise districts are designated service areas in the unincorporated county which do not overlap in Pierce County. The WUTC enforces service and safety standards and sets rates for the services offered by these companies. The WUTC sets rates based on a "cost of service" principle. Rates approximate how much it costs to offer a particular service to a particular customer class. There is minimal cross-subsidization between residential and non-residential service. Certificates may have terms and conditions attached and may be revoked or amended after a hearing held by the WUTC.	
Recycling	County Contract Option Counties may contract with private vendors to provide recycling services to residences. Counties that choose this option assign service territory, establish and enforce service standards, and set rates. The WUTC Option Counties may notify the WUTC to carry out and implement the provisions of the waste reduction and recycling element of a comprehensive solid waste management plan. If a county chooses this option, WUTC-regulated haulers will provide the recycling services specified in the solid waste plan, but under the economic and service regulation of the WUTC. (Pierce County chose this option.)	Open Market. The Federal Government has pre-empted state and local government regulation of commercial recycling collection.

directed the solid waste staff to work with existing haulers to design a recycling collection system that the haulers could implement. To both these ends, the Plan and related implementation ordinances established minimum levels of service for: a single-family residential curbside recycling program; a recycling program for multi-family complexes, condominiums, and mobile home parks; and a residential yardwaste collection program.

The 1989 Plan and the ordinances also stated that the service cost of subscribing to garbage collection alone should be more than the cost of subscribing to garbage collection and recycling; in effect, providing a financial incentive to participate in the recycling programs. The Minimum Service Levels and the suggested rate structure are enforced by the WUTC when it audits the haulers and sets rates.

***Incorporated cities and towns*:** The cities and towns of Pierce County have three options available to them when it comes to deciding how to regulate the collection of waste and recyclables within city / town limits. The matrix in Table 5.2 illustrates the cities' many options to contract, collect, or choose WUTC oversight.

Cities do not have to choose the same option for garbage collection and recycling. Some cities (outside Pierce County) contract with multiple haulers for different services. Cities may declare participation in garbage collection mandatory and may impose utility taxes on top of service fees.

Cities' recycling services: The 19 cities using the Pierce County disposal system have adopted and implemented recycling collection programs similar to the County's Minimum Service Levels. In effect, the recycling system is countywide.

Cities in the county that contract for garbage collection also contract for recycling. Those cities which have chosen to be under the WUTC franchise system (Edgewood, Fife, Gig Harbor, South Prairie, Wilkeson) receive the same service as unincorporated areas. Tacoma, Ruston, and McChord AFB have similar but separate curbside recycling collection programs. Fort Lewis does not have curbside recycling collection. The Fort separates recyclables at its recycling center. (Chapter 4 describes recycling collection programs in more detail.)

Areas recently annexed or incorporated: The cities of Edgewood, Lakewood, and University Place, which incorporated after the adoption of the Plan, as well as any areas recently annexed to other cities, are special cases. Technically, the WUTC franchise expires upon annexation/incorporation. For at least seven years, however, a city is required to utilize the services of the franchised hauler at rates which allow the hauler to recoup all investment made prior to annexation/ incorporation. The city and the hauler may choose to negotiate an immediate contract or to establish a longer "buy-out" period.

Often, the WUTC has continued serving as the regulatory agency in areas annexed or incorporated for the minimum time. Afterward, cities have traditionally assumed authority.

Interlocal Agreements: This Plan represents a coordinated planning effort between the County, all municipalities, the Tacoma-Pierce County Health Department, and the two military bases. Through Interlocal Agreements, Pierce County's cities and towns join with the County in implementing and enforcing the Plan. No agreements are required to be adopted with the military bases.

Table 5.2 City Authority (incorporated areas)	**Residential Collection Service**	**Non-residential Collection Service (commercial)**
Garbage	<u>Municipal Option</u> Cities may operate their own solid waste utilities. A city can own/operate its equipment, assign routes, establish service standards, and set rates within the municipality. Ruston and Tacoma use this option and each collects garbage using municipal crews and equipment. <u>Contract Option</u> Cities may contract with haulers to provide garbage collection services to residences and businesses. The city assigns service territory, establishes and enforces service standards, and sets rates. Bonney Lake, Buckley, Carbonado, DuPont, Eatonville, Fircrest, Lakewood, Milton, Orting, Puyallup, Roy, Steilacoom, Sumner, and University Place contract with private haulers. Cities and towns may also reach interlocal agreements with other local jurisdictions to provide or contract for municipal services, including solid waste collection and other services. Other than Tacoma's interlocal agreement with Ruston for disposal, no city in Pierce County contracts with another municipality via interlocal agreement for solid waste services in 1999. <u>WUTC Option</u> Solid Waste Collection Permits for franchises assigned by the WUTC often overlap city limits. If a city does not choose one of the first two options, the WUTC regulates (by default) as in unincorporated areas. In Pierce County, the residents and businesses of Edgewood, Fife, Gig Harbor, South Prairie, and Wilkeson have their waste collected by the WUTC franchised hauler at the same rates as charged in the unincorporated areas outside each city.	
Recycling	<u>Municipal Option</u> Cities may collect recyclables. <u>Contract Option</u> Cities may contract with private vendors to provide residential recycling services. <u>WUTC Option</u> If cities do not choose one of the other options, and their solid waste plan calls for residential curbside recycling, the WUTC will regulate the service, as in the unincorporated County. Unlike counties, cities do not have a formal mechanism to "notify" the WUTC to regulate recycling and implement the city's solid waste management plan.	<u>Open market.</u> The Federal Government has pre-empted state and local government regulation of commercial recyclables collection. Cities may provide their own commercial recycling services (e.g. Tacoma) but cannot mandate participation.

The agreements state the general obligations of each jurisdiction and provide for review, renewal, and amendment processes. For the 19 cities using Pierce County's disposal system, the County is responsible for countywide planning and management services for waste generated and collected within the unincorporated areas and municipalities; the development of model recycling collection programs; countywide public education and outreach programs; data monitoring and collection; disposal rates and operating rules; and to "cost-effectively plan for, design, and/or site disposal facilities."

Cities are responsible for collection within their jurisdictions; implementation of similar or the same residential recycling collection programs; and coordination with the County on all other programs.

As a joint-participant in the Plan, the City of Tacoma is responsible for its own planning, management, and disposal system. Tacoma coordinates with the County on educational efforts and other special collection programs; and provides disposal services for the Town of Ruston. Ruston has an Interlocal Agreement with the County supporting the Plan and its policies and an Interlocal Agreement with Tacoma for disposal. Like the other cities and towns, Ruston is responsible for collection, the recycling program, and coordination with the County.

Table 5.3 compares the different city and county legal authorities. (Chapter 10 provides a more detailed discussion about administrative systems and how they work.)

Disposal and collection rates: Collection rates --- the fee everyone is familiar with in their monthly, bi-monthly, or quarterly bills --- incorporate both the cost of collection and the cost of disposal. With respect to garbage disposal, the County's authority is delineated in Chapter 36.58 RCW:

> The legislative authority of a county may by ordinance provide for the establishment of a system or systems of solid waste handling for all unincorporated areas of the County or for portions thereof. A county may designate a disposal site or sites for all solid waste collected in the unincorporated areas pursuant to the provisions of a comprehensive solid waste management plan adopted pursuant to Chapter 70.95 RCW.

Pursuant to the 1989 Plan and Interlocal Agreements with the cities, Pierce County negotiated a new agreement with Land Recovery, Inc. (LRI) to provide disposal services to Pierce County residents and to those cities using the County's management system. The basic agreement was last revised in 1998 and it extends to the year 2011. It directs the relationship between the County and LRI by setting out base rates for waste disposal, transfer, recycling, and administration programs and it establishes a procedure to adjust those rates for inflation or compliance with new environmental laws or standards.

Disposal rate-setting process: Disposal rate increases are handled in the following manner: LRI submits an informal rate increase proposal to the Solid Waste Division of the Pierce County Department of Public Works and Utilities. The Division works with LRI to finalize the proposal for submission to the County Executive. The Executive in turn submits the rate increase proposal to the County Council for its consideration. The Council may hold hearings on whether the proposed increase is consistent with the terms of the Pierce County-LRI Agreement. If the Council

disputes the appropriateness of the increase, the Agreement outlines an arbitration process. If the Council does not object to the increase, disposal rates will increase as proposed.

When the disposal rate increases, the individual hauling companies must pay the higher disposal rate or "tipping fee" each time a collection truck crosses the scales. After the Council has increased the disposal fee, haulers must then go to the appropriate regulatory authorities (either a city council with which they contract or the WUTC) to get collection rates adjusted in accordance with the higher disposal fees. Cities may add administrative or other fees to their collection rates.

In the County, the cost for collection and disposal varies depending upon the service provider and the number of cans the customer chooses to set out. All of the franchise haulers offer a mini-can with recycling services to single-family households at the direction of the County's Minimum Service Levels ordinance. Businesses are provided a multitude of container sizes to fit their needs and choice.

The Solid Waste Division does not formally track collection fees and refers all inquiries to the haulers, city/town administrators, or the WUTC. Rate complaints are forwarded to city/town administrators or the WUTC.

Tacoma: Disposal and collection rates for the City of Tacoma Solid Waste Utility are determined by the Tacoma City Council and are not subject to WUTC review. Collection service fees and rates are calculated on a cost per service basis, with a variable fee schedule based on the frequency of service and the amount collected. Service fees are proposed by the Tacoma Solid Waste Utility for review by the City Council. Service fees are established through the adoption of City ordinances. The adoption of City ordinances requires readings at a minimum of two City Council meetings, which are considered public hearings. Each ordinance must also have a majority vote of the City Council at a minimum of two public hearings.

Tacoma establishes a single rate for residential services, which includes all curbside recycling services, taxes, and other related charges. In 1995, Tacoma established a Rate Advisory Group to help evaluate and steer Solid Waste Utility rates and charges.

Fort Lewis and McChord AFB: Military bases are not subject to WUTC regulations and can arrange for refuse collection independently.

In 1995, Fort Lewis adopted the *Fort Lewis Final Solid Waste Management Plan*, which describes the military collection and disposal system in more detail than the following summary.

Fort Lewis contracts for residential collection and then collects all other industrial/commercial waste itself.

McChord AFB contracts for all collection services, including recycling, and has a recycling center. Fort Lewis provides disposal services for both bases and has a front-end recycling center that separates recyclables from the military's commercial/ industrial waste stream. (The recycling programs of the two bases are discussed in more detail in Chapter 4.)

Table 5.3 Comparison of City Authorities to Other County Authorities	
Comprehensive Solid Waste Plan	A city which provides its own disposal system may also author its own plan for inclusion within the County plan, participate in the County's planning process, or develop a joint plan with the County. Plans may specify a level of service for a city that differs from that suggested for the unincorporated County. Except for Tacoma, cities in Pierce County have authorized the County to prepare the plan. Tacoma has elected to be a joint participant. The Fort Lewis and McChord AFB plan is summarized within the County's plan.
Solid Waste Collection Districts	Cities do not need to form a collection district to mandate garbage collection. A simple ordinance would suffice. A county collection district cannot include incorporated areas without consent of a city. Public hearings must be held and the county must determine that mandatory collection is in the public interest. Under mandatory collection, a hauler may request that the county collect fees from delinquent customers. A county can provide collection services only if the WUTC notifies the county that no qualified haulers are available for a district.
Solid Waste Disposal Districts	Through its existing authority, a city may include any collection, disposal, and administrative costs within rates. Cities may also levy a utility tax on waste collection services. Proceeds from this tax may fund operations outside solid waste management. Counties can obtain similar power through the formation of a Waste Disposal District.
RCW 36.58.045 Collection Surcharge	A city may not impose this surcharge as it has other funding mechanisms available.
Formal comments to the WUTC	State law does not grant cities the same permission and authority as counties to have comments "become part of the record of any rate, compliance, or any other hearing" held by the WUTC per RCW 81.77.120. Therefore, cities that contract for waste collection or recycling, are the regulator of "last resort." There is no WUTC oversight or consumer protections offered to city residents unless the city chooses to have the WUTC regulate collection service. Counties can use their commenting authority in working with the WUTC to ensure implementation of solid waste plan policies through rates or to comment on issues of adequacy of collection by a franchised hauler.

5.3 Service Areas and Population Densities

Service availability: Refuse and recycling collection services are available across the entire County. In the unincorporated areas, refuse and residential recycling collection are not mandatory. Residents and businesses may choose to self-haul their waste to the transfer stations or to the landfill. It is estimated that about 20% of the single-family households choose to self-haul; however, this percentage appears to be declining with the increase in urban densities and new residents choosing collection services.

Refuse is mandatory in those cities that contract for services. Most cities include both refuse and recycling services as one bill. Yardwaste collection is billed as a separate, additional service. Tacoma includes yardwaste collection as part of its refuse/recycling bill.

Those five cities or towns who have chosen to remain under the WUTC franchise have the same voluntary services as the unincorporated areas served by the franchises.

Curbside collection of recyclables is available to all residents, urban or rural, with three exceptions: 1) Anderson Island residents have a recycling / refuse drop-off site. 2) Some residents live on isolated roads which recycling collection trucks are incapable of traversing. The County's Minimum Service Levels Ordinance provides for an alternative system for these residents to receive a reduced refuse rate for recycling at buy back centers. 3) Some rural farms and home-based businesses have their household waste collected in commercial containers. These households are not eligible to receive residential recycling service, but can separately arrange for commercial recycling services.

The collection of recyclables from commercial or industrial businesses is unregulated but available to most businesses within urban areas.

For residential and commercial self-haulers, or for those people living on inaccessible roads, there are numerous recycling drop-off sites provided throughout the county by hauling companies and other recycling businesses. Most residents are within a 1-2 mile driving radius of either a drop-off site or buy-back recycling business. In accordance with the policy direction of the 1989 Plan, recycling collection containers were added to the transfer stations by LRI, which also maintains a recycling facility at the Hidden Valley Transfer Station. Tacoma built a substantial drop-off site at the Tacoma Landfill. (Transfer station locations, capacities, and needs are discussed in Chapter 7.

Franchise holders: The following refuse haulers hold certificates by the WUTC and serve most Pierce County residents. Cities served by the franchised haulers through contracts or under the franchise certificate are also listed.

- *Murrey's Disposal Company, Inc.*
  Certificate # G-9 *
  and
- *American Disposal*
  Certificate # G-37 *
  PO Box 399
  70th Ave E.
  Puyallup, Washington 98371

Cities: • Bonney Lake • Carbonado • Edgewood • Fife • Gig Harbor • Milton • Orting • Puyallup • South Prairie • Sumner • Wilkeson.

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* Subsidiaries of Waste Connections, Inc.

Harold LeMay Enterprises, Inc.

- *Pierce County Refuse*
  Certificate # G-98
  P.O. Box 44459
  13502 Pacific Avenue
  Tacoma, Washington 98444

  and

- *Lakewood Refuse Service*
  Certificate # G-18
  3902 Steilacoom Boulevard SW
  Lakewood, Washington 98499

Cities: • DuPont • Eatonville • Lakewood • Roy • Steilacoom

- *University Place Refuse Service, Inc*.
  (*Westside Disposal*)
  Certificate # G-64
  2815 Rochester Street West
  University Place, Washington 98466

Cities: • Fircrest • University Place

The City of Buckley contracts with Superior Refuse (Subsidiary of Waste Connections, Inc.).

The following company provides garbage collection services to Fort Lewis and McChord. The military bases also contract with LeMay Enterprises and Waste Management Inc., for other services.

- *U.S. Eagle, Inc.*
  Certificate # G-205
  PO Box 1666
  Suisan, California 94585

The following company holds permits to collect medical/dental, hazardous, or infectious wastes for transport to appropriate disposal facilities within the State.

- *BFI Medical Waste Systems of Washington, Inc./Stericycle of Washington, Inc.*
  Certificate # G-244
  11411 NE 124th St., Suite 190
  Kirkland, Washington 98034

The Pierce County Health Department has also permitted LeMay Enterprises, Inc. and Murrey's Disposal Company, Inc. to collect and haul infectious wastes within their Pierce County franchise areas under the Health Department's infectious waste regulations (Pierce County Code Chapter 8.38 Infectious Waste Management).

Service areas and population densities: Service areas assigned to the franchised haulers which serve unincorporated Pierce County are shown on Map 5.4. Also shown are the areas served by the Tacoma and Ruston utilities, and the military bases.

The existing population densities of franchise service areas, Tacoma/Ruston, and the two military bases are shown in Table 5.5. The table also estimates the projected growth within these areas to the year 2001. These figures are rough approximations based on countywide population projections matched with census tracts, city limits, and franchise service areas. Because the boundaries from these sources don't precisely match, the estimated populations can only be approximations. However, there

is sufficient information to estimate collection and disposal needs in the future.

Haulers experienced substantial growth in their service areas and the cities from 1990 to 1995 --- approximately 12%. Similar growth is expected by 2001. No problems caused by this population growth have been identified. Haulers have been able to provide refuse collection and to extend new recycling collection services to all those who have requested services.

With the adoption of the urban growth boundaries by the County and cities, population will be more concentrated in urban areas. The projected increases in densities may provide for more efficient route collections and cost-effectiveness of service.

(Tables 3.13 and 3.14 of Chapter 3 Waste Analysis show total projected population for twenty years and related disposal needs. Transfer capacity needs are discussed in Chapter 7 Transfer Facilities and Systems. Long-term disposal capacity needs are also projected in Chapter 8 Landfilling.)

Insert Map A

Table 5.5 Projected Population by Service Provider[1]					
Population	**1990**	**1995**	**1998**	**2000**	**2001**
Area 1 --- Murrey's Disposal and Superior Refuse	136,563	159,092	171,119	179,137	183,146
Area 2 --- American Disposal	38,875	45,331	48,758	51,043	52,185
Area 3 --- Pierce County Refuse	115,098	131,260	141,188	148,521	151,973
Area 4 --- University Place Refuse	33,716	37,312	40,133	42,013	42,954
Area 5 --- Lakewood Refuse	58,175	64,830	69,297	72,276	73,766
Area 6 --- Tacoma / Ruston	177,014	193,031	207,624	217,353	222,218
Area 7 --- Fort Lewis / McChord AFB	26,762	29,344	31,562	33,041	33,781

[1] The projected population figures were taken from Washington State Office of Financial Management's (OFM) projected countywide growth and combined with the Forecast Analysis Zones (FAZ's) used by the Puget Sound Regional Council (PSRC). The FAZ's were then matched, as closely as possible, with the franchise service areas and city limits. Because the FAZ's are based on census tracts and neither the city limits nor the franchise areas precisely match census tracts, there is necessarily some inaccuracies. This chart tracks total population, not the number of residential customers. Business customer growth may be impacted by more than just population growth.

5.4 Needs

Pierce County: For unincorporated Pierce County and the 19 cities using the County's disposal system, no immediate needs for refuse or residential recycling collection have been identified. All areas have access to service. There have been no complaints of lack of service and few complaints of service quality to the Solid Waste Division, which have not been speedily resolved.

Residents have expressed satisfaction with the new recycling services offered in the unincorporated areas and in the cities and towns. As directed by the 1989 Plan, the County adopted Minimum Service Levels for recycling and worked with the WUTC to implement the levels through the haulers' rates. These service levels resulted in extension of curbside recycling services to all County residents, urban and rural. The County reached a 50% recycling rate in 1995 without the need to implement either a mandatory collection district option or to use the option to contract for recyclables collection. These two options were discussed, although not recommended, in the 1989 Plan as alternatives to implement residential recycling collection.

In 1999, recycling collection rates for all franchises remain stable about $2 per month per customer, which is among the lowest rates in Washington. The system is flexible and allows collection of additional recyclables without a major system change. Working with the haulers and the WUTC through the minimum service levels approach, the County was able to design a recycling system, at minimal cost to the residents, which did not penalize the haulers and encouraged them to invest in additional equipment for service. The competitive growth of recycling businesses in Pierce County is evidence that the WUTC regulatory system did not hinder innovation among the private sector.

Data obtained by the County (as discussed in Chapters 3 and 4), indicates that the commercial waste generators are taking advantage of the many expanded private sector recycling opportunities with no direct involvement by Pierce County government. It is expected that, as the value of recycled materials increase over time and disposal costs increase, more businesses will take advantage of the many private sector opportunities to reduce their disposal costs.

Tacoma/Ruston: As a result of an extensive review of Solid Waste Utility operations, the City began implementing new collection services in early 1998 which were designed to increase the efficiency of all collection programs. For the first time in many years, Tacoma elected to reroute its collection services and date of pickup for the entire city, eliminating and consolidating some routes. In addition, the City switched from a multi-bin system to using a commingled recycling bin system for its curbside recycling collection. While these changes resulted in a different service delivery system, they did not affect the availability or actual delivery of the service. All customers have equal access to Tacoma collection service. Ruston offers a recycling collection service to its residents that is similar to other areas of the county.

Fort Lewis/McChord Air Force Base: The *Fort Lewis Solid Waste Management Plan* does not identify any needs for refuse collection. Both bases have adequate service systems. It does identify a need to consider and evaluate the cost-effectiveness of curbside pickup of recyclables on Fort Lewis, as is done on McChord, in addition to processing at the recycling center. McChord is evaluating implementation of a 44% container capacity reduction plan.

5.5 Issues and Evaluation Criteria

While no collection needs have been identified, the following are issues that may arise, alternative courses of action to consider if they do, and criteria to evaluate those alternatives.

Issue #1-- Service availability and quality of services for the Pierce County system: As discussed in the 1989 Plan, the basic criteria for determining needs for refuse and recycling collection is the availability of the services to all residents. A second criterion is fairness of rates or quality of services. A third, subsidiary criteria would be consideration of whether collection systems support or hinder achievement of the waste reduction and recycling goals. The following options are evaluated against these criteria.

- *Existing system:* Both the WUTC and the cities who contract for services can and do regulate the availability, cost, and quality of services through *enforcement* of franchise and contract rates. Through direction in the 1989 Plan, Pierce County supported this existing system by ensuring that self-haulers have adequate access to transfer stations and the landfill and by supporting the private sector drop-off recycling system. For example, the transfer facilities and the landfill have drop-off collection containers, and drop-off sites have been incorporated into the recycling programs. *Maintenance* of this self-haul system was a 1989 Plan recommendation. The County established rate criteria for the initial design of the recycling collection programs when it specified that recycling collection should be around $2 per household or less.

This alternative allowed achievement of the County's 1995 50% recycling goal.

- *Mandatory collection alternative:* In the case of a hauler failing to provide adequate refuse collection service, the County could consider instituting a mandatory collection district as indicated in the 1989 Plan. Part of forming such a collection district is review by the WUTC of the fitness of the local hauler to provide the mandatory service. The WUTC is obligated to assign the territory to an entity that can, or the County may step in and provide the service.

Mandatory collection means that all households would be billed for collection at some minimum rate. Implementation would require formation of solid waste collection districts, public hearings, and approval by the County Council. Cities could be included only by their legislative consent. The procedures and costs to the County to form a collection district could be substantial.

A proposal for mandatory collection may draw criticism from private haulers and residents. Those residents who dispose of their waste on their own property or self-haul would likely not support such a mandate. Forcing refuse collection on all residents, particularly those in remote areas, would incur substantial additional costs to haulers in terms of travel time, equipment maintenance, and use of vehicles with little payload. These costs are not easily recovered under the current WUTC regulatory system. Resulting rate increases would be applied system-wide for hauling companies with large remote areas.

The County would have to consider whether or not to make residential recycling collection mandatory. An issue of concern would be consideration of the equity between residential and commercial rates. The County cannot mandate recycling collection from commercial businesses. At

issue would be how to equitably spread the cost of the system between residents and commercial businesses.

The County would have to coordinate closely with the WUTC on the development of a reasonable rate system that would not penalize the haulers and to develop a County mechanism to handle collection of delinquent accounts and regular billing.

A particular concern would be whether or not the system could be cost-effective if cities elected not to be included. In addition, large portions of the County that have developed at urban densities have recently been incorporated, reducing the population densities of the unincorporated areas. The remaining areas are more rural with lower densities, which make routes less efficient and less cost-effective to serve.

The County would also need to reconsider whether all of the transfer stations were necessary since a change to a mandatory collection system would likely limit the need to provide for self-haul activity. The 1989 Plan considered mandatory collection unnecessary to achieve recycling goals and only minimally successful as a rational for illegal dumping. It concluded that "the limitation of self-haul activity does not appear to be a desirable goal" and recommended continued support for transfer facilities for self-haul residents.

Mandatory collection would address both the service availability and quality of service criteria. It would support residential recycling programs; however, it would not guarantee increased recycling. This is because commercial businesses, rather than the residential sector, account for the largest percentage of recycling in Pierce County, and the County does not have the authority to mandate commercial recycling collection.

- *Contracting for recycling alternative:* In the case of a hauler failing to provide residential recycling service, the County can reconsider contracting for residential recycling collection.

The existing recycling system is countywide with almost identical services in the cities provided by the same hauling companies that serve the County. Because of economies of scale, this approach has resulted in a stable, reasonably cost-effective system. Recycling collection bins are bought in bulk and County promotional and educational materials are the same throughout the County and in the cities and towns. Haulers can use their trucks and other equipment across jurisdictional boundaries within their service area. Any consideration of a change to a recycling contract system would need to evaluate whether the contract should be countywide; whether cities would join in on the contract; and the effect of the contract on the current operational system.

Another concern would be about contract costs and the reliability of long-term contracting under fluctuating recycling market conditions. Recycling markets have a history of ups and downs.

Again, while this alternative would ensure the availability and quality of recycling services to residents, it would not ensure recycling collection to businesses. The County does not have the authority to contract for commercial recycling collection. Cities may contract but the contracts must be non-exclusive -- allowing for many contractors. As a result of Congressional actions which limited the availability to contract for commercial recycling collection, the WUTC no longer regulates rates or service areas for the transportation of recyclable materials from businesses,

although commercial recyclables haulers must possess a common carrier permit and show proof of insurance to operate in the state.

Issue #2 -- Potential changes to Washington State's regulatory system: Between 1991 and 1995 proposals were made by other municipal jurisdictions or multi-national waste companies to change the way counties and the State regulate the collection of garbage and recyclable materials. Essentially, under these proposals counties would have been granted the same regulatory authority now held by cities. In effect, a county could run its own collection utility, contract for collection, or remain under the WUTC regulatory system.

Pierce County opposed these proposals on the basis that the current system has worked quite well providing citizens and businesses sufficient incentive to recycle. The County also opposed the proposals on the basis that existing state law provides the County with adequate avenues for active involvement in regulation by establishing a partnership framework between County government, private sector haulers, State regulators, and customers. Pierce County used this partnership approach to design and implement the recycling minimum service levels ordinances.

This issue may come up again in other legislative proposals. If the County should feel, at some time, that the WUTC regulation is insufficient, the County may wish to pursue state authority to regulate the hauling companies.

If regulatory changes occur, the following alternatives could address service availability and quality of service and could support recycling systems in much the same way as the alternatives listed above.

Another criterion of importance for evaluating these alternatives is cost-effectiveness. The question that needs to be considered is: would it be wise to extend an option that may end up forcing the County to implement an inefficient regulatory system? A study would be needed to evaluate all of these alternatives in more detail than discussed here, if the need arises.

- *Continued WUTC regulation alternative:* Any future proposal needs to be evaluated as to the range of options that would be available to the County. Past proposals to change the regulatory system did not address how counties would fund their new regulatory responsibilities nor how the existing WUTC solid waste regulatory program would remain viable if it were to regulate a reduced number of haulers. If enough counties with large haulers left the WUTC regulatory system, then the WUTC may not have the resources necessary to regulate for the rest of the counties and the cities left behind. The WUTC would be unable to set a regulatory fee high enough to fairly regulate the haulers and low enough not to be a burden on the remaining haulers or ratepayers. If regulation authority remains with the WUTC as it is now, Pierce County can continue its positive relationship with that entity and the haulers to whom the WUTC has granted franchises in the County.

- *County regulation alternative:* Eventually, the County might be forced to regulate the haulers if there are changes to the State's regulatory system. Such a change would also substantially effect small cities under the franchise system in Pierce County who have no solid waste staff.

The County and these cities would have to consider either adding regulating staff or contracting for regulation. Pierce County would have to assume new auditing and

customer service responsibility. When citizens have service problems or concerns, the County could take care of them through enforcement of contacts with the service providers. Either way, collection rates would probably rise. The existing WUTC regulatory system would be comparatively more cost-effective because of the economies of scale provided by statewide regulation.

Besides contracting for the regulation/ auditor function, the County could also consider contracting for collection. Becoming a regulatory agency could pose problems with the current partnership approach the County has established with the local hauling companies. A certain amount of goodwill has enabled the haulers, recyclers, and the County to cooperate in the design of recycling programs. Also, the County has no experience in regulating other large, national corporations who have an interest in serving the county and city residents. Given the growing competition in Washington and the growing presence of large national and multi-national hauling businesses interested in expanding into Washington, the local existing haulers might lose out in a competitive bidding process for County contracts to provide collection service. The local owners who helped build Pierce County's recycling programs might be undercut out of the system.

- *County utility alternative* -- If these regulatory changes were made, the County could consider starting its own collection utility. There would be substantial capital, operation, maintenance, and personnel costs if the County were to establish a collection utility.

Issue #3-- Flow control limitations and disposal rates: Complicating all of the above discussions about alternatives to various issues that may arise is what has happened on flow control and what may happen to future disposal rates.

Some of the proposed regulatory changes by other municipalities outside of Pierce County were based on a desire to increase their recycling percentages by setting garbage collection rates which were substantially more costly than the WUTC's "cost of service" approach. Some of the proposals were based on the municipality's need to ensure funding to support system investments already made by the municipality for capital facilities.

Flow control enters the picture because decisions handed down by the United States Supreme Court (*C & A Carbone Inc. v. Town of Clarkstown, NY*) have impacted the ability of municipalities to control the flow of waste materials and recyclables. In the past, municipal governments have been able to assure that waste streams went to specific processing or disposal facilities. This guaranteed the municipality a way to collect fees on that waste. The U.S. Supreme Court recently has held this type of "flow control" to be unconstitutional infringement on the "Commerce Clause" of the U.S. Constitution. Because of this precedent-setting case, the public financing of waste processing facilities and other system costs has become riskier. In addition, without the ability of municipal regulatory oversight of commercial recyclables, it is also difficult for municipalities to identify, let alone control, where recyclables are collected and processed. As a result, municipalities may be facing uncertain funding for the future.

Subsequent federal court decisions have refined the holdings in *Carbone* by holding that flow control is not an undue burden on interstate commerce where the municipality is actually performing the solid waste collection with its own employees or via contract. Washington State law (*Article. 7,*

Section 7 Washington Constitution, RCW 35.67.020) gives Tacoma, as well as all cities and towns, clear authority 1) to engage in the enterprise of solid waste collection; 2) to exclude other providers of solid waste collection service from collecting municipal solid waste within the municipal boundaries; and 3) to determine where the waste that has been collected will be disposed.

Carbone addressed only an ordinance that required all solid waste generated within the town limits to be processed at a designated transfer station. Thus, the decision addressed only the legality of excluding competition in the provision of solid waste disposal service, and is not directly controlling on the question of whether a city or town may exclude other providers of solid waste collection service.

More recent decisions of the U.S. Court of Appeals for the Second Circuit support the authority of a municipality to require use of a particular disposal facility through its involvement in solid waste collection, such as in *SSC Corp v. Town of Smithtown*. In that case, the court confirmed that a town has authority to include in a contract for solid waste collection by a private company a provision requiring such a company to deliver such solid waste to a facility specified by the town. This contractual designation of a disposal site did not violate the Commerce Clause because in contracting for solid waste collection service, the town acted as a market participant rather than a market regulator. In *USA Recycling v Town of Babylon*, a town's decision to provide municipal collection, funded by taxes, through a single contractor constituted market regulation and therefore was subject to the limitations of the dormant Commerce Clause. Nevertheless, there was no Commerce Clause violation because the town's action did not discriminate against interstate commerce, rather the town eliminated the market entirely. A similar Commerce Clause case is currently pending before the U.S. District Court of the Western District in Washington.

In building its public/private partnership, Pierce County has relied less than some other jurisdictions on flow control to fund its existing system.

(More detailed discussions of flow control and how its limitations effect other components of the waste management system can be found in other chapters and in the Appendix.)

- *Disposal districts alternative:* Rather than make changes to regulatory systems in the guise of solving flow control, counties in Washington State have the option to solve financing problems through disposal districts. Such a district is an independent taxing authority with the ability to implement charges or taxes to pay for the services provided within the district. The County Council could impose a tax on all waste generators to fund solid waste disposal facilities and services. Even if waste flowed out of the system, revenues could be secured. This approach would lessen the current reliance upon tipping fees to fund the system.

One issue of concern would be whether cities would consent to a disposal district. The effect of an out-of-county disposal facility on disposal rates may be one of their concerns that may generate a lack of support for a disposal district.

A disposal district would ensure funding for the existing system's fixed costs, which include:

- bond financing and operations of the Pierce County Yardwaste Composting Facility;

- operations of the residential waste transfer stations at Purdy, Anderson Island, Key Center, and South Prairie;

- the transfer of waste from those facilities to a disposal facility;

- solid waste planning;

- enforcement of solid waste regulations by the Health Department;

- recycling and waste reduction education programs; and

- household hazardous waste programs.

Issue #4 -- Changes that may occur in how waste is collected: In addition to potential regulatory changes, "street-level" modifications to existing solid waste collection programs could impact waste reduction, recycling, composting, and disposal programs. The following reviews:

- automated collection practices;

- frequency of waste collection services;

- mini and micro-can collection services;

- collection of waste, recyclables, and / or yardwaste in the same vehicle; and

- methods to weigh garbage and impose weight-based, rather than volume-based, rates.

Impacts from these operating system changes can be positive or negative and are related to: the cost of providing the service; the ease of providing recycling collection alongside garbage collection; and customer/ citizen acceptance of options and the resulting impact on participation rates.

- *Automated garbage collection:* In unincorporated Pierce County, and in the cities and towns, other than Tacoma and parts of Lakewood, haulers manually collect garbage generated from residences and small businesses. An employee of the hauler moves the can from the curb to the truck and manually lifts and empties the contents into the collection vehicle.

In Tacoma, and in some sections of Lakewood, haulers use containers which attach to a lift mechanism mounted on the truck. The lift raises cans and empties the contents into the vehicle.

Since beginning its automated collection program, Lakewood Refuse reports that automated collection service can be more cost-effective to the haulers, cutting stop time and reducing on-the-job injuries. Customers benefit because they will most often be provided with a wheeled cart. Neighborhood aesthetics are improved because every household has the same can type placed out front or in the alleyway, rather than a hodgepodge of sizes and styles.

On the other hand, a large percentage of the single-family customer base in Pierce County now subscribes to single-can service. Would a large-scale move to sixty or ninety gallon containers provide service in excess of demonstrated need? Does providing too much container space for garbage create an incentive to fill the container and act as a disincentive to source-separate household recyclables or yardwaste and a disincentive to practice waste reduction?

One way to achieve the benefits of automated collection without creating excess garbage collection capacity and thus, reducing the incentive to recycle, is to couple automated collection with less frequent "every-other-week" collection.

• *Changes in collection frequency:* It is the custom in Washington, for single-family residential customers to have weekly service and businesses to have a scheduled or as-needed service. In some parts of the United States, the common practice is to have waste collected less frequently than weekly.

When curbside recycling service began in Pierce County, there was a major shift as customers moved to one-can weekly service rather than two-can service. Other customers chose to subscribe to a mini-can 20-gallon container. Under municipal contracts, some haulers also offer a 10-12 gallon micro-can service. Now, there is a full-scale service for curbside recycling and yardwaste collection, and many "drop-off" opportunities to recycle material not collected through curbside programs. With these services and increasing disposal fees, customers may seek further ways to reduce their level of service and save more money.

From a customer's perspective, every-other-week collection would cut service in half, with the expectation that rates would drop by half. A cost-of-service regulatory standard as administered by the WUTC, however, does not result in such a direct reduction. Even if a customer has waste collected once every two weeks, unless all the neighbors likewise switch, the garbage truck must still pass by the customer's home once a week. The hauler will still require the same number of support and customer service staff, and would also have to take on the additional burden of tracking which customers on a given route were weekly vs. every-other-week customers. Further, a transition to every-other week collection would require a re-examination of the average weight of a can full of residential garbage. The can weight is important because much of the cost of service is related to can weight. If bi-weekly collection resulted in a higher average can weight, this would also have to be accounted for in rates.

Until an entire neighborhood is converted to every-other-week collection, the haulers realize few savings and can pass few savings onto the customer. At this time, a scatter-shot approach to making every-other-week collection available in Pierce County does not seem warranted. There is a potential for misunderstanding about why rates do not drop as much as would seem likely and the difficulties placed on haulers might jeopardize existing successful programs by creating ill will and reducing their desire to participate in County-sponsored programs.

Every-other-week collection combined with an automated collection program might be a more cost-effective approach.

• *Promotion of mini- and micro-can services:* While mini- and micro-cans do not pose routing difficulties to haulers, the same potential for misperceptions about cost savings exists as for every-other-week collection. Once the hauler has a truck in front of the house and the employee walking the can to the truck, much of the cost of collection has been incurred. In late 1996, for example, a Pierce County Refuse customer could save approximately $1.90 per month by switching from a 32 gallon can service to a 20 gallon mini-can pickup which is a savings of approximately 20% on the waste collection/disposal portion of the monthly bill.

Future promotion of mini- and micro-cans may need to emphasize the reasons why rates do not drop as much as expected.

Rate issues for cities are even more complex. While haulers who operate in unincorporated areas are regulated on a cost-of-service basis, some cities subsidize micro-can customers

with revenues collected by larger waste generators such as 2 or 3 can customers or commercial customers. As more and more customers adopt the waste reduction and recycling ethic, there are more customers receiving the subsidy and fewer doing the subsidizing. Some cities, outside of Pierce County, have faced major rate and revenue problems because of this practice.

• *Same vehicle collection:* Some communities outside of Pierce County have adopted programs that collect waste, recyclables, and/or yardwaste in the same vehicle at the same time. The most common approach is the collection of waste and recyclables in one container. Sometimes recyclables are separated into a "blue bag" but still placed in a container with other wastes. Collected materials are then bought to a material resource recovery facility ("dirty" MRF) for sorting. There are no facilities sorting mixed garbage in the Central Puget Sound Region. Until such a facility is a reality, a co-mingled waste and recyclables collection program is not practicable for Pierce County.

Some collection companies have developed modified equipment to allow for the collection of separated waste and recyclables in the same vehicle at the same time. Waste is placed into one compartment and recyclables (generally co-mingled with other recyclables) are placed into a second compartment. Haulers who support this type of program argue that such a system results in fewer trucks passing each home.

On the other hand, unlike the current system used to collect source-separated recyclables, this system requires a material resource recovery facility that separates co-mingled recyclables ("clean" MRF). Although Pierce County is fortunate to have local access to the required processing facilities, one of the successes of the County's program has been that household's source-separate recyclables and they generate uncontaminated products that are more easily processed and marketed. Thus, a full-scale commingled facility has not been needed.

A wet-dry system is a method for collection of traditionally non-recycled wastes. With wet-dry collection, a household separates dry wastes (non-recyclable packaging and plastics, broken glass, dirty paper such as tissues and used paper towels) from wet wastes (foodwaste, clean wet paper, and sometimes yardwaste). The dry waste is landfilled or incinerated and the wet waste is composted. Presently, Pierce County does not have access to a facility to compost wet wastes. Further, yardwaste, which traditionally would be one of the largest components of the wet collection has already been substantially diverted from the Pierce County waste stream.

• *Weight-based, rather than volume-based rates:* A final type of modification to the collection system could be a change from volume-based to weight-based rates. Most rates set by the WUTC or by city councils, establish a fee for the collection of a fixed volume of waste (e.g. a 32 gallon can or a 6-yard container) the exception is that some businesses that own their own containers pay separate hauling and disposal fees, with the disposal fee purely weight-based.

Some argue, that a weight-based system that rewarded customers on a pound-for-pound basis might be a better incentive to reducing and recycling waste, rather than can service levels. To be effective, collection vehicles would need to be outfitted with scales to measure the weight of each can. Various computer, bar code, and radio-tag technologies have been developed, but none perfected to the point that this form of metered system has been implemented on a large scale.

Some solid waste professionals in Washington argue that instead of the weight based system described above, rates should be based on the number of pounds that *could* be placed in a garbage can, rather than the potential volume of the can which is how it is currently done. Proponents of weight-based rates argue that since such weights are used to set disposal fees, setting long-haul transportation rates, and determining landfill capacity, then customers' rates should be based on weight, not volume.

Studies by the WUTC established that the current volume-based method achieves the same results as weight-based method. This is because the volume based rates are actually based on both the estimated weight of a can, how long it takes to tip that can at the curb, and "down-time" between stops. Most of the cost is attributed to factors based on weight. Testimony in rate cases and court hearings indicates that the current Washington method for "volume-based" rates provide the same incentives and achieves results similar to weighing each customer's can. In surveys around the country, industry magazines and studies usually report Washington's system as "weight-based."

5.6 Recommendations

Self-haul needs

#5-1 Transfer stations should be operated or sited to meet the collection needs of self-haul residents. Any changes in the locations, replacement facilities, or closures should be evaluated in terms of the effect on self-haul residents and how the changes could impact the refuse collection system.

Rate support

#5-2 The County and involved local governments should support efforts by the haulers to receive rate approval from the WUTC for the development of recycling programs and acquisition of equipment.

Minimum Service Levels

#5-3 To ensure recycling services remain available to all residents, Pierce County will continue Minimum Service Levels for single-family, multi-family, and yardwaste curbside recycling. The County will review and revise them as necessary in keeping with implementing other recycling goals and policies of the Plan.

Tacoma's role

#5-4 The City of Tacoma will continue to provide solid waste collection and disposal services within its corporate city limits. The City shall retain the right to determine all minimum service levels and collection and disposal rates as adopted by the Tacoma City Council, pursuant to RCW 35.21.120.

CHAPTER 6

SOLID WASTE PROCESSING TECHNOLOGIES

This chapter describes various types of solid waste processing technologies and facilities, identifies existing facilities in Pierce County, and evaluates alternatives for meeting remaining solid waste processing needs in the County.

Since adoption of the 1989 Solid Waste Management Plan, Pierce County has completed a number of studies on solid waste processing to handle the County's municipal solid waste stream. In addition, the County has requested proposals from private firms to provide specific solid waste processing facilities and services. These reports include:

- *Report on Alternative Solid Waste Processing Technologies* (1990)
- *Compostable Waste Diversion Report* (1991)
- RFP for a waste-to-energy (WTE) facility (1989) and subsequent contract negotiations
- RFP for mixed waste composting (1991)
- RFP for waste export services
- A summary report of alternative disposal technology costs (prepared and submitted to the County Council in 1991)

The County has also completed two phases of a siting study to determine the possibility of siting a County-owned landfill in Pierce County. The *Phase I: Countywide Screening Study* identified broad, general areas with the potential for meeting the State's siting criteria and it is discussed in more detail in Chapter 2 Background. The *Phase II: Site-Specific Screening Study* identified potential sites for a County-owned landfill. The status of this second phase is described in Chapter 8.

6.1 Goals and Permitting

Goals: Solid waste processing reduces the amount of material requiring disposal and, in some cases, also produces a useful product. Examples of solid waste processing technologies include material recovery facilities, where recyclable materials are removed and/or sorted; composting facilities where organics in solid waste undergo controlled decomposition; and waste-to-energy facilities where waste becomes energy for electricity.

Landfilling continues to be required even if solid waste processing technologies are employed because all of these technologies produce some sort of residue or handle only a portion of the waste stream. For example, landfilling is still required for ash and bypass waste (waste that can't be burned) from waste-to energy facilities. Thus, solid waste processing technologies do not replace landfilling; rather they are a part of an integrated system that reduces the amount of material that requires landfill disposal.

Decisions to implement such technologies typically consider the costs and benefits of processing and the costs of landfilling the remaining material to be disposed. Because the success of each type of processing technology also depends in part on the nature of the feedstock or material to be processed, a decision to implement a particular processing technology needs to also consider the effects of upstream waste reduction and recycling programs.

The consideration of any large-scale solid waste processing technology should meet

existing and projected needs within the framework of the following goals:

> ***Goal**:* To ensure the compatibility of processing technologies with the other elements of the solid waste system, and with the overall Plan goals.
>
> ***Goal**:* To use reliable processing systems that protect human health and the environment, and reduce dependency on landfills.

These goals are intended to present a comprehensive and balanced approach to solid waste management that complements existing programs and reduces the need for disposal capacity.

Permitting: The state permitting regulations for recycling, composting, and other processing technologies such as incineration are found in the Minimum Functional Standards (MFS), WAC 173-304. Most solid waste handling facilities must meet the requirements of this regulation through permits issued by the Tacoma-Pierce County Health Department. Permitted facilities must meet design and operation requirements; have operation and safety plans; and be in compliance with land use comprehensive plans, zoning codes, and the Solid Waste Plan.

The Health Department regularly inspects solid waste handling sites and reviews the permit status. In general, recycling facilities, solid wastes stored in piles, and surface impoundments are the most lightly regulated. The regulations have more stringent rules for disposal facilities, such as incinerators, and other waste handling facilities, such as transfer stations.

The following sections state when facilities need or may not need a permit under the MFS. Generally, recycling facilities (or businesses) within an enclosed building do not need a permit under the MFS, although they do need to meet the requirements of all land use codes. Specific types and sizes of waste-to-energy facilities will need a permit, as will all waste storage piles and surface impoundments.

A more detailed discussion of permitting issues is found in Chapter 10.

6.2 Overview of Types of Technologies

The following discussions describe various types of materials recovery, composting, and waste-to-energy facilities. It also includes a brief discussion about storage facilities.

6.2.1 Material Recovery Facilities

Several types of facilities are commonly referred to as “Material Recovery Facilities” or MRFs. These include:

- Waste separation and recovery facilities, often referred to as “dirty” MRFs, which process mixed municipal solid waste to recover recyclable materials.
- Recycling processing facilities, which complement recycling programs by providing the means to sort, process, and prepare recyclable materials for market. These are often referred to as “clean” MRFs because they do not sort mixed municipal solid waste, only mixed recyclables.
- Specialized MRFs, which accept a specific type of recyclable material or waste for processing, such as construction debris.

Table 6.1 summarizes the principal characteristics of the various types of Material Recovery Facilities.

Waste separation and recovery facilities: A waste separation and recovery facility is often called a "dirty" MRF because it accepts mixed municipal solid waste. Such a MRF can be arranged in various ways, using many methods and equipment to separate individual recyclable materials from the waste stream prior to disposal. For the purposes of land use and solid waste permits, a stand-alone facility is permitted under the requirements for a transfer station in the State's Minimum Functional Standards (MFS), WAC 173-304. These facilities can also be added as the front-end element to an existing transfer station or other disposal facility.

Waste separation and recovery facilities are designed based on several factors, including the following:

- Type and concentration of recyclable materials remaining in the waste stream after source-separation programs are implemented.
- Material markets and specifications.
- Material prices and the cost of recovery.
- Availability of sorting equipment, labor and labor cost.

Low technology facilities, often called "dump and pick" operations, depend largely on hand sorting. Mechanical systems in such facilities may be limited to conveyors. Low technology systems are less capital cost-intensive and allow for more operational flexibility than mechanized systems because expenses can be cut by reducing staff if a material becomes uneconomical to recover. If the market for the material rebounds, costs to resume recovery of the material are generally not high.

Medium- to high-technology waste separation and recovery facilities are more capital intensive and, therefore, are more likely to be economical where waste volumes are large. At these facilities, conveyors, screens, and magnets are commonly used to separate components of the waste. Some facilities also use air classifiers (devices that use forced air to separate the light burnable fraction from the remaining inert material) and shredders. Computerized equipment is also sometimes used to recover and segregate aluminum, paper, glass, and plastic.

Generally, residues left after recyclables are removed must be landfilled. Some may be compostable and some may be suitable for a WTE facility.

Recycling processing facilities: At a recycling processing facility, recyclable materials are separated by type and processed further to meet market requirements. These facilities are often called "clean" MRFs because they do not include mixed municipal solid waste in the sorting process. They can be a stand-alone facility/business, or sited along with a transfer or disposal facility. Totally enclosed stand-alone facilities do not necessarily require a permit under the MFS. Those with outside storage must meet permit requirements.

Land use permits vary depending upon the scale of the facility and type of zone the facility is being sited in. Pierce County's land use regulations define a "buy-back recycling center" as a small-scale processing business which collects, receives, or buys recyclable materials from household, commercial, or industrial sources. The business sorts or packages the recyclables for subsequent shipment and marketing.

A "recycling processor," as defined in the County regulations, is a large-scale business that specializes in collecting, storing and processing material (other than hazardous waste or municipal solid waste) for reuse. It may accept commingled recyclables for sorting or baling and transport off-site, or it may specialize in one category of material. A recycling processor typically uses heavy equipment to process materials.

In small communities using a recycling processing facility to process their waste stream, economics typically limit the size and complexity of the facility. For example, in a small community such a facility most often consists of covered receiving areas and storage containers without any processing equipment. For larger communities, recycling processing facilities typically contain processing equipment. Although the type and size of equipment depend on the type and volume of recyclables, collection and transport methods, and market conditions, processing at such facilities often involves:

- Baling Newspaper. Some additional processing to remove glossy papers, magazines, or other contaminants may be used to upgrade the quality of the newspaper. If newspaper is mixed with lower grades of paper, it may be shredded and then baled.
- Segregating and Baling Corrugated and Office Paper. Typically, a trommel screen is used to remove contaminants. Hand sorting may also be used to segregate grades of paper or remove contaminants.
- Metals Separation. Hand sorting is typically used to segregate aluminum, steel, and bi-metal cans. Magnets may be used to separate ferrous metal cans from non-ferrous (aluminum) cans. Air classifiers may be used to remove aluminum cans and plastic containers from heavier materials.
- Glass Sorting and Processing. Glass is often sorted by color to increase its value. Glass is typically sorted by hand to separate colors and remove contaminants. After sorting, glass is crushed into small pieces (cullet). Metal caps, rings, and labels are removed by screening the cullet.
- Shredding and Baling Plastics. Intact plastic containers occupy a large amount of space relative to their weight, making it inefficient to transport these materials long distances without processing. Processing may include specialized sorting equipment and shredding, baling, perforating, and/or granulating the plastic to reduce its volume.

Residues from recycling processing facilities include contaminants that are mixed in with the recyclables, non-recoverable, or not easily marketed materials (such as broken, mixed colored glass), and materials that cannot be handled by sorting equipment. The amount of residue depends on the processing efficiency of the facility, the degree of separation by generators, and the collection method.

Construction demolition (CD) waste MRFs: CD MRFs are specialized facilities or businesses designed to segregate construction, demolition, or landclearing debris into recyclable or reusable materials. For the purpose of land use permitting, a stand-alone CD MRF would be identified as a recycling processing facility.

The processing strategy employed at a CD MRF is determined primarily by the composition of the material and degree of contamination. Three general strategies are employed.

"Dump and Pick" Operations: Material is dumped and hand picked for items that can be recycled or reused. Generally, the materials are dumped on a hard surface such as concrete or asphalt. Depending on the climate, the surface may be covered to protect the sorters and the material. Front-end loaders are used to distribute material for better access to recyclables by the sorter and to remove residue from the floor. The materials removed are placed in open containers or, if heavy, stockpiled on the floor. A simpler method would be to modify transfer stations by providing embayments/containers for specific materials and require generators to source-separate into the appropriate bin or container.

The sorted material is often taken to another site for additional processing or is marketed as a recyclable. Residuals are taken to appropriate disposal facilities such as a CD landfill.

Negative sort operations: These are where contaminants or small quantities of material are removed from the larger volume of material. These operations are used when only one or two types of CD material, such as woodwastes, concrete or asphalt are accepted. The material is then processed by size reduction, such as crushing or shredding. Contaminants may also be removed after size reduction.

High technology strategies: These rely on mechanized sorting. In a highly mechanized system, bulky materials are removed by presorting with front-end loaders and manual sorting. Following the presorting, materials are recovered using various types of equipment, including:

- Crushing/size reduction equipment, such as impactors, hammermills, stump grinders, and shredders to reduce the size of material;
- Screening/separating equipment, such as disc screens to split similar materials into various size fractions and segregate different materials;
- Float tanks and air classifiers to separate light and heavy material;
- Conveyors; and
- Balers used at facilities that receive large quantities of cardboard.

6.2.2 Composting Facilities

Composting is the controlled decomposition of complex organic materials by microorganisms such as fungi and bacteria. Although decomposition occurs naturally, composting facilities are designed to speed the rate of biological decomposition by managing key parameters, including moisture content, oxygen, temperature, and the ratio of carbon to nitrogen. In general, composting systems are designed to produce a stable end product quickly. The rate of decomposition depends on the type of material, local climatic conditions, system configuration, and operating procedures. Most composting operations can produce an end product in one to six months.

Types of systems: Composting employs oxygen as part of the decomposition process (aerobic). Composting facilities use four basic methods to introduce air.

After initial composting using one of these methods, material is cured, used on site or prepared for market, screened, stored and shipped in bulk, or packaged.

Windrow systems: This type of facility is where material is composted in long piles (windrows) on a flat site. Windrows are kept porous mechanically by turning the material periodically with front-end loaders or special windrow turning equipment. If piles are not turned often enough, the center of the pile may not receive enough oxygen, producing anaerobic conditions that may produce strong, unpleasant odors.

Aerated static pile systems: In this type, air is introduced into a large pile through air duct systems installed beneath the base of the pile. Aeration can be positive, blowing up through the pile; or negative, drawing air down through the pile. Negative aeration has the

Table 6.1 Generalized Comparison of Material Recovery Facilities				
Type	**Description**	**Cost Range**	**Compatibility/ System Integration Issues**	**Environmental Effects**
Waste Separation and Recovery Facilities ("dirty" MRFs)	Facility to centrally process mixed municipal solid waste for the recovery of recyclable and/or compostable materials. Processing methods range from manual "dump and pick" operations to highly mechanized systems.	$40 - $60/ton. Including costs for residue disposal and revenue from sale of recyclables. [1]	▪ The need for such a facility is reduced by effective source-separation programs. ▪ The value of recovered material may be reduced by contamination relative to materials recovered by a facility handling only commingled recyclables. ▪ Significant residue (up to 50%) that requires disposal. ▪ Stand-alone facilities are permitted under the requirements for a transfer station. ▪ May be designed as a front-end element and sited with a transfer station, mixed-waste composting facility, or mass burn facility.	▪ Similar to waste transfer facility and will depend on facility size and location. ▪ Impacts most likely to require mitigation are traffic, noise, and odor. ▪ Processing residues typically require landfilling; however, some may be compostable or suitable for a WTE facility.
Recycling Processing Facilities ("clean" MRFs)	Facility to centrally process recyclable materials following collection in order to meet market requirements. Processing activities typically include one or more of the following: 1) baling of newspaper, corrugates, and office paper; 2) metals and glass separation; and 3) shredding and baling of plastic.	$20 - $25/ton minus revenue from sale of material. [1]	▪ Compatible with source-separation collection programs (type of material collected) and markets (type of recycled materials needed). ▪ Needs to be integrated with recyclables collection contracts. ▪ Totally enclosed, stand-alone facilities do not necessarily require a permit under WAC 173-304. ▪ Facilities with outside storage must meet permit requirements. ▪ Land use permits vary depending on facility/business size and type of zone.	▪ Vary depending upon size of facility, material throughput rates, and location. ▪ General impacts would be those typically associated with commercial/light industrial project construction and operation. ▪ Traffic impacts likely, but will depend on existing road network and traffic levels. ▪ Noise impacts may be a problem, especially in unenclosed facilities.
Construction/ Demolition (CD) Waste MRF	Facility which segregates CD materials into recyclable or reusable materials and processes those materials.	$25 - $125/ton	▪ Generally designed to serve needs of the construction industry. ▪ Identified as a recycling processing facility for the purposes of land use permitting.	▪ Depends on location. Impacts most likely to require mitigation are traffic, noise, and air quality (dust). ▪ Impacts typical of an industrial facility.

[1] These are only estimates; heavily dependent upon the market rate for recyclables.

added capability of exhausting the processed air through odor scrubber systems when necessary. In general, aerated static pile systems have higher capital costs but lower overall operating costs than windrow systems.

Turned-aerated pile systems: These types of composting facilities combine both of the above technologies for more consistent process control and product quality.

In-vessel systems: These facilities are designed to promote rapid decomposition by continuously aerating and mixing the material in an enclosed structure. Moisture and temperature levels must be closely monitored in these systems. Although in-vessel systems can produce an end product more quickly, large-scale facilities for composting municipal solid waste are complex and costly to construct, operate, and maintain. In contrast, small-scale in-vessel composting systems use, for example, modified roll off containers to allow generators to avoid disposal costs by composting a single feedstock at the source of generation. Typical users of this type of facility include small wastewater treatment plants, hospitals, prisons, universities, and companies involved in food processing and distribution. This approach is particularly favorable in locations where composting might otherwise not seem feasible. Most of these small-scale systems also combine in-vessel composting with curing in aerated static piles and windrows. Composting time in the container varies depending on the amount of material and the degree of compost stability required. The facilities are costly on a per ton basis compared to large-scale in-vessel facilities.

Vermicomposting: In addition to the methods described above, there is "vermicomposting," the use of worms to achieve controlled composting of organic wastes. It is beginning to be used in some commercial-scale facilities in other states. Worms digest organic materials from the feedstock and produce castings. In addition to significantly reducing the quantity of waste material, the castings can be used as a soil amendment or organic fertilizer. Compared to other composts, worm castings have a finer texture, do a better job of enhancing the soil, have typically higher levels of nitrogen, potassium and phosphorous, and have more microorganisms to fight diseases in plants. Vermicomposting has been used to compost kitchen scraps, and has been demonstrated as a viable solid waste management tool used on site by businesses, institutions, and farms as well as commercial composting of source-separated resources. (Pierce County demonstrates worm composting to kids as a regular part of the school education program. The County sponsors workshops to teach residents to compost with worms at home.)

Design Issues: Most biodegradable organic material is suitable for composting, although meat scraps and fatty foods like dairy products and cooking oil may cause odors and attract rodents and insects. Facilities must be designed for more control of aeration and these animal vectors. In the United States, most composting programs use yardwaste, biosolids from wastewater treatment plants, a combination of the two (co-composting), or in combination with another feedstock such as compostable paper. Composting mixed municipal waste and source separated organics is relatively common in Europe, but has been used in the United States with mixed success. The potential for composting source-separated foodwaste is being evaluated by several communities in the Northwest. The Health Department permits composting facilities under the recycling regulations of the State's Minimum Functional Standards.

Table 6.2 summarizes the principal characteristics of various types of centralized composting facilities.

Mixed solid waste (MSW) composting: Paper, food scraps, woodwaste, and yardwaste make up the compostable portion of the mixed municipal solid waste stream. However, because mixed waste also includes non-biodegradable items such as plastics and metals, the quality of the compost product will depend on the degree to which non-compostable items are removed in the process. Generally, separating contaminants early in the process results in higher quality compost. Thus, a municipal solid waste composting facility would generally be co-located with a MRF.

Preprocessing of mixed municipal solid waste before composting typically involves:

- Materials classification - where large non-compostable and bulky items (such as white goods and tires), glass, metals, and other abrasives are removed to protect machinery, improve the quality of the final product, and increase recycling. Other non-compostable materials that are not removed in the preprocessing stage are removed during post-processing.
- Size reduction - by grinding or shredding to reduce particle size and facilitate handling and decomposition. Not all processes use grinding before decomposition; some processes allow non-biodegradable glass and metals in the feedstock and use these materials to grind the waste as it tumbles in an enclosed vessel (rotating drum process).
- Mixing - adding water and air to the mixture as it begins to decompose. The more homogenous the mixture, the less likely it will be to develop anaerobic pockets that can cause temperature differences, reduced product quality or odor problems.

Following preprocessing, mixed waste is composted in windrows, static turned-aerated piles, or vessels; cured, screened, and marketed as a soil amendment. The product must be regularly tested for contaminants. Municipal solid waste compost that doesn't meet state standards may end up being landfilled. In that case, such a facility would only serve as a means to reduce the amount of waste to be landfilled. Controlled land application is still an option. Landfilling should rarely occur if MSW is properly processed.

Yardwaste composting: Yardwaste consists of leaves, brush, tree trimmings, grass, garden waste, shrubs and materials generated by nurseries, landscapers, utility and public facility maintenance operations, and individual citizens. Generation of these wastes varies seasonally, with most yardwaste being produced in Spring and Fall. Yardwaste also includes Christmas trees.

Yardwaste usually does not require much preprocessing to remove contaminants. At operations dedicated to yardwaste, preprocessing may be limited to reducing the size of woody materials using commercial/industrial tub grinders, hammermill shredders, and/or chippers. Before the waste is ground, impurities such as plastic bags, wire or rope may be removed by hand. Reducing the size of brush and tree trimmings facilitates handling and speeds the composting process. In addition, the harder, more uniform wood also help aerate the piles, thereby enhancing decomposition. The composting process can be further enhanced if leaves are also preshredded.

Seasonal heavy grass loadings create the need for forced aeration or very porous windrows. This is because fresh-cut grass with a high moisture content begins decomposition quickly. The high density and low porosity of the material can result in anaerobic (without oxygen) decomposition, which results in offensive odors. This condition occurs frequently during wet springs when grass is

placed inside a curbside collection bin, awaiting collection before being transported to the yardwaste composting facility. Drier weather increases the need to irrigate the compost piles. The nutrient level in yardwaste is generally high and it is marketed easily. Yardwaste collection systems are described in Chapter 4 Waste Reduction and Recycling.

Biosolids co-composting: In the past, industrial discharges to municipal sewage systems have led to high heavy metal concentrations, such as cadmium, mercury, and lead, in sewage sludge. Wastewater pretreatment programs, which began in the early 1980's, have significantly reduced the metal levels in many municipal wastewaters. Secondary treatment eliminates pathogens and the attractiveness of treated solids to animals that carry disease. The resulting biosolids now produced from these systems can often be used as a beneficial resource, particularly when fully composted. Co-composting of biosolids can increase its usefulness as a soil conditioner. As a soil amendment, composted biosolids release organic nitrogen slowly, allowing plants to use more nutrients and minimizing nitrogen losses to groundwater.

Aerated biosolids have little odor. Because biosolids are normally 15 to 25 percent solids (75 to 80 percent water) and have the consistency of toothpaste, it is difficult to keep the material aerated unless it is mixed continually, exposing new surfaces for oxygen transfer or forced aeration. Adding bulking agents such as sawdust, wood chips, ground tree trimmings, or other yardwaste can significantly reduce the need for mechanical aeration because these bulking agents aid in drying the biosolids, decreasing its density, and increasing air voids. Amendments such as wood chips can also increase the available organics in the compost mixture by improving the balance of carbon to nitrogen. (The various municipal and special sewerage district agencies are responsible for the management of biosolids from wastewater treatment plants. Chapter 9 briefly describes Pierce County's management program.)

Foodwaste composting: The nature of foodwaste as a compost feedstock varies depending on the type of waste generator. Food processors, food wholesalers/ distributors, grocery stores, restaurants, schools, and hospitals tend to discard large, homogeneous quantities of materials. In contrast, the composition of household foodwaste is more varied.

As a compost feedstock, foodwaste is very dense, has a relatively high energy potential, and has a high moisture content. Because of these characteristics, decomposition can begin very quickly. However, the high density and low porosity of the material means there are few air spaces and the concentration of oxygen in the materials can be limited, resulting in anaerobic (without oxygen) decomposition. Unlike aerobic decomposition, anaerobic decomposition produces odorous sulfur gases ("rotten egg" smell). To address this concern foodwaste needs to be mixed with a bulking material such as woody yard trimmings, wastepaper, and/or woodwaste to increase the carbon/nitrogen ratio, and reduce the moisture content. Collecting non-recyclable paper with the foodwaste has been identified as an effective means of reducing moisture content at the point of collection. Wastepaper mixed with yard trimmings is also an effective bulking agent.

Foodwastes are also more likely than yardwastes to attract nuisance animals and pests, especially at the beginning of the compost process. Frequent turning of windrows early in the composting process promotes decomposition, forces aeration, and heats up windrows more quickly, which kills insect larvae and deters rodents. In addition,

Table 6.2 Generalized Comparison of Composting Facilities				
Feedstock	**Description**	**Cost Range**	**Compatibility/ System Integration Issues**	**Environmental Effects**
Mixed Solid Waste (garbage)	▪ Mixed solid waste is first processed to remove bulky materials, contaminants, and recyclables; then it is ground; mixed with water; and aerated using a windrow, static pile, turned-aerated pile, or in-vessel system. Vermicomposting may also be used. ▪ Finished compost or worm castings is cured, screened, and marketed for soil amendment, fill, landfill daily cover, or landscaping.	$45 - $65/ton including residual disposal	▪ Mixed waste composting may be incompatible with a system that has already established aggressive source-separated recycling and yardwaste composting because these materials comprise a large portion of the compostable elements of the mixed waste stream. ▪ Due to the large amount of residue (up to 50%), it is often best to locate close to disposal site. ▪ Would require siting adjacent to a MRF to remove uncompostable materials. ▪ Need and specifications for product should be carefully examined. Markets may be limited.	▪ Odors can be a significant problem unless facility is completely enclosed and provided with odor control. ▪ Collection system must be efficient and effective to prevent odor problems at the source and during transit. ▪ May require significant area for curing stock piles. ▪ Requires leachate collection and treatment. ▪ Other impacts similar to other centralized waste facilities (e.g., traffic). ▪ May be difficult to site and permit due to public perception. ▪ To use the compost as a soil amendment requires regular testing for contaminants.
Yardwaste	▪ Facility to centrally process and compost source separated yardwaste, including grass clippings, leaves, tree trimmings.	$30 - $35/ton	▪ Compatible with source-separation collection programs. ▪ Product generally of high quality with few restrictions on use. ▪ Seasonal fluctuations and putrescibility mean varied collection efforts.	▪ Generally impacts will be associated with traffic and odor. ▪ Traffic impacts will somewhat depend on collection program (curbside or self-haul). ▪ Odor impacts for yardwaste have been found to be a problem at some locations, but not at the existing County-owned facility.
Foodwaste	▪ A facility to compost source-separated foodwaste to produce a compost product for use in landscaping applications. ▪ Several processes have been utilized, including aerated static pile, aerated turned windrow, in-vessel, and vermicomposting. ▪ Co-composting with yardwaste/ paper improves porosity control.	$30 - $40/ton (limited cost data available from operating systems)	▪ Source-separated foodwaste from food distribution, food services, and restaurants, and food product processes required. ▪ Collection from residential households requires weekly collection similar to refuse collection. ▪ Can be compatible with source-separated collection programs.	▪ Odor is the principal potential impact. ▪ Collection system must be regular and frequent to prevent odor problems at the source and during transit. ▪ Final product typically of high quality and low contamination (i.e., from metals or pesticides.)

using an enclosed building for composting also minimizes nuisances associated with vector attraction.

Prior to implementing a foodwaste composting program, several issues should be considered. First, the frequency of collection is critical because of potential vector attraction and odor problems. Allowing foodwaste to sit for a considerable amount of time before collection can make the waste more difficult to handle without odor problems, as decomposition begins very quickly. Once a week may be the minimum collection frequency.

In addition, containers should decrease potential vector attraction and odor problems. If a range of container types (to fit the generator's foodwaste production rate and available space for storage) is allowed, collection vehicles must be able to handle all types of containers. Co-collection with yardwaste is feasible if collection is frequent.

6.2.3 Waste-to-Energy Facilities

Waste-to-energy (WTE) facilities dispose solid waste or recover energy through mass burning, refuse-derived fuel incineration, pyrolysis, or any other means of using the heat of combustion. A volume reduction of 90 percent is typical for these facilities; the unburned waste fraction (ash) continues to require landfill disposal or may, in certain circumstances, be recycled into useful products such as bricks or concrete. The energy generated can be used to offset the initial capital and operating costs of a waste-to-energy facility. For the purposes of land use permitting in Pierce County's zoning regulations, a facility that handles mixed municipal solid waste (garbage) is termed a "Municipal Solid Waste (WTE) Facility.

Pierce County development regulations define a "Special WTE Facility" as a facility designed to burn more than 12 tons per day and which specializes in disposal or energy recovery from a single type of waste *other than municipal solid waste*, such as tires or infectious waste. WTE facilities require a permit under the State's Minimum Functional Standards (MFS), WAC 173-304. Land use permits vary depending upon the type of facility, its size, and the waste stream it handles. Hospitals and industrial businesses often use small-scale WTE facilities that are considered accessory to their operation.

Waste ash from WTE facilities must undergo testing. Based on the testing results, the waste ash is characterized as state-regulated "special incinerator ash," as municipal solid waste, or as a state and federally regulated hazardous waste. WAC 173-306, Special Incinerator Ash Management Standards, sets forth specific requirements for handling, packaging, transport, disposal, and record keeping. Special incinerator ash must be disposed at a permitted landfill that meets the requirements of WAC 173-306-405 through WAC 173-306-470. If the ash tests as hazardous waste, disposal must occur in accordance with Washington State Dangerous Waste Regulations (WAC 173-303) and Federal Hazardous Waste Disposal Regulations (RCRA Subtitle C). Emissions from incinerator facilities are regulated under Washington State Solid Waste Incinerator Facilities (WAC 173-434) and Title 40, Code of Federal Regulations, Part 60.

Generally, ash from a WTE facility usually tests as "solid waste" and it can be re-used or recycled. Uses include road and soil stabilization, manufacturing of cement, and stabilization of hazardous or chemical wastes.

The three general types of waste-to-energy facilities include mass burn incinerators, refuse derived fuel facilities, and pyrolysis facilities. Table 6.3 summarizes the principal characteristics of the various types of waste-to-energy facilities. These waste-to-energy facilities are described in more detail below.

Mass burn incinerators: Mass burn incinerators burn mixed municipal solid waste at very high temperatures with limited preprocessing to remove large items such as stumps and appliances. In some cases, additional preprocessing is added to remove materials for recycling or other materials such as metals, that may cause ash contamination, damage equipment, or contribute to toxic air emissions. MRFs are often a front-end element of a mass burn facility.

Waste brought to a mass burn facility is either stored in a large pit or loaded directly into the furnace where it is tumbled over moving grates or through a rotating drum, advancing the waste toward the ash pit. There are two basic types of furnaces used in mass burn plants:

- Refractory Lined Incinerators - are lined with a 6-inch to 8-inch thick heat resistant coating (refractory). Refractory-lined furnaces experience low rates of heat loss through the furnace walls and are able to maintain steady combustion temperatures when subjected to wide variations in fuel quality. "Excess air" refractory-lined incinerators are used to keep temperatures within the combustion chamber from getting too high and producing slag, an undesirable byproduct. To control temperature, air is allowed to enter the combustion chamber at a volume and rate significantly greater than that needed for combustion (excess air). "Controlled air" refractory-lined incinerators are typically smaller (modular) mass burn units with two combustion chambers. Most controlled-air systems are used to produce steam, which is then used either for heating, industrial processes, or electricity generation.
- Waterwall Incinerators - a waterwall incinerator has the walls of the combustion chamber lined with boiler tubes containing water. Thus, the boiler in a waterwall system is an integral part of the combustion chamber. Temperatures may still need to be reduced through the introduction of excess air. Overall, a waterwall incinerator provides a higher thermal efficiency than a refractory-lined incinerator. A disadvantage of waterwall furnaces is that the entire unit must come off line if the boiler becomes inoperative. This results in less frequent operation time or higher costs for redundant systems to guard against unscheduled downtime.

RDF facilities: Refuse derived fuel (RDF) facilities process solid waste into a relatively homogeneous fuel with a uniform particle size and defined moisture content, suitable for burning in conventional boiler systems. In a typical RDF plant, mixed municipal waste is loaded onto conveyors that lead to shredders, magnetic separators, trommels, disc screens, and/or air classifiers. End products produced by a typical RDF plant include fuel, recyclable materials, and an unusable fraction that is disposed at a landfill. RDF can be prepared as shredded fluff (undensified RDF) or compressed pellets (densified RDF).

After processing, RDF is typically burned in a dedicated combustion unit directly affiliated with the processing area, and, in some instances, sold to an electric utility or an industrial customer. If RDF is sold to an electric utility or an industrial customer, it is typically fired as a supplementary fuel, contributing 10 to 20 percent of the heat input to the boiler. Two boiler technologies are used to incinerate RDF:

- Spreader-Stoker Boiler: In this system the RDF is fed into a boiler, and a portion is burned in suspension while the remainder burns on a traveling grate. The recovery of bottom ash and fly ash and the air pollution control equipment are similar to those for mass burn technology.

- Fluidized Bed Boiler: In this system, the combustion unit contains a bed of sand or comparable material that is heated to 1,500° F, while air is blown upward through the material to keep it in a state of suspension. The air movement transforms the sand into a fluid-like substance. The principal of the fluidized bed is to combust the RDF in a fluid bed of hot, inert material, such as sand or limestone. The turbulence of the sand particles acts to scrape off the burned surfaces of the RDF and continuously expose fresh surfaces. Principal advantages of fluidized bed incineration are the ability to combust a wide variety of fuels, a smaller furnace size, and the ability to reduce gas emissions with limestone in the bed material.

Pyrolysis: Pyrolysis is the process of decomposing materials with heat in an oxygen-deficient atmosphere. In a pyrolytic gasification facility, waste would be preprocessed to remove materials, such as metals, that cannot be decomposed. The waste would then be dried and transported to a chamber where it would be exposed to radiant heat tubes in an oxygen-free atmosphere. The heat reduces the waste into basic components: gases, (methane, ethane, hydrogen, and carbon monoxide); liquids (oil and tar); and solids (char and carbon black). The gases can be cleaned and used as a fuel for other purposes or transferred back to the chamber where it would be used to heat the radiant tubes. Solid residues are landfilled.

There is reason to believe that pyrolysis can provide more complete combustion than mass burn or RDF technologies. More complete combustion reduces the levels of some pollutants in emissions from the facility. The main uncertainty of pyrolysis for handling municipal solid waste is that economic and technical feasibility have not yet been demonstrated on a full-scale commercial basis. More development is needed to make this technology commercially viable. Several companies are actively pursuing development of pyrolysis projects.

Anaerobic digestion: This is a biological process that occurs in the absence of oxygen. It uses organic wastes to produce a gas, which can be used to generate electricity, and a residue, which can be used as a soil amendment or fertilizer similar to compost. The biogas, mainly methane and carbon dioxide, is made from such organic wastes as livestock manure, food processing waste, or biosolids. The process is not suitable to be used on a large scale to handle municipal solid waste but is a common process used in wastewater treatment plants. There are many anaerobic digestion technologies commercially available.

More and more organics recycling projects are using anaerobic digestion systems, particularly large dairies and hog farms, where unprocessed wastes can cause odor and water pollution. Some communities in other parts of the country are experimenting with projects using yardwaste as one of the feedstocks.

Anaerobic processes can either occur naturally or in a controlled environment. The organic waste is put in an airtight container called a digestor where decomposition begins and the biogas is captured and sold for electricity. All of the wastewater treatment plants in Pierce County have digestors to capture the gas and which help to provide electricity to run the facilities. Both the Tacoma Landfill and the closed Hidden Valley Landfill capture methane produced from the anaerobic processes that occur within the landfills. A biogas digestor does not require a solid waste permit under solid waste regulations.

Table 6.3	Generalized Comparison of Waste-To-Energy Facilities			
Type	**Description**	**Cost Range**	**Compatibility/ System Integration Issues**	**Environmental Effects**
Mass Burn Facilities	▪ A central facility where mixed municipal solid waste is burned to reduce volume and produce steam and electricity.	$60 - $70/ton including ash and by-pass disposal	▪ Requires energy to produce revenue. ▪ Requires extensive air quality monitoring.[1] ▪ Usually requires a MRF as a front-end element (or sited in tandem with a MRF). ▪ Ash residue may require disposal at an out-of-county facility. [2]	▪ Similar to waste transfer facility for traffic, noise and odor. ▪ Potential air quality impacts. ▪ Needs large amounts of cooling water. ▪ Typically difficult to site and permit because of public perception and concerns over air quality.
RDF Facilities	▪ A facility to process waste to a relatively homogeneous fuel. ▪ RDF is burned in a dedicated boiler or used at an electric utility or industrial facility.	$60 - $70/ton including residue disposal	▪ Requires fuel uses. ▪ Extensive air quality monitoring required. ▪ Large amount of by-pass and residue requiring disposal. ▪ Ash generally of higher quality than in mass burn facilities.	▪ Similar to mass burn. ▪ Some studies have indicated lower toxic air emissions and higher quality ash than mass burn facilities.
Pyrolysis Facilities	▪ A central facility to decompose material in an oxygen-deficient atmosphere to provide gasses and liquids, which can be used as fuel; and solids, which require disposal.	Only limited cost information available	▪ No commercially demonstrated facilities. ▪ Requires disposal of residue.	▪ Similar to mass burn with exception of air quality.

[1] Incinerator Facility Emissions are regulated under Washington State Solid Waste Incinerator Facilities Regulation (WAC 173-434) and Title 40, Code of Federal Regulations, Part 60.

[2] Depending on ash characteristics, disposal of ash and facility residues must occur at permitted facilities in accordance with Dangerous Waste Regulations (WAC 173-303), Minimum Functional Standards for Solid Waste Handling (WAC 173-304), Criteria for Municipal Solid Waste Landfills (WAC 173-351).

6.2.4 Storage Facilities

Two other types of facilities that can be used for storage and treatment for recycling are required to meet the permitting standards of the State's regulations. These are solid waste surface impoundments and waste piles.

Surface impoundments: These are solid waste facilities designed to hold an accumulation of liquids or sludges and are most often found as an accessory facility to an industrial business. State requirements include liners, methods to avoid washout under flooding conditions, and slopes designed to maintain structural integrity under conditions of a leaking liner or erosion factors. Some facilities may be required to have groundwater monitoring or leachate detection, collection and treatment systems. To be closed, facilities must have all solid waste removed, otherwise the facility must be closed to meet the landfill standards of WAC 173-304.

There are no solid waste surface impoundments in Pierce County. However, the County's zoning regulations allow solid waste surface impoundments as an accessory use to all businesses. Such accessory uses do not require a land use permit.

Waste piles: Under the recycling facility standards, the regulations define waste piles as any noncontainerized waste used for storage or treatment. The regulations apply "to facilities engaged in recycling or utilization of solid waste on the land." These can include noncontainerized composting or the accumulation of waste in piles for recycling. The definition is a bit unclear. Under the MFS, permits are not required for a number of things that might be considered a waste pile such as "woodwaste or hog fuel piles to be used as fuel or raw materials stored temporarily" and being actively used, or where single family residences or family farms are engaged in composting of their own waste. Interpretation of when to apply the regulations has been inconsistent from jurisdiction to jurisdiction around the State, so the regulations are undergoing review by the State SWAC and Ecology for the possible need for modifications.

Basically, however, facilities that the Health Department determines need a permit must show that at least fifty percent of the material has been recycled in the past three years; that material has not been on-site more than five years; that groundwater or surface water, and that air and/or land contamination has not occurred.

There are no legally permitted waste piles in Pierce County although there are some piles under review by the Health Department to determine if they need permits and if they are part of a legally permitted business. Under the Pierce County zoning regulations, waste piles that have obtained permits from the Health Department are allowed outright as an accessory use to any legally allowed principal use of the property. Such accessory uses do not require a land use permit. An illegally sited business, however, should not be able to obtain a waste pile permit since the Health Department is required under the MFS to permit only those facilities in compliance with all comprehensive land use plans and zoning

Table 6.4 Storage Facilities		
Facility	**Compatibility / Siting Issues**	**Environmental Effects**
Surface Impoundments	▪ These facilities are not a necessary feature for management of municipal solid waste (garbage). ▪ Facilities may be necessary for some industries' management of industrial sludges or liquids for treatment or recycling.	▪ Potential impacts to air quality, and ground and surface water. MFS standards are designed to protect ground and surface water. PSAPCA administers air quality standards. ▪ Closure requires complete removal or facility must be closed to meet landfill standards to prevent ground and surface water contamination. ▪ Not difficult to permit under existing zoning regulations.
Waste Piles	▪ These facilities are not a necessary feature for the management of municipal solid waste (garbage). ▪ Waste piles may be a necessary adjunct to a variety of businesses for recycling, treatment, or storage; or for composting facilities. ▪ Requires evidence of recycling and no long-term storage on site. ▪ MFS regulations under scrutiny by Ecology and State SWAC to clarify when regulations apply and when to apply them.	▪ Potential air quality and ground or surface water impacts. MFS standards are designed to protect ground and surface water and air quality. ▪ Potential improper storage of some materials may attract rodents, insects, or cause other vector problems. ▪ As an accessory use to a legally permitted principal use, not difficult to site or permit under zoning regulations. ▪ Because of environmental siting difficulties, large-scale composting operations are not permitted as waste piles, which is for regulating small-scale accessory activities to a business.

6.3 Planning, Implementation, and Existing Facilities

Planning: The 1989 Plan recommended a waste-to-energy facility as a long-term option in addition to landfilling for Pierce County. The Plan also supported completion of the Fort Lewis incinerator and the renovation of Tacoma's Steam Plant No. 2 to use RDF from Tacoma's waste stream. The County negotiated a WTE contract but did not pursue its implementation. The County chose instead to complete a number of other studies called for in the 1989 Plan to evaluate all processing and landfilling alternatives.

In response to the Council's request, the County Executive prepared the *Report on Alternative Solid Waste Processing Technologies*, which described and compared several technologies, including centralized processing, mixed waste composting, RDF production, anaerobic digestion, and pyrolysis. The County also completed the *Compostable Waste Diversion Report*.

With the information from these reports, the County conducted a series of processes called Requests for Proposals (RFPs) on varying sized facilities for mixed waste composting and short and long-term waste export. The RFP processes solicited proposals and costs. The County then compared the results with the costs of in-county landfilling combined with yardwaste composting, and with the negotiated WTE contract.

Based on proposals prepared in response to the RFPs, and on its study of alternative processing technologies, the County reached the following conclusions:

- *Waste-to-energy (mass burn):* This option, while technically feasible, proved to be the most costly option in terms of initial capital and operating costs. In addition, concerns regarding emission controls, ash disposal, siting and long-term regulatory compliance, created substantial uncertainties about this technology. Accordingly, the County decided not to proceed with development of a mass burn waste-to-energy facility.

- *Mixed waste composting:* A mixed waste composting facility was also determined to have relatively high capital and operating costs. In addition, it is not widely used in the United States at a commercial scale. Odor and end-use market problems at other facilities in the United States were being experienced and had not been resolved. Further, vendor proposals indicated a large amount of residue (approximately 50%) would have required disposal. Based on these considerations, the County decided not to further pursue development of a mixed waste composting facility.

- *Pyrolysis:* Due to the lack of a demonstrated successful operating history on a commercial scale, the County concluded that pyrolysis was not a feasible option for implementation at that time.

- *Source-separation/private processing*: The County elected to continue to pursue development of source-separated recycling collection programs as the most cost-effective alternative to meet its recycling and recovery goals.

Implementation: The following is a brief summary of the actions taken by the County, Tacoma, and the military bases to implement recycling and yardwaste processing, and waste-to-energy programs. Chapter 4, Waste Reduction and Recycling, provides more detail about each system's recycling programs.

Pierce County: The source-separation recycling collection program adopted by the County relies heavily on the processing and marketing capacities of private businesses, rather than on the development of a County-owned materials recovery facility. As a result of this approach, a number of recycling and hauling businesses expanded their facilities after 1990 to include "dump and pick" operations or sorting, shredding, and baling equipment. In addition, a number of new businesses have located in the County specializing in the processing of various recyclable materials. (Chapter 3 Waste Analysis illustrates the effects on the waste stream of the growth of the new businesses.)

Because of earlier permitting problems experienced by private developers, Pierce County elected to build a model yardwaste composting facility in 1992 to provide capacity for a portion, not all, of the yardwaste expected to be collected through the curbside pickup programs. This was done with the stated intention that the County would also encourage private development of additional composting facilities to meet needed composting capacity. The County's facility has been operating near or at capacity since inception.

As has been discussed in other chapters, this public-private partnership has worked fairly efficiently, costs have remained low to moderate when compared with other jurisdictions, and the County has seen considerable expansion of private capacity for processing recyclables and yardwaste. The growth in private composting businesses appears to be continuing, although one older facility ceased operation due to odor control problems.

Tacoma: The City completed expansion of Steam Plant No. 2 and the RDF facility and developed a substantial drop-off center for recyclables at its solid waste facility site, adjacent to the household hazardous waste

collection facility. The City implemented curbside source-separation programs for recyclables and yardwaste and contracted with private businesses to process some of the materials collected by City crews. Tacoma conducted an extensive analysis of its programs to identify efficiencies and needs for the future and made a number of program changes during 1998.

Fort Lewis and McChord AFB: Both of the military bases established recycling centers for processing recyclables collected on the bases. McChord also implemented source-separation curbside residential recycling programs and contracted with private businesses for collection. The hauling companies that collect the material use private capacity for processing and marketing for most materials and the bases market recyclables taken to their recycling centers.

The waste-to-energy facility built by Fort Lewis to handle municipal solid waste was unable to meet emission requirements and will not be reopened. Fort Lewis built a transfer station in 1999 and began operations to facilitate transfer of waste off base.

Existing Facilities: The facilities and private businesses described in Table 6.5 are either the municipally-owned WTE or composting facilities, or those private businesses which contract with municipal jurisdictions for composting yardwaste. All of the other private businesses that collect and process recyclables are listed in Chapter 4. Private businesses that process or dispose of a special waste that generally does not enter the municipal solid waste stream to be managed by the County or the cities are listed in Chapter 9 Special Wastes.

Table 6.5 Existing Facilities [1]	(as of May, 1999)
Municipal Facilities	▪ **The Pierce County Yardwaste Composting Facility** is a County-owned facility, operated by Land Recovery, Inc. under contract with Pierce County. It accepts vegetative material including grass clippings, leaves, garden and landscaping trimmings, weeds, sod, clean wood, wood shavings and bark, aquatic weeds, hay, and straw. The facility provides for covered aeration and curing areas with mechanically turned windrows and negative forced aeration. In 1998, approximately 42,343 tons of materials were processed at the facility. Because the facility is located adjacent to the Purdy Transfer Station, it is able to take advantage of the back-haul capacity of the trucks which pickup municipal solid waste to take to the disposal facility. At present, the trucks pick up yardwaste from the landfill where it has been shredded, bring the yardwaste to the composting facility, and then leave filled with municipal solid waste. Further expansion of the composting facility is not feasible due to predicted traffic impacts on already congested local roads.
	▪ **Tacoma RDF and Waste-to-Energy Facilities** use two fluidized bed combustors to burn mixed fuels consisting of refuse derived fuel (RDF), coal, and woodwaste to produce electricity. The installation is at the existing City of Tacoma Steam Plant No. 2 which the Tacoma Solid Waste Utility leases from Tacoma City Light. In addition to coal and woodwaste, this facility can burn up to 300 tons of municipal solid waste per day, which represents about 15 percent of the fuel heating value. The fluidized bed combustors were designed and permitted to handle up to 30% RDF by weight. The RDF portion of the fuel is prepared at the Resource Recovery Plant located at the City of Tacoma Landfill. The Resource Recovery Plant was designed to process approximately 500 tons of mixed waste per day. The waste is shredded, magnetically separated, and air classified to yield ferrous metals, RDF, and a heavy fraction residue. It is estimated that approximately 20 to 25 percent of the available waste stream from the City is delivered to the RDF plant.
	▪ **Chambers Creek Soil Manufacturing Facility.** The County is designing a soil manufacturing facility to be located at the Chambers Creek Wastewater Treatment Plant to turn biosolids into a soil amendment to restore the adjacent gravel mine site.
Fort Lewis & McChord AFB Facilities	▪ **Fort Lewis Recycling Center** currently receives commingled residential recyclables, commercial paper and other recyclables collected at drop boxes, such as cardboard, newspaper, aluminum, and glass. The recycling center also receives municipal solid waste generated at Fort Lewis and the McChord Air Force Base. This material is sorted to remove cardboard, paper, aluminum, steel, and car batteries. Certain bulky waste such as furniture and classified documents bypass the Recycling Center. The Recycling Center was expanded in 1996 by doubling the length of the sort conveyor, adding a magnetic separator, and installing a finger screen to remove small batteries.
	▪ **McChord Air Force Base Recycling Center** accepts recyclables from the on-base residential curbside collection program. The recycling center processes the recyclables and markets the materials. Recyclables accepted at the recycling center include paper, cardboard, aluminum, glass, yardwaste, tree debris, and scrap wood.

Table 6.5 Existing Facilities [1] (as of May, 1999)	
Private Sector Composting Facilities [2, 3]	▪ **Land Recovery, Inc.** has an in-vessel composting facility, a yardwaste transfer facility, and a large, fully enclosed organics composting factory. The yardwaste transfer facility is located on Sales Road in Lakewood. It collects yardwaste and other land clearing debris from Tacoma and self-haulers or contractors. The material is shredded and sent to other facilities for composting or to be used as Green Mulch on farmland. Both the in-vessel compost facility and the compost factory are located at the Hidden Valley site. The in-vessel facility consists of 15 modified roll-off containers and is designed to handle 27 tons per day of such materials as food residuals from commercial/ institutional generators, waxed cardboard, and yardwaste. The compost factory is designed to compost 130 tons per day and it will compost a number of types of organics from treated biosolids, food processing waste, animal manure, yardwaste, pre- and post-consumer foodwaste, wax coated cardboard and waste wood, to mixed paper and other land clearing debris.
Private Sector Composting Facilities [2, 3]	▪ **University Place Refuse, Inc.** has a small private yardwaste composting facility. It is capable of accepting some vegetative yardwaste from curbside collection, the local school district, or landscaping contractors. The mixing and composting operations are contained on a 70-foot by 30-foot reinforced concrete slab with a leachate collection system. The collected leachate is stored in an above ground tank and utilized as a wetting agent in the composting process.

[1] Private businesses that process recyclables are listed in Chapter 4. Businesses processing or disposing of special wastes are listed in Chapter 9.

[2] A recycling processing facility and a transfer station are also located at the Hidden Valley site.

[3] A private facility that would co-compost chicken manure and yardwaste or other bulking material on a farm in south Pierce County may also be developed. Other composting facilities are also in the early planning stages.

6.4 Needs and Alternatives

As discussed, a number of solid waste processing facilities have been developed in Pierce County by both the public and private sectors to provide recycling processing and waste reduction capacity. These facilities and the reliance upon, and encouragement of, private businesses to provide recycling processing and composting capacity has worked well. The County, cities, and military bases together reached a 52% recycling rate in 1996. Costs for various new recycling collection programs have remained relatively low when compared to other jurisdictions. Therefore, since the systems work well as they have developed, the approach taken in the following discussion about needs and alternatives is one of building upon the strengths of the existing systems to add capacity or increase diversion of materials from disposal.

Pierce County/Cities and Towns: There are still opportunities for the public and private sectors to develop processing facilities within Pierce County which build upon the County's incremental, source-separation approach.

The 1995 Waste Characterization Study conducted by the County indicated that there may be limited need for additional processing options based on the type of material that continues to be disposed. Relevant findings regarding waste compositions include:

- Much of the hauler-collected waste consists of various types of paper that could be composted or recycled (approximately 32, 35, and 38 percent of the waste collected from single family, multi-family, and commercial generators, respectively). The Waste Characterization Study concluded that there is potential to divert greater amounts of corrugated and craft paper from the multi-family and commercial waste streams.

- Foodwaste accounts for a relatively large percentage of the hauler-collected waste stream, reflecting the County's overall success in removing recyclables and yardwaste through its source-separation programs. Foodwaste accounted for approximately 22, 15, and 17 percent of the waste from single family, multi-family, and commercial generators, respectively.
- The self-haul waste stream consists primarily of construction/demolition (CD) waste. Over 71 percent of the commercial self-haul waste stream is CD waste. The greatest percentage is wood.
- The existing County-owned yardwaste composting facility is operating beyond its designed capacity. Although the County is composting more than 33,000 tons of yardwaste, there still remains approximately 12,000 more tons being disposed annually.

Based on these findings, there appears to be some potential for additional diversion of paper, foodwaste, CD materials, and yardwaste from Pierce County's waste stream.

CD MRF: A recycling processing facility to recover CD debris from self-haul waste could be located at either an in-county landfill or at a central transfer station. A self-haul facility could range from a simple dump and pick/salvage operation to a more mechanized facility, or existing transfer stations could be retrofitted with storage bays to allow and encourage self-haulers to deposit already separated material. There would be few, if any, added environmental impacts. Financial risks associated with competition would be minimized because capital costs would be relatively low for a "dump and pick" or retrofit operation.

Foodwaste composting: Because of environmental issues associated with foodwaste composting, such as vector attraction and leachate generation, it is common to add bulking agents to aid in moisture absorption and promote aerobic decomposition. Paper and/or yardwaste are commonly used bulking agents. It is possible that yardwaste collection programs could be modified to collect foodwaste with yard or paper waste.

With the opening of Land Recovery Inc.'s compost factory in 1999 and its capacity to compost a variety of wastes, there is substantial private capacity in Pierce County to compost commercial, and possibly residential foodwaste. Any consideration of developing a County-owned facility would have to recognize that the County would have little assurance of a secured waste stream because it could not flow-control materials, or require through contract, that foodwaste be directed to a designated facility. The County would also have virtually no control over collection.

The County may want to consider the feasibility of developing programs to collect residential foodwaste now that private capacity exists. The County would need to work with the haulers and the cities and towns to revise the curbside minimum service levels to implement this residential foodwaste collection.

Agricultural application of compost: To reduce the peak loading of the County's yardwaste composting facility, freshly composted yardwaste can be applied at agronomic rates on local farms. Land Recovery, Inc. (LRI), who operates the facility for the County, uses this approach with local farmers under the Environmental Excellence Program. This action increases the capacity of the existing facility because it decreases the time it takes to move yardwaste through the process. Best Management practices have been established for this "Green Mulch" in Pierce County and under the Environmental Excellence agreements with Ecology. (This is described in more detail in Chapter 9 Special Wastes.)

Waste-to-energy: Because Pierce County has taken aggressive steps to remove paper and yard debris from its waste stream, development of a waste-to-energy facility is not likely to be a cost-effective option for the County as long as other lower cost options, such as landfilling or long-haul, are available. Further, development of a waste-to-energy facility by the public sector would face financial risks since the County could not easily direct materials to the facility.

Although pyrolysis has been developed to a limited scale on private sector projects, it has yet to be successfully demonstrated at a commercial scale. However, there is reason to believe that pyrolysis can provide a more complete combustion than existing implemented processing technologies which can reduce pollutants in facility emissions. Therefore, the County could continue to monitor the development of pyrolysis and, if and when any pyrolysis projects have been commercially demonstrated, verify the economic and technical feasibility of the process.

Waste separation and recovery facility ("dirty" MRF): If the County wants to increase the diversion of recyclables, going beyond existing programs and the source-separation of CD materials or organic wastes, such as foodwaste, then the County's long-term approach might be to develop a recycling processing facility that would sort the remaining fraction of recyclables from the waste disposal stream. If private recycling capacity does not continue to grow, the County may choose to consider siting its own facility.

Before making a decision to site its own "dirty" MRF, the County would need to carefully explore why private sector recycling capacity did not grow as expected. If, despite the efforts of the private sector, there is additional demand for local processing capacity (in terms of quantity of capacity or quality of services offered) and a long-term outlook for positive markets for recycled materials, the County may wish to site such a facility to serve demonstrated unmet demand for capacity. A similar examination of private sector capacity in the early 1990's spurred

Pierce County to site a yardwaste composting facility.

Besides demonstrating need, the County would need to look at other possible impediments, particularly those dealing with financing the siting and construction of such a facility.

Bond financing is the common method used to finance construction of new solid waste facilities by public entities. Historically, Pierce County utilized this method once, for the construction of the Purdy yardwaste composting facility. For a materials recovery facility, Pierce County could take the same approach, using the revenue generated by the facility (from tipping fees and commodity sales net of operating expenses) to repay bonds.

The County could consider meshing the recovery facility with the County-contracted waste disposal system. Much like was done with the yardwaste compost facility, the County could contract with Land Recovery Inc. to include operating charges for the facility within the County's waste tipping fees. It is not certain, however, whether Land Recovery Inc. would be amenable to this proposal.

Much study would be required to determine whether a tipping fee could be set sufficiently high to meet operating costs and bond requirements without exceeding the costs of other alternatives available to the haulers and the public (e.g., self-hauling recyclables to private facilities, hauling waste to facilities not part of the County's disposal system, or illegal dumping).

If such a facility were included with the County's system, the benefits (increased recycling, resource conservation, and reduced long-haul fees) would need to outweigh the costs (facility siting, construction, and operation costs, and the costs associated with changed collection practices).

Tacoma: The Tacoma Solid Waste Utility has been undergoing a number of evaluations of its recycling and yardwaste collection and its processing system. Most of the alternatives under review by Tacoma involve additions and modifications to the existing system which would increase production of RDF, increase extraction of recyclable materials from the disposed waste stream, and improve the BTU value of the RDF fuel for Steam Plant No. 2.

Recycling collection/MRF: Tacoma shifted its recycling collection system to a curbside commingled recycling collection system in 1998. This was done as a result of "pilot" collection programs tested in 1996 which were done at the direction of a 1995 evaluation report, *Refuse Utility Operations Performance Analysis*; *Analysis of Collection Practices and Recycling Incentives*. The new commingled approach required the purchase of new collection vehicles and containers and securing the services of a materials resource recovery facility (MRF) on a long-term basis. It is expected that moving from source-separation to commingled curbside collection of recyclables has resulted in an increased volume of recyclables directed to processing facilities. Tacoma contracts with nearby private operations for processing and sale of recycled material.

RDF/Steam Plant: The City is exploring opportunities to improve efficiency, capacity, and the fuel product (RDF) by increasing the efficiency and capacity of its existing resource recovery facility. The alternatives may include implementing waste separation and recovery operations or specialized MRF processes to the solid waste before it enters the existing resource recovery facility. The City may also alter or expand the hours of operation of the facility to increase capacity.

Modifications are also being explored at Steam Plant No. 2, which the Tacoma Solid Waste Utility leases from Tacoma City Light. The modifications being explored would

enable the Steam Plant to accept a wider range of RDF quality and potentially increase the volume of RDF that can be used for fuel. The modifications will also allow the use of alternative fuels processed from solid waste, such as roofing tear-off waste, CDL, and other wastes. If the modifications are successful, the City will obtain the necessary permits to operate the alternative fuels.

If upgrades to Tacoma's resource recovery facility are implemented, Tacoma may have excess capacity to process solid waste into fuel. If the capacity of the facility exceeds the amount of processible solid waste generated in Tacoma, the City may explore arrangements with the haulers and officials of nearby jurisdictions to increase the amount of solid waste brought to the Tacoma facility.

Composting: The City has also evaluated the current yardwaste composting market and existing facilities and is making changes in its collection methods. Tacoma used to contract for composting with a private business that is no longer in operation. The City is exploring siting a municipal composting facility or a public-private partnership, which will provide a stable, long-term outlet for its yardwaste. Should the siting of a composting facility be economically feasible, the Solid Waste Utility will pursue this option. The City also will consider the possibility of a partnership with other cities or Pierce County.

Fort Lewis/McChord Air Force Base: Fort Lewis and McChord Air Force Base both operate recycling centers to recover recyclable materials and remove contaminants from the waste stream before disposal and have implemented residential collection programs. McChord's aggressive approach to recycling has achieved substantial results. The Fort expanded the size and sorting capabilities of its recycling center in 1996. Outside of continuing improvements to the existing recycling centers, opportunities for additional waste processing are limited at this time.

Private sector opportunities: The private sector may wish to take advantage of opportunities to divert Pierce County waste away from disposal and into other processing or volume reduction facilities. Private sector entities, however, may want to examine more areas than the opportunities identified for composting and diversion of paper and CD material. How and when the local, regional, national, and international recycling markets stabilize will affect their decisions. Pierce County's central location on major transportation corridors and the local and regional public support for recycling collection make the County a prime area for locating regional processing and recycling facilities. For example, a company might want to ship mixed recyclables to Pierce County by truck or rail, and sort those materials before seaborne export.

Joint Opportunities: Private and public capacity for composting is under rapid change in Pierce County. New facilities are scheduled to be available by 1999 and this capacity will substantially change the costs, efficiencies, and alternatives for all three waste management systems. It is possible there will be no new need for composting facility capacity and that all jurisdictions can cost-effectively contract for, or design their yardwaste or other organics composting programs to suit the new public and private sector capacity. If the private sector capacity does not develop, the three management systems may want to consider the joint development of another composting facility.

In addition, changes to Tacoma's RDF system and Steam Plant may add or decrease disposal capacity for the Pierce County region. Until these issues are resolved, it is not clear what are the joint, cost-effective alternatives for increasing recycling processing capacity.

6.5 Evaluation Criteria

Table 6.6 outlines technical, economic, and environmental criteria to use to evaluate remaining waste processing alternatives. The weighting or emphasis on a particular criterion or group of criteria will vary depending on whether the proponent is a private sector applicant or the public sector.

All applications to build and operate a waste processing facility would have to comply with applicable zoning and environmental criteria mentioned both in this Plan and elsewhere. This is true of both public and private sector applications.

Other criteria listed in Table 6.6, however, pertain more to Pierce County's evaluation as to whether it should be involved in the siting or development and operation of a facility. These would be particularly pertinent if Pierce County should want to alter its system approach. Such a directional change could go from reliance upon a system which heavily emphasizes source-separation, private recycling processing capacity, and landfilling, to a system with less reliance upon source-separated recycling and more upon recovery through a mixed waste composting facility, or energy recovery from a waste-to-energy facility. For instance, before committing to construct a municipal solid waste MRF or a waste-to-energy facility, it would be prudent for the County to evaluate the commercial feasibility of the technology, the planned facility's compatibility to the existing and planned waste reduction and recycling programs, and the County's access to feedstock.

A private sector applicant, however, may be willing to take a risk with an as yet unproven technology, or may choose to risk competing for recyclables on the open market. With regard to private sector proposals, the criteria in Table 6.6 are meant to be descriptive rather than prescriptive.

Flow control: One issue that is particularly important for municipalities to consider in deciding whether or not to add waste processing facilities to management systems is the facilities' relatively large capital cost. These costs are typically financed by municipal bonds. If revenues to cover the financed costs are generated from tipping fees, then having an assured waste stream is critical. If revenues from the sale of a processed commodity (e.g. finished compost to market or a processed recyclable commodity to a consolidator or end-user) are anticipated to repay the bonds, then having a dedicated, high-quality feedstock is important. Decisions that have been handed down by the United States Supreme Court affect a municipality's ability to control the flow of waste stream materials and recyclables as discussed below.

Flow control as it pertains to mixed waste (garbage): In the past, municipal governments have been able to assure that waste streams went to specific processing or disposal facilities, guaranteeing the government a way to collect fees on that waste. The U.S. Supreme Court has held this type of "flow control" to be an unconstitutional infringement on the "dormant Commerce Clause" of the U.S. Constitution. Thus far, local waste haulers in Pierce County have not challenged the ability of the County to direct the flow of waste materials. Given the Court's decisions (*C.A. Carbone vs. Town of Clarkstown, NY*), however, public financing of waste processing facilities has become riskier. Federal Appeals courts on the East Coast, however, have mitigated the *Carbone* decision somewhat. (See Chapter 5 or discussion of U.S. Second Circuit Court of Appeal decision.) The Supreme Court has declined to review subsequent appeals of those decisions.

Flow control issues could affect the County's ability to finance waste separation and recovery facilities ("dirty" MRFs), specialized MRFs, or WTE facilities, unless adding the MRF or WTE facility to the waste management system reduced overall waste

management costs and added significant value to processed recyclables.

Even without a court or congressional fix, there are things a municipality can do to maintain some control of the waste stream:

- Provide the least expensive disposal system so that markets dictate waste flow.
- Design facilities to reduce system costs and/or increase market value of recyclables.
- Enter into voluntary agreements with waste haulers, other municipalities, and large waste generators.

As explained in Chapter 5, cities and towns that contract for waste collection, or Tacoma and Ruston, which have their own collection utilities, have more control over the waste stream than the County. They could use their ability to flow control the waste to a facility, thus guaranteeing a way to collect fees and finance the cost of a facility.

Flow control as it pertains to recyclables: In the past, municipal governments outside of Pierce County have entered into agreements to take ownership of collected recyclable materials or have directed those materials to specific recycling centers. This assisted local government collection of revenues that were often used to offset collection charges. As was the case with waste, the U.S. Supreme Court has held this type of flow control to be an unconstitutional infringement on the "dormant Commerce Clause" of the U.S. Constitution. Decisions in court cases about the flow control of recyclables are unclear. Pierce County does not direct the flow of recyclables, but would have to consider the latest decisions, if it decided to build facilities to process recyclables, yardwaste, or foodwaste. A prohibition on recycling flow control would affect the County's ability to finance recycling processing or composting facilities unless adding facilities to the waste management system reduced overall waste management costs and added significant value to processed recyclables.

In addition to the Federal court prohibition on the local government flow control of recyclables, Washington State prohibits County governments from regulating the collection of recyclable materials generated by non-residential sources. Without regulatory oversight, it would be very difficult for the County to identify, let alone control, where recyclables were collected and processed.

Because Tacoma can control where waste is taken, the City has the ability to develop and finance additional facilities to separate recyclables from the waste stream. As explained in Chapter 5, cities can not flow control the collection of commercial recyclables.

Both Fort Lewis and McChord AFB have complete control over their entire waste streams, both garbage and recyclables, and their financing of facilities is not dependent on waste tipping fees or for the base to become the lowest-cost provider in order to attract waste or recyclables.

Table 6.6 Evaluation Criteria – Solid Waste Processing Facilities	
Criteria	**Related Questions and Issues**
Technical Criteria	
1. Commercially proven technology	▪ Has the same technology been successfully employed in commercial operation for at least 5 years? ▪ Has a facility of similar size been successfully operated? ▪ What has been the record of success and failure?
2. Compatibility with existing and planned waste reduction and recycling programs	▪ Would such a facility compliment or compete with source-separated waste reduction and recycling programs? ▪ What special provisions for collection would be required?
3. Compatibility with disposal system	▪ Could such a facility be implemented with either an in-county landfill or waste-export based disposal system? ▪ Would there be specific implementation issues related to waste export?
4. Effectiveness/Reliability	▪ What is the diversion potential? ▪ How frequently would the facility be off-line or operating under capacity?
Environmental Criteria	
1. Water	▪ What is the potential for leachate to be generated at such a facility? ▪ How would run-off, run-on, and stormwater be handled? ▪ How much process water is required?
2. Earth	▪ How much clearing is required?
3. Air	▪ What types of air pollutants would be generated? How effective are typical control technologies? ▪ What is the potential for off-site odor impacts? How effective/expensive would odor controls be to implement? ▪ How would the haul distance impact air pollution?
4. Land use	▪ How noisy would such a facility be? ▪ What are the relevant zoning/comprehensive plan requirements? ▪ Can aesthetic impacts be identified? ▪ What are the transportation needs and impacts?
5. Processing residue	▪ What residues would there be? What facilities are available to handle specific residues? ▪ What environmental issues are related to disposal/reuse of these residues?
Economic Criteria	
1. Life-cycle Cost	▪ What is the cost per ton and how does it compare to disposal costs per ton?
2. Financial Risks	▪ How capital-intensive would the facility be? ▪ How likely is it that competing facilities would draw waste away from the processing facility? ▪ How does market stability affect the facility? ▪ For publicly procured facilities, what waste stream guarantees, if any,

	can be made?

Table 6.7 Overview of Pierce County Processing Facility Alternatives			
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
1A Centralized Self-haul CDL Recovery - "Dump and Pick" operation.	▪ Commercially proven – yes ▪ Compatibility with waste reduction and recycling programs – yes, but may compete with existing and future private sector facilities. A contract with private businesses to take the separated material may resolve the competition issue. ▪ Compatibility with disposal system – would be compatible with either an in-county landfill or waste-export disposal system. Implementation should follow disposal decision. ▪ Effectiveness/reliability - very reliable because there is little reliance on mechanical equipment that is prone to break down. Such a system could be expected to reduce self-haul disposal waste about 20%.	▪ Water – some water may be required for dust control. Low potential for leachate. ▪ Earth – Relatively little additional area required if developed as an integrated facility with either a landfill or transfer station. ▪ Air – dust and loader exhaust would be controllable by misting and ventilation systems. ▪ Land use – noise similar to transfer station noise. Crushing/grinding operations could be noisier. If stand-alone facility, it is considered a Recycling Processing Facility for land use permitting purposes. Otherwise, it can be part of a transfer station. ▪ Traffic – little, if any, incremental traffic impact expected since self-haul material would be delivered to landfill or transfer station anyway.	▪ Life-cycle cost = $35 - $55 /ton ▪ Financial risks: - Capital costs for covered area and loaders. Would be higher if located at a transfer station that required a fully enclosed facility. - For a County-owned facility, there would be some competition from private facilities. Extent of use would likely be very price sensitive.

Table 6.7 Overview of Pierce County Processing Facility Alternatives			
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
1B Centralized Self-Haul CDL Recovery – Mechanized Operation	▪ Commercially proven – yes ▪ Compatibility with waste reduction and recycling programs – yes, but may compete with existing and future private sector facilities. ▪ Compatibility with disposal system - either an in-county landfill or out-of-county disposal system. Implementation should follow disposal decision. ▪ Effectiveness/reliability – reliable, but mechanical equipment can break down. Such a system could be expected to reduce the self-haul disposal waste steam by 25 – 40 percent.	▪ Water – some water may be required for dust control. Low potential for leachate. ▪ Earth – Approximately 2 to 5 acres required if developed as an integrated facility with either a landfill or central transfer station. ▪ Air – dust and loader exhaust, controllable by misting and ventilation. ▪ Land use – noise similar to transfer station noise. Crushing/grinding operations could be noisier. If stand-alone facility, it is considered a Recycling Processing Facility for land use permitting purposes. Otherwise, it can be part of a transfer station. ▪ Traffic – little, if any, incremental traffic impact expected since self-haul material would be delivered to landfill or transfer station anyway.	▪ Life-cycle costs = $80 - $150/ton ▪ Financial risks: - Capital costs for enclosed facility and equipment higher than Alternative 1A. - For a County-owned facility, there would be some competition from private facilities. Extent of use would likely be very price sensitive.
1C Retrofit transfer stations with storage bays or drop-off containers for source-separation of CD materials by self-haulers.	▪ Simple, established process. ▪ Compatible with waste reduction and recycling programs and source-separation approach. ▪ Compatible with any disposal system- either an in-county landfill or out-of-county disposal. ▪ Effectiveness depends upon willingness of self-haulers to separate materials. No mechanical equipment to break down.	▪ No processing would occur on site, thus no effects on water, air, or noise. ▪ Traffic – little, if any incremental traffic impact expected since self-haul material would be delivered to landfill or transfer station anyway. ▪ Minimal land use space needed	▪ Can be funded within existing operation costs. ▪ Value of materials for re-use may increase over time. ▪ Capital investment minimal.

Table 6.7 Overview of Pierce County Processing Facility Alternatives			
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
2A Foodwaste Composting (commercial scale)	▪ Commercially proven – moderate operating expense, not widely used. ▪ Compatibility with waste reduction and recycling programs - would compliment programs since they do not target foodwaste. ▪ Compatibility with disposal system - compatible with either a landfill or waste export based system; would reduce some problems (i.e., odor, liquids) associated with long-haul transportation. ▪ Effectiveness/reliability – unknown. ▪ Private capacity already available in Pierce County.	▪ Water – for a new facility, some water may be required for processing. Leachate control required. ▪ Earth – approximately 9 to 30 acres required (for a facility with a capacity of 75,000 tons per year). ▪ Air – dust and equipment exhaust, controllable by ventilation. Odor impacts could be substantial and could require an enclosed facility. ▪ Land use – potential for off-site odors would be primary facility siting issue. Odor and leakage from collection vehicles could be an issue en route to the facility. ▪ Traffic – additional collection traffic if separate vehicles/pickup schedules required.	▪ Life-cycle costs = $25 to $67/ton ▪ Capital investment required for covered and/or enclosed facility and additional collection fleet. ▪ Financial risks: - County could not guarantee waste stream (commercial stream) to privatized facility.
2B Small-Scale In-Vessel Composting (as accessory to feedstock generator such as an industrial business or institution)	▪ Commercially proven – mostly limited to pilot programs. ▪ Compatibility with waste reduction and recycling programs – would compliment existing programs and could serve institutions and others in the private sector at the point of generation. ▪ Compatibility with disposal system - would reduce some problems (i.e., odor, collection) and would divert compostable waste from the disposal stream, especially in locations without large-scale composting facilities. ▪ Effectiveness/reliability – unknown.	▪ Water – potential for leachate production depending on feedstock. ▪ Earth – relatively little area require, completely contained on site of feedstock source. ▪ Air – minimal equipment exhaust or dust. ▪ Land use – noise and odor significantly less than large-scale facilities. ▪ Traffic – none expected.	▪ Life cycle cost = unknown. On a per ton cost it will likely be more costly than a large-scale facility. But cost would be born directly be generator. ▪ Financial risks: - Limited and isolated to the individual user. - Waste stream would be guaranteed since composting occurs at the point of generation.

Table 6.7 Overview of Pierce County Processing Facility Alternatives			
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
3 County-owned Waste Separation and Recovery Facility ("dirty" MRF) to sort remaining fraction of recyclables from disposed waste stream.	▪ Proven technology. ▪ Would have to be sited with a transfer station or landfill. ▪ Compatible with existing source-separation WRR programs if designed to sort remaining fraction of recyclables from waste disposal stream. ▪ Flexible to adapt to changed market conditions. ▪ Technically compatible with any disposal choice. ▪ Capacity only limited to size, hours, and equipment.	▪ Water – Low potential for leachate within enclosed facility. ▪ Earth – Approximately 2-5 acres required if developed with as an integrated facility with a landfill or transfer station. ▪ Air – Dust and loader exhaust, controllable by misting and ventilation. ▪ Land Use – Noise similar to transfer station noise. ▪ Traffic – Little, if any incremental traffic impact expected if sited at existing transfer facilities.	▪ Life cycle costs = $40 to $60 per ton. ▪ Financial risks: - Capital and operating costs for enclosed facility would need to be funded by tipping fee which might exceed the cost of other private alternatives

6.6 Recommendations

Reduce disposal

#6-1 Reduce the amount of solid waste for disposal using solid waste processing technologies that are protective of human health and the environment.

Processing facilities for paper, yardwaste, CD, foodwaste, and plastics

#6-2 Encourage safe and effective in-county recycling processing systems and new materials processing technologies for recyclable waste components that are found in significant quantities in the waste stream, such as paper, yardwaste, CD, foodwaste, and plastics.

Reserve processing capacity

#6-3 Pierce County encourages private recycling, composting, and processing facility operators located within Pierce County to reserve processing capacity for materials generated within Pierce County.

Alternative technologies

#6-4 Pierce County should maintain its understanding of the characteristics and limitations of existing and new technologies and all available alternatives to in-county landfills for consideration in the implementation of the County's solid waste management system. The County should pursue those technologies and alternatives that can be effective in enhancing the existing waste reduction and recycling programs.

#6-5 Only those technologies with demonstrated reliability should be implemented as primary processing alternatives of the solid waste management system. However, governments and the private sector may wish to conduct pilot programs and explore new and innovative ideas. The appropriate regulatory agencies shall determine whether or not any potential technology meets the requirements of this Plan.

#6-6 Only processing technologies that are protective of human health and the environment (for example those that create no adverse odor impacts to neighboring properties) should be deemed to be in compliance with the Solid Waste Management Plan. As new processing technologies emerge, the environmental and health impacts should be carefully considered.

#6-7 Encourage processing technologies that make fiscal and environmental sense.

Financial assurances

#6-8 With any alternative technology project, the operating vendor must provide sufficient financial assurances to minimize financial risk to the public for environmental and technical performance. Each city, town, and the County Council will independently determine the level of financial and environmental assurances that will be required for projects under their own jurisdiction.

#6-9 The Tacoma-Pierce County Health Department should evaluate the need for requiring financial assurance for some permitted solid waste recycling facilities.

Regulatory consistency and standards

#6-10 Work with other regulatory agencies to strive for consistency.

#6-11 The Tacoma-Pierce County Health Department, in conjunction with Pierce County and municipalities, should encourage and participate in the process to revise Chapter 173-304 WAC, the Minimum Functional Standards for Solid Waste Handling. Should the revisions not adequately address local public health and safety issues, the need to adopt more stringent local regulations should be considered. These issues include, but are not limited to, odor, air, and water impacts, and by-product quality.

The planning process identified the following examples of regulations that may be considered:

- In order to minimize air impacts, composting of organic wastes should be accomplished through controlled aerobic decomposition methods.
- Odorous organic waste feedstocks or feedstock mixtures should be processed and/or composted with effective enclosure and odor controls. Permit conditions should include progressive odor management plans – which require significant and prompt changes in feedstocks, and improvement in management and facilities – to remediate odorous conditions to result in no adverse impacts on the environment and neighboring properties.
- Composting of organic waste should require control and treatment of liquid wastes so as to avoid any surface or ground water impacts.
- Prior to their use by the public, the Tacoma-Pierce County Health Department should review (and approve as appropriate) the probable health impacts of products and by-products generated by a permitted solid waste handling facility.

Notification of landowners

#6-12 When an applicant applies for a Solid Waste Permit, the Tacoma-Pierce County Health Department shall notify the property owner(s) and verify that the owners understand they will be responsible for clean-up of any waste left by any solid waste facility or activity on their property.

Tacoma Recommendations

Composting

#6-13 Tacoma may continue its evaluation of organic waste processing or composting needs. Should a new facility become feasible with Tacoma's evaluation, Tacoma may choose to proceed with the development of the new facility in accordance with applicable regulations and policies.

Steam Plant

#6-14 Tacoma Steam Plant No. 2 may continue to operate under the existing solid waste permit. Tacoma Power or any other entity that owns or leases the facility shall continue to operate the facility in accordance with all applicable regulations and permits. The owners or operators of the facility may investigate and implement the use of alternative fuels and/ or other improvements that would increase the efficiency and viability of the operation.

Resource Recovery Facility

#6-15 Tacoma's existing Resource Recovery Facility may continue operation at the Tacoma site. To continue operations, the owners or operators of the Tacoma Resource Recovery Facility may need to expand or improve the facility to increase capacity and take advantage of alternative fuels. Should the Steam Plant facility close, Tacoma could explore the use of the Resource Recovery operation to extract other recyclable or usable materials.

CHAPTER 7

TRANSFER FACILITIES AND SYSTEMS

This chapter addresses solid waste transfer in Pierce County. Waste transfer is the collection or interim processing of municipal solid waste prior to transport to a permanent disposal site. Included in this chapter is a description and inventory of existing transfer facilities and a discussion of needs and alternatives for three waste management systems - Pierce County/Cities and Towns, Tacoma/Ruston, and Fort Lewis/McChord Air Force Base. State regulatory requirements are covered under WAC 173-304, Minimum Functional Standards for Solid Waste Handling.

A waste transfer system is made up of facilities that transfer waste from self-haul or route collection vehicles to large capacity containers, which subsequently transport the waste to a disposal site. Transfer facilities are typically used in areas located more than 15 miles from collection routes or when special transportation containers are required to deliver waste to a remote in-county or out-of-county disposal facility. Transfer facilities are also used to consolidate commercial and self-haul loads, which in turn reduce traffic to disposal or processing sites or to process household hazardous (moderate risk) waste. The type and design capacity of a transfer facility is determined based on the projected size and characteristics of the waste stream and the anticipated number of vehicles using the facility.

Goals: Pierce County and the SWAC established the following goals for transfer of waste:

> ***Goal:*** To utilize transfer facilities and systems which provide cost and operational efficiency to the waste disposal system.
>
> ***Goal:*** To provide convenient waste transfer locations for public and commercial needs.
>
> ***Goal***: To provide opportunities for recycling to the public and commercial haulers at transfer locations.

Transfer facilities increase the efficiency of the countywide collection system by reducing self-haul travel time and by allowing collection vehicles to remain closer to routes while larger capacity vehicles make the trip to the disposal facility. Transfer facilities also provide opportunities for recovery and consolidation of recyclables for transport to markets.

7.1 Facility Types and Siting Issues

Types of facilities: In the three management systems in Pierce County, transfer facilities include publicly and privately-owned transfer stations, drop-box transfer stations, moderate risk waste fixed and mobile facilities, and an intermodal facility. There is also a privately-owned transfer facility that collects only yardwaste and wood debris. The following descriptions define each type of municipal waste transfer facility.

Transfer Station: A transfer station is a permanent, fixed facility used by self-haul customers and/or route collection vehicles to deposit collected solid waste from off-site into

a larger transfer vehicle for transport to a disposal facility. A transfer station may include baling and compaction activities, and manual or mechanical sorting of recyclables, and drop-off containers for separated wastes such as yardwaste. They may be sited adjacent to, or with, other solid waste facilities.

Drop Box Transfer Station: A drop box transfer station uses a detachable container (drop box) for receiving solid waste delivered to the site. Separate containers are provided for yardwaste and recyclables. This type of transfer facility normally serves general public self-haul customers.

Drop box facilities are designed to serve rural or low-density residential areas remote from a disposal facility or other transfer stations, or areas with particular transportation problems such as an island with only intermittent ferry service.

Moderate Risk Waste Fixed Facility: A moderate risk waste (MRW) fixed facility is used to recycle, sort, and package household hazardous and moderate risk waste prior to transport to a disposal facility. A MRW fixed facility receives hazardous waste from households and/or moderate risk waste from businesses that generate hazardous waste in quantities below the threshold for regulation under Washington's Dangerous Waste Regulations WAC 173-303. (These small business generators are generally referred to as Small Quantity Generators - SQG's.) Waste that is collected must be recycled or disposed in designated hazardous waste landfills or incinerators or handled by other alternatives allowed by law. (*The Tacoma-Pierce County Local Hazardous Waste Management Plan* provides a full discussion about moderate risk waste handling requirements.)

Mobile Collection Facility: A mobile collection facility operates for short durations at numerous locations convenient to residents in order to collect wastes generally not permitted for MSW landfill disposal. Mobile collection facilities are generally used to collect household hazardous waste only and do not serve small businesses.

Intermodal Facility: An intermodal is a facility where material is transferred from one mode of transportation to another (e.g., truck to rail). An intermodal facility typically is used to change the mode of solid waste transport from highway to rail or barge. Intermodals are generally used to ship waste out-of-county. They must be capable of efficiently handling large amounts of waste on a timely basis.

General siting issues: State regulatory design and operation requirements for transfer facilities are included in the Minimum Functional Standards for Solid Waste Handling (MFS - WAC 173-304)

Transfer stations should be located in areas of greatest need, which include urban areas where consolidation of waste may have operational and economic advantages or in rural areas where accessibility to other transfer or disposal facilities is limited.

Transfer and drop-box stations and Moderate Risk Waste facilities must be permitted through the solid waste permit process under the Minimum Functional Standards (MFS), which is administered by the Tacoma-Pierce County Health Department. For the purposes of the County's land use regulations, an MRW Fixed Facility is permitted as a transfer station. An intermodal facility would not require a permit under the MFS as long as the facility only transfers waste that is already in containers. If waste were to be delivered to an intermodal facility to be put in containers or to be processed prior to shipment, the intermodal facility would need a Solid Waste Permit.

The State's permit regulations require specific designs for the containment of waste, measures to prevent pollution of ground and surface water, odor and dust

control plans, operations plans and safety procedures, buffer areas and long-term closure plans. Included within these requirements are monitoring and maintenance of the site and vector control.

Facilities should be sited to prevent or reduce impacts to other land uses. It is generally appropriate to site these facilities with other solid waste recycling or waste processing or composting facilities, industrial-scale intermodal transportation facilities, or on the site of a closed landfill.

Transfer facilities should be sited to provide good public access and with convenient access to major haul routes such as freeways and rail-lines. In rural areas, other public facilities that are generally considered compatible include fire stations, public works road shops, and maintenance facilities. Advantages in co-locating these facilities include shared access and compatibility for similar intensity of use. In addition, transfer facilities need to be sited to minimize impacts to sensitive noise receptors such as schools, hospitals, libraries, churches, parks, rest homes, and residential areas.

Just like any other business, potential sites for transfer facilitates must be evaluated to determine the mitigations necessary to protect historic properties, archeological sites, and natural resources, fish and wildlife habitat, and critical areas such as geologic and flood hazard areas, wetlands, aquifer recharge areas. The design and operation requirements of the Solid Waste Permit are intended to protect and mitigate environmental impacts on wetlands, aquifer recharge areas, and ground and surface waters. Siting a facility in shoreline areas is not allowed under Pierce County's Shoreline Management Regulations.

Other issues that must be considered for evaluation of individual sites include impacts from odor, noise, dust, litter, the attraction of vermin and wildlife, and traffic. Buffering, landscape screening, and fencing can reduce the impacts and improve aesthetic appearance. In addition to the State's buffering and emission control measures, the Pierce County Development Regulations contain additional buffering requirements to mitigate these impacts. These regulations are designed to be compatible with the State's requirements.

Once a facility is sited and operated according to state requirements, it should have no significant impact upon ground or surface waters, soils or air. Permit operations are monitored by the Health Department and violations can result in the loss of the permit and closure of the facility.

7.2 Existing Facilities and Systems

The existing system evolved as a mixture of public and privately owned facilities that focused on delivering waste to three landfills - Hidden Valley, City of Tacoma, and Fort Lewis Landfill. During the last seven years, the three transfer systems have been modified to accommodate the addition of disposal, processing, and recycling facilities including Tacoma's RDF plant and renovated steam plant, and the County's yardwaste composting facility. While long-range disposal decisions are being evaluated, the systems have been adapted to incorporate shipment of some waste out-of-county. However, the focus of collection and transfer of garbage remains on using the same historical solid waste sites.

These facilities are listed on Table 7.1 and located on Map 7.2.

7.2.1 Pierce County/Cities and Towns

System description: The County government's solid waste transfer system consists of four transfer stations, three rural

drop-box facilities, and one intermodal transportation facility. Most of the transfer capacity is under private ownership. This limits Pierce County government's control over the transfer system because the County is dependent upon the operation of the private facilities. The County-owned facilities are small and could not be adapted to provide capacity to handle all of the waste.

Two transfer stations are owned by collection companies and operated solely for the convenience of their route collection vehicles. Neither facility is open to the general public, although one facility provides drop-off containers for selected recyclable materials. The County-owned transfer station is located on the site of a closed, County-owned landfill and is open to both route collection vehicles and residential and commercial self-haulers. This facility is operated under contract with a private company. The fourth transfer station is located at the closed Hidden Valley Landfill and began solid waste transfer operations upon the closure of the landfill in January 1999. This facility, although privately owned, allows use by public and commercial self-haulers and route collection vehicles.

All three rural drop-box facilities are owned by the County and are open to the public solely for self-haul residential waste. Each is located at historic "dump" or gravel mine sites as a convenience to the citizens in these rural or isolated locations. None handle sufficient volumes nor have the capability to containerize waste for export.

All transfer facilities open to the public provide drop-off recycling facilities for mixed waste paper, cardboard, magazines, glass, aluminum, tin, recyclable plastics and yardwaste. White goods (appliances) are also provided separate bays for drop off; however, there is a processing charge to pay for processing, such as removal of pollution-causing chemicals from old refrigerators.

For the purposes of the Plan the privately owned yardwaste/woodwaste transfer facility is considered as a recycling processing facility because it does not contribute to the management system for handling municipal solid waste. This transfer type of facility is described in more detail in Chapter 6 Waste Processing Facilities.

Table 7.1 Municipal Solid Waste Transfer Facilities Serving The Pierce County System			
Transfer Facility	**Operating Schedule**	**Design Capacity (tons/day)**	**1997 Tonnage**
Publicly-Owned Facilities			
Purdy Transfer Station 14515 54th Avenue NW (Gig Harbor Peninsula)	Wednesday-Sunday 9 a.m. to 5 p.m.	300	39,130 (107 tpd)
Prairie Ridge Drop Box Station Corner of Prairie Ridge Road and South Prairie Road (Near Bonney Lake)	Wednesday-Sunday 9 a.m. to 5 p.m.	NA [1]	2,168 (6 tpd)
Key Center Drop Box Station 5900 Block of Key Peninsula Highway	Wednesday-Sunday 9 a.m. to 5 p.m.	NA [1]	927 (2.5 tpd)
Anderson Island Drop Box Station 9607 Steffenson Road	Schedule Varies [2]	NA [1]	148 (0.4 tpd)
Privately-owned facilities			
Murrey's	NA [3]	200	200 tpd
LeMay Enterprises	NA [3]	300	200 tpd
Hidden Valley [4]	Everyday 8 a.m. - 5 p.m.	600-800 [5]	NA
Additional facilities			
Intermodal Facility	NA [3]	NA [6]	

[1] Each facility includes four 50-cubic yard open-top roll-off containers. Each facility is serviced approximately once per week to ensure there is adequate capacity for self-haul waste drop-off.

[2] The Anderson Island Drop Box Station operates on a winter and summer schedule. From October 1 through March 31, the station is open Sunday from 10 a.m. to 2 p.m. and Monday from 1 p.m. to 5 p.m. From April 1 through September 31, the station is open from 10 am to 6 p.m. both Sunday and Monday.

[3] Transfer facility is not open to public use.

[4] Transfer station will handle solid waste when the existing landfill is closed in late 1998. Operating schedule is to be negotiated

[5] Facility is designed to handle 600 tons per day, on average, and 800 tons per day maximum.

[6] The intermodal facility has no capacity limitation that affects its ability to handle current and projected future growth

Publicly-owned facilities: Each facility, owned by the County is operated under contract by Land Recovery, Inc. These facilities have the ability to expand to serve the needs of growing rural populations by increasing days or hours of operation, increasing the number of containers, or more frequent transfer of containers.

Purdy: The Purdy Transfer Station is a direct load facility located at the closed Purdy Landfill site on the Gig Harbor Peninsula. The County's yardwaste composting facility is also located at the site. Waste is accepted from route collection vehicles and residential and commercial self-haulers. The waste is hauled via transfer truck to Hidden Valley Landfill for disposal.

Anderson Island: The Anderson Island drop box site is located on an old "dump" site of approximately 25 acres which served island residents and summer tourists prior to its closure as a "dump" in November 1985. The containers are hauled via roll-off truck to the Hidden Valley Transfer Station. Haul distance to Hidden Valley is approximately 30 miles and includes a ferry crossing.

Key Center: Formerly an open dump site, this drop box station is located on the Key Peninsula in western Pierce County. The waste is hauled to the Purdy Transfer Station and reloaded into larger capacity transfer trailers en route to Hidden Valley Transfer Station.

Prairie Ridge: The Prairie Ridge drop box station is located northwest of South Prairie, adjacent to a County-owned gravel pit south of Bonney Lake. Waste from this facility is hauled approximately 15 miles to the Hidden Valley Transfer Station.

Privately-owned facilities: Presently, Murrey's Disposal and Harold LeMay Enterprises operate two privately-owned transfer facilities in Pierce County. Both of these facilities utilize a direct discharge system to large open-top trailers. A third private facility is located at the Hidden Valley Landfill site and is owned by Land Recovery, Inc.

Murrey's Disposal Transfer Station: This transfer station is located at the Company's headquarters on 70th Avenue East, just north of the Puyallup River between the cities of Fife and Puyallup. Approximately 90 percent of the waste collected by Murrey's, (and affiliated companies, American, and D.M. Disposal) is handled at this facility with the rest directly hauled by collection vehicle to Hidden Valley. Loaded transfer trailers are either hauled approximately 10 miles to Hidden Valley or taken to the intermodal facility where they are hauled via rail to the Roosevelt Regional Landfill. Approximately 95 percent of the waste handled at the transfer station is hauled out-of-county for disposal as allowed under agreements with the County. The facility is not open for public disposal.

LeMay Enterprises: This transfer station is located at 3902 Steilacom Boulevard. The facility operates two 114-cubic yard (25-ton) transfer trailers which service both drop box (primarily construction material) and route collection vehicle waste. Approximately 60 percent of the waste collected by LeMay companies, Pierce County Refuse and Lakewood Refuse, is handled at the transfer station. The remainder is hauled by collection vehicle to Hidden Valley. Transfer trailers loaded at the facility are hauled to the intermodal facility for transport by rail to the Roosevelt Regional Landfill. The facility is not open for public disposal, but does have a public drop-off site for recyclables (no buy-back).

Hidden Valley: In early 1996, construction was completed on the third privately owned transfer station. The facility, located at the closed Hidden Valley Landfill, began operation in January 1999. Owned and operated by

Land Recovery, Inc., the facility accepts waste from residential and commercial haulers. The facility was designed to handle 600-800 tons of solid waste per day with the potential to double capacity. This facility is conveniently located at a familiar countywide disposal site.

Intermodal export facility: Pierce County solid waste disposed out-of-county is routed through an intermodal facility located on Burlington Northern's property located within the Port of Tacoma. Waste from Tacoma also goes through this facility. Transfer containers delivered to the facility are loaded onto rail cars for transport to an out-of-county disposal site. Land Recovery, Inc. leases and operates the facility, which consists of a concrete and asphalt paved area, approximately 150 by 1800 feet. The paved area located between siding tracks serves for container delivery, storage, and loading.

7.2.2 Tacoma Facility and System

The City of Tacoma collects and provides disposal for wastes generated within the Tacoma City limits independent of Pierce County. However, a limited quantity of waste generated outside of the City limits is accepted at the Tacoma Sanitary Landfill. In 1993, a transfer station constructed at the landfill began operation. Solid waste is hauled directly to the landfill site by commercial collection vehicles and residential and commercial self-haulers. Haul distances within the City vary, ranging up to 10 miles.

In 1999, approximately 20 percent of the waste disposed was processed into fuel, 15 percent was landfilled at the Tacoma Landfill; and 65 percent was taken to an outside landfill through the transfer facility. Currently, the waste transferred offsite is disposed at the

304th Landfill. The transfer facility currently handles approximately 400 tons of waste per day, operating near capacity.

A Household Hazardous Waste (HHW) program was implemented to insure environmental protection of the Tacoma Landfill, storm and sewer systems, and to provide citizens with an environmentally acceptable alternative for HHW disposal. In October 1990, Tacoma began operation of a temporary, fixed Household Hazardous Waste Collection Facility at the city landfill. In 1994, the facility was redesigned and upgraded to serve both Tacoma and Pierce County system residents. The County pays for HHW collection services based on the level of county resident participation.

Tacoma also developed a Mobile HHW Collection Unit. The Mobile HHW Facility currently operates once annually for two weeks at a site located in northeast Tacoma. An agreement between Tacoma and Pierce County will allow for mobile HHW collection on a countywide level. All waste collected at the mobile HHW facility is brought back to the permanent facility for processing.

Household hazardous waste accepted include:

- Antifreeze
- Poisons
- Flammable Liquids, Solvents
- Flammable Liquids, Poisons
- Corrosive Liquids, Alkaline
- Corrosive Liquids, Acids
- Other Corrosives
- Flammable Gas Aerosols
- Paint, and related wastes
- Flammable Solids
- Chlorinated Liquids

There are a number of local and regional businesses which process hazardous waste. Because of their availability, the City's facility does not accept waste from small quantity generators.

7.2.3 Fort Lewis/McChord AFB System

Waste collected on Fort Lewis and McChord Air Force Base is taken to the existing Fort Lewis recycling center. Currently, the Fort has a contract for long-haul with Waste Management which hauls MSW to the landfill in Arlington, Oregon. Waste at the landfill and recycling center site is put into transfer trailers with the use of front-end loaders. Fort Lewis is in the process of building a full-scale transfer facility and modifying the existing recycling center on the site.

Since 1946, Fort Lewis has used and closed ten landfill sites on the military reservation. In addition, McChord AFB has been disposing their MSW at the Fort Lewis landfills since the early 1970's, when the McChord AFB sanitary landfill closed.

Map 7.2 illustrates the location of transfer facilities in Pierce County.

Insert Map 7.2

7.3 Needs and Alternatives

In 1997, the three systems (Pierce County, Tacoma, and Fort Lewis/McChord AFB) handled approximately 1,750 tons of waste per day, a portion of which was shipped out-of-county for disposal. By 2017, the systems are projected to need capacity to handle between 2,100 and 2,300 tons per day (based on the current per capita disposal rate, a 50 percent recycling rate, and projected population growth). Long-term projections are in Chapter 3 Waste Analysis.

Based on the continually changing recycling industry, some materials currently being disposed have the potential to be removed from the waste stream. If the quantities are reduced, it could substantially change the projections for future transfer capacity needs.

The configuration of all three systems to provide this future transfer capacity will depend on whether long-term disposal will be provided in-county or through an out-of-county facility. Other factors which could influence overall capacity needs include whether Tacoma's steam plant and RDF facility can expand processing capacity

7.3.1 Pierce County System

There are three basic needs of the Pierce County transfer system: (1) to provide long-term transfer capacity for either in-county or out-of-county disposal; (2) to provide opportunities to remove additional recyclable materials from the waste disposal stream; and (3) to provide the most convenient and cost-effective customer service to all geographic areas within the county. The following discusses these needs in more detail.

#1. *Long-term transfer capacity:* With planned modifications to private transfer facilities and the opening of the new transfer station, the Pierce County transfer system will have an estimated total capacity of 1,500 tons per day by late 1998.

The majority of the transfer capacity, 500 tpd, is provided by three transfer facilities: Purdy (100 tpd), Murrey's (200 tpd), and Lakewood (200 tpd), with the remaining tonnage directly hauled to the Hidden Valley. Most of the waste delivered to the Murrey's and Lakewood transfer facilities is sent to the intermodal facility for transport out-of-county. The County-owned drop boxes only account for 8.8 tons per day, all of which must be hauled to either Purdy or Hidden Valley. Proposed changes to the waste compaction systems in place at the Murrey's and Lakewood facilities will add some additional capacity to the system in the short-term (perhaps a total of 100 tpd each) but are being implemented primarily because they will significantly increase the efficiencies of operating these sites.

The County-owned Purdy Transfer Station provided capacity for about 100 tons per day. Although the facility is permitted to handle a maximum of 300 tpd, this level is unattainable due to its location on the Gig Harbor Peninsula and the customer service base.

During 1997, the Hidden Valley Landfill handled approximately 571 tons per day of waste delivered to it directly by self-haulers and route collection vehicles, in addition to the 108 tons per day originating at Purdy and the three residential drop boxes. The new Hidden Valley Transfer Station handles 600-800 tons per day. Its operation does not provide additional transfer capacity to handle growth in the waste stream since it "replaces" the landfill at the same site that handled up to 1,000 tons per day.

Required future transfer system capacity: By 2017, it is estimated that the County's transfer needs will grow between 23 to 68 percent to 1,239 to 1,689 tons per day. This assumes that all waste presently handled by LRI, the waste collection companies, and the County transfer stations, continues to be handled within the system.

Table 7.3 shows the projected transfer capacity for the County's system requirements over the next 20 years. These projections will be affected by both the total quantity of waste disposed and the relative quantities that are direct-hauled to a landfill and processed through transfer stations. Five factors affect the amount of waste disposed: 1) changes in the recycling rate; 2) changes in the per capita disposal rate; 3) population growth at levels other than projected; 4) changes in waste generation as a result of economic activity, and 5) whether tipping fee increases will force more tonnage out of the system. Because of these variable factors, long-term capacity needs can only be estimated. Yearly monitoring of disposed tonnages is necessary to revise projections based on any of these factors.

If a new landfill is opened within Pierce County, it is likely that some waste currently hauled by route collection vehicles to Hidden Valley would also be hauled directly to the new landfill. This would free up existing capacity at the new Hidden Valley Transfer Station for future waste generation. However, the more remote a new landfill is, the less waste that will be direct-hauled by collection vehicles.

Table 7.3 Pierce County System Long term capacity needs [1]

	Growth Rate in Tons per Day		
	1 percent [2]	2 percent	2.5 percent
1996 Actual Tonnage : 1005 tons/day			
1997	1016	1026	1031
1998	1026	1046	1056
1999	1036	1067	1083
2000	1046	1088	1110
2001	1057	1110	1138
2002	1067	1132	1166
2003	1078	1155	1195
2004	1089	1178	1225
2005	1100	1202	1256
2006	1111	1226	1287
2007	1122	1250	1319
2008	1133	1275	1352
2009	1144	1301	1386
2010	1156	1327	1421
2011	1167	1353	1456
2012	1179	1380	1493
2013	1191	1408	1530
2014	1203	1436	1568
2015	1215	1465	1608
2016	1227	1494	1648
2017	1239	1524	1689

[1] The dark line indicates years when needed handling system capacity may exceed existing handling capacity.

[2] As discussed in Chapter 3 Waste Analysis, waste reduction and recycling activities have had a major impact upon Pierce County's waste stream. The column with a one-percent growth rate roughly reflects MSW disposal trends since 1993.

Intermodal facility capacity: The capacity of the existing intermodal facility is adequate to meet anticipated future needs; however, if long-term out-of-county disposal is chosen, additional long haul containers, staffing, and equipment will be required. Lack of an adequate number of containers has occasionally been a problem due to train delays and due to the railroad companies holding containers at the intermodal facility until train size is maximized. Containers held too long may cause odor problems in the Port and along the rail routes. In addition, there is also a need for emergency storage capacity in case rail transport is suspended due to derailments, or impassable rail-lines caused by flooding or landslides as occurred in 1995 and 1996. Emergency storage capacity would be essential if there is no in-county landfill disposal capacity.

Transfer station capacity: Based on current projections for transfer station requirements, the existing system appears to have capacity to handle future waste needs under most disposal scenarios through the year 2009, and, perhaps, under some scenarios for the entire 20-year planning period.

Alternatives for expanding capacity: If disposal out-of-county becomes the preferred alternative, additional transfer capacity will depend upon future waste generation, recycling rates, and other factors outside the control of the Pierce County waste management system and choices made by the County. The County will need to consider how to ensure continued, cost-effective services without having control over private transfer capacity. For any option that would require expansion of the two private transfer facilities, the County would need to establish a more formal, contractual relationship with Murrey's and LeMay Enterprises. The County's contract agreement with LRI already governs use of the Hidden Valley Transfer Station.

Four alternatives are available for increasing transfer capacity to meet the needs of an out-of-county disposal system for the long-term.

■ INCREASE THE CAPACITY OF THE HIDDEN VALLEY TRANSFER STATION**:** Land Recovery, Inc. designed the transfer station so that it could be expanded beyond its 600 to 800 tons per day capacity. Its site design and the agreement between Pierce County and LRI, which governed its construction and future operations, identifies the potential for doubling its size to 1,200 to 1,600 tons per day. Without other changes to the transfer system, this change would increase capacity to a range of 1,800 to 2,200 tons per day

■ COMPACT AND CONTAINERIZE WASTE AT PURDY**:** As previously discussed, because of its location on the Gig Harbor Peninsula, the Purdy Transfer Station is not a candidate for expansion. Waste generated and handled by the Purdy and Key Center facilities, however, could be containerized at Purdy and shipped directly to the intermodal facility, thus bypassing the Hidden Valley Transfer Station and, in effect, increase the transfer capabilities of the system. Without other changes to the transfer system, this change would increase system capacity to a range of 1,300 to 1,500 tons per day.

If large amounts of material could be diverted from the disposed waste stream, such as through waste reduction or recycling, it is likely that implementing only one of the above alternatives would be required. It is also possible that a 100 percent long haul system could be operated without relying on the Murrey's and Lakewood facilities. However, there may be benefits to continuing to depend upon these facilities because of their proximity to the Tacoma railhead intermodal facility.

■ INCREASE THE CAPACITY OF THE MURREY'S AND LAKEWOOD FACILITIES: Planned expansions will increase the capacity at the Murrey's and Lakewood facilities to approximately 300 tons per day each. Routing changes, site expansion, and other activities undertaken by the haulers could further increase these facilities' capacity. At this point it is uncertain exactly how much additional capacity could be moved through these stations. The County would need to explore the willingness of these companies to enter into additional contractual relationships.

■ SITE AND CONSTRUCT NEW, CENTRALLY LOCATED TRANSFER STATIONS**:** Such facilities would be used in conjunction with the existing facilities and could be a joint project by the County with Tacoma. The new transfer station could also possibly be combined with an intermodal facility or refuse companies could site a new private transfer facility to serve a particular city or area

#2. *Recycling capacity at transfer stations:* As identified in Chapters 3 and 4, there are opportunities to remove additional recyclable materials from the waste disposal stream; in particular, compostable organics, CDL, and paper. Programs developed under new waste reduction/recycling (WRR) policies may require modification of the existing transfer facilities and will likely require continued monitoring of the waste stream to evaluate effects upon disposal tonnages or commodity percentages.

*Private sector recycling**:*** It is expected that private recycling capacity will continue to grow (as it has) under the County's current WRR policies, particularly if commodity markets improve and stabilize. Increases in disposal rates may continue to support private development of WRR capacity if recycling collection becomes a cheaper option than disposal. Therefore, flexibility of the existing transfer system is needed to adapt to changes in the recycling processing facilities within Pierce County. In addition, flexibility allows the system to adapt to probable long-term technological changes that are expected to occur in the collection, processing, and recycling of waste materials.

Short-term capacity needs: For the short-term, with continued growth in the private recycling industry, the County should pursue cost-efficient methods to remove additional compostable organics and CDL from the waste disposal stream. This may be achieved through minor modifications to the Purdy Transfer Station, the three drop-box facilities, and the Hidden Valley Transfer Station. Modifications would involve implementing source-separation at the transfer facilities of CDL and selected organic materials for transport to processing or composting facilities.

Long-term capacity needs: For the long-term, the County may choose to consider siting its own materials recovery facility (MRF), particularly if private recycling capacity does not continue to grow. Before making a decision to site its own MRF, the County would need to carefully explore why private sector recycling capacity did not grow as expected. If, despite the efforts of the private sector, there is additional demand for local processing capacity (in terms of quantity of capacity or quality of services offered) and a long-term outlook for positive markets for recycled materials, the County may wish to further explore siting a MRF to serve demonstrated unmet demand for capacity. A similar examination of private sector capacity in the early 1990's spurred Pierce County to site a yardwaste composting facility.

A more detailed discussion of a County MRF is included in Chapter 6.

#3. *Cost effectiveness and customer service:* Additional self-haul capacity in eastern and southern rural Pierce County may be needed to handle proposed developments and growth, and discourage illegal dumping.

Eastern Pierce County: The proposed Cascadia development, south of Bonney Lake, is projected to add upwards of 10,000 residents and an unknown number of businesses within the next 20 years. This development is located in eastern Pierce County within the Prairie Ridge drop-box service area.

The project developer estimates at full build-out by 2017, that the development will generate a potential volume of approximately 53 tons per day. The hauling company serving this area, Murrey's, has indicated there is sufficient capacity to handle this tonnage by route collection vehicles and at their transfer facility. However, the development and other subdivision growth in the area may generate a need to expand capacity for self-haul customers or as a partial deterrent to illegal dumping. It is too early to project the effects of growth. Recent population growth in the area has not caused problems for the facility probably because the area is becoming more urbanized and new residents use to an urban style of life are more likely to sign up for garbage service rather than self-haul.

If the population growth exceeds the capabilities of the small Prairie Ridge drop-box facility, the County might want to consider developing a full-scale transfer station, similar to the Purdy facility, either at the existing drop-box site or a new site. The benefits of a full-scale transfer facility include the added ability to handle route collection vehicles in addition to self-haul, and the potential for a more cost-effective transport of waste by using transfer trailers rather than route-collection vehicles as the main means of moving the waste.

The cost-effectiveness of this alternative would depend upon decisions about long-term disposal and other transfer system modifications made to accommodate future growth, such as expansion of private facilities for more efficient handling of waste sent to the intermodal facility. If the facilities are expanded, the demand for additional capacity at the drop box facility will be less.

Southern Pierce County: Growth is also expected to occur in the Elbe/Ashford area of southern Pierce County. Presently, this area, which does not have a convenient, regional disposal facility for local residents, experiences substantial illegal dumping. Siting a new drop-box facility in this area, as well as additional recycling drop-off sites coupled with a strong public outreach campaign may alleviate some of the illegal dumping problems. In addition, assisting in the community planning process should help ensure that adequate self-haul or route collection service is provided to residents of new developments. If an in-county landfill is located in this area it might reduce the need for facilities to serve self-haul customers.

The National Park Service and timber companies have also experienced major illegal dumping in this area. Coordinating with the Park Service to provide improved drop-off facilities for summer visitors might reduce the potential for illegal dumping within the Park. (A more detailed discussion about illegal dumping and alternatives is found in Chapter 10 Enforcement and Administration.)

7.3.2 Tacoma/Ruston System

The City plans to fill the Central Areas of the Tacoma Landfill to the maximum grade allowed by its permits. In 1998, the Tacoma landfill was granted an extension to continue landfilling until 2004. With an extension, it is estimated that approximately 20,000 tons of waste will be disposed in the landfill per year until closure.

Currently, Tacoma waste is routed to either the RDF facility or the city transfer station. The transfer station is already operating near capacity. If the RDF facility and steam plant processed additional material, it would decrease the quantity of material sent to the transfer station. However, even with this modification, long-term transfer capacity would likely need to be expanded to handle the projected waste quantities. The configuration of the existing station does not allow for expansion; however, a similar facility could be constructed adjacent to the existing facility.

Tacoma has recently completed an evaluation of options for future operation of the RDF facility and steam plant. Options considered include: (1) closing both facilities; (2) maintaining current processing levels; or (3) increasing the quantity of RDF processed and types of fuel used. The City is scheduled to decide on its preferred alternative during the year 2000.

7.3.3 Fort Lewis/McChord AFB System

Fort Lewis built a transfer station which began operation in 1999 and is continuing to study its options to expand recycling.

7.3.4 Joint Opportunities

Given the similarity of needs between the three waste management systems, joint efforts may present the most cost-effective approach for dealing with independent system needs. Two such opportunities exist:

- Development of a coordinated approach to provide or obtain guarantees for long-term transfer capability within the county and to an intermodal facility. This would be most advantageous if in-county landfill disposal capacity is not available.
- Consideration of a coordinated approach to maximize waste incineration at the Tacoma Steam Plant in order to reduce the need for out-of-county disposal capacity and associated transfer capacity. A number of factors would need to be addressed in assessing the feasibility of this concept including permit conditions, required standby capacity, and cost.

7.4 Evaluation Criteria

Table 7.4 describes technical, economic, and environmental criteria to use in evaluating transfer alternatives, if needed. The specific criteria to be considered will depend on whether or not siting of a new transfer station is involved. In planning for future changes, the impacts of both individual facilities and the system as a whole must be considered. The trade-offs between specific local impacts at multiple locations will need to be evaluated. Table 7.5 provides a summary of technical, environmental, and economic considerations for the transfer alternative.

Table 7.4 Evaluation Criteria – Solid Waste Transfer Facilities	
Criteria	Related Questions and Issues
Technical Criteria	
1. Site Access	• Is the site located such that it provides reasonably convenient service to commercial haulers and self haul customers?
2. Customer Service (System – All Facilities)	• Does the system provide an adequate and reasonably equitable level of service to self-haul customers? • Does the system adequately address transfer needs resulting from population growth in specific geographic areas?
3. Compatibility with existing and planned waste reduction and recycling programs	• Does the transfer system compliment and is it compatible with source-separated WRR programs? • Is it flexible enough to adapt to changing conditions? • Does it provide required provisions for collection?
4. Compatibility with disposal system	• Does the system adequately address near-term and long-term needs?
5. Provisions for future expansion	• Does the system have the capability to be expanded to meet long-term projected transfer needs and unanticipated increases in transfer needs?
Environmental Criteria (for siting a new facility)	
1. Earth	• How much clearing is required? • What are the potential impacts to wetlands and other sensitive areas?
2. Air	• What is the potential for off-site odor impacts? How effective/expensive would odor controls be to implement?
3. Land Use	• How noisy would such a facility be? • What are the relevant zoning/comprehensive plan requirements? • Could there be aesthetic impacts? • What are the traffic impacts to the surrounding community? • What are the transportation needs and impacts? • What are the offsite impacts resulting from development of new and expanded transfer facilities?
4. Water	• What is the potential for leachate to be generated at such a facility? • How much process water is required? • What are the potential impacts from surface water runoff from the facility?
Economic Criteria	
1. Life-cycle cost	• What is the life cycle cost per ton and how does it compare to other transfer options?
2. Financial risks	• How capital-intensive would the facility be? • What will be the cost impact to the system and how likely is it that competing facilities would draw waste away from the transfer system thereby reducing the need for the facility?

Table 7.5 Overview of Pierce Transfer Facilities and Systems Alternatives			
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
1 To Increase Long Term Capacity [1]:			
1A Increase the capacity of the Hidden Valley Transfer Station	• Location provides reasonably convenient services. • Continues current level of service to self-haul customers. • Compatible with current WRR programs and flexible to adapt to changing conditions. • Maximum potential expanded capacity unknown.	• Existing facility capable of being expanded with relatively minor on-site environmental impact. Off-site impacts limited to traffic.	• Addition to existing building relatively low cost option. Overall effect would be to lower per ton transfer costs (due to increased waste throughput). • Should be cost competitive with other options.
1B Compact and containerize waste at Purdy	• Essentially same level of service as current. • Relatively small increase in capacity compared with expansion of Hidden Valley or new Central Transfer Station.	• On-site impacts relatively minor. • Some increase in traffic to and from sites.	• Relatively low cost.
1C Increase capacity of the Murrey's and Lakewood Facilities.	• Essentially the same level of convenience as current. • Relatively small capacity increase compared with expansion of Hidden Valley Transfer Station or new Central Transfer Station. • Proximity to Tacoma railhead facility.	• Relatively minor modifications; should not create significant environmental impacts. • May increase traffic volumes.	• Relatively low cost.
1D Site and construct new, centrally located transfer station.	• New design could maximize layout and operating efficiencies. • Could be built with expanded capacity for accepting source-separated materials. • May be difficult to find a suitable location that meets public approval. Typically difficult to site.	• Construction of a 700-1000 tpd central transfer station would result in - Clearing of 8-15 acres - Potential impacts to wetlands - Construction related impacts,(i.e. noise, traffic, dust) - Potential off-site impacts (i.e., aesthetics, traffics, surface water runoff) • May be difficult to find a suitable location that meets public approval. Typically difficult to site.	• Relatively high capital and operating costs. Potential savings on transportation costs, depending on location. • Could be developed jointly with Tacoma, which would reduce costs. • Could be a smaller facility sited by a refuse hauler to serve a particular city.

[1] The existing transfer capacity of the Pierce County System is likely sufficient to at least 2009 and may be sufficient beyond that time under either in-county or out-of-county disposal alternatives. The alternatives for increased capacity are only for the long term and if an out-of-county disposal system is chosen.

Table 7.5 Overview of Pierce Transfer Facilities and Systems Alternatives			
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
2. To Increase Recycling Capacity and Maximize Transfer Capacity.			
2A Increase recycling capacity at transfer stations, particularly for CDL (See processing alternatives 1A, B, & C in Chapter 6)	• Simple technology – typically manual sorting. • Possible increase in congestion at existing facilities. • Compatible with WRR programs. • Compatible with any disposal alternative.	• Potential impact for off-site noise impacts if activities are not in enclosed building. • Other impacts expected to be minimal.	• Low capital cost. • If customer sort is used, lower operating cost. • If operators sort material, higher capital and labor cost.
2B County-owned waste separation and recovery facility that separates recyclables from mixed municipal solid waste (dirty MRF). (See Chapter 6 for detailed description)	• Proven technology. • Would have to be sited with or as a transfer station. • May not be compatible with exiting source-separation WRR programs. • Flexible to adapt to changed market conditions. • Would be technically compatible with any disposal choice. • Capacity only limited to size, hours, equipment.	• A "less stable" feedstock, potential impacts to water (leachate protection), air (equipment exhaust and dust), land and traffic (similar to transfer stations). • May be difficult to find a suitable location that meets public approval. • Minimal impacts to earth, as siting would likely avoid impacts to wetlands and sensitive areas.	• Risks in a competitive environment for disposal services. • For a County-owned MRF—capital and operating cots, minus commodity revenue, may not compete favorably with traditional recycling and disposal services. • Capital intensity varies from highly mechanized to low technology.
2C County-owned recycling processing facility that separates commingled recyclables ("clean MRF). (See Chapter 6 for more detail)	• Proven technology. • Compatible with existing programs but may compete with existing private sector facilities. • Flexible to adapt to changed market conditions. • Technically compatible to any disposal choice. • Capacity limited only by size, hours, equipment.	• A more predictable and stable feedstock, likely to produce fewer impacts than processing of mixed waste. • Siting would be similar to any other industrial-scale business.	• Risks in a competitive environment for disposal services. • Capital and operating costs, minus commodity revenue, may not compete favorably with traditional privatized processing in the Pierce County system. • Capital intensity varies from highly mechanized to low technology.

Table 7.5 Overview of Pierce Transfer Facilities and Systems Alternatives			
Alternative	**Technical Criteria**	**Environmental Criteria**	**Economic Criteria**
3. To Improve Cost-Effectiveness and Customer Service.			
3A Increase self-haul capacity at Prairie Ridge.	• Zoned appropriately but surrounded by residential neighborhoods. • Centrally located to area residents. • Room to expand. • Compatible with remainder of system.	• Minimal impacts. Improvements would be designed to ease access by current users and vehicles.	• Already in planning stages—costs estimated around $200,000.
3B Develop full scale transfer station at Prairie Ridge.	• Zoned appropriately but surrounded by residential neighborhoods. • Centrally located to area residents. • Room to expand. • Compatible with remainder of system. • No urgent need identified.	• Potential impacts include air and noise if vehicle traffic and equipment use increases. • If moved to a nearby location, potential for other impacts.	• Replacing the current facility with a full service facility would cost at least ten times more than an upgrade. Costs could be spread over the entire system.
3C Site new drop box facility in southern Pierce County.	• Compatible with existing collection systems and any disposal alternative. Would make disposal and recycling facilities closer to waste generation and accessible to seasonal residents and tourists.	• Positive impacts in reducing illegal dumping and littering. • Potential for air, noise, and traffic impacts.	• Rural drop box transfer stations may cost up to $200 per ton received to build and operate, but costs could be spread over entire waste stream to minimize impacts.
3D Coordinate with National Park Service to provide improved drop off service for park visitors.	• May not require a formal site; education and outreach may be sufficient or may result in placement of more or larger litter barrels and recycling collection sites. • Compatible; may help to reduce illegal dumping.	• Minimal environmental impacts and may improve environmental quality by reducing illegal dumping.	• Costs would vary with intensity of effort.

7.5 Recommendations

County-owned transfer facilities

#7-1 Transfer service to the public through rural transfer facilities should be continued.

#7-2 The Pierce County Solid Waste Division shall investigate usage patterns at County-owned transfer facilities to determine the cost-effectiveness of existing services. The County will evaluate if usage patterns indicate that facilities should be closed or the hours of operation modified, if there is a need for new facilities, and if there is a demonstrated need to expand the list of materials collected at the existing transfer sties. The study should also review ownership options for new transfer stations.

Recycling facilities

#7-3 Transfer facilities shall continue to provide opportunities to recycle and, where feasible, provide systems which allow for the source-separation of other potentially recyclable materials (i.e. demolition).

Transshipment facility

#7-4 As becomes necessary to ensure sufficient transfer capability, Pierce County should obtain the use of additional transshipment facilities, public or private, for transferring waste to out-of-county disposal facilities.

Reserve transfer capacity

#7-5 Pierce County encourages private transfer facilities located within Pierce County to reserve transfer capacity for waste generated within Pierce County.

Tacoma Recommendation

#7-6 The City of Tacoma should continue to evaluate the need for transfer facilities, along with export of waste options, both as primary and supplementary solid waste disposal options for the City. The City may implement any of these options in order to meet its solid waste disposal needs.

CHAPTER 8

LANDFILLING

This chapter describes the existing disposal system for mixed municipal waste for the three separately managed disposal systems in Pierce County - Pierce County/Cities and Towns; Tacoma/Ruston; and Fort Lewis/McChord Air Force Base. It also identifies future landfill disposal needs and alternatives and provides criteria to be used in the evaluation and selection of alternatives for implementation.

8.1 Landfill Requirements and Goals

Definitions: The following definitions are used throughout this chapter:

Municipal Solid Waste (MSW) Landfill: A landfill used for the disposal of a combination of commercial and residential waste generated within urban, suburban, and rural areas. MSW landfills constructed after 1985 and prior to 1991 were regulated under the requirements of WAC Chapter 173-304. New landfill cells receiving MSW waste after October, 1991 are regulated under WAC Chapter 173-351.

Demolition Waste Landfill: A landfill used to dispose of demolition waste which is defined as largely inert solid waste resulting from the demolition or razing of buildings, roads, and other man-made structures.

Inert Waste Landfill: A landfill used to dispose of inert waste which is defined as non-combustible, non-dangerous solid wastes that are likely to retain their physical and chemical structure under expected conditions of disposal, including resistance to biological attack and chemical attack from acid rainwater.

Ash Landfill: A landfill used for the disposal of incinerator ash that is classified as non-hazardous as defined by federal and applicable state regulations. Disposal of incinerator ash is regulated under Washington State Special Incinerator Regulations (WAC 173-306).

Limited Purpose Landfill: A landfill used for the permanent disposal of one or more specific type of waste of limited, known, and consistent composition such as an ash monofill, a landspreading disposal facility, problem waste landfill, or any facility other than those permitted for the disposal of woodwaste, garbage, inert waste or demolition waste. In the Pierce County development regulations these are titled "Special Waste Landfills."

Landfill disposal is a necessary part of any integrated management system providing for any of the following:

- the major disposal method for municipal solid waste in a region,
- disposal for municipal solid waste that cannot be recycled,
- disposal for bypass waste that cannot be reduced or recycled through other processing methods such as municipal solid waste composting, or
- disposal of incinerator ash from waste-to-energy facilities.

In order to preserve landfill capacity, volume reduction is commonly used in association with landfill facilities. Volume reduction can be achieved through mechanical means such as use of mobile compaction equipment and mechanical waste balers. Mobile compactors are large, heavy-wheeled or tracked vehicles which run over the waste as it is placed in thin layers on the working face of a landfill. Non-compacted municipal solid waste density is on the order of 400 - 600 pounds per cubic yard, which can be increased to 1500 pounds per cubic yard or greater using mobile compactors.

Waste baling is a much less common method of volume reduction, used only in relatively few locations. A waste baler is a stationary piece of equipment into which waste is loaded on a batch basis and compressed into a bale. The bale is then loaded on a truck and transported to the disposal area. Volume reduction from waste baling is similar to mobile compactors.

Another volume reduction technique is incineration, which results in an ash residue differing in both physical, and to a certain extent, chemical characteristics from the original waste. Depending on the composition of the waste and the incineration process employed, volume reduction can range from 50% to 90%.

Goals: Pierce County and the SWAC established the following landfilling goals:

Goal:	To provide a strategy that will ensure adequate disposal capacity through the planning period. The strategy should promote efficient use of landfill capacity and minimize disposal costs consistent with the protection of human health and the environment.
Goal:	To provide for maximum protection of human health and the environment and support cleanup activities for facilities with existing environmental problems.

Summary of actions taken: The 1989/92 Plan contained a number of recommendations related to landfill disposal and related issues, which provided the context for earlier County actions. The goals and recommendations of the 1989/92 Plan are included in Appendix D. In summary form, these recommendations stated that:

- Private efforts to site, develop, and operate a regional MSW landfill serving the entire county should be encouraged.
- If there was a lack of capacity in Pierce County and if out-of-county options were cost effective, the County should contract for use of a MSW landfill sited out-of-county.
- The County should begin a public siting process for a MSW landfill.
- The County could elect to develop a county-owned MSW landfill in Pierce County or delay development based on alternative costs.
- The County should study alternative technologies determined to be worth consideration within the solid waste management system. The study was to include gathering performance and cost data to provide a basis for future decision making.
- The County should close the Purdy Landfill.
- The County should site an inert and demolition landfill.

To fulfill these recommendations, the County closed the Purdy Landfill and studied the costs of a number of alternative technologies. After comparing these costs to the cost of landfill disposal, the County Council chose landfilling as the main disposal method, coupled with the development of a County-owned yardwaste composting facility. (More detailed discussions about the comparison studies and yardwaste composting facility are in Chapters 1, 4, and 6.)

Also, to fulfill the recommendations, the County began a landfill siting study to determine the feasibility of developing a County-owned landfill in Pierce County. The County also negotiated a contract to accommodate disposal at an out-of-county landfill to extend the life of the existing

landfill and then to provide for disposal when the landfill reached capacity.

Meanwhile a private company, Land Recovery Inc. (LRI), began the public process to site a private MSW landfill in Pierce County.

These actions are discussed in more detail in the following sections of this chapter.

The County did not pursue the development of an inert and demolition landfill because the private sector developed sufficient capacity to recycle and dispose of these materials, as discussed in Chapter 9.

State regulations:

Priorities: In RCW 70.95, the Washington State Legislature established waste management priorities. These priorities identify that landfilling of separated waste is preferred over disposal of mixed waste. This means that the State's priorities focus on reducing the generation of waste, removing recyclables, as much as possible, and resource recovery through incineration before landfilling of mixed municipal waste. Consistent with this policy, Pierce County has established an approach and programs to implement cost-effective source separation recycling. These programs are discussed in Chapter 4 of this Plan.

Environmental requirements: The regulatory requirements for solid waste management are established by the Minimum Functional Standards for Solid Waste Handling (MFS), WAC 173-304.

The State's regulations governing the design and operation of municipal solid waste landfills were revised in 1993 by WAC 173-351, Criteria for Municipal Solid Waste Landfills. These revised regulations supersede the landfill requirements for MSW landfills which were in the Minimum Functional Standards (WAC 173-304, MFS). However, the requirements for other types of landfills which are in the MFS are still applicable. The new WAC 173-351 revisions are based on federal requirements to conform with the U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA), Solid Waste Disposal Facility Criteria (40 CFR, Parts 257 and 258), and on generally accepted engineering practice.

The overall intent of the regulations for municipal solid waste landfills is to prevent and mitigate surface and groundwater contamination, air pollution, and other environmental impacts from the development and operation of landfills. The design and operation criteria contained in WAC 173-351 are intended to provide environmental mitigation as are the location siting criteria discussed in Chapter 2, and include the following:

- Location restrictions, which identify state and federal criteria for airport safety, flood plains, wetlands, fault areas, seismic impact zones, and unstable areas. The standards also include state locational standards to protect groundwater.
- Operating criteria for hazardous waste exclusions, cover requirements, vector control, explosive gas control, surface water requirements, liquids restrictions, and record keeping and reporting requirements.
- Plan of Operation, which establishes how the facility is to be operated in order to meet operating criteria.
- Design requirements for liners placed below the waste, and other environmental control features.
- Groundwater monitoring requirements including sampling and testing methods, and parameters and statistical analysis standards.
- Hydrogeologic report requirements.

- Closure/post closure requirements, including post closure period and requirements for closure design.
- Financial assurance requirements including financing mechanisms and reserve accounts.
- Permit requirements.

At a minimum, demolition, inert, woodwaste and limited-purpose landfills must be designed and operated in accordance with WAC 173-304, which is, in many respects, similar to WAC 173-351, but with some specific differences related to the facilities.

Demolition and inert waste landfill standards differ from those in WAC 173-351 in that there are no locational restrictions; except for unstable slope areas; no requirements for liner and leachate collection, less strict closure requirements, and no post-closure care.

Woodwaste landfill standards are similar to those for inert and demolition waste, except that locational standards related to proximity of surface water and down gradient drinking water wells and certain requirements for groundwater monitoring and leachate collection apply.
Limited purpose landfills must meet, at a minimum, the requirements for facility design, closure and post-closure, performance standards, financial assurance, and groundwater monitoring identified in WAC 173-304.

Incinerator ash, which meets requirements to be classified as "Special Incinerator Ash" based on comprehensive testing and statistical analysis may be disposed of in ash monofills, provided that the monofill is constructed and operated in accordance with the Washington Special Incinerator Ash Regulation (WAC 173-306).

Gas management: The state requirements for design, operation, and monitoring for municipal solid waste landfills include standards for management of gas. Landfill gas is generated during the slow decomposition of waste in a landfill.

Although many factors influence the quality and quantity of gas generated at a landfill, landfill gas contains roughly 50% methane, 40% carbon dioxide, and smaller percentages of other hazardous and non-hazardous gasses. When considering energy production from landfill gas, methane is the valuable part of the mixture while the other gasses are either acceptable (but generally not valuable) or contaminants. Landfill gas can be purified and sold as natural gas or can be used on-site (with varying degrees of cleaning) to generate electricity. The feasibility of electricity generation depends on the quantity and quality of the gas produced, the market for electricity, and the location of the landfill.

Ongoing deregulation of the electric utility industry may offer additional opportunities for landfill gas electricity generation by providing a broader market (and higher prices) for electricity generated at landfill sites. As part of their deregulation programs, some states are considering requirements that utilities purchase a minimum percentage of their power from renewable sources including solid waste. Deregulation may also encourage electricity generation from landfill gas by opening markets for "green" power in which other utilities or energy users would pay a premium for energy produced from renewable sources. Capturing gas for energy reuse would need to comply with the State's standards.

Reclamation: It is possible existing landfills can be "mined" or "reclaimed" by removing material from the landfill and processing it through screens, magnets, air classifiers, and other equipment. The State's permitting process and the requirements for allowing landfill reclamation are not specified in the WAC's. These procedures would need to be determined if any reclamation of closed

facilities were proposed. Environmental concerns would revolve around maintaining the integrity of the liner and monitoring systems required for closure. Landfill mining offers the following advantages:

- can recover marketable materials (recyclables and soil or soil amendment) or allow a portion of the mined materials to be burned for energy recovery;
- can extend the useful life of the landfill (by allowing new wastes to be landfilled in the area that was mined) and thereby reduce the area required for landfill closure; and
- remove contaminants of environmental concern from the landfill to reduce the potential for future pollution and associated liability.

The health and safety of workers performing the landfill mining is of particular concern due to the potential for encountering hazardous materials, the presence of combustible gasses, and the potential for trench collapse. While landfill mining is technically feasible, economic feasibility varies according to many local conditions such as the composition of waste buried in the landfill and the value of the space occupied by the existing waste. Landfill mining is not a common practice, and has not been practiced on a commercial scale in the Northwest, although changes in market conditions may make it economically favorable in the future. The State's process and requirements for allowing landfill reclamation are not specified in the WAC's.

Permitting processes: For landfills to be developed, they must complete both the solid waste permitting (WAC 173-351 or WAC 173-304) and land use permitting processes. The solid waste permitting process is administered by the Tacoma-Pierce County Health Department. Permit applications for landfills must show evidence of compliance with SEPA rules and include plans, reports, and other supporting information required in WAC 173-304 or WAC 173-351. A public comment period is required for MSW landfills under WAC 173-351. No formal public comment period is required for permits issued under WAC 173-304.

Following receipt of the application, the Health Department reviews the application and makes a determination as to whether or not the proposed facility meets all applicable laws and regulations, conforms with the most recently adopted solid waste management plan, and complies with all zoning requirements.

After reviewing all information in the public record, the Health Department either issues or denies the permit, which is then sent to the Washington Department of Ecology. Ecology reviews permits issued and may appeal the permit as set forth in RCW 70.95.

In addition to the Solid Waste Permit process, landfill facilities must obtain the appropriate land use permits. The land use permit process, whether the facility is allowed outright or is required to have a public hearing process, provides for integration of the environmental review analyses needed for the solid waste permit process. This reduces duplication, allowing for reports, analyses, and mitigations that are standard requirements of the Solid Waste Permit to also be used for environmental review and decision making during the land use permit review. One of the standards of approval used by the Health Department in review of Solid Waste Permit applications is a demonstration that the disposal facility complies with all zoning requirements. The land use permit process must be completed before the Health Department can complete the Solid Waste Permit process. (More detailed information about land use permits are provided in Chapter 2 and Chapter 10.)

***Closure/post-closure*:** An MSW landfill cannot simply be "closed" when it stops

accepting new waste. Federal and state regulations require that, after a landfill stops accepting waste, a final cover be placed over the waste to complete "closure" of the landfill and that the landfill owner be responsible for at least 30 years of "post-closure" care which includes operating and maintaining the systems designed to control the environmental impact of the landfill, such as leachate collection and treatment systems, landfill gas collection and treatment systems, surface water controls, groundwater monitoring systems, and the final cover system. The final cover system typically includes layers of soil to achieve the desirable terrain features (with slopes that promote drainage off the top), a plastic liner, two feet of low-permeability soil, a layer of soil to promote growth of vegetation, and vegetation (such as native grasses).

Closure and post-closure costs are a significant portion of an MSW landfill's overall costs, and these costs are typically incurred after revenues obtained from tipping fees on incoming waste have stopped. Federal and state laws require landfill owners to set aside funds during the active life of a landfill to cover closure and post-closure costs, and to demonstrate that these funds are adequate to pay closure and post-closure costs. Therefore, a portion of the tipping fee paid during the active life of a landfill goes toward reserves to fund closure and post-closure.

Corrective action costs are also required to have a financial assurance component. In Washington, this part of the Financial Assurance requirements can be implemented using a Financial Test mechanism. For some municipalities, a bond rating mechanism can be used. The City of Tacoma uses this method to comply with the Corrective Action Financial Assurance requirements.

The closure standards for other landfills under WAC 173-304 are less stringent and are only applicable to limited purpose and woodwaste landfills, surface impoundments, and landspreading disposal facilities. The closure standards for these facilities include final grading, soil placement and planting in accordance with an approved closure plan. Closure for limited purpose landfills requires a cap meeting specific permeability requirements. Woodwaste landfills must be closed with a compacted soil cap, but there is no specific permeability requirement. There are no post-closure care requirements for inert or demolition landfills.

In its role as the lead governmental agency in solid waste management planning and enforcement, the County may be viewed as a potentially liable party for any problems resulting from the handling and disposal of solid waste. If any landfill that receives waste from Pierce County causes environmental or other damage, the County may be held liable because it is often difficult to determine what other parties are responsible and the County may be viewed as the "deep pocket of last resort". In addition, cities in the county also have potential liability. Like the County, they have financial resources that could be tapped in the event that other potentially responsible parties cannot be identified or lack such resources.

Research into this subject has revealed an uncomfortable irony. Neither legislatures nor courts have clearly addressed the nature and extent of governmental liability in an era when the U.S. Supreme Court has stripped from those local governments much of their ability to mandate use of specific disposal sites through flow control. Thus, as long as Pierce County or the cities enter into any sort of contract for waste handling, liability is an issue of concern; but government agencies may want to explore opportunities for reducing exposure.

Of particular concern is the liability associated with past, present, and future disposal activities. The Hidden Valley landfill, for example, has been identified as a

Superfund site. However, this does not necessarily mean that costly cleanup of the site will be required. The current status of the cleanup requirements for Hidden Valley and the Tacoma Landfills are discussed in section 8.3, about existing conditions.

Regardless of whether or not the County utilizes an in-county or long-haul disposal option, the County may remain at least partially liable for problems arising out of the disposal of municipal solid waste generated in Pierce County.

8.2 Economic Studies

Since 1989, at the direction of the Plan's recommendations and the County Council, the Solid Waste Division has completed a number of studies comparing the costs of solid waste handling and disposal alternatives. This section summarizes the various economic analyses completed or analyzed by the Division.

Unless otherwise noted, all costs are presented on a per ton basis and are the costs for the specific processing or disposal option calculated at the time the study was first reported. Not included are the costs of ancillary facilities or programs such as recycling programs, transfer stations, or administrative fees collected to operate the County's solid waste management system.

The information in this section complements the following sections, which explain the existing systems for management of the Pierce County solid waste stream.

1987 - 1990 Waste-to-Energy: The County commissioned a Waste-To-Energy Report that included a review of current technologies, institutional and legal arrangements, and procurement and financial options. Based on its findings, the County proceeded to consider the viability of incineration through a negotiated contract which identified disposal costs and annual average capital and operating costs. The contract terms stated that Pierce County waste could be processed at a waste-to-energy facility for a cost of **$51.00 per ton**. The Council decided not to proceed with the ordinance that would have authorized the Executive to sign the contract.

1991 Mixed municipal solid waste composting: The 1989 Plan recommended a policy to "pursue development of information gathering for alternative processing technologies in order to provide performance and economic data roughly comparable to the waste-to-energy project." To that end, the Pierce County Utilities Department commissioned the *1990 Report on Alternative Solid Waste Processing Technologies.* Following up on that report in 1991, the County issued a Request for Proposal (RFP) for mixed municipal solid waste (MMSW) composting systems. The composting RFP included two alternatives, one for 300 tons per day and one for 1000 tons per day. The County received no response to the second alternative which would have made composting the primary method of waste handling. The County did receive a bid of **$39.00 per ton** to compost approximately 1/3 of the waste stream. Wastes not composted would have been long-hauled or landfilled locally.

1991 Long-haul: The County also solicited bids from private sector providers to ship Pierce County's waste to landfills east of the Cascade Range. The RFPs for long-haul (at that time known as "waste export") asked for bids for a short-term strategy and for a long-term strategy which would include development of transfer stations and permanent intermodal facilities. The low bids ranged from **$40.50 to $43 per ton.** The higher-end rate represented a long-term strategy that would have included the construction of a transfer station through

which waste could be containerized and shipped to a remote landfill by rail.

1991 Contract renegotiation: In January, Pierce County renegotiated its landfill disposal contract with Land Recovery, Inc. for use of the Hidden Valley Landfill. Landfill disposal in the newer portions of Hidden Valley (which were then being developed to be in compliance with the applicable *Minimum Functional Standards*) at a cost of **$19.93 per ton.**

1991 Comparison of alternatives: After completion of the RFP processes and with the results of the negotiated waste-to-energy contact, the Utilities Department reported to the County Executive about the advantages, disadvantages, costs per ton, and environmental compliance issues of all options. Based on these comparisons, the County Council adopted Ordinance #91-126 signifying that the County would pursue the lowest-cost alternative, in-county landfilling. Waste export to an out-of-county disposal site was identified as a back-up alternative if siting of an in-county landfill, either public or private, was not completed, or if waste export became more cost competitive.

1994 Landfill Siting Study - Phase I As part of Phase I of the *Pierce County Landfill Siting Study*, the consulting firm Parametrix estimated the costs of planning, permitting, land acquisition, construction, and operation of a landfill within Pierce County. With project costs ranging from $466 million to $596 million, Parametrix determined that per ton costs could range from **$33.30 to $49.50 per ton.** These estimated costs and fees included the cost of hauling waste from a transfer station located in the vicinity of the Hidden Valley Landfill to an in-county landfill located 16 to 22 miles away.

1994 Chase Economic Analysis: Following Phase I of the *Landfill Siting Study*, the County obtained the services of consultant Robert Chase to develop a model to estimate the economic impacts of developing and operating a landfill in Pierce County. His analysis looked not only at the impacts of local firms engaged in the landfill process, but the economic effect caused by workers spending a portion of their earnings on goods and services produced or supplied by Pierce County firms. He estimated creation of up to 483 jobs and an economic impact of $30 million county-wide during initial construction, and creation of 259 jobs and an economic impact of $22.7 million during the initial years the landfill is open. He concluded that "a new County landfill will support hundreds of jobs and millions in wages. If the County decides on the long-haul alternative, these jobs and wages would, in effect, be exported out of the county."

1995 304th Street Landfill: During 1995, Land Recovery, Inc. (LRI) completed its application for a conditional land use permit from Pierce County for its proposed 304th Street Landfill. LRI included an Economic Analyses as Appendix A to its State Environmental Policy Act (SEPA) documentation. The Solid Waste Division reviewed and commented upon Appendix A as to the appropriateness of the assumptions and calculations included, primarily that LRI could recoup its investment in site acquisition, planning, permitting, and environmental compliance with a fee of **$20 to $25 per ton.** By means of comparison, the same analysis indicated that Pierce County was then paying **$43.36 per ton** (the 1991 bid price, explained above, increased by 6.8% to account for inflation) for long-haul services. In January 1996, the Pierce County Hearings Examiner, in granting LRI the conditional use permit it sought for the 304th Street Landfill, concluded that Appendix A to the SEPA documents "represents a reasonable estimate of the cost of in-county landfilling and two long-haul options." In making this finding, the

Examiner rejected analysis of project opponents' expert witnesses.

1995 Landfill Siting Study Phase II: Phase II identified specific locations in south Pierce County which appeared feasible for landfill development. The consultant, Parametrix, developed landfill models for each site and refined the Phase I economic analysis. For the three sites which appeared most suitable from an environmental standpoint, total development costs ranged from $290 million to $366 million. Disposal fees necessary to recoup this investment could range from **$29.60 to $33.61 per ton.** As was the case for Phase I, these fees included transportation services to the remote landfill sites.

1997 3rd Contract Addendum: Pierce County negotiated a Third Addendum to its landfill disposal agreement with LRI in July. The fees charged by LRI for handling Pierce County's waste were revised to include **$37.99 per ton** for the transportation and disposal of waste at the Roosevelt Regional Landfill in Klickitat County. Prior to this renegotiation, the fee was **$45.84 per ton** (effective 1/1/97, the 1991 bid price increased by 12.9% to account for inflation). These fees are calculated from the "back door of the transfer stations." Costs associated with transporting waste from local transfer stations to the intermodal facility are included in the stated fee. (The 1998 Waste Handling Agreement used the long-haul rates negotiated as part of the 1997 3rd Addendum. Adjustments were made for inflation, but there were no substantive changes.)

1997 Other long-haul rates: In addition to Pierce County, in the Central Puget Sound region Snohomish County and the City of Seattle also long-haul municipal solid waste. Effective April 1997, Seattle paid its contractor, Waste Management, $41.57 per ton. As of October 1991, Snohomish County paid Rabanco/Regional Disposal Company $42.27 per ton. Unlike Pierce County's long-haul fees which are calculated from the transfer station, Snohomish County's and Seattle's are calculated from the "front door" of each jurisdiction's intermodal facility, thus costs associated with transporting waste to the intermodal facility are included in neither Snohomish County's nor Seattle's rates.

8.3 Existing Facilities and Systems

8.3.1 Pierce County/cities and towns

Existing system:
Hidden Valley Landfill: Since 1967 the Hidden Valley Landfill served as a primary disposal facility for the County's system. Now closed, the landfill site is owned and operated by Land Recovery Inc. (LRI). The landfill was operated and is closed in accordance with applicable standards and includes leachate collection, gas monitoring and collection systems, and groundwater monitoring.

The closed landfill site also serves as the location for other solid waste management related facilities including a transfer station, recycling facility, in-vessel composting facility, and an enclosed composting facility.

Consistent with the County's goal in the 1989/92 Plan to expand the landfill according to all state regulations, the Hidden Valley Landfill was expanded by constructing a cell which met the requirements in place at the time it was constructed, WAC 173-304. In addition, old portions of the landfill were capped in accordance with applicable regulations.

The Hidden Valley Landfill is listed on the National Priorities List (NPL or "Superfund"

list) due to groundwater contamination. Ecology has determined that this groundwater contamination is emanating from the older, unlined portion of the landfill. After the new cell was built, waste was placed in areas of the landfill equipped with liners intended to isolate the waste and associated leachate from groundwater. Based on responses provided by Ecology in the June 1997 Responsiveness Summary, Ecology is not aware of any health-based cleanup standard being exceeded in neighboring drinking water. Ecology further states that a groundwater extraction and treatment program is not a likely remedial alternative for the site and that cleanup activities will likely include covering the landfill, expanding the groundwater monitoring network around the landfill, conducting a detailed well canvass in the vicinity of the landfill, providing an alternative water supply to individuals whose water supply is found to be impacted by the landfill, and conducting quarterly groundwater monitoring.

The landfill was closed at the end of 1998 using a cover approved as meeting the State's standards, gas control, and surface water control system. The site remains open for waste transfer and composting activities.

Long-haul to the Roosevelt Regional Landfill: The County receives disposal service from LRI under an agreement first executed in 1977. The agreement originally provided for in-county landfill disposal only, but was amended in 1994 to allow for transport and disposal of a portion of the waste to the Roosevelt Regional Landfill in Klickitat County. LRI contracts with the owner of the landfill for disposal services.

The agreement with LRI was modified in 1998. This revised agreement extends the long-haul agreement through 2011, and deletes County waste guarantees and eliminates commitments regarding in-county landfills. It does provide that the County direct what waste it does control to the LRI disposal system and, in return, receives assurance of set rates for the term of the agreement. However, if an in-county landfill becomes available, the agreement allows the County to use that landfill at a rate to be determined later.

The Roosevelt Landfill is located in a remote area of Klickitat County in South Central Washington. The landfill has a theoretical capacity of 120 million-tons based on available site area. The actual allowable waste disposal is currently limited to two million tons per year by the conditional use permit issued by Klickitat County.

The landfill is designed to meet all current solid waste landfill regulations, including the MFS and WAC 173-351.

Closed facilities - Purdy and McNeil Island: The MSW landfills at Purdy and McNeil Island stopped accepting solid waste in November, 1989. These facilities were closed under the MFS (WAC 173-304) provisions in effect at the time which included capping of the waste fill area and monitoring groundwater. The closure constructions were completed in 1990 at the Purdy Landfill and in 1991 at the McNeil Island site.

Both sites have shown impacts to groundwater and downgradient contamination has been detected. At this time the level of contamination is not sufficient to warrant any cleanup action and, in fact, contamination levels have shown a reduction since the landfill closures were completed with the construction of landfill caps.

Abandoned and pre-MFS closed sites: A number of both public and private disposal sites in the county ceased operation prior to implementation of the MFS in 1985. These sites vary considerably in terms of the types

of material disposed and how they were closed.

The Health Department monitors these sites for presence of off-site contamination. In 1993 the Health Department conducted a study of these sites -- *Closed Landfill Study April, 1993* -- which assessed the conditions at these sites.

The study identified 21 (including Purdy and McNeil Island) municipal garbage disposal sites and three private demolition waste sites. Preliminary investigations determined that of 24 sites, 19 needed further investigation including a combination of surface and groundwater sampling, periodic methane monitoring, and routine inspections to monitor for illegal dumping. No immediate health concerns were detected at any of the sites. This study is currently being updated.

Land Recovery Landfill*:* In the 1980's, Land Recovery Inc. (LRI) began the siting and permitting process for a landfill located near the intersection of 304th Street and Meridian in south Pierce County. This process involved conducting extensive site investigations, environmental review by local, state and federal agencies, and many adjudicative proceedings.

Consistent with the policies of the 1989 Solid Waste Plan, the Pierce County Hearings Examiner granted a Conditional Use Permit in January 1996. The Tacoma-Pierce County Health Department, with Department of Ecology concurrence, issued the Solid Waste Permit in February 1996.

LRI and its affiliated company, Resource Investments, Inc. (RII), also filed an application with the Army Corps of Engineers for a permit from the Corps. In July 1998, the U.S. 9th Circuit Court of Appeals reversed a lower court's ruling and held that the project was exempt from the regulation by the Corps.

After the court's decision, LRI obtained the remaining permits and began construction. The landfill at 304th Street opened on December 13, 1999.

County Landfill Siting Study: Consistent with the 1989 Plan's recommendation of conducting a public process for siting of a landfill to serve Pierce County, the County initiated a landfill siting study in 1993, which was to have five phases. The Siting Study was not completed. *Phase I: Countywide Screening* was completed in 1994 and is described in more detail in Chapter 2. It established the basic landfill parameters that would be used for the siting of a County-owned landfill. It developed countywide screening criteria based on regulatory requirements and engineering considerations, and applied these criteria comprehensively throughout the County without consideration of specific sites.

Phase II: Site Specific Screening: Based on the results from the Phase I Study, the County identified and evaluated potential landfill sites under Phase II. In 1995, a focused evaluation was applied to four potential sites using a weighted scoring of 26 criteria covering site characteristics/ engineering, groundwater protection/ hydrology, natural environment and land use. The evaluation included new aerial photography, topographic mapping, visual flyover, site drilling, wetlands identification, priority habitat identification, and conceptual design to determine site capacity, grading, and access. The study also included an economic evaluation of the four sites which included environmental review, permitting, construction, operations, closure, and post-closure care.

SWAC recommendations: The SWAC conducted an extensive review of the Phase II Study which included review of consultant reports, receiving public comments at two special meetings and at regular SWAC

meetings, and conducting a work session to discuss options. In September 1996, the SWAC made the following recommendations related to the Phase II Study:

- The Pierce County Council should direct, authorize, and appropriate adequate funds to the Pierce County Solid Waste Division to proceed with the Landfill Siting into a Phase IIB: a study of the permitability of the three top-ranked sites identified in the Phase II Study; and
- Until the results of Phase IIB have been reviewed and analyzed, Pierce County should not proceed with Phase III: a detailed Environmental Impact Statement (EIS) for a limited number of sites.

The purposes of conducting a Phase IIB study prior to initiation of the Phase III EIS process are to:

- further differentiate among the preferred sites;
- identify whether the sites pose unusual challenges to the permitting process; and
- develop information which may serve as the basis for undertaking an EIS for a single preferred site, rather than two, to reduce overall cost.

Status: The County Council did not take any action on the SWAC's recommendation. Due to the length of time since completion of the initial evaluation in 1995, some aspects of the Study may now be out-of-date in regards to land uses, land availability, and siting regulations.

8.3.2 Tacoma/Ruston

Existing system: The City of Tacoma disposal system includes landfilling, waste processing, and incineration. Until 1979 the City relied primarily on landfill disposal at the Tacoma Landfill. In 1979 the City constructed a resource recovery facility producing a refuse derived fuel (RDF) which was intended to be sold as fuel to local energy producers. Lack of demand for the RDF caused the facility to be used only on an intermittent basis.

In 1991, the City of Tacoma Light Division completed renovations to and put the Hylebos Stream Plant No. 2 into commercial operation. This facility burns a combination of coal, woodwaste and RDF in two fluidized bed combustors. Since that time, the resource recovery facility has been operating on a regular basis providing up to 300 tons per day of RDF to the steam plant. The City has recently been evaluating the operation of the steam plant to improve its cost effectiveness in order to provide a more competitive energy production cost. This evaluation includes consideration of alternative RDF use, price options, and alternative fuels.

City of Tacoma Landfill: The Tacoma Landfill is located within the city limits at 3510 South Mullen Street and began operation in 1960. The current site size is approximately 246 acres; of this area 105 acres have not been used for disposal and 110 acres have been closed in accordance with a consent decree negotiated between EPA, Ecology, and the City. An additional 31 acres are an active landfill and was constructed to meet MFS (WAC 173-304) standards. As of January 1997, the active portion of the landfill had a remaining capacity of less than 325,000 tons of solid waste.

The Tacoma Landfill was added to EPA's National Priorities List (NPL) of sites requiring further investigation and cleanup in 1983 as part of the "Commencement Bay South Tacoma Channel" site. The landfill has been the subject of investigation and significant cleanup work under EPA and

Ecology authorities since 1986. These investigations showed that the landfill was causing contamination of area groundwater with volatile organic compounds and was generating landfill gas that could be dangerous to the surrounding community. In 1988, EPA and Ecology proceeded to negotiate with the City about cleanup actions resulting in the Consent Decree.

The Consent Decree includes actions that would: reduce the production of leachate; eliminate off-site gas migration; prevent further migration of the contaminated groundwater plume and reduce the concentration of contaminants within the plume, and monitoring of groundwater, surface water, subsurface gas, and air emissions. It also includes provisions for alternative water supply to any residents deprived of their domestic water supply and the establishment of institutional controls to promote and support the cleanup action.

In 1998, the Tacoma Landfill was granted an extension to continue landfilling until 2004. Under the Consent Decree, the City of Tacoma may request two additional five-year extensions. Approval of the two additional extensions, if granted, would allow the landfill to remain open until 2014.

Long-haul: Tacoma contracts directly with LRI for the long-haul of solid waste. Tacoma currently disposes of approximately 350 tons per day through the LRI contract. In the past, the waste was taken from the Tacoma Landfill transfer site to the intermodal facility in the Tacoma tideflats where it was loaded onto trains for shipment. Recently, waste disposed through the LRI contract is hauled directly to the 304th Landfill.

Ash management: Ash from the Steam Plant No. 2 has tested as non-hazardous. Of 11,890 tons produced in 1996, only 1,455 tons were disposed out-of-county. The other 10,435 tons were used for road and soil stabilization, manufacturing of cement, and for hazardous and chemical waste stabilization.

8.3.3 Fort Lewis/McChord AFB

Existing system: Solid waste generated in the Fort Lewis/McChord system is managed independently under the *Final Solid Waste Management Plan for the Fort Lewis Military Reservation*, dated August 25,1995. Fort Lewis and McChord AFB handle wastes generated on the military reservations. Until 1997 all solid wastes were disposed at the Fort Lewis Landfill. Demolition and inert waste landfills located at McChord and at the Fort Lewis Landfill property were also available.

In 1985 Fort Lewis began construction of a waste-to-energy facility which was intended to process most of the municipal solid waste generated from the two bases. The project was halted in 1987 and then completed in 1996. However, the facility was unable to meet air quality permit standards and will not be reopened.

Fort Lewis Landfill: The Fort Lewis Landfill consists of six waste cells which have been developed over a number of years. Cells 1 through 4 were closed with a final cover in 1990. Cell 5 was designed in accordance with the Minimum Functional Standards. The cover system was designed to RCRA-Subtitle D standards as a result of a variance request. The request was because of inadequate building materials used in the construction of the bottom liner. Cell 5 reached capacity in 1994 and was closed in 1995. Cell 6 was designed to meet Washington State Minimum Functional Standards. Cell 6 is 99% full and being kept open as a backup transfer point and as an opportunity to study the impact of leaving it uncovered on decomposition and improvement of leachate.

A seventh cell was proposed for the landfill; however, attempts to permit Cell 7 have been unsuccessful. The primary environmental concern is related to the sole source aquifer designation for the area. A proposal to construct an incinerator-ash disposal cell has also been abandoned for the same reason.

Closure of the demolition waste cell at the Landfill began in 1996 and was completed in 1997. The demolition landfill cap consists of a flexible membrane liner with landfill gas collection system, which is much more elaborate than state requirements. Additionally, Fort Lewis has opened an inert waste landfill cell for asphalt and concrete disposal.

McChord Air Force Base demolition fill: McChord operates a landfill permitted as a demolition fill. The demolition fill is nearing capacity with remaining useful life estimated to be one to two years.

McChord inert waste fill: In 1998, the base obtained a Solid Waste Permit for an inert waste landfill. The landfill will have a capacity of approximately 500,000 cubic yards and occupy approximately 3 acres.

Long-haul: Because the waste-to-energy facility could not meet emission requirements, Fort Lewis built a transfer station in 1999 to facilitate long-haul of most of its waste off base. As of January 2000, Fort Lewis' longhaul contractor is Waste Management which hauls MSW to the landfill in Arlington, Oregon.

Table 8-1 Pierce County Other Landfills[1] August 1997		
Facility (Owner) & Location	**Facility Type**	**1996 Tonnage**
Foran Inert Waste Landfill (Jim Foran Company) 1635 Marine View Drive Tacoma	Inert Waste Landfill	Asphalt – 4,982 yards Concrete – 4,935 yards Mix-Inert – 8,413 yards Mud – 7,824 yards Mud Soup – 4,496 yards Dirt - 22,868 yards
Tyler Street Inert Landfill (William Dickson Company) 4925 Tyler Street Tacoma	Inert Waste Landfill	Concrete – 13,544 yards Asphalt – 8,843 yards Glass – 2,140 yards Dirt – 22,243 yards
Waller Road Inert Waste Landfill (William Dickson Company) 48th Street East and Waller Road Tacoma	Inert Waste Landfill	Concrete – 16,355 yards Asphalt – 6,427 yards Glass – 2,848 yards Dirt – 13,399 yards

[1] These facilities are all privately owned and operators provide service on a county wide basis. Additional discussion of these facilities, and other facilities that handle special wastes, is provided in Chapter 9.

8.3.4 Other Types of Landfills

Certain disposal facilities in the county serve special needs related to specific waste types and are available for use on a county wide basis. As shown in Table 8-1, there are currently three private inert waste landfills permitted in the County which fall into this category. Additional information about other types of waste landfills is provided in Chapter 9.There are currently no limited-purpose landfills permitted in the County. However, WAC 173-304 and the Pierce County Development Regulations allow for development and permitting of limited-purpose landfills by private industry, should the need arise.

8.4 Needs

***Long term disposal capacity for MSW*:** As discussed in Chapter 3, the County maintains long term solid waste forecasts (1998-2020) for the entire Pierce County geographic area and for Pierce County's system. These projections are based on historical waste disposal data and current projections for future population growth. Using these forecasts, projections were developed for future disposal needs through the term of the current long-haul agreement between Pierce County and LRI and through a 20-year planning period. The forecasts represent long-term needs but do not include projections of short-term or seasonal patterns.

Table 8-2 shows the range of projected needs for disposal capacity for municipal solid waste for the entire county and the Pierce County system.

The 20-year disposal needs for the Pierce County system are projected to range from 9.9 to 10.9 million tons. The 20-year projection of waste disposal capacity needs for the entire county range from 14.9 to 15.9 million tons. The disposal needs projected through the term of the existing long-haul agreement (2011) for the Pierce County system range from 6.0 to 6.5 million tons.

Short-term MSW disposal needs: The short-term disposal needs in Pierce County depend not only on the total waste requiring disposal, but also on the status of current and projected disposal options particularly as it relates to facilities scheduled to be closed or facilities scheduled to go into operation in the near future.

Pierce County/Cities and Towns: After a number of years of uncertainty regarding how the short-term disposal needs of the County system were to be met, this issue was resolved. Under the contract with LRI, the County is assured of disposal capacity either in an in-county landfill or through long-haul through the year 2011. In the event that an in-county landfill begins operation before 2011, the agreement allows for use of that facility.

Tacoma system: The City of Tacoma intends to keep its landfill open and to continue to have available long-haul disposal through the Contractor. The City is also reviewing operation and design alternatives for the production of RDF. If the RDF production is increased or decreased in the future, the amount of waste currently landfilled will decrease or increase proportionally.

The City plans to fill the Central Area of the Tacoma Landfill to the maximum grade allowed by its permit. As of January 1, 1997, the Landfill had a remaining permitted capacity of approximately 325,000 tons. At a planned disposal rate of approximately 20,000 tpy, the maximum capacity would be reached by the end of 2014. If the City can not demonstrate to the regulatory agencies that it can meet the requirements of the Consent Decree the agencies will not grant the necessary extensions and the Landfill will need to close by the end of 1999. In 1998, the City was granted the first of three possible 5 year extensions, allowing the landfill to remain in operation until 2004.

The City has no plans for a new City-owned replacement landfill at this time. To reduce the amount of waste going to the Central Area, or when the Central Area is full, all landfill waste would be made into RDF, long-hauled under either the City's current or a re-procured long-haul contract or disposed in a new in-county landfill.

Ash management is the responsibility of the Steam Plant operators, which operates Steam Plant No. 2. Recycling and re-use of the ash is conducted as a regular part of plant operation and no needs for ash disposal from this facility have been identified. Ash disposal is the lowest priority in the Solid Waste Utility Division's ash management hierarchy and utilized as a last resort.

Table 8-2 Projected Long-Term Disposal Needs [1]		
	Pierce County/Cities and Towns[2]	**Countywide[3]**
2000 to 2020	9,819,142 to 10,855,651 tons	14,808,866 to 15,915,511 tons

[1] Based on annual waste stream projections detailed in tables 3-13 and 3-14.
[2] Does not include Tacoma/Ruston and Fort Lewis/McChord Air Force Base.
[3] "Countywide" includes the military bases and the Tacoma/Ruston system.

Fort Lewis/McChord AFB: Disposal capacity for the military bases will be provided through a combination of use of the existing facility and by long-haul.

Needs for other types of landfills: At this time there does not appear to be any identified need for other types of landfills, such as inert waste, woodwaste, demolition, or any other limited purpose landfill. As discussed in Chapter 9, there are many recycling and disposal opportunities offered by private businesses in Pierce County to handle these materials. As discussed in Chapter 3, there has been a substantial decrease in the amount of these materials in the municipal waste stream and it appears that industry is recycling, reusing, or reducing the amount of materials in this category. However, these facilities are dependent upon the ebbs and flows of the recycling marketplace or the evolution of Pierce County's industrial base and more facilities may be needed in the future. Zoning regulations in Pierce County's zoning code allow an industry wishing to permit a limited purpose landfill to site such a facility. Permitting for these facilities is summarized in Chapter 2 and discussed in more detail in Chapter 10.

Other issues to consider: Other regulatory changes were passed in early 1999 which add to the landfill siting standards that apply to facilities not yet constructed, 100 acres in size, and 100 feet in height. It is not yet certain how these changes would impact the siting of all types of new landfills both for the short and long term, nor how the changes will impact solid waste disposal economics in the state.

There are three other issues that need to be considered when evaluating either in-county or long-haul alternatives. The following briefly summarizes them. How they impact the in-county or long-haul alternatives is discussed in the next section of the chapter.

Flow control: Flow control refers to the ability of local government to control the delivery of waste generated within a given potential geographic area to a specific facility, thereby providing the ability to guarantee delivery of waste. This issue is discussed in detail in chapters 5 and 7.

After a number of years of legal review and consideration of legislative actions to resolve the issue, it appears very unlikely that flow control will ever again be available to local government, unless said local government is a market participant (as in *Smithtown and Babylon*). Essentially this means that local government becomes a market participant along with the private sector in providing municipal solid waste disposal services.

Interlocal agreements: Under Washington State law cities and towns have the option to develop their own solid waste management plans. Typically, as is the case in Pierce

County, cities and towns agree to cooperate through interlocal agreements in the planning and funding of solid waste management programs.

Potential long-term effects of waste reduction and recycling on disposal capacity: Waste generation quantities are influenced by a number of factors such as population growth, levels of employment, personal income and the cost of disposal. The waste reduction and recycling rate, which in turn directly affects the quantity of waste requiring disposal, is also influenced by similar factors. It is not possible to precisely predict total future waste reduction and recycling quantities. The County's high disposal capacity projection assumes a 50% recycling rate. The high range assumptions provide leeway for planning if the recycling rate falls below the current level, population grows faster than projected, or a boom in the economy generates more waste. (This is discussed in more detail in Chapter 3 Waste Analysis.)

Some of the factors which should be addressed when considering disposal alternatives include:

- the relative cost of disposal versus recycling programs could drive either more or less recycling;
- the future markets for specific recyclable materials will affect both the type and quantity of materials removed from the waste stream;
- as discussed in Chapter 3, based on the conclusions of the Waste Audit Study there are currently certain materials such as CDL and paper which present a greater potential for recovery and could reduce overall disposal needs; and
- if certain disposal alternatives reduce the availability of funds to support County education programs, the overall waste reduction and recycling levels could suffer.

If, however, there were to be a large drop in recycling rates, it would increase the need for disposal capacity. It would be very unlikely that this would occur suddenly; it would most likely be a long-term trend. The annual updates of disposal and recycling quantities can be used to detect any trend towards a significant reduction in recycling rates or significant increases in disposal rates.

8.5 Alternatives

8.5.1. Pierce County/Cities and Towns

The needs and alternatives for the Pierce County system relate primarily to the relative role played by in-county landfilling and long-haul for municipal solid waste, and to other special needs such as management of closed disposal sites.

***In-county landfill*:** The County is currently conducting a long-term planning process for handling municipal waste, which could result in in-county landfilling or a system that relies primarily on either long-haul or some combination of the two. When considering in-county landfilling, in addition to siting considerations previously discussed, several ownership options are available:

- COUNTY-OWNED*:* Under this option, the County would implement the siting decisions resulting from completion of the landfill siting study previously described. Ownership of a site would obligate the County to take the lead in final siting, environmental review, permitting, financing, and construction. Public ownership would not preclude contracting with the private sector for operation of the facility.
- PRIVATELY-OWNED 304TH STREET: Under this option, the 304th Street Landfill would serve as the principal

disposal site and the County would continue a contractual relationship with LRI for disposal services.

- OTHER MUNICIPALLY-OWNED: Under this option, it is assumed that some or all of the cities and towns who are currently participating in the Plan would form their own solid waste management entity and take the lead in developing a publicly-owned landfill in Pierce County. This could possibly involve taking over the County's siting study; however, there would likely be significant legal, administrative, and procedural issues which would need to be worked out, the possibility of which are unknown at this time. No proposals have been made.
- OTHER PRIVATELY-OWNED: Under this option, it was assumed that the 304th Street Landfill would not be developed and another privately-owned landfill could be developed at a site other than 304th Street. There have been no specific proposals.

Flow control: A long-term, reliable waste disposal stream is important to the viability of options available for an in-county landfill. A lack of flow control may result in higher overall rates to users if fixed costs or contractual obligations cannot be met. This is probably more critical with a publicly-developed site or publicly-contracted site unaffiliated with waste hauling companies because the County will be directly responsible for covering debt service and other fixed costs or complying with contract requirements.

Interlocal agreements: The development of a County-owned landfill may require long-term interlocal agreements related to the financing and operation of such a facility. Whether or not these agreements can be reached (in total or in part) will be a fundamental factor in determining not only whether an in-county landfill is feasible, but also which of the in-county options available would be preferred.

Potential long-term effects of waste reduction and recycling on disposal capacity: The in-county landfill options under consideration (304th Street Landfill or a County-owned facility) would have adequate capacity to adapt to changes that may occur in waste reduction and recycling programs and recovery rates. Based on current estimates, the overall disposal cost for an in-county landfill is lower than long-haul and, therefore, would provide somewhat less economic incentive to increase diversion rates.

On the other hand, waste reduction and recycling programs are treated as integral components of Pierce County's solid waste management system. The portion of the costs associated with those programs not collected directly from users (the directly-billed costs for subscribing to curbside, yardwaste, multi-family, or non-residential recycling programs) are funded through a component of solid waste tipping fees.

If the choice of a more expensive long-term disposal option (e.g., long-haul alternatives) leads to any diminishing in the number of tons of waste entering local disposal sites, there may be less revenue available to fund the centralized public outreach and education programs which have been crucial to achieving Pierce County's current diversion rates.

It remains an unknown whether higher disposal rates and the associated economic impetus to recycling is enough, or whether successful recycling programs need a constant base of education and information to continue successfully.

***Long-haul alternatives*:** The County is currently under contract through 2011 with LRI for disposal. Waste has been hauled to the Roosevelt Regional Landfill. Shortly after the opening of the 304th Street Landfill,

County waste was sent to the new facility. If the County elects to continue long-haul after 2011 there are currently available other potential alternatives to the Roosevelt facility. The present status of the other options is summarized in Table 8.6. The future use of these facilities will need to consider financial, environmental and other factors that exist at the time.

Some of the regional landfills listed in Table 8-3 serve as backup disposal sites for others in case one of the landfills is unable to accept waste.

Seattle, Snohomish County, Lewis County, and several other smaller counties in Washington presently ship waste via rail to the regional landfills. Portland's regional government sends its waste via truck to one of the regional landfills. While both systems are reliably serving long-haul transportation needs, there are many factors which differentiate rail and truck hauling, including:

- *Scale:* Rail transportation is generally cost-efficient only on a large scale due to the high fixed costs of rail infrastructure, the work involved in assembling rail cars into trains, intermodal handling (truck to rail and vice versa) at one or both ends of the rail haul, and the fact that moving a 60-car train is much more cost-efficient than moving a 10-car train. Truck hauling, on the other hand, is easily scaled to whatever size is needed, and a relatively constant incremental cost is incurred for each additional truckload shipped. Because large-scale waste-by-rail is an established means of transporting waste to landfills in the Puget Sound region, the incremental cost for a new jurisdiction to add additional rail cars to the existing trains can be quite low.
- *Energy consumption and air emissions*: Rail transportation is more energy efficient and produces fewer air emissions than truck shipping.
- *Industry attitudes*: The railroad industry and trucking industry have markedly different histories that affect how they do business today. Railroads tend to be more bureaucratic, and are traditionally not geared for time-critical deliveries. The trucking industry is more entrepreneurial and can generally achieve the fastest door-to-door service. Each train contains many containers of waste, and the late arrival of a single train may delay operations at the landfill or transfer station. With trucking, each truckload may develop a problem or be late, but it is less likely that a single problem would cause *every* truck to be delayed, because trucks can be relatively easily re-routed around a problem, and more tractors/drivers can be brought in on relatively short notice.
- *Future capacity limitations:* Freight and passenger train use of the rail lines connecting Pierce County with the regional landfills is growing, and some believe it is unlikely that additional rail lines would be constructed. As rail line demand increases and reaches capacity, the cost of rail hauling will likely increase. These increased costs could make long-haul by rail less economical in 2011 than is reflected in today's contracts. Highway usage is subject to similar trends of increased usage with a limited capacity, but many believe that highway capacity will be increased in the future to keep pace with demand.
- *Backup methods:* Alternate transportation methods or routes are necessary when heavy rains, snow, flooding, or other factors interrupt deliveries. The rail-haul programs can use alternate but parallel rail routes (for example, there are two lines connecting Pierce County to the Portland area and running up the Columbia Gorge), alternate rail routes (running over the

Cascades to Spokane, and then to the regional landfills), or truck transportation over a variety of routes. Truck transportation can use alternate routes and additional tractors/drivers to help when necessary. Sometimes a single event could incapacitate both the primary and backup methods, leading to the need for short-term storage at transfer stations and/or long-haul vehicles, and for disposal at backup landfills (locally, or at other regional landfills which are not affected by the transportation disruption).

- *Unit capacity*. A rail-haul system with direct rail access to the landfill site and direct rail access to the transportation site does not have to limit per-container weights to road-legal values. Waste-by-rail systems with this advantage can achieve even greater economies of scale due to reduced handling requirements.

Table 8-3 Summary of Potential Long-Haul Alternatives

Facility Name and Location	Ownership	Status	Access	Capacity
Adams County Landfill, Adams County, WA	Waste Management, Inc.	Construction not yet started. Land use and Solid Waste permit issued but under appeal. (Ownership changes in 1998 may reduce the possibility of this landfill being built.)	Truck and Rail	90 million tons.
Columbia Ridge Landfill, Gilliam County, OR	Waste Management, Inc.	Presently permitted and operated as a regional landfill accepting waste from many locations	Rail (using intermodal yard on facility site) and truck	123 million tons starting in 1990; approx. 8.5 million tons already consumed; remaining capacity approx. 72 years at 1.4 million tons per year
Finley Buttes Landfill, Morrow County, OR	Waste Connections	Presently permitted and operated as a regional landfill.	Truck; potential for rail, but intermodal yard would be minimum 10 miles away.	40 million tons starting in 1990
Roosevelt Regional Landfill, Klickitat County, WA	Regional Disposal Company (Allied Waste)	Presently permitted and operated as a regional landfill accepting waste from many locations	Rail (using intermodal yard in Roosevelt, several miles from landfill) and truck	120 million tons starting in 1991 (3 million tons per year over 40 years); received approx. 1.8 million tons in 1995
North Wasco County Landfill, The Dalles, OR	Waste Connections.	Presently permitted and operated as a relatively small landfill; Oregon DEQ permit application in progress for significant expansion	Truck	2.8 million tons at current facility; pending expansion permit would increase to 24 million tons
Cedar Hills Landfill King County, WA	King County	A publicly owned and operated landfill serving the King County, WA area (excluding Seattle).	Truck	30 million tons based on current plan of operations.

Flow control: The County's risk in undertaking its own long-haul program outside the contract with the haulers is heightened with the loss of flow control. Without the ability to commit waste to a County-initiated long-haul program, the County would probably not be able to receive competitive pricing for the long-haul services, and the haulers who do control the waste might choose more economical options within Pierce County or nearby. These other options, which could include general purpose MSW landfills, limited-purpose landfills, or recycling, would serve to further increase the unit costs of a County-initiated long-haul program. There may be less of an impact to disposal using the long-haul disposal alternative than if the County were required to support a fixed cost with a declining revenue base such as with development of an in-county landfill. Transfer costs, on the other hand, include a significant portion of fixed costs and, therefore, a reduction in total waste delivered would cause the per ton rate to increase.

Loss of system revenue due to a reduction in waste disposal would reduce the financial support to county-wide education programs unless rates were raised to support them

Interlocal agreements: Long-haul contracts typically obligate a solid waste management agency to commit a portion of the waste stream in a solid waste management area. The commitment is usually in the form of dedicating municipal solid waste, which is not recycled or otherwise diverted from the waste stream. If Pierce County were to proceed with long-haul for the 20-year period, the interlocal agreements with cities and towns would be advantageous in the negotiation of a favorable long-haul agreement.

Potential effects of waste reduction and recycling: Changes in waste reduction and recycling programs or other factors affecting the quantity of waste diverted from the disposal waste stream would likely not impact the long-haul disposal options in terms of availability of required disposal capacity or the unit disposal cost ($/ton).

Managing closed landfills: Current closure standards for landfills are intended to isolate municipal solid waste over a long period of time in order to minimize environmental impacts. In the future, it may be desirable to "mine" the materials or add gas/energy recovery to closed landfills, should markets and other conditions warrant.

There are currently no specific regulations or permit requirements for landfill mining, and if such an action was proposed, the Health Department would need to develop specific criteria under which to review such an action and get concurrence from Ecology. Landfill mining could potentially cause significant air quality impacts which would likely require SEPA review.

Landfill gas/energy recovery would require a Notice of Construction from the Puget Sound Air Pollution Control Authority. In addition, certain WAC 304-351 requirements would apply which would require review by the Health Department.

8.5.2 Tacoma/Ruston

The Tacoma Solid Waste Utility plans to continue recycling, composting, and landfilling. Due to changes in the recycling programs, the amount of wastes diverted to recycling and composting will change. In addition, the production process for RDF is currently under review and the amount of waste processed into RDF will also change. Implementation of these changes is scheduled for 2000 and 2001.

The Utility plans to keep the landfill open as long as permitted and to use it as part of its integrated waste management system. This will include by-pass for the Resource

Recovery Facility, backup for production of RDF due to maintenance and repair of the Resource Recovery Facility or Steam Plant No. 2, and for interruptions in long-haul services. The Utility's primary and alternative plans for future use of each disposal method are discussed in the following paragraphs.

Tacoma Landfill: The City plans to fill the Central Area of the Tacoma Landfill to the maximum grade allowed by its permit. In 1998, the Tacoma Landfill was granted an extension to continue landfilling until 2004. Under the Consent Decree, the City of Tacoma may request two additional five-year extensions. Approval of the two additional extensions, if granted, would allow the landfill to remain open until 2014. The City also plans to review and implement feasible options that would increase the amount of waste that can be disposed in the Central Area. Different options would include operational, design, and permitting changes that would increase the usable capacity of the Central Area. When the Central Area is full or if the additional time extensions are not granted, all wastes currently disposed in the Tacoma Landfill will be made into RDF or transshipped to an offsite landfill.

Use of private landfills: The City currently has a contract with LRI for long-haul disposal and for in-county disposal. The following is a brief review of two potential future disposal sites the City may use:

Roosevelt Regional Landfill: When the City's present contract with LRI for transportation and disposal of waste expires on December 31, 1999, the Tacoma Solid Waste Utility may request new bids for long-haul waste disposal services.

304th Street Landfill: The City may elect to use the 304th Street Landfill to reduce the amount of waste going to the Central Area or for some or all of its long term landfill disposal needs. Disposal at the 304th Street Landfill can be accomplished using the existing contract or under a new re-procured contract.

8.5.3 Fort Lewis/McChord Air Force Base

Management of solid waste in the Fort Lewis/McChord AFB system is established by the *Solid Waste Management Plan for the Fort Lewis Military Reservation*, which was most recently updated in 1995. Because the incinerator was not able to meet emission requirements, Fort Lewis will rely on landfilling and is updating its Plan.

8.5.4 Joint Opportunities

Given the similarity of needs between the three waste management systems, joint efforts may present a cost-effective approach to dealing with independent system needs.

- Jointly develop and fund a publicly developed, in-county landfill,
- Fort Lewis/McChord could join the County's disposal agreement,
- Blend disposal contracts of all three systems,
- Cities may join together to develop their own disposal system.

8.6 Evaluation Criteria

Table 8-4 summarizes technical, environmental, and economic criteria to use in the evaluation of landfilling alternatives. The applicability, weighting, or particular emphasis will depend on the specific situation such as whether or not the proponent for siting an in-county landfill is a private sector applicant or the public sector and whether or not the facility is to handle MSW or other material. The criteria are fully described in the following.

Technical criteria

Permitting the likelihood that the alternative will be able to obtain the necessary permits to allow for construction and long-term operation.

Timing: The ability of the project to be brought on-line within a time frame consistent with the overall project objectives.

Capacity and size: Whether or not the alternative is of sufficient capacity and size to provide long-term service (generally considered to be 20 years or more for MSW disposal facilities).

Environmental criteria

Site characteristics: The degree to which site characteristics prevent or mitigate impacts to earth, air, and water resources.

Groundwater protection/hydrology: The degree to which subsurface conditions will prevent or mitigate impacts to groundwater resources in the area.

Land use: The compliance with applicable land use codes and regulations and compatibility with adjacent land uses.

Specific impacts: The degree to which operation of the facility results in impacts from noise and odor or other impacts.

Status of state legislation: Whether or not impending legislation could impact project feasibility related to economics, permitting, development time, or other factors critical for project success.

Economic criteria

Initial capital costs: The cost of developing the project including preplanning, design/construction of facilities, and mitigation costs.

Life-cycle costs: The total cost of disposal over the life of the disposal facility, or the planning period (typically the useful life plus post closure period), including project financing, operation, maintenance, renewals and replacement, and closure and post-closure costs and waste transportation.

Economic development: The extent to which the facility will contribute to economic development in Pierce County.

Other issues to consider

Back-up disposal capacity: The ability of an alternative to provide back-up disposal capacity in the event of emergency or other conditions, which disrupt the transportation of waste or make the disposal site unavailable for use.

Landbanking: The advantages and potential disadvantages of completing part or all of siting process on a specific parcel of land, and purchasing that land with the intent of "landbanking" for future use.

Long-term long-haul rates: The ability to assure that rates for long-haul will remain stable for the long-term and be subject only to escalation from general economic conditions (e.g., inflation, fuel prices) as opposed to rates which might rise sharply due to lack of cost competition or other factors.

A summary comparison of municipal solid landfill disposal alternatives is provided in Table 8.5.

Table 8-4 Evaluation Criteria—Solid Waste Disposal	
Technical Criteria	**Related Questions and Issues**
1. Capability to obtain required permits	• Are wetlands involved that could trigger a Corps of Engineers individual permit? [1] • Can permitting requirements be clearly defined? • If privately developed, does the proposer have a track record in permitting similar facilities? • Have the project needs and objectives been clearly defined? • Has the site been selected based on criteria required under state law and consistent with the SWM plan?
2. Ability to bring project on line to meet project objectives	• Would significant delay be a fatal flaw to the project and, if so, how likely is a delay? • Has sufficient up-front planning been conducted so that a realistic schedule can be developed? • Do future phases of the project present possible serious schedule delays?
3. Adequate capacity and size	• Does the project provide for long-term disposal needs (20 years or more)? • Is the site of adequate size to accommodate support facilities (operations buildings, maintenance facility, gas and leachate collection, etc.) that may be required in the future? • Is all land for full facility development under current ownership of project developer (public or private)?
Environmental Criteria	
1. Site Characteristics	• Does site allow for adequate buffers and set backs? • Can aesthetic impacts be mitigated or required by land use and solid waste permits?
2. Groundwater Protection	• Have sufficient hydrogeologic studies been conducted to define subsurface conditions? • Do the subsurface conditions provide mitigation for potential leaks in liner systems?
3. Land use	• Does the facility comply with relevant zoning/comprehensive plan requirements? • Is the facility compatible with adjacent land uses?
4. Specific Impacts	• What is the affect of vehicle traffic to the facility on local traffic congestion? • Do operating equipment and procedures provide adequate control of noise? • What are the critical noise and odor receptors in the area and under what conditions are impacts most critical?
5. Status of State Legislation	• Is there any pending legislation which would significantly increase costs or technical requirements for the facility? • If contracting with the private sector can the County protect itself from changes in law?
Economic Criteria	
1. Initial Capital Costs	• Are initial capital costs difficult to estimate and subject to large variation? • Are all initial costs included such as equipment purchase, financing costs, site investigations?
2. Life Cycle Costs	• What is the relative life cycle cost of the alternatives? • Are operating costs difficult to estimate or subject to large variations? • Is the project particularly sensitive to economic factors such as operating cost escalation, and power rates? • Are later phases of the project undefined for which it is difficult to prepare accurate cost estimates? • How do flow control issues affect likely waste deliveries and project revenue? • Can long term rate stability be achieved; i.e. can the County achieve protection from large rate increases in the future?
3. Local Economic Development	• To what extent does the project contribute to economic development in Pierce County?

[1] A wetlands permit from the Corps may not be a pertinent issue if the decision of the 9th Circuit Court of Appeals on the 304th Street Landfill proposal stands.

Table 8-5 Summary Overview of Alternatives for Landfill Disposal of Municipal Solid Waste					
	Existing and Active Alternatives			**Unknown proponents but identified possibilities**	**Alternatives for future contract decisions in 2011 for backup capacity**
	Long-Haul	**In-County**		**In-County**	**Other Long-haul**
	Roosevelt Regional Landfill	**304th St. Landfill**	**County-Owned**	**Other facility either municipally-owned or privately-owned**	**Other regional landfills Adams, Columbia Ridge, Finley Buttes, North Wasco, Cedar Hills**
Technical					
Capability to obtain required permits	**Permits in place for currently-operating landfill** • Needs clearly defined and consistent with goals and recommendations of Plan.	**Permitting complete** • Project needs clearly defined and consistent with the goals and recommendations of the Plan. • Land use permits and permits from Health Department and Ecology obtained.	**Siting Study not completed** • Site selection not completed; preliminary selection process based on state law. Changes to state law made in 1999 must be evaluated. • Necessity for wetlands permit to be identified in next phases. • Permit requirements known, SEPA review yet to be conducted; permit conditions will depend upon results of SEPA review. • County has sited other controversial facilities but not sited a landfill. • Project needs and objectives clearly defined and consistent with goals and recommendations of Plan.	**No specific projects proposed. Capability to obtain permits unknown.** • Facilities would be in compliance with goals and objectives of Plan.	**Permits in place for currently operating landfills: Adams County, Columbia Ridge, Finley Buttes, North Wasco, Cedar Hills** • Sites consistent with Washington, Oregon, or Federal criteria therefore consistent with Plan. • Tonnage disposal needs estimated for years 2012-2020. Other future needs not specifically identified. • Need for backup capacity not specifically identified. • Permits issued for Adams County Landfill are currently under appeal and scheduled to go before the Pollution Controls Hearing Board.

Table 8-5 Summary Overview of Alternatives for Landfill Disposal of Municipal Solid Waste					
	Existing and Active Alternatives			Unknown proponents but identified possibilities	Alternatives for future contract decisions in 2011 for backup capacity
	Long-Haul	In-County		In-County	Other Long-haul
	Roosevelt Regional Landfill	304th St. Landfill	County-Owned	Other facility either municipally-owned or privately-owned	Other regional landfills Adams, Columbia Ridge, Finley Buttes, North Wasco, Cedar Hills
Technical					
Ability to bring project on line to meet project objectives.	**Landfill developed and operating**	**Project built** • Project needs and objectives clearly stated.	**Initial steps need to be updated; evaluation of "permitablity" yet to be completed.** • Project needs and objectives clearly stated. • Project objectives remain achievable even with future delays because of interim long-haul disposal agreement.	**No specific projects proposed.**	**Landfills which are already operating can likely meet estimated disposal needs, provided that the required expansions are constructed.**
Adequate site capacity and size.	**Yes. Operating facility provides capacity for 20+ years**	**Yes. Site provides space for 20+ years** • Site is under control of developer applicant.	**Yes. Candidate sites provide sufficient space for 20+ years** • County does not own sites, but could use eminent domain authority, if necessary. County has identified sites with a minimum number of owners to make acquisition easier.	**No specific projects proposed.**	**Yes. At this time it is anticipated that operating facilities can provide 20+ years of capacity. Available capacity may change in future.**

Table 8-5 Summary Overview of Alternatives for Landfill Disposal of Municipal Solid Waste					
	Existing and Active Alternatives			**Unknown proponents but identified possibilities**	**Alternatives for future contract decisions in 2011 for backup capacity**
	Long-Haul	**In-County**		**In-County**	**Other Long-haul**
	Roosevelt Regional Landfill	**304th St. Landfill**	**County-Owned**	**Other facility either municipally-owned or privately-owned**	**Other regional landfills Adams, Columbia Ridge, Finley Buttes, North Wasco, Cedar Hills**
Environmental Criteria					
Site characteristics mitigations.	**Permits for facility identify necessary mitigations.**	**Mitigations required for land use and solid waste permits have been identified and permits approved.**	**Candidate sites appear to have suitable characteristics, but siting study is not complete.** • Permit and SEPA review yet to be conducted; permit conditions will depend upon results of SEPA review. • Conceptual site plans include buffers/setbacks at least twice those require by regulation. • Compatibility with adjacent land use to be determined through permit review process.	**No specific projects proposed**	**Permits for operating facilities identify necessary mitigations.**
Groundwater protection.	**Permit from Klickitat County Health Department and Ecology approved the facility as meeting required conditions to protect groundwater.**	**Permits from Health Department and Ecology approved project as meeting required conditions to protect groundwater.** • Hydrologic studies completed.	**Siting study not completed.** • Limited data on subsurface conditions indicates that candidate site conditions are favorable; detailed investigations necessary.	**No specific projects proposed.**	**Permits from jurisdictional Health Departments the Washington Dept. of Ecology, or the Oregon Dept. of Environmental Quality (DEQ) approved the facilities as meeting required conditions to protect groundwater.**

Table 8-5 Summary Overview of Alternatives for Landfill Disposal of Municipal Solid Waste					
	Existing and Active Alternatives			**Unknown proponents but identified possibilities**	**Alternatives for future contract decisions in 2011 for backup capacity**
	Long-Haul	**In-County**		**In-County**	**Other Long-haul**
	Roosevelt Regional Landfill	**304th St. Landfill**	**County-Owned**	**Other facility either municipally-owned or privately-owned**	**Other regional landfills Adams, Columbia Ridge, Finley Buttes, North Wasco, Cedar Hills**
Environmental					
Land Use	**Landfill determined by Hearing Examiner to be compatible with zoning and adjacent land uses with mitigation**	**Landfill determined by Hearing Examiner to be compatible with zoning and adjacent land uses with mitigation.**	**Candidate sites proposed in areas zoned to allow landfills, but study is not complete.** • Sites would require a public hearing review process for a Public Facility Permit. • Compatibility with adjacent land use to be determined.	**No specific projects proposed.**	**Facilities are in compliance with applicable zoning and are compatible with adjacent lands uses.**
Economic Criteria					
Cost	**Disposal services are under contract through 2011.** • Disposal rate of $37.99 per ton in 1997 $. • Costs $539 million based on haul of 14.2 million tons at a rate of $37.99 per ton in 1997 $. • Future price increases limited to less than CPI. • Flow control issue will not affect County costs.	**A great deal of information available to accurately develop cost estimates and disposal costs.** • Disposal rate proposed to range from $20 to $25 per ton in 1997 $. • Costs range from $185 million to $255 million less than long-haul of 14.2 million tons (1997 $). • Partial common ownership between LRI and haulers controlling waste flowing to private, in-county facility.	**Significant unknowns; more variability associated with cost estimated until site selected and additional evaluations are conducted.** • Preliminary estimates indicate costs in the range of $29 to $34 per ton. • Unanticipated cost increases more likely due to pre-liminary nature of estimate. • Costs range from $62 million to $127 million less than long-haul of 14.2 million tons. • Waste deliveries can be controlled by setting attractive tipping fee; other revenue sources may be required if costs exceed tipping fee revenues.	**No specific projects proposed. Costs unavailable.**	**Current disposal contracts provide reasonable estimates of range of costs for future contracts.** • More sensitive to long-term uncontrollable cost escalations related to transportation of waste (labor, fuel, capacity or rail or road transportation routes). • Flow control issues will likely not affect County costs for landfills in eastern Washington or Oregon. • King County requires higher rates for waste coming from other out-of-county jurisdictions to the Cedar Hills Landfill.

Table 8-5 Summary Overview of Alternatives for Landfill Disposal of Municipal Solid Waste					
	Existing and Active Alternatives			**Unknown proponents but identified possibilities**	**Alternatives for future contract decisions in 2011 for backup capacity**
	Long-Haul	**In-County**		**In-County**	**Other Long-haul**
	Roosevelt Regional Landfill	**304th St. Landfill**	**County-Owned**	**Other facility either municipally-owned or privately-owned**	**Other regional landfills Adams, Columbia Ridge, Finley Buttes, North Wasco, Cedar Hills**
Economic development	**Less local employment; funds flow out-of-county.** • Provides fewer local employment opportunities; more funds flow out of community compared to in-county alternatives.	**Local employment; reinvestment of local funds.** • Provides local employment for local reinvestment of project costs, but does not bring in new dollars to community (project costs paid with local funds). • Property tax revenues could be substantial due to private ownership.	**Local employment; reinvestment of local funds.** • Provides local employment for local reinvestment of project costs, but does not bring in new dollars to community (project costs paid with local funds).	**No specific projects proposed.**	**Less local employment; funds flow out-of-county.** • Provides fewer local employment opportunities; more funds flow out of community compared to in-county alternatives.

8.7 Recommendations

Out-of-County disposal

#8-1 If there is a lack of landfill capacity in Pierce County for solid waste generated in the Pierce County solid waste management system in the future or if the County determines by resolution that out-of-county disposal options are cost effective, then the County may contract for the use of an out-of-county landfill.

Public siting process

#8-2 County government should maintain Phase I of the Pierce County Landfill Siting Study in a current status by revising the "Composite Map of Exclusionary Areas for Countywide Screening" as the exclusionary criteria change. These revisions should be made in conjunction with updates to the Solid Waste Management Plan.

Permits and decision-making related to Municipal Solid Waste Disposal

#8-3 When the Tacoma-Pierce County Health Department and the Pierce County Department of Planning and Land Services review permit applications to site, develop, and operate new MSW landfills, or to expand existing MSW landfills in Pierce County or whenever Pierce County is considering decisions to contract for MSW disposal, the agencies must include in the decision-making process an evaluation of:

- Effect on public health and safety;
- Protection of the environment, including aquifers and waters of the State;
- Pierce County's waste generation habits and trends with an assurance that options are adequate for meeting Pierce County's waste generation needs;
- Competition for disposal services;
- Meeting potential emergency needs should a primary disposal site suddenly become unavailable; and
- The costs of using various alternatives which will be analyzed and verified through the use of publicly available data published by other government organizations, formal requests for proposals, qualifications or information (RFP, RFQ, or RFI), or through another method as recommended by the Solid Waste Advisory Committee.

The Solid Waste Division shall have primary responsibility for the evaluation, but will work with the Department of Planning and Land Services, the Tacoma-Pierce County Health Department and the applicant to minimize duplication of effort.

#8-4 MSW landfill expansions within unincorporated Pierce County shall undergo a permitting process with adequate public notice and opportunity for public comment. Expansions shall be required to meet the regulations in effect at the time of expansion and to protect public health and safety and the environment. Expansions shall be prohibited for any landfill that is in violation of existing surface water or groundwater standards.

Reserve disposal capacity

#8-5 The County shall require, to the extent allowed by law, private MSW disposal companies located within unincorporated Pierce County to reserve existing disposal capacity to handle MSW generated within the Pierce County solid waste management systems. When negotiating disposal contracts with any such facility owner/operator, the County shall propose terms which:

- Reserve adequate disposal capacity to serve the Pierce County solid waste disposal system as projected in the 'County-wide' column of Table 8-2, 'Projected Long Term Disposal Needs;'
- Require the mutual agreement of the contracting parties before the contractor can bring in waste from outside the County solid waste management system.

#8-6 No municipal solid waste landfill located within unincorporated Pierce County shall accept waste from outside the Pierce County solid waste management systems without addressing the impacts of that action. The impacts under the facility's conditional use permit shall be reviewed by the Pierce County Hearing Examiner. The impacts under the facility's solid waste handling permit shall be reviewed by the Tacoma-Pierce County Health Department. These reviews shall be conducted as a public process and follow the applicable laws and regulations governing the conditional use permit and the solid waste handling permit processes The results of the review shall be reported at a Pierce County Council meeting.

#8-7 While this Plan recognizes and describes the complex authorities and regulation of waste disposal, nothing in the Plan specifically authorizes or specifically prohibits the importation of solid waste from outside the County solid waste management systems to MSW landfills located in unincorporated Pierce County.

Public Process

#8-8 Before approving the acceptance of municipal solid waste from outside the Pierce County solid waste management systems or before approving a substantial change in the design or operation of a municipal solid waste landfill within unincorporated Pierce County, the TPCHD shall give the public notice of the issue and provide the public an opportunity to be heard.

Tacoma Landfill improvements

#8-9 Continued landfill improvements at the City of Tacoma Landfill are recommended. The City should continue to evaluate all available options to obtain additional landfill space.

Tacoma Disposal Needs – Long Haul and In-County

#8-10 To reduce the amount of waste going to the Tacoma landfill, and when the Tacoma landfill reaches its capacity, the City may implement long-haul disposal or use the 304th Street Landfill for some or all of its disposal needs.

CHAPTER 9

SPECIAL WASTE STREAMS

This chapter discusses existing programs and facilities operating within Pierce County for managing special wastes. Special wastes are those solid wastes with special collection, handling, and disposal requirements and which are not generally part of the mixed municipal solid waste stream. The special wastes discussed in this chapter are:

- Construction, Demolition and Landclearing Debris
- Asbestos Contaminated Wastes
- Contaminated Soils
- Street Cleanings and Vactor Wastes
- Biosolids
- Septic Tank Pumpings
- Tires
- Waste Oil
- Biomedical Waste
- Other Industrial Wastes
- Agricultural Wastes
- Green Mulch
- Hog Fuel Ash

This chapter is organized somewhat differently than the other chapters in this plan in order to provide self-contained discussions and evaluations of the handling methods for each special waste. Management of household hazardous waste and small-quantity generator hazardous waste is discussed in a separate *Local Hazardous Waste Management Plan* for Pierce County.

9.1 Goals

Pierce County and the SWAC established the following goals for management of special wastes:

Goal: To develop guidelines and strategy for disposal of all special waste types.

Goal: To ensure that special wastes are managed in a manner that complies with all local, state, and federal regulations or best management practices; promotes and maintains a high level of public health and safety; and protects the environment.

9.2 Construction, Demolition & Landclearing Debris

Construction, demolition, and landclearing (CDL) debris results from construction and remodeling; demolition of buildings, roads, or other structures; and landclearing associated with new development activities.

Construction and demolition wastes typically consist of concrete, brick, wood, masonry, composition roofing, steel, asphalt, and gypsum wallboard. Landclearing wastes typically consist of dirt, mud, rocks, stumps, trees, and brush.

In Pierce County, the private sector has developed capacity for recycling, reuse, and disposal of this waste stream because it is primarily generated, collected and transported by private industry. As indicated in Chapter 3, there has been a growth in the number of businesses handling this material in Pierce County. Materials are being diverted to these facilities. Since 1993 there are

decreasing amounts in all categories in the municipal waste system. Tables 9.1 and 9.2 present information on private and public sector CDL handling facilities currently operating in Pierce County, respectively.

These tables also show the facility locations, the types of wastes accepted for disposal or recycling, and, when available, the estimated tonnage handled in 1996.

Table 9.1 Private Sector CDL Handling Facilities in Pierce County

Facility (Owner) and Location	Facility Type	Type of Waste	1999 Tonnage
Fife Sand & Gravel 3120 Freeman Road East Puyallup	Inert Waste Recycling Facility	Concrete, woodwaste, landclearing debris, asphalt waste	Concrete/Asphalt - 1,230 tons Woodwaste - 6,115 tons
Foran Inert Waste Landfill (Jim Foran Company) 1635 Marine View Drive, Tacoma	Inert/Demolition Landfill & Recycling Facility	Concrete, Brick, Asphalt, Dirt, Mud	Asphalt – 6,571 yards Concrete – 4,766 yards Mix/Inert – 2,482 yards Mud – 10,096 yards Mud soup – 360 yards Dirt – 31,996 yards Brick – 253 yards
Hidden Valley Transfer Station and Composting Factory (Land Recovery, Inc.) 17925 Meridian E. Puyallup	Transfer Station, Composting Factory & In-Vessel Composting Facility	Demolition & landclearing debris, yardwaste, foodwastes, and other organic wastes (Includes all yardwaste for County's Purdy Yardwaste Composting Facility)	Heavy Demolition – 738 tons Sheetrock – 702 tons Roofing – 5,833 tons Asbestos – 28 tons Tires – 42 tons Ash – less than one ton Composted organics (yardwaste, foodwaste and landclearing wood) – 60,029 tons
New West Gypsum Recycling Inc. 1321 54th Ave. East Fife	Gypsum Recycling Facility	Gypsum wallboard	> 20,000 tons
Organic Recycling Center (Land Recovery, Inc.) 10308 Sales Road S. Lakewood	Organic Waste Transfer Station	Landclearing debris, yardwaste	Yard/woodwaste – 13,747 tons
Purdy Topsoil and Gravel, Inc. (Owned by Randles Sand & Gravel) 5819 133rd Street NW Gig Harbor	Recycling Facility Topsoil Business	Brush, limbs, landclearing debris, concrete, soil, asphalt	Concrete – 2,690 cubic yards Brush & stumps –7,396 cubic yards
Randles Sand & Gravel, Inc. 19209 Canyon Road East Puyallup	Inert Waste Recycling Facility	Concrete, asphalt, landclearing and woodwaste	Concrete – 322 tons Asphalt – 5,044 tons Dirt – 6,918 tons Woodwaste – 26,976 cubic yards Cinder blocks – 9,197 tons

Table 9.1 Private Sector CDL Handling Facilities in Pierce County (continued)			
Facility (Owner) and Location	**Facility Type**	**Type of Waste**	**1999 Tonnage**
Recovery I, Inc. 1630 East 18th Street Tacoma	Demolition & Woodwaste Recycling Facility	Woodwaste from construction/demolition and landclearing debris -- tree stumps, brush, limbs, laminated wood products, crates, debris, pallets, cedar shakes	Engineered wood – 14,700 tons Stumps/brush – 4,650 tons Demolition wood – 37,567 tons Clean wood – 2,207 tons
Rhine Marine Recycling Facility R.W. Rhine, Inc. 1621 Marine View Drive Tacoma	Inert Waste Recycling Facility	Brick, cement or asphalt concrete, masonry	Concrete/Asphalt/Rock – 57,106 tons
Tyler Street Inert Landfill (William Dickson Co.) 4925 South Tyler Street Tacoma	Inert Landfill	Permitted for inert wastes but presently not accepting	Dirt – 550 yards
Tucci & Sons 4224 Waller Road Tacoma	Inert Waste Recycling	Concrete, asphalt	Concrete/Asphalt – 14,969 tons Petroleum Contaminated Soils – 3,645 tons
University Place Refuse 2815 Rochester West University Place	Composting Facility	Yardwaste	Inactive
Waller Road Inert Waste Landfill (Wm. Dickson Company) 48th Street E. & Waller Road Tacoma	Inert/Demolition Landfill	Clean dirt, concrete, asphalt, rubble, concrete blocks, bricks, clean mud	Concrete – 32,564 yards Asphalt – 12,842 yards Glass – 431 yards Dirt – 26,654 yards
Walrath Trucking 7807 12th Avenue East Tacoma	Concrete Recycling Facility	Concrete (waste block from plants and concrete from mixer trucks)	15,772 yards
Weyerhaeuser Integrated	Recycling and Disposal	Industrial and construction woodwastes, landclearing debris, Petroleum Contaminated Soils (PCS)	Information not available in a form to represent Pierce County. Service area is I-5 corridor from Snohomish to Clark Counties.
Woodworth & Company, Inc. 2800 104th Street SW Lakewood	Inert/Demolition Waste Recycling	Concrete, asphalt, asphalt roofing, sandblast grit, foundry sands, brick/cedar shingles, non-asbestos shingles, glass, brick, masonry	Concrete/Asphalt – 214,686 tons Asphalt shingles – 19,311 tons Foundry sand – 2,708 tons Sand Blast Grit – 61 tons

Table 9.2 Public Sector CDL Handling Facilities in Pierce County			
Facility & Location	**Facility Type**	**Type of Waste**	**1996 Tonnage**
Department of the Air Forces McChord Air Force Base	Inert and Demolition Landfills	Demolition Debris (from military property only)	1,700 cubic yards
Purdy Transfer Station *Operated by:* Land Recovery, Inc. 14515 54th Avenue, Gig Harbor	Solid Waste Transfer Station	Sheetrock, Demolition and Landclearing Debris	All CDL included with totals at Hidden Valley Landfill

The following discussions address management practices for various types of CDL waste including: asphalt, concrete, lumber, and other woodwaste.

Asphalt: Asphalt waste results from the reconstruction of existing paved roads and may also contain gravel, crushed rock, dirt or concrete. Asphalt can be disposed at inert landfills; however, reclaimed asphalt pavement (RAP) can also be recycled for beneficial use.

Reclaimed asphalt pavement must be processed to meet material specifications which depend on the materials end use. Processing of RAP can occur in stand alone asphalt processing facilities; in facilities that accept asphalt in addition to other materials such as concrete, brick, or rock; or by mobile crushing and screening equipment at construction job sites.

The use of reclaimed asphalt pavement is becoming widely accepted and practiced. The material is extensively used in Washington State Department of Transportation (DOT) road maintenance and construction projects. Typical end use includes:

- Aggregate base course, backfill, and in asphalt;
- soil stabilization;
- pipe bedding;
- light weight fill;
- slope protection;
- shoulder aggregate;
- subbase; and
- soil modifier.

As Fort Lewis completes road repair projects, the old asphalt is ground and used to provide a better wearing surface on gravel range roads and tank trails.

As shown in Table 9.1, several private facilities for reclaiming asphalt and asphalt roofing materials are currently operating in Pierce County.

Concrete: Concrete waste is generated from road reconstruction and from the demolition of structures such as foundations, slabs, sidewalks, and curbs. Concrete waste, like asphalt, is an inert waste, but can be crushed to produce aggregates of specified sizes for beneficial reuse.

Recycled aggregate can be produced by mobile concrete crushers at the job site and at centralized facilities operating large stationary concrete crushers. Concrete processing produces some residuals, such as rebar metals, which are physically separated during the recycling process.

Recycled concrete aggregate (RCA) is widely accepted for use as aggregate, base course,

and fill. Common end markets for RCA include:

- road base aggregate;
- construction fill;
- crushed rock;
- asphalt pavement aggregate;
- decorative landscaping;
- erosion control; and
- shoreline protection.

Other uses include cement and lime manufacture, agriculture, metallurgical flux, and fillers and extenders. In some cases, recycled concrete aggregate used as a road base has been found to produce highly alkaline runoff and calcium carbonate precipitate, which can clog drainage systems.

As shown in Table 9-1, several private facilities that recycle concrete are currently operating in Pierce County.

Gypsum wallboard: Wallboard waste results from construction or demolition activities. When it is from new construction, wallboard waste is relatively free of paint, asbestos, or other substances that can contaminate wallboard waste from demolition projects.

Because wallboard can generate toxic hydrogen sulfide gas and acidic leachate, it is not defined as a demolition or inert waste and cannot be disposed in demolition or inert landfills. Disposal of wallboard waste is limited to landfills permitted to accept gypsum waste, such as a municipal solid waste (MSW) landfill. Similarly, waste wallboard is not suitable for incineration because the sulfur dioxide gas from the wallboard reduces the ability of incinerators to remove other gases.

There are two alternative management strategies for waste wallboard: land application as a soil amendment and recycling. Only clean construction wallboard free of metal pieces can be shredded and applied to the land to improve the porosity of soils and add essential plant nutrients.

However, land applications must be correctly applied at specific agronomic rates. It can also be ground-up and used as bedding material for dairy cows and poultry. Land application requires a Solid Waste Permit. Wallboard waste coming from demolition activities should not be applied to the land because of the potential for contamination. Most demolition projects in Pierce County or Tacoma do not generate much gypsum wallboard, because the demolition is of older structures which used lath and plaster for wall construction.

Recycling is the State's preferred best management practice. The waste can be processed to remove paper and other contaminants, pulverised, and mixed with virgin gypsum and other additions to form new wallboard. Up to 95% of the waste gypsum can be recovered using this process.

In Pierce County, most of the waste wallboard is recycled because there is extensive private recycling capacity provided by one business. According to the 1995 Waste Audit, gypsum wallboard waste only makes up 1.7% of the County's total disposed waste stream.

Timber and woodwastes: Woodwaste is produced from a variety of activities including landclearing and demolition, and as a by-product of lumber production and manufacturing. Woodwastes are disposed, recycled, composted or reused depending on the quantity generated at a particular site and on whether or not the woodwaste has been chemically treated. As indicated in Table 9-1, there are a number of facilities handling woodwaste in Pierce County.

Painted and treated timber: Woodwaste from demolition sites often includes painted or treated lumber. In some cases, these materials can be recycled or reused. For example,

painted lumber can be ground and used as hog fuel in boilers as long as it does not contain lead-based paint. Typically, painted lumber can be disposed in lined municipal solid waste landfills, but is prohibited from disposal in inert/demolition landfills.

In contrast, creosoted timbers, which are treated to prevent rot, are not recycled although they may be reused. Creosoted timbers, considered by the State of Washington to be a hazardous waste, were at one time required to be disposed only in permitted hazardous waste landfills. However, the State has recently modified its regulations to allow disposal in lined municipal solid waste landfills with leachate collection systems or incinerated in an industrial furnace for energy recovery. Creosoted timbers are not accepted at inert waste landfills.

As with many other materials in the solid waste stream, the potential to generate contaminates depends on how the treated wood behaves in the landfill environment. The principal factor involved in how easily the wood treatment chemicals leach from the wood in the presence of water. There is limited data available for most available treatment products. As more knowledge is developed, disposal requirements may change.

Landclearing: Stumps, trees, and large amounts of brush typically result from clearing land for development. At one time, this material was typically burned on site. However, there is now a permanent ban on outdoor burning in incorporated and urban growth areas within Pierce County. Outside of these areas, burning requires a permit and is limited to burning only natural vegetation generated on the permitted site.

Stationary and mobile grinders are now frequently used to grind the debris into chips for use in landscaping and hogged fuel. Landclearing debris is also composted.

Manufacturing byproducts: Woodwaste generated as a by-product from the manufacturing of wood products typically includes sawdust, chips, shavings, bark, pulp, hogged fuel, and log sorting yardwaste. This material is not contaminated with chemical preservatives. It is most often landfilled when mixed in with other materials. Otherwise, woodwastes are typically recycled or reused as landscaping products, burned as fuel in a boiler, used as bulking agents for composted products, used as feedstock in the panel board industry, or chipped for the manufacture of various paper products.

Woodwaste is becoming a more valuable commodity in Washington with the decrease in the availability of trees in the forest industry.

Remaining alternatives: Much of the CDL waste produced in Pierce County is either recycled or reused by the private sector. Centralized private facilities exist in the County to handle most types of woodwaste and construction debris. There is substantial private facility capacity for all types of handling methods. The most recent waste characterization study conducted by Pierce County indicates that some of these materials continue to be disposed at the Hidden Valley landfill or transfer stations. Relevant findings of the characterization study include:

- CDL waste totals only about 1.5 percent and 5 percent of the single and multi-family waste collected by route-collection vehicles in Pierce County. Furniture and treated and untreated lumber account for nearly 70 percent of the multi-family CDL waste.
- CDL waste totals about 13 percent of the commercially generated waste collected by route-collection vehicles. About 60 percent of the commercially generated CDL is treated and untreated lumber. Carpeting accounts for 30 percent while

drywall and sheetrock each account for another 3 percent of the waste stream.

- CDL waste accounts for about 14 percent of the residential self-haul waste stream. Treated and untreated lumber and furniture account for about 44 percent of the residential self-haul CDL waste stream. Sheetrock and concrete account for about 38 percent.
- CDL waste accounts for about 71 percent of the commercial self-haul waste stream. Untreated lumber accounts for 45 percent of commercial self-haul CDL waste. Furniture and painted wood account for 25 percent.

Thus, it appears that any additional efforts to remove CDL wastes from the disposal waste stream should be targeted at self-haul wastes. If the County implements a long-haul system, there could also be a need for increased construction waste diversion to private recycling businesses. Recovery alternatives for self-haul CDL waste are discussed in more detail in Chapter 6 Solid Waste Processing Facilities.

9.3 Asbestos Contaminated Waste

Asbestos waste is any waste that contains more than one percent asbestos by weight and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry. Airborne asbestos presents a considerable risk to human health and is therefore considered a hazardous air pollutant.

If asbestos wastes are managed in compliance with the asbestos management procedures of federal regulations (40 CFR 61, Subpart M), they are excluded from the requirements of Washington's Dangerous Waste Regulations (WAC 173-303) and can be disposed in a permitted MSW landfill.

The City of Tacoma Landfill is an approved asbestos waste disposal site within Pierce County (see Table 9-3); however, the City of Tacoma Landfill only accepts asbestos waste generated from within the City of Tacoma limits. Most large amounts of asbestos waste are taken to Seattle. Very little asbestos contaminated wastes are disposed in Pierce County.

Currently, asbestos waste haulers are required to notify landfill staff 24 hours before delivering asbestos waste. The asbestos waste must be double-bagged in yellow asbestos bags and marked with asbestos label tape. The Puget Sound Air Pollution Control Authority's (PSAPCA) Asbestos Control Standard (Regulation III, Article 4) requires a permit for the removal, encapsulation, and disposal of asbestos for projects greater than 10 linear feet or 28 square feet. These procedures are subject to changeable conditions of State and Federal guidelines.

Needs and alternatives: If the County implements an in-county landfill alternative, asbestos handling and disposal procedures would have to be established. For a long-haul based disposal system, special provisions for collecting asbestos wastes are required. The operations for the Hidden Valley Transfer Station has storage standards that may suffice.

9.4 Contaminated Soils

Petroleum contaminated soils: Petroleum contaminated soils are soils contaminated with gasoline, diesel, or oil created from surface spills or from leaking underground storage tanks. Due to the high cost of disposing petroleum contaminated soils as solid waste or, in some cases, as hazardous waste, it is often preferable to treat the contaminated soil for reuse. Treatment processes include aeration, bio-remediation, hot-air extraction, and thermal hydrocarbon destruction. Treated soils can be used as landfill cover and construction fill and in landscaping. Table 9.4 identifies petroleum

Table 9-3 Asbestos Disposal in Pierce County	
Facility	**Method**
Hidden Valley Station	• Prepared for transport out-of-County
City of Tacoma Landfill	• Disposed with other MSW in current cell

contaminated soils recycling facilities operating within or planned for Pierce County.

TPST Soil Recyclers' facility in Pierce County accepts petroleum contaminated soils produced in Pierce County and from remediation projects statewide, and uses a thermal hydrocarbon destruction process. If this facility is operating at capacity, contaminated soils can be transported to a TPST facility in Portland, Oregon.

Approximately one out of ten petroleum contaminated soils remediation sites use vendors to perform on-site remediation. These vendors typically perform a hot-air extraction process where heated air is forced into contaminated soil mounds through perforated pipes. Volatized hydrocarbons in the air stream then pass through a high temperature incineration chamber where they are oxidized. This method is particularly effective in reducing diesel contaminants. Another treatment process involves aeration of the contaminated soil. This process is accomplished over a period of time sufficient to volatize the hydrocarbons contained in the soil and release them to the atmosphere. Tilling of the material is necessary to maintain the oxygen levels required for contaminant destruction. This process only works well for small quantities of contaminated soil because it is dependent on large storage and aeration areas.

A third treatment process is bio-remediation, which involves the addition of bacterial agents to the soil to enhance contaminant destruction rates. It also works much faster than aeration. This can be accomplished through the addition of sludge, fertilizer and wood mulch, or other organic matter, nitrogen, phosphorous, microorganisms, and water.

Fife Sand and Gravel operates a bio-remediaton facility. The reclaimed soil accounts for one quarter of the material that goes into their topsoil mix. Another bio-remediation facility near Buckley is under development by RPW Industries, Corp.

Thermal hydrocarbon destruction is a relatively new process which produces asphalt or gravel base materials. The contaminated soil is fed into a rotating ceramic cylinder inserted between the burner and dryer of a hot-mix asphalt plant. The soil is brought to a minimum temperature of 500°F to completely remove the hydrocarbons which volatize and burn. The treated soil is dropped into the dryer and mixed with virgin aggregate to cool the material down to the normal 300°F to 350°F range. The mixed material can then be made into asphalt or stockpiled for use as gravel base.

Mobile units utilizing the thermal hydrocarbon destruction process for treatment of contaminated soils are commonly available.

Petroleum contaminated soils can also be disposed at municipal solid waste landfills. Using petroleum contaminated soils for

Table 9.4 Pierce County Petroleum Contaminated Soils Recycling Facilities			
Facility	**Treatment Process**	**Quantity Processed**	**Treated Soil Use**
Fife Sand and Gravel 3120 Freeman Road East Puyallup	Bio-remediation		• Topsoil
Tucci & Sons 48th Street & Waller Road Tacoma	Bio-remediation	N/A	• Topsoil
TPST Soil Recyclers of Washington 2800 104th St. Court South (Sales Road Area) Lakewood	Thermal Desorption	68,584 tons[1] (1996)	• Topsoil and Fill • Gravel Base
Fort Lewis (Treats only soils from military property)	Bio-remediation, Aeration	30 tons (1996)	• Landfill cover material and landfilled
RPW Industries Corp. of Kirkland, WA Proposed Buckley facility (it has obtained a land use permit but is not yet built)	Bio-remediation	When built, the facility will treat 50-60,000 tons annually. An application for a solid waste permit has not been submitted to the Health Dept. The facility has an approved land use permit.	• Topsoil and Fill

[1] Only 16,608 tons of total came from Pierce County

daily cover material is an efficient allocation of valuable landfill space. A portion of the petroleum contaminated soils generated within the Tacoma City limits is used as a daily cover material at the City of Tacoma Landfill.

Currently, Pierce County has substantial capacity for handling contaminated soils with existing facilities.

Arsenic contaminated soils: Arsenic contaminated soils resulted from past operation of the ASARCO Plant located in both Tacoma and Ruston. Planning for the cleanup and management of contaminated soils is not a responsibility of the Solid Waste Plan. The lead agency for this cleanup is the U.S. Environmental Protection

Agency, Region 10. Remediation has been divided into three areas (or phases): the Upland-Tacoma Area, the Smelter Site, and the Off-Shore area. Remediation will continue through 2005.

Remediation is currently underway in the Upland-Tacoma Area, which consists of residential and light commercial properties surrounding the smelter plant. Properties located within this area are sampled for arsenic contamination to determine if remediation is required. Properties may experience only partial remediation based on sampling results (arsenic and lead concentrations). The contaminated soils are

excavated, replaced with "clean" soil, stockpiled at the smelter site, and covered with plastic. The arsenic contaminated soils will be placed under the site's area wide cap.

Remediation design for the smelter site has not begun and is scheduled to take more than two years. Site remediation will involve building demolition, capping the entire site, shoreline armoring to prevent slag erosion into Commencement Bay, replacement of the on-site surface water control system, and construction of an on-site containment facility.

Studies are currently being completed for the Off-Shore Area. Alternatives for remediation include capping, dredging, and natural recovery, or a combination of all three. Cleanup of this area cannot begin until remediation of the smelter site has been completed in order to avoid further contamination of off-shore areas from the smelter site cleanup.

Dredge spoils: In 1989, the Puget Sound Dredge Disposal Analysis designated open-water, unconfined disposal sites for clean dredge spoil sediments, two of which are located in Pierce County. These sites, although in use, do not allow for disposal of contaminated dredge spoils.

Contaminated dredge spoils, classified as a problem waste by WAC 173-304, Minimum Functional Standards for Solid Waste Handling, result from the dredging of surface waters where contaminants are present at concentrations not suitable for open-water disposal. Contaminated spoils must be disposed of at confined sites, which contain the dredged material so that migration of contaminants and adverse effects to the environment and human health are minimized.

A six-agency team is currently developing an action plan for multi-user contaminated dredge spoil disposal sites from dredging navigation channels, waterfront development projects, environmental cleanup, and aquatic habitat restoration projects. The United States Army Corps of Engineers, the Washington State Department of Ecology, and the Washington State Department of Natural Resources are preparing a joint federal-state Programmatic Environmental Impact Statement which will evaluate the following disposal alternatives for contaminated dredge spoils:

- No action;
- Level bottom capping and confined aquatic disposal;
- Near-shore confined disposal;
- Upland disposal;
- Disposal in municipal solid waste landfills; and
- Multi-user fills.

Upland and municipal solid waste landfill disposal are under the authority of solid waste management regulations. Because of the capacity issues with Pierce County municipal solid waste landfills, disposal in any of the existing or potential future in-county landfills is not a practical option. Siting and permitting of an upland disposal site falls under the requirements of WAC 173-304. Since Commencement Bay, in Tacoma, is one of the primary generators of contaminated dredge spoils, one or more of the above disposal options may eventually be located in Pierce County. Bio-remediation might reduce the need or size of a disposal facility.

9.5 Street Cleanings and Vactor Waste

Vactor and "street maintenance' wastes include liquid and solid wastes collected during maintenance of stormwater catch basins, road ditch dredgings, and street

sweeping. Contamination of these wastes can vary depending upon adjacent land use, unauthorized discharges, accidental spills, and frequency of cleaning. The wastes can contain a variety of substances that present a threat to human health, wildlife, and the environment such as pesticides, fertilizers, fecal material, petroleum hydrocarbons, and metals. The wastes may also be harmless.

The Washington State Department of Ecology issued a draft *Best Management Practices for Management and Disposal of Street Wastes* (BMPs) in July 1995 which outlines recommendations for testing, use, and disposal/reuse or recycling of the wastes. The Tacoma Pierce County Health Department recommends routine testing to determine disposal and use options. Ecology is developing Facility Design Standards for facilities designed to handle these wastes.

At the present, vactor wastes can receive one of three general classifications in the state of Washington; clean fill, solid waste, and dangerous waste. Generally, the wastes can typically be considered solid waste and disposed at a permitted MSW landfill, often the simplest, but becoming more costly, method of disposal. Recycling involves incorporating the solids into other products, such as asphalt, cement, and concrete blocks. Or if the material tests out as harmless, it can be used as fill. In some instances, handling and disposal of the waste may fall under the Dangerous Waste Regulations (WAC 173-303) and must be handled through the processes established for dangerous waste.

Solids: For those vactor or street cleaning wastes which test as a solid waste without harmful residues which need treatment, end use options may include:

- road-subgrade or fill;
- commercial and industrial fill;
- portland cement manufacture;
- pre-fab concrete manufacture;
- daily cover or fill in a landfill;
- asphalt manufacture;
- treatment; and
- compost and artificial topsoil manufacture.

These end use options are outlined in Ecology's 1995 draft BMPs and therefore, may be subject to change. In addition, because a generator utilizes one of these end-uses it does not necessarily mean a solid waste permit is not required.

Technologies developed for remediating contaminated soils may also be applicable to treating vactor and street cleaning solids that have petroleum or chemical residues but not enough to the point that they need to be handled under the dangerous waste regulations. Potential treatment methods include bio-remediation, thermal desorption, and soil washing.

Bio-remediation uses natural and biological activity to degrade organic contaminants. One method of bio-remediation is composting, which involves mixing contaminated soil with organic material to enhance biological activity.

Thermal desorption destroys contaminants by heating the contaminated soils to temperatures between 300°F and 700°F. (However, gases emitted from the treatment process contain organic compounds which may require additional treatment.)

Soil washing involves agitating a mixture of contaminated material and water or solvent to remove contaminants. One concern with soil washing is that the residual wash solution requires further treatment or disposal.

Liquids: Vactor liquids are disposed in a liquids/solids decant station or liquids-only

treatment facility that discharges to a permitted wastewater treatment plant. The problem with the liquids is the potential for ground and surface water pollution. A decant station could provide additional pre-treatment if necessary before entering the wastewater treatment system.
Decanting liquids directly back into the catch basin or other structure they were removed from is allowed only if no other practical means of disposal are available, if the structure is remote from surface waters, and if the liquids will not leave the structure within 24 hours.

Facilities in Pierce County: At present, Fort Lewis built a vactor waste dewatering facility which only accepts wastes from within the base's property boundaries. The facility has experienced design difficulties and isn't always capable of handling the wastes.

The City of University Place built a vactor waste facility which become operational in 1999. Additional vactor waste handling facilities are located in King and Thurston counties.

Current disposal practices by most municipalities and the Washington State Department of Transportation (DOT) in Pierce County include dumping the waste into pits, use as fill material, or use for repairing road shoulders.

Needs and alternatives: The state DOT and the municipalities have identified a need for facilities to handle vactor waste and street cleanings. DOT worked with a private company on the design of such a facility but no agency is currently pursuing the development of a facility. Planning for these facilities is the responsibility of stormwater and transportation agencies.

When Ecology issues the facility design standard, the Health Department should work with municipalities and DOT to determine if there needs to be changes to methods for handling the waste in Pierce County and to determine the need for facility capacity. It may be that some of these wastes can be handled through the existing composting or petroleum contaminated soils facilities.

9.6 Biosolids

The term "biosolids" refers to treated municipal sewage "sludge" that has been treated to meet regulatory requirements for beneficial land application. (Industrial "sludge" is waste from industrial processes which must be treated and recycled, or disposed in an appropriate landfill.)

Biosolids are a primarily organic, semisolid substance consisting of residual solids and water derived from the wastewater treatment process. It is generated from public or privately owned systems used to treat either domestic sewage (waste and wastewater from human or household operations) or a combination of domestic sewage and liquid industrial waste that has characteristics similar to domestic sewage.

Planning for the management of biosolids is the responsibility of individual municipal and sewer agency sewerage general plans. The Federal and State governments encourage recycling and utilization of biosolids and discourage their disposal as solid waste except in emergencies. EPA conducted substantial testing on land application of biosolids to adopt standards for land application. In response to EPA-established standards for biosolids management (40 CFR 503), the State adopted regulations for the use and disposal of sewage biosolids, WAC 173-308. The regulations establish application rates, limit pollutant quantities for land applied biosolids, protect ground and surface water resources, and provide for permitting systems. Both the Federal and State regulations are based on the principle that biosolids, applied correctly, are a safe

soil amendment. The Tacoma-Pierce County Health Department manages the permit process in Pierce County.

Land application sites are categorized by acreage size and maximum application rates. Each site is permitted by the Tacoma-Pierce County Health Department as "solid waste handling facility" under WAC 173-304 (with the new rules in draft regulations, WAS 173-308, the permitting process will change substantially). Municipalities and sewerage agencies must have a biosolids management plan for their wastewater treatment systems. In Pierce County, most sewerage agencies have biosolids management plans and programs based on land application. On the average, the Health Department issues 80 to 90 biosolids land application permits each year.

Pierce County has adopted a biosolids management program for the Chambers-Clover Creek Wastewater Treatment Plant that gives priority to land application. Biosolids are currently being applied out-of-county on suitable, permitted sites. The County's long-term approach to biosolids handling is to create a Class A product suitable for all conceivable land applications beyond just permitted sites. Pierce County will build a soil manufacturing facility at the Chambers-Clover Creek Plant to produce such Class A material. The resulting soil amendment will be used to reclaim the gravel mine site adjacent to the treatment plant.

The City of Tacoma produces a biosolids product which is marketed as TAGRO.

Many of the sewer agencies in Pierce County are interested in composting biosolids rather than relying solely upon permitted land application sites.

Needs and alternatives: Although planning for how to handle biosolids is not a responsibility of solid waste agencies, there may be benefits for sewer and solid waste agencies to work together developing public or private capacity for co-composting of yardwaste and biosolids. The Pierce County Sewer Utility is already moving in this direction with the development of a facility for the Chambers Creek Wastewater Treatment Plant. Land Recovery Inc.'s new composting factory can compost biosolids.

The land application of biosolids is regulated by application rates, timing, and acreage through a permit system. Class A biosolids must not be applied at rates greater than agronomic rates or in a manner which contaminates surface water. Class B biosolids can also be applied to land but are subject to stricter access restrictions. Although when properly applied, biosolids are a safe soil amendment, the general public doesn't always understand and opposition can occur. Recently, a private facility which composted biosolids for small communities and sewer agencies stopped composting biosolids, requiring these agencies to re-think their handling methods and to find other alternatives.

Pierce County could work with other agencies to continue to support additional public or private co-composting capacity and public outreach and education programs.

9.7 Septic Tank Pumpings

Septage is a "semisolid substance consisting of settled sewage solids combined with varying amounts of water and dissolved materials generated from a septic tank system." Septage wastes are collected, handled, and disposed by private septic tank pumper haulers and sewer systems.

Table 9.5 Septage Disposal Sites

Facility	Location	Function
IN-COUNTY FACILITIES		
City of Tacoma Treatment Plant No. 1	2201 Portland Avenue Tacoma, WA 98421	Septage Disposal
Northwest Cascade Septic Service	16207 Meridian Street Puyallup, WA 98373	Landscape Soils
OUT-OF-COUNTY FACILITIES		
METRO Treatment Plant	1200 Monster Road Renton, WA 98055	Septage Disposal
LOTT Treatment Plant	500 North Adams Olympia, WA 98501	Septage Disposal
Bio-Recycling	1506 Sergeant Road Rochester, WA 98579	Septage Disposal (Farm Application)

The Health Department has permitted approximately 30 haulers to pump and haul septage wastes in Pierce County. The majority of septic tank pumpings are disposed at the City of Tacoma's Treatment Plant No. 1 or at the Renton Wastewater Treatment Plant in King County. The only other facility in the County that handles septage waste is Northwest Cascade Septic Service. Some haulers transport wastes out-of-county. In-county and out-of-county septage disposal and composting sites and their locations are listed in Table 9.5.

Septage wastes that have been fully treated by digestion, composting, lime stabilization, or other biosolids treatment processes that kill microorganisms are regulated as biosolids. Final disposal or land application must meet the Health Department's biosolids guidelines.

9.8 Tires

Disposal and storage of used tires continues to be somewhat of a problem within Pierce County. Tires incorporated into landfills create problems because they do not readily decompose and usually resurface due to their resilient nature.

Because of the difficulty of handling tires, disposal sites charge a premium to those who wish to dispose tires. However, these disposal fees tend to promote illegal dumping at non-permitted tire storage yards (which accept tires at little or no cost) and along roadsides. Unpermitted storage yards or "tire piles" can create fire hazards, water contamination from runoff, and public health problems associated with mosquitoes and rodents.

Until 1994, State funding generated from a one-dollar-per-tire tax assessed on new tire purchases aided in eliminating the larger illegal tire piles in the State. This tax had only a limited life since it was first imposed in 1989/90 and has no remaining funds. In Pierce County, the Health Department was able to cleanup and close down the largest, problem piles using these funds. The tires were chipped and the material recycled. Now, because the State's authorization to assess the tax sunsetted, only the most potentially hazardous tire piles in the State are targeted for cleanup with the limited remaining funds.

Smaller piles still remain throughout the County and there is evidence that more tires are being illegally stored or dumped. One of the problems of the growing number of illegal piles is that once a small pile is dumped, they tend to grow in size as people see them and add to the pile.

Recently, used tire shops, which are licensed by the State to accept and transport tires for disposal or recycling, have opened in Pierce County. Although these tire shops are not licensed for tire *storage,* some have stored tires on-site for extended periods of time.

Chapter 8.84 of the Pierce County Code addresses the subject of tire storage yards. In order to legally store more than 200 tires, a permit must be obtained from the Pierce County Fire Marshall, although storage is never to exceed 30,000 tires at any one site.

Pierce County Development Regulations include zoning, landscaping, and buffering requirements for legally permitted tire piles. The State's Minimum Functional Standards, WAC 173-304-420(4), require that the operators of tire piles of 800 or more tires be required to:

- control access to the tire pile by fencing;
- limit the tire pile to a maximum of one-half acre in size;
- limit the height of the tire pile to 20 feet;
- provide a 30-foot fire lane between tire piles; and
- provide on-site fire control equipment.

There are collectors who will accept and will even pick up used tires for a fee, but collectors must be licensed by the Washington Department of Ecology. Private collectors have offered to provide the Health Department with a trailer for a fee at special tire collection events. Unlicensed collectors have been known to run a scam by collecting tires for a small fee and then illegally dumping the tires on vacant land they have leased, leaving the owner of the property with a mess to cleanup.

The Health Department is concerned about the growing number of stockpiled tires and their un-permitted status. The Department is evaluating how many piles exist to determine what alternatives there are to reduce and prevent the growing number of piles and what funding sources might be available for cleanup and enforcement. Few of the existing piles are permitted or meet the adopted standards administered by the Pierce County Fire Marshal.

In earlier years, to prevent illegal tire piles and to provide means of collections other than at landfills, the Health Department conducted once or twice-a-year tire collection events. These events were expensive and did not provide a complete solution to discourage illegal dumping. With the advent of the tire tax and the State's licensing of tire shops to accept and transport tires, the Health Department ceased the collection events. Without a continuing funding source, as was provided for cleanup from the State tax on tires, the Health Department has no long-term funding sources to cleanup piles or to re-institute collection events.

Currently, several businesses in the Northwest provide recycling options for used tires. Used tire recycling includes shredding tires as an asphalt pavement additive, fuel additive in power plants, and in playgrounds and athletic surfaces. Used tires also can be used for artificial reefs, erosion control, highway guards, and dock bumpers. Increased retreading can also help ease the generation rate of used tires. Although the existing tire recycling alternatives do not completely solve the used tire problem, they do reduce the number of tires required for landfill disposal or storage and therefore decrease the potential for illegal or hazardous operations.

As discussed in Chapter 10, tire piles are just one part of the illegal dumping problem in Pierce County.

Needs and alternatives: There are three needs related to tire waste: to remove the existing illegal tire piles; to ensure that new illegal piles are not created and don't grow; and to enforce existing, adopted standards for storage.

Removing illegal piles and enforcement of storage standards is both a matter of policy priorities and allocation of money. The Health Department must identify how many piles there are and where they are located and work with the Fire Marshal and other agencies to have the piles cleaned up, and for permitted piles, to have the storage standards enforced. In addition to completing its study, the Health Department needs to identify what enforcement/policing barriers exist which prevent quick cleanup of illegally dumped piles by private property owners and what can be done to reduce these barriers and ensure standards are met. It may be that, like other illegal dumping enforcement issues, the legal system acts against enforcement. Illegal dumping is not a high priority for the legal system. A tougher citation and fine system may offer quicker enforcement rather than any existing criminal penalties.

Also, the Health Department needs to identify and acquire funding sources for enforcement, cleanup of those piles, and public education. One means to prevent tire piles is through stronger public education tactics about enforcement actions and existing disposal methods. Another measure to prevent tire piles from growing is by quick removal. A public education program could be broadly educational making tire dumping, like other illegal dumping, socially unacceptable. It could also target those geographic areas where it most often occurs and target those age groups who most often dump the tires. The educational program could work with all auto body and tire shops to broadcast the information.

The Health Department could also work with local community groups to take responsibility for cleaning up small piles and to quickly identify the piles before they continue to grow. Health could develop incentives for community groups to become involved and could coordinate these groups activities with the County's Adopt-A-Road Program. (Chapter 10 discusses illegal dumping issues and alternatives in more detail.) The Health Department could also work with the County and cities to encourage the State to consider re-instatement of the tire tax assessment to provide funding for cleanups.

Ultimately, however, it is a matter of whether or not there is local political will to set priorities for funding for enforcement, cleanup, and public education.

9.9 Waste Oil and Antifreeze

There are several waste oil and antifreeze collection locations within Pierce County. The Health Department maintains a list of businesses which collect used oil and antifreeze, and publishes a handout. Tacoma, Pierce County, and the Health Department work together to sponsor some collections sites and the County works with the Health Department on public information programs about used oil collection. Some private companies, such as auto parts stores, will accept residential used oil (typically up to 5 gallons) for no charge. Waste oil recycling companies will accept larger quantities but may charge a fee depending on quantity. Waste oil has been collected by the County, the City of Tacoma, and the Tacoma-Pierce County Health Department at household hazardous waste collection events. The City of Tacoma's transfer facility also collects used oil and antifreeze. Pierce County has recently

installed a collection site for used oil at the Thunfield Airport.

Currently there are no specific County regulations for the disposal of used oil. Used oil is burned as fuel in power plants (for energy recovery) regulated by WAC 173-303-515. Facilities exist which can re-refine the oil (such as the one located in British Columbia, Canada); however, at this time there is no capacity for the re-refinement process in Washington State. The primary concern with the disposal of used oil is illegal dumping and its impact on surface and ground water quality.

Illegal dumping is not considered a major concern in Pierce County since there have been few reports or complaints ever filed with the Health Department. The combined public-private collection system appears to provide adequate capacity.

9.10 Infectious or Biomedical Waste

Medical waste consists of infectious and non-infectious wastes generated by hospitals; laboratories; and medical, dental, and veterinary clinics. Residential users of syringes and other home health care materials also generate medical wastes. Non-infectious medical wastes require no special treatment and are part of the regular municipal waste stream. The approximately 5 percent of the medical waste stream that is considered infectious is regulated by the Health Department. The management system is designed to ensure that wastes are properly treated and no longer "infectious."

Infectious or biomedical wastes contain pathogens or other biologically active materials in sufficient concentrations that exposure to the waste creates a significant risk of disease to humans. Biomedical wastes include cultures; laboratory waste; needles and other sharps; and human and animal blood, tissue, and body parts. These wastes require special handling and disposal practices to protect the health and safety of both medical and solid waste disposal personnel.

Pierce County Code 8.38 regulates the storage, handling, treatment, and disposal of infectious wastes by the Health Department. Generators of biomedical wastes are responsible to provide proper on-site storage facilities, segregated from the non-infections wastes regulated for landfill disposal. Within seven days of storage, a certified hauler is required to remove the infectious wastes from the site. Each hauler is allowed to store the material for an additional 48 hours before transporting the wastes to a treatment facility.

Currently, four haulers have been authorized by the State and the Health Department to haul infectious wastes from the generator facility to a treatment facility. The certified haulers are Murrey's Disposal, LeMay, Stericycle, and BFI. If the hauler has refrigerated storage facilities, they are allowed to store the infectious wastes for up to 30 additional days at temperatures below 45° F and for up to 90 days at temperatures below 32° F.

Treatment: Treatment methods for infectious wastes include incineration, autoclaving, and microwaving. Stericycle operates a microwave processing facility in Morton. BFI, located in Woodinville and Bellingham, operates an incinerator. Treated wastes are then hauled to an approved facility for final disposal. Technically, once infectious waste has been treated, it is no longer considered "infectious waste." Hospitals located within the City of Tacoma transport their infectious waste to the City of Tacoma Landfill. Following receipt, the treated waste is buried

in a segregated portion of the landfill. Land Recovery Inc. has recently been permitted to operate an autoclave at the Hidden Valley site.

Fort Lewis had planned to incinerate treated infectious wastes at its incinerator. The treated wastes would have come from military installations such as Madigan Army Medical Center. Currently, infectious waste is autoclaved at Madigan and packaged and sealed in sturdy plastic containers for transport to be incinerated at a small incinerator on Fort Lewis at boiler plant No. 9. Without the incinerator, the military management system will have to develop other treatment and disposal options and may have to contract with private businesses.

Residential generators are currently required to containerize sharps prior to disposal. The Health Department has developed a brochure describing proper disposal practices for residential generators.

Inspections: The Health Department currently inspects hospitals, medical and dental clinics, and laboratories. There is an estimated 1,000 facilities in the Tacoma-Pierce County area that have the potential to contribute to the biomedical waste stream. Currently, only about 600 facilities are permitted and inspected by the Health Department in one year.

Needs and alternatives: In addition to ensuring that all facilities are permitted and inspected, the Health Department may need to expand the program to veterinary clinics. Some concern has been expressed about whether sharps (needles and other discarded implements) from operation of these clinics are being properly disposed. The Health Department could conduct a survey of veterinary clinics and their current practices within Pierce County to determine if permitting requirements should be imposed in the future.

9.11 Other Wastes

Other industrial wastes: The Health Department monitors the disposal of questionable or unknown wastes through the Waste Disposal Authorization (WDA) program. This includes materials handled at the landfills and at other solid waste facilities. In 1992, approximately 215 waste disposal authorizations were issued; only 26 were issued in 1996. The decrease is largely a function of ceasing to require WDAs for asbestos disposal. Although industrial waste generators may obtain disposal authorization, landfill operators are not required to accept their wastes. The Health Department works with the various permitted solid waste facilities on WDAs to coordinate responses and provide consistency. Out-of county disposal alternatives for certain industrial wastes are at Olympic View Landfill in Kitsap County and Rabanco's Seattle transfer station. As indicated in Chapter 3, industrial sludges make up only a small portion of the Pierce County waste stream. This category was less than .2% of the total disposed.

Industrial waste pretreatment programs implemented by Pierce County, the City of Tacoma, and other operators of wastewater treatment plants regulate the discharge of industrial wastes to wastewater treatment facilities so that only those wastes which can be processed at the treatment plants enter the sewage collection system. Agencies have full-time inspection programs in place. The existing Tacoma and County treatment plants now accept pretreated liquid industrial wastes and operate secondary treatment processes.

Agricultural wastes: Wastes produced on farms such as manure, crop residue, and animal carcasses are defined as agricultural wastes by the Minimum Functional Standards

(WAC 173-304). On-farm disposal of agricultural wastes is not regulated under solid waste laws.

Crop residue waste is usually returned to the soil at the end of the growing season. Pollution and waste are possible with agricultural wastes, but they are not (generally) within the scope of the Solid Waste Management Plan.

Farm animal manure and other agricultural materials are also beneficial when reused properly as a resource, rather than as a waste. Generally, the manure is stored on site and eventually applied to farmlands as fertilizer. The major concern for manure processing and application is contamination of surface water. Ecology investigates existing manure practices and enforces proper application rates to minimize surface and ground water impacts. The Pierce County Conservation District works with farmers to develop Best Management Plans for their farming operations.

Animal carcasses can be recycled at rendering plants, which derive useful products from the animal remains. In addition, carcasses can be disposed in landfills or buried on the owner's property without creating a health hazard. Because there are existing in-county rendering facilities, implementation of a waste export system should not affect disposal of dead animals.

Recently, there have been a number of questions raised in the media about the regulation of fertilizer with complaints by farmers that hazardous waste chemicals from industry are not regulated sufficiently and are being included in some fertilizer products. Complaints have also been made about crop damage. The issues center around whether or not existing EPA standards have adequately tested fertilizer ingredients for long-term health implications.

According to Ecology, some "testing of fertilizers in Washington showed that the levels of toxic metals are well below the limits set for the land application of biosolids. However, there are unresolved questions about comparing fertilizer products to biosolids in that the forms of the metals in biosolids may be taken up by plants differently than the forms of metals found in fertilizer products. Because of this, the biosolids standards may underestimate the plant uptake of metals from fertilizers."

Other issues have been raised about overuse and improper application of fertilizer and the long-term effects on the land. The Washington State Department of Agriculture is working with the Ecology to sample and analyze a variety of fertilizers. The two departments may recommend legislation which will strengthen the review process for products applied to farmland.

Needs and alternatives: Washington has guidelines governing the testing and application of foodwaste and yardwaste compost and there are Federal and State standards for land application of biosolids and biosolids compost. All of these are based on the principle that the product must be proven safe as a soil amendment. It appears that fertilizer has no comparable standards or regulations. Requiring that fertilizer producers undertake equally rigorous testing and meet the same stringent standards that organic composts meet, is one alternative to ensure ground and surface water protection. If the State moves in this direction, the County could work with the State on public outreach and education through the umbrella of the watershed management plans' policies and public outreach programs.

Another alternative from a solid waste management point of view, and one the County may wish to promote or support, is the use of regular compost applications on

farmland as a way to cut back on the use of pesticides and synthetic fertilizers. Compost can be used as a soil amendment to build-up depleted soils. Various studies indicate that compost "tea" can be used to prevent some fungus conditions such as potato blight. The composting of manures may also offer better management practices to prevent surface water impacts.

The County could support composting of manures and the use of compost on farmland through working with the State and other agencies on public education and with permitting agencies to support the development of composting facilities and composting practices on farmland in Pierce County.

Green mulch: In Pierce County, green mulch is yardwaste collected from Pierce County's yardwaste curbside pickup or drop-off programs. Currently, Land Recovery, Inc. processes the yardwaste (grinds and screens) at the Hidden Valley transfer station. One of the reasons this is done is to extend the seasonal composting capacity for the County's yardwaste composting facility.

This processed yardwaste, consisting primarily of grass clippings, is composted aerobically for 3-5 days prior to being delivered to farmers' fields for application.

Green mulch processed during the months of March through September contains significant amounts of nitrogen that is utilized by growing plants. In addition, the organic matter in green mulch improves soil quality.

After conducting research on green mulch, the Washington State University Cooperative Extension Office in Puyallup developed a *Management Plan for Green Mulch in Agriculture*. The document established best management practices for managing LRI's composted yardwaste to agricultural lands in Pierce County.

Under the Environmental Excellence Program authorized by the Legislature in 1997, LRI applied for and received approval from Ecology to land apply GreenMulch without the need for a solid waste permit. The agreement between Ecology, LRI, participating farms, and effected counties spells out precise agronomic applications rates and other operating procedures for the use of GreenMulch on farms. In effect, GreenMulch is not considered a "solid waste" when applied under the agreed upon conditions.

Hogged fuel ash: Typically, certain types of hogged fuel ash are acceptable for co-disposal with municipal solid waste and are regulated as a solid waste by the Health Department. Ash derived from woodwaste and related inputs (paper, cardboard, etc.) is exempt from the Dangerous Waste Regulations (WAC 173-303) if it is designated as hazardous based solely upon a high pH.

If it is designated for any other reason, such as elevated metals levels, it is still a dangerous waste and must be disposed in a designated hazardous waste landfill. Ash derived from other forms of hogged-fuel is subject to all aspects of the Dangerous Waste Regulations, pH and all. Only in those instances where the ash is not a solid waste would it leave the purview of the Health Department.

The Health Department can require testing by the generator but does not perform analyses. Characterization of a waste is the responsibility of the generator. No needed alternatives have been identified

9.12 Opportunities

Although most special wastes are not a disposal problem in Pierce County, some opportunities exist for construction and demolition wastes, asbestos, vactor/street cleanings, biosolids, tires, and agricultural wastes. These opportunities are summarized in Table 9.6. There are several inert/ demolition landfills located in Pierce County; however, as a landfill space becomes a scarce resource, other options for material recycling and reuse will become increasingly needed and required.

Technologies have been developed to recycle and reuse these materials to create new construction materials. Also, companies have begun to offer services for collection of these materials so they do not end up in the mixed municipal solid waste disposal stream.

If Pierce County implements a waste export program, new collection and handling needs may arise with respect to construction and demolition wastes, asbestos, and other special wastes. For example, considering the cost of long-haul, it may become economical to recycle or reuse more construction and demolition waste. Without an in-county landfill, transfer facilities that typically do not accept asbestos waste may be required to do so.

Table 9.7 compares each special waste management alternative with the evaluation criteria.

Table 9.6 Special Waste Management Alternatives				
Additional Management Strategies	**Method**	**Measurement Methods**	**Environmental Impacts**	**Financial Impacts**
CDL --- divert additional CDL from municipal solid waste stream	Target commercial self-haul with public education program. Modify transfer stations for source-separation.	• Waste Characterization Audit evaluation of CDL waste stream.	None	Modest investment in transfer facility infrastructure. Public outreach program can be incorporated within existing budget.
Asbestos -- Change in handling system if all waste shipped out-of-county.	Health Department to determine handling methods and disposal procedures. Provide for receipt of properly packaged asbestos waste at transfer facility.	• Handling methods and disposal procedures in place.	None	Within scope of Health Department's assigned duties. Possible modest investment at transfer station.
Street Cleanings and Vactor Wastes --- establish and implement changes to handling methods as necessary.	Health Department and DOT to determine appropriate handling methods and identify if a need for a facility exists. If a facility is needed, all jurisdictions, including DOT, could coordinate and work with private industry to develop a facility to serve all jurisdictions In Pierce County.	• Management system established and implemented. • Facility built and operating, if needed.	None	Management system within scope of Health Department's assigned duties.
Biosolids Co-composting	Pierce County to work with other agencies to support development of public or private co-composting facility and through public outreach and education.	• Public outreach and education programs. • Public and/or private co-composting capacity in place.	Co-composting facility may have impacts which must be evaluated on a site-specific basis through established permit regulations.	Potential increase in costs, however, co-composting may result in savings over separate handling and processing of wastes.
Tires --- remove illegal piles and enforce storage standards.	Remove existing illegal tire piles; enforce existing pile standards and identify and acquire funding; public education programs; work with other municipalities and State for reenactment of Tire Tax or develop other funding sources.	• Decrease in number of existing illegal tire piles	Net positive impact	Additional cost to County or Health Department if responsible parties lack financial resources to remove/mitigate piles.

Table 9.6 Special Waste Management Alternatives				
Additional Management Strategies	**Method**	**Measurement Methods**	**Environmental Impacts**	**Financial Impacts**
Infectious Waste --- expand program to veterinary clinics.	Health Department survey of veterinary clinics and identify management requirements or permitting if necessary.	• Program in place to survey veterinary clinics.	None	Some cost to Health Department to expand existing program.
Agricultural Composting --- support.	Support for agricultural composting and Green Mulch program.	• Program in place.	None	Potential additional cost over use of conventional fertilizer.

9.13 Recommendations

Industrial waste outreach program

#9-1 Develop programs or activities to inform industrial waste generators about issues relating to disposal of industrial wastes through the solid waste management system.

Street cleanings and vactor wastes

#9-2 The Tacoma-Pierce County Health Department and local public works agencies should work together to develop and implement appropriate standards for the disposal or treatment and utilization of street cleaning and vactor wastes.

#9-3 Generators of street cleanings and vactor wastes are encouraged to manage their wastes through either composting or petroleum-contaminated soils facilities to the degree that their wastes are compatible with those facilities. Landfill disposal should be a backup option.

#9-4 Pierce County should consider a separate facility approach only after Ecology issues the Facility Design Standards, and only after determining that none of the existing options (composting; PCS; landfill; or a new processing technology that becomes available via Chapter 6 recommendations) can appropriately manage these wastes.

Woodwaste and CDL

#9-5 Pierce County and other local governments should promote the source separation and recycling of recyclable CDL wastes from the commercial waste stream. Additionally, transfer stations open to the public should be modified to facilitate woodwaste and CDL recycling for residential self-haul customers.

#9-6 The Tacoma-Pierce County Health Department should ensure that regulations and enforcement programs are in place for the permitting of woodwaste handling systems. The Pierce County Solid Waste Division should develop an informational program to inform woodwaste generators of their disposal and recycling options.

#9-7 Pierce County and the Tacoma-Pierce County Health Department should support Ecology and other stakeholders to reduce regulatory impediments to woodwaste recycling and utilization, to the extent consistent with assuring protection of human health and the environment.

Biosolids

#9-8 Pierce County and other local agencies should collaborate in the development and implementation of biosolids co-composting facilities.

Septage

#9-9 Pierce County should investigate accepting septage at the Chambers Creek Wastewater Treatment Plant.

Agricultural waste and animal manures

#9-10 Pierce County should promote the use of composts on agricultural lands to minimize the fertilization and pesticide requirements, and to encourage the composting of animal manures.

Tires

#9-11 Local governments should request the Legislature to reinstate or devise a new funding system which would provide state grants to local governments for the cleanup and recycling of existing tire piles, and for the enforcement of disposal restrictions.

#9-12 Pierce County and the Tacoma-Pierce County Health Department should work together to develop a stricter enforcement and penalty system to discourage illegal tire dumping and sham recycling.

#9-13 Pierce County and the Tacoma-Pierce County Health Department should work together to develop methods to encourage community groups to identify and clean up small tire piles before they become large and to develop educational programs about proper methods to dispose of tires so as to prevent illegal dumping.

Infectious or Biomedical wastes

#9-14 Pierce County and the Tacoma-Pierce County Health Department should work together to assess the risks and issues presented by medical wastes from veterinary sources and animal wastes (other than manures) from other sources, and develop appropriate regulatory and management programs if necessary.

Prosecution

#9-15 Agencies should work together to develop effective prosecution of illegal tire haulers and illegal disposal site operators.

Dredge spoils

#9-16 Pierce County and other governments should monitor proposals for upland dredge disposal sites; consider environmental risk; and ensure that dredge disposal, if proposed, occurs in a manner consistent with the letter and spirit of this Plan.

CHAPTER 10

ENFORCEMENT AND ADMINISTRATION

This chapter describes the administrative structure for solid waste management planning, permitting, financing, and enforcement for the three waste management systems in Pierce County. It also discusses illegal dumping issues.

10.1 Goals

Goals: The Pierce County Council and the Solid Waste Advisory Committee (SWAC) established the following goals to govern administration and enforcement issues:

Goal: To ensure that the Health Department's permitting, monitoring, and enforcement programs for solid waste are adequately funded, staffed, and managed in a cost-effective manner.

Goal: To ensure that there is a coordinated approach by all enforcement agencies to resolve illegal dumping problems and to remove regulatory barriers that prevent clean-up in a timely manner.

Goal: To ensure that disposal service levels are maintained consistent with the Plan and that rates charged are equitable and reflect cost effective management and operation practices.

Goal: To promote inter-jurisdictional cooperation and the orderly, cost-effective, and environmentally sound management of the solid waste system.

Goal: To ensure thorough public discussion on proposed waste management projects.

Summary of actions taken: The 1989/92 Plan contained a number of recommendations which repeated or reinforced support for the development of curbside collection programs or directed the County to support educational activities about all waste management and recycling issues. The 1989/92 goals and recommendations, included in Appendix D, provided the context for earlier County actions. Other recommendations specifically related to enforcement and administration included:

- Continuance of the existing funding method used to support the Tacoma-Pierce County Health Department (TPCHD) and the Solid Waste section of the Pierce County Public Works and Utilities Department, Environmental Services Division.

- Recognition of Tacoma's continuing role for controlling all aspects of solid waste management within its corporate limits.

- Continuation of the coordinated household hazardous waste collection programs.

- Development of and support of zoning code amendments on issues related to solid waste facilities.

- Adoption of a country-wide flow control ordinance and a limitation on the importation of out-of-county solid waste until short term needs were identified.

- Establishment of a working group of waste managers from the public and private sector to share ideas and brainstorm problems.

- Development of a general public education program to coordinate with other related solid waste issues such as litter, illegal dumping, and increased disposal fees.

All of the 1989/92 Plan's recommendations relating to the establishment of waste reduction and recycling programs and public outreach were implemented, and hazardous waste collection programs were expanded and extended according to the adopted *Local Hazardous Waste Management Plan*. Also, revisions were made to Pierce County's Development Regulations (zoning code) to ensure a coordinated process between the County and the Health Department for the permitting and siting of solid waste, composting, and recycling facilities. As recommended, the tipping fee continues to be used as the financing mechanism to support Pierce County and Health Department programs. (Permitting and financing mechanisms for all jurisdictions are discussed in more detail later in this chapter.)

Recommendations about flow control, waste importation, and the working group of waste managers were partially implemented. A Recycling Roundtable was formed to provide guidance for developing recycling programs. Its formation was to generally carry out the Plan's recommendation to establish a group of waste managers to "keep each other informed, share new discoveries, and brainstorm on problem issues." The Roundtable acted in this capacity until members decided there was no need to continue meeting once the recycling collection programs were in place. Since that time, the Solid Waste Division has communicated directly to city managers and mayors about issues related to the Pierce County management system, and to private recycling and hauling businesses, as issues arise. The Solid Waste Division sponsors meetings with the cities and towns to respond to their inquiries, explain an issue, gather comment, and coordinate responses.

In 1995, Tacoma established a Rate Advisory Group to help evaluate and steer Solid Waste Utility rates and charges related to Tacoma's waste management system.

As discussed in other chapters, both flow control and the limitation of the importation of waste may no longer be legally possible.

The County adopted a handling system ordinance that would have allowed the County to direct the flow of waste to any one facility. It was never used to flow control waste. Instead, it has been used to provide annual public notice of all the existing solid waste and recycling facilities operating in Pierce County. (The ordinance is discussed in more detail later in this chapter.)

The following sections provide more detail about administration, enforcement, and funding issues.

10.2 Organizational Structure

There are three management systems in the county: the Pierce County/cities and towns system; the Tacoma/Ruston system; and Fort Lewis/McChord Air Force Base system. For all jurisdictions, the Tacoma-Pierce County Health Department (TPCHD) acts as the regulatory agency for the permitting of solid waste facilities, for enforcement of solid waste regulations, and to provide public education about these permitting and enforcement activities and related public health risks.

Following is a summary of the management structure for the three separate systems.

Pierce County/cities and towns: Until 1987, Pierce County government played only a marginal role in solid waste management. Up to that time, management was loosely provided through the Health Department's oversight of permitting and enforcement activities, through individual cities' collection contracts and the County's disposal contract, and through the services provided to residents in the unincorporated areas by the hauling companies. Oversight of collection rates of the hauling companies serving the unincorporated areas and some cities was, and continues to be, under the jurisdiction of the Washington Utilities and Transportation Commission (WUTC).

As a direct result of the 1989 Plan, the management system substantially changed. Pierce County added a Solid Waste Division to the Department of Public Works and Utilities; signed Interlocal Agreements with all the cities and towns; modified the disposal contract; and began working with private industry and the cities to implement the recycling programs of the Plan.

Interlocal Agreements: The Agreements state the general obligations of each municipality and provide for review, renewal, and amendment processes. Through the agreements, Pierce County's cities and towns join with the County in adopting, implementing, and enforcing the Solid Waste Plan. The three new cities, Edgewood, Lakewood, and University Place, did not sign agreements when they were formed. They continued to contract with the existing haulers that served their areas or are served under the franchise system. Thus, they remain part of the County's system which provides management and disposal for the unincorporated areas and 19 of the 21 cities and towns.

The County is responsible for countywide planning and management services for waste generated and collected within the unincorporated areas and 19 municipalities; the development of curbside recycling minimum service levels and other model recycling programs; countywide public education and outreach about solid waste disposal issues and waste reduction and recycling; data monitoring and collection; contracts for disposal rates; and to "cost-effectively plan for, design, and/or site disposal facilities."

Cities are responsible for collection within their jurisdictions; implementation of similar or the same residential recycling collection programs through their contracts with hauling companies; development of any other special collections or outreach specific to their jurisdiction; and coordination with the County on all other programs.

County management: The Pierce County Council's role is to develop policy through adoption of the Plan and to approve budgets in order to implement programs. The Council sends issues to the Solid Waste Advisory Committee (SWAC) for review and comment and adopts ordinances to implement the Plan as necessary. The County Executive, as the County's chief administrator, is responsible for directing the activities of the Department of Public Works and Utilities and for proposing a budget to the County Council. Both the County Council and the County Executive have a non-voting representative on the SWAC.

The Department of Public Works and Utilities Solid Waste Division has a solid waste manager and a small staff of solid waste analysts, planners, environmental educators, and an office assistant who

provide all the County's solid management services for the County and 19 cities and towns. The staff is also responsible for coordinating with the Tacoma Solid Waste Utility and the Tacoma-Pierce County Health Department. The Solid Waste Division staffs the SWAC and acts as the Executive's non-voting representative.

Solid Waste Advisory Committee (SWAC): The State requires that counties establish a SWAC "to assist in the development of programs and policies concerning solid waste handling and disposal...." (RCW 70.95). By law, the SWAC is established to report to the Pierce County Council. The SWAC members must be representatives from "public interest groups, citizens, businesses, waste management industry, and local elected officials."

The SWAC "serves in an advisory and technical capacity to the County Council…" and makes "recommendations to the Council on matters relative to the development of solid waste handling programs and policies." One of its main functions is to "provide a forum within the community for the expression of opinions regarding solid waste handling and disposal plans, ordinances, resolutions, and programs prior to adoption…" SWAC meetings provide regular opportunities for public comment. (Pierce County Code, Chapter 2.92).

At different times, and for particular issues, some cities in the county have established their own SWAC to look at an issue particular to their jurisdictions or an important countywide solid waste issue.

Inter-government coordination: The County Executive and the County Council communicate directly with the city and town mayors on an issue-by-issue basis. The County and its cities also have other forums available to raise and discuss issues about solid waste. In particular, there is the Pierce County Regional Council (PCRC) which is the planning group formed by all municipalities to resolve comprehensive land use planning issues under the Growth Management Act (GMA), RCW 36.70A.

To implement the Growth Management Act, Pierce County and the cities and towns have adopted *Countywide Planning Policies*, comprehensive land use plans, and development regulations. These policies, plans, and regulations provide procedures for coordination with other jurisdictions. They also provide guidance for the siting of capital facilities and the adoption of service levels for capital facilities. Particularly important to the solid waste system are those policies and procedures which identify "essential public facilities of a countywide or state-wide nature." Under State law, these are public facilities "that are typically difficult to site, such as…solid waste handling facilities." (RCW 36.70A.200 (1)). Under this law, no comprehensive plan or development regulation may preclude the siting of essential public facilities. (Solid waste policies from the *Pierce County Comprehensive Land Use Plan* and related policies from the *Countywide Planning Policies* are included in the Appendices.)

To implement the countywide waste reduction and recycling outreach programs, the Solid Waste staff regularly provides the cities and towns with information about recycling and education programs and an annual report. The office often responds to requests made by each city mayor or administrator about a variety of activities throughout the year.

In the last few years, Solid Waste has coordinated emergency storm or flood debris programs for the unincorporated areas and the 19 cities when an emergency has

been declared. The most recent example was in early 1997, when staff worked with the haulers and the Public Works Transportation Division to provide residents with curbside pickup and drop-off sites for debris from a severe, after-Christmas ice storm. More than 40,225 tons of debris were collected and processed into fuel or wood mulch.

Tacoma/Ruston: The City of Tacoma has operated a refuse utility (renamed the Solid Waste Utility) since 1929 and that agency is responsible for management and operation of the City's municipal solid waste and recycling collection programs and disposal system. As a joint-participant in the Plan, the City is responsible for its own planning, management, and disposal system. As explained in the other chapters, Tacoma coordinates with the County on educational efforts, special collection programs, and data monitoring about recycling and disposal tonnage.

The Tacoma Solid Waste Utility is responsible to the City's Department of Public Works, which is under the direction of the City Manager who reports to the City Council. The Tacoma City Council sets policy direction and adopts budgets and ordinances as necessary to implement the solid waste management programs of the City. Tacoma has a voting position on the Pierce County SWAC.

The Tacoma Solid Waste Utility provides Pierce County staff with information about Tacoma and its planning activities, collection and disposal programs, and any needs and alternatives that have been identified by the Tacoma City Council for insertion within the Solid Waste Plan.

The Town of Ruston has an interlocal agreement with Tacoma for disposal at Tacoma's facilities and an agreement with the County for adoption of the Solid Waste Management Plan. Ruston operates its own collection utility system. Like other communities, Ruston is responsible for collection, the recycling program, and coordination with Tacoma and the County. The Ruston Town Council adopts the Plan and ordinances to implement the Plan, and is in charge of the Town's refuse and recycling collection staff.

Fort Lewis/McChord AFB: Fort Lewis and McChord Air Force Base jointly use the Fort Lewis disposal system with separate but coordinated collection systems for solid waste and recycling. Fort Lewis has adopted the *Solid Waste Management Plan for the Fort Lewis Military Reservation* which describes the military system in more detail.

The County does not sign an Interlocal Agreement with the two military bases. However, the military systems are described in a summarized form in this document. As a result, this Plan acts as an umbrella document for the military in terms of coordination with the County, other cities, and the Health Department about general goals and issues shared by all jurisdictions. The Solid Waste Division works with the two bases on data collection and analysis of countywide recycling achievements and special recycling collection events. County staff also assist the two bases with public education and outreach, and school education services.

The Fort Lewis Public Works Department is the primary organization involved with solid waste management at Fort Lewis. Its responsibilities generally include refuse collection, management of the disposal and collection facilities, and oversight of contracts with waste haulers. The Fort's

solid waste plan was prepared under the guidance of the Fort Lewis SWAC.

McChord Air Force Base has its own management program which works with Fort Lewis and has established a Quality Recycling Program to specifically implement Federal directives on recycling, procurement, and other environmental compliance issues. (For more detail, please consult the Fort Lewis plan and McChord's brochure "Join McChord As It Travels The Recycling Highway.")

Tacoma-Pierce County Health Department (TPCHD): The Health Department is a separate agency from the County with a seven member board serving the entire county and all of its cities and towns. The Health Department's role in solid waste management is to implement programs to ensure solid waste handling complies with state and local solid waste regulations. This includes the permitting process and enforcement for solid waste facilities under the *State's Minimum Functional Standards* (MFS) (WAC 173-304) and the *Criteria for Municipal Solid Waste Landfills* (CMSWL) (WAC 173-351) and other waste-related local regulations.

The Health Department coordinates with the County and cities on special collections and public information programs, and administers the *Local Hazardous Waste Management Plan* adopted by all municipalities. The Health Department has a non-voting ("ex-officio") representative on the SWAC and participates in the planning and review of all solid waste management programs and the development of the Plan.

The Health Department works with other agencies charged with implementation of various enforcement regulations. For instance, the Pierce County Fire Marshal has responsibility for enforcement of tire pile storage requirements. Various municipal public works departments and the Sheriff's Department work with the Health Department to handle illegal dumping, nuisance, or public health-related issues resulting from illegal dumping, improper storage, or littering.

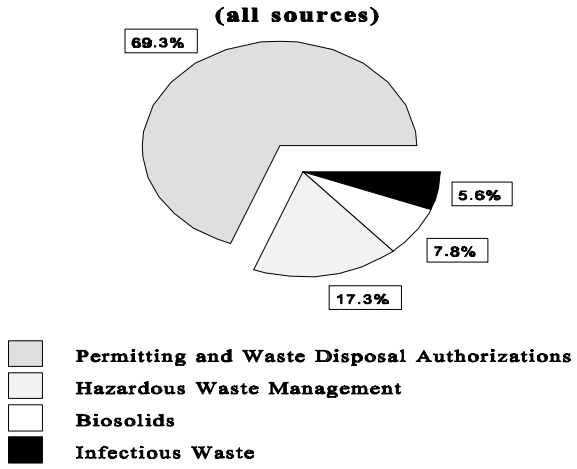
10.3 Monitoring, Enforcement, and Compliance Programs of the Health Department

General description: The Tacoma-Pierce County Health Department's *Source Protection / Waste Management Programs* assure protection of the public from health risks and environmental contamination resulting from the handling and disposal of solid and hazardous waste materials. Health Department staff work in partnership with other agencies and private industry to identify solid and hazardous waste handling problems and to determine economically and environmentally sound solutions.

Through these programs, the Health Department performs regulatory oversight of solid waste handling and disposal sites in accordance with State solid waste regulations and the Solid Waste Management Plan.

Regulatory oversight includes activities such as the permitting, monitoring, inspection, and enforcement of state and local solid waste regulations. The Health Department also participates in the development of state and hazardous waste management policies and regulations. The Waste Management Program includes a strong educational component with the household and small business hazardous waste program.

Figure 10.1 Allocation of 1997 Revenues (all sources)



Figures 10.1 illustrates how the Health Department allocates the revenues received from all sources to the Source Protection / Waste Management Programs. The following provides a more detailed description of these four programs.

Solid waste permitting: The largest proportion of the Health Department's solid waste efforts goes towards the permitting, monitoring, and inspection of solid waste facilities, as follows:

Landfills: The objective of landfill permitting requirements is to ensure that landfills are sited, constructed, operated, and closed in a manner that is protective of the environment, the public's health, and in compliance with the State's regulations.

To achieve these objectives, the Health Department reviews solid waste facility applications, engineering designs and reports, hydrogeologic reports, human health risk assessments, facility operation and closure plans, and various other documents. Once a facility is permitted, staff perform construction oversight with regards to facility design requirements; routine operational compliance inspections; methane and groundwater monitoring and data analysis; waste characterizations; enforcement activities; preparation of annual reports; and the drafting of annual permits. The program also provides information to the general public and special interest groups regarding both current and closed landfills.

Other facilities: For other facilities, the objective is to assure that facilities do not create public health problems, nuisances, or environmental contamination. The Health Department provides similar services as those provided to landfills which includes inspections, document review, annual reports, education, enforcement, and general permitting activities.

Enforcement: To ensure facilities are in compliance and to protect the public, staff must sometimes take actions, such as establishing compliance schedules and requiring remediation or corrective action at sites not in compliance. Two additional enforcement tools are revocation or suspension of solid waste permits. Additionally, the Health Department has the ability to not renew a solid waste permit if the permit holder is unwilling or unable to comply with the conditions of the permit.

The following Table 10.2 illustrates the solid waste permitting workload for 1996 and 1997.

Table 10.2 Solid Waste Permitting Workload		
Landfills	**1996**	**1997**
Inspections of permitted MSW landfills	80	75
Inspections of permitted inert and demolition landfills	15	20
Inspections and methane monitoring of closed landfills	48	50
Other facilities		
Inspection of composting and recycling facilities	101	70
Inspection of transfer stations, incinerators, and contaminated soil treatment facilities	71	75

Waste Disposal Authorization (WDA): This program provides a mechanism to review and authorize the disposal of suspect wastes at Pierce County facilities. Program components include: review of available information regarding the waste from the generator; coordination of sampling and analysis requirements with landfill operators and the Washington State Department of Ecology; inspection of the waste generation process and sample collection; review of waste analysis results; issuance or denial of the disposal authorization; inspection of disposal facilities for compliance with disposal authorization requirements; development of policies and procedures related to the WDA program; and education regarding various waste streams.

Health Department staff work with the generators of these questionable or unknown wastes to inform them of the relevant state and local regulations, as well as of the potential environmental and human health risks posed by a given waste material. As part of the process, the staff periodically make on-site visits to more completely review a waste stream or to observe sampling events.

The Health Department also works closely with the permitted solid waste facilities that accept wastes via the WDA process and has begun to work with businesses on a more industry-wide basis. The Department has identified business types most likely to generate wastes that are marginal for landfilling and they have been contacting and advising the businesses of the process that is available for proper disposal.

Enforcement is through acceptance or denial of the WDA. The Health Department continually tracks the permits and assesses ways to improve the process. This tracking and evaluation system has led to the abolition of WDA's for asbestos-containing materials and to the educational programs already discussed. The Health Department reviews about 80 WDA's per year and may approve less than half.

Biosolids: The Health Department provides permitting services to the local wastewater utilities for the controlled land application of biosolids. Properly handled, biosolids can be utilized as a fertilizer and soil conditioner. Biosolids are no longer defined or regulated as a solid waste. The State has new permitting regulations that remove biosolid land applications sites from the solid waste regulation process. While the permitting procedures have changed, the Health Department continues many of the same functions under different funding mechanisms.

The program has provided services which include: review of permit applications and environmental checklists for all proposed land application sites; mapping and recording of all application sites; pre-

application and post-application inspections; review of biosolids quality reports from wastewater treatment plants; enforcement; and education for both the public and other agencies regarding biosolids. Staff also has reviewed sources to obtain information regarding details of an individual site, such as surrounding drinking water wells, the types of soils on-site, and the location of surface waters on or near the site (river, lakes, ponds, creeks, etc.). A database has been kept on all sites to determine site life and potential impacts. Possible enforcement actions have included the withdrawal of the permit and/or monitoring to evaluate potential impacts. The Health Department typically has permitted 80-90 biosolids utilization sites per year.

(Chapter 9 Special Wastes includes more information about biosolids management alternatives in relation to solid waste issues.)

Infectious waste management: The focus of this program is to ensure that infectious waste is handled, treated, stored, transported, and disposed properly as mandated by local ordinances (Pierce County Code, Chapter 8.38). Program activities include: the inspecting and permitting of all infectious waste generators, transporters, and treatment facilities; review and approval of alternative treatment technologies; providing education information for infectious waste facilities; and serving as a source of information for other agencies and the general public.

On an annual basis, 50% of the permitted infectious waste facilities receive individual site inspections while the other 50% are required to complete a self-inspection with reports submitted to the Health Department.

The Health Department has produced a number of publications for use by the general public and which have been distributed to the regulated and unregulated infectious waste community. For instance, a "syringe safety" brochure was given to individuals who need information on the handling and disposal of home-generated sharps, and a brochure about how to develop an infectious management plan is provided as a tool to infectious waste management facilities, businesses, and individuals. The staff has also conducted a survey of the infectious waste generating community to gather information regarding the amount of waste that is generated, methods of handling and disposal, and other information.

Health Department staff works with all infectious waste management facilities that are not in compliance. Available enforcement tools include compliance schedules, administrative hearings, permit revocations, facility closure, and criminal prosecutions.

(Chapter 9 Special Wastes defines and describes infectious waste in more detail and identifies possible additional activities.)

Local Hazardous Waste Management: Local governments are required to plan and implement programs to address Household Hazardous Waste (HHW) and Small Quantity Generator Hazardous Waste (SQGHW). The Health Department, with Pierce County Solid Waste Division and Tacoma Solid Waste Utility, addresses these issues under the guidance of the *Tacoma-Pierce County Local Hazardous Waste Management Plan*, which has been adopted by all municipalities. The Health Department works with the various cities and agencies and also provides education

and training services to Pierce County residents and businesses.

This Health Department service differs from the other programs in two respects. First, it is funded by Department of Ecology grants, in coordination with similar grants received by Pierce County Public Works and Utilities and by City of Tacoma Solid Waste Utility. The local matching funds for this grant are currently received from Pierce County.

Secondly, the program has little or no "regulatory" emphasis. The goal is to provide training and information to enable county residents and businesses to:

(1) generate less hazardous waste; (2) use hazardous products, when needed, more safely; (3) properly store and dispose of hazardous wastes; and (4) comply with the various regulations that address hazardous substances/hazardous waste. Currently, staff are completing an analysis of data from a survey of small businesses to identify their waste management issues and how they prefer to receive information. As discussed in Chapters 4 and 7, it is through this program that the Health Department, Tacoma, and the County have established agreements which allows all county residents to take household hazardous waste to the Tacoma collection facility.

The following are some of the program' other public outreach aspects:

- *Hazardous Waste Line:* A toll-free hotline provides residents and businesses with information regarding proper storage and disposal of hazardous wastes. Also provided is information on alternative (less or non-toxic) products and on applicable regulations. The hotline has been in service since late 1991, and receives an average of 350 calls per month. In 1997, it handled approximately 4,200 calls.

- *Fair / Community Events:* Displays are designed and staffed at several home and garden shows, the Spring Fair, Pierce County and Western Washington Fairs, and at major trade shows (e.g., Automotive Service Association). A hazardous waste display is available for use at local environmental fairs and community centers. In addition, the Health Department staff make numerous presentations to local community and business groups.

- *Publications / Publicity:* The Health Department has developed a number of publications for use by the general public as well as several publications targeting specific groups. Examples include "Household Hazardous Waste" brochures used by several agencies and distributed throughout Pierce County, and a small business hazardous waste disposal directory that is used by many county agencies. The Health Department periodically updates and reprints a listing of used oil collection centers throughout Pierce County.

- *Business Inspections: The* Health Department conducts visits to local businesses to review current waste management practices, evaluate compliance with applicable regulations, and describe ways to improve waste handling. These visits are educational, not enforcement, in nature. Automotive / allied trades and printers / photo developers have been emphasized in prior years. Currently, the Health Department is designing a pilot project wherein visits would be concentrated in a "wellhead protection zone." This project is expected to be implemented in coordination with a local water purveyor and with the Health Department's Wellhead Protection Program.

Health Department staff also assist businesses in classifying their waste as

hazardous or not, and to interpret dangerous waste regulations. These business visits are routinely coordinated with other agencies, including Pierce County Sewer Utility and Tacoma Solid Waste Utility.

- *Oil and Antifreeze Collection:* In response to demand from residents, staff worked with private businesses to develop drop-off sites for used antifreeze and contracts separately with a hauler to transport and recycle the antifreeze. There are currently five Department-sponsored sites accepting antifreeze, with more planned. In addition, where the existing system of private oil collection sites does not provide adequate service, the Health Department staff can establish oil collection sites. There is currently one sponsored oil collection site located in Key Center. Additional sites in Sumner-Lake Tapps-Orting area are planned. Again, these collection efforts are the "last-resort" where private sector collection has been inadequate. Staff periodically survey collection site operators to gauge overall reclamation rates, or to evaluate the need for additional sites.

(Additional information about the coordination of these household hazardous waste programs is in Chapter 4 Waste Reduction and Recycling and in Chapter 9 Special Wastes.)

Compliance Program: The primary agency charged with responding to illegal dumping complaints is the Health Department. The Compliance Program staff of the Health Department handles illegal dumping and improper storage complaints for all of the cities and the unincorporated areas of Pierce County. The major funding source for this program comes from the "pool" of monies provided to the Health Department from all municipalities. Unlike other Health Department waste management programs, this program is not funded by tipping fees.

When incidents are reported, the staff of the Compliance Program responds to complaints and investigates the dumpsite. Illegal dumping is a criminal offense. If they are able to identify the dumper through the contents of the material or if a license plate number is reported, the Health Department can require the violator to cleanup the site. If there is sufficient evidence and a reluctance of the violator to do the cleanup, the Health Department can press for prosecution, with a maximum of 90 days in jail. However, the enforcement of illegal dumping complaints does not seem to be a high priority within the legal system. More money may be spent trying to enforce cleanup than it might cost to do the cleanup. Legally, money collected through the court system cannot be used to fund the Health Department's programs.

In the event that the dumper is not identified, the property owner is responsible for the cleanup and is notified by the Health Department of the complaint. If the site is on public right-of-way, the Health Department notifies the appropriate municipal public works department. The Health Department does not pick-up illegally dumped materials. The Sheriff's Department is authorized to issue citations and enforce a $1000 fine if they encounter the violator in the act of dumping.

In 1996, the Compliance Program staff handled 384 illegal dumping requests and 484 requests as of September 1997. These totals included sites in unincorporated areas and all cities and towns. In 1996, this represented approximately 1,970 service work hours.

The activities of the Compliance Program include more than just handling illegal dumping. Other activities include: resolving problems with failing septic systems and broken public sewer lines; rodent investigations and control; and dealing with the improper storage or disposal of solid waste / garbage. Improper storage in not a criminal offense, and it is handled through a citation process.

(More detail about illegal dumping is found later in this chapter in section 10.6.)

10.4 Permitting

Solid waste permits: A variety of solid waste and recycling facilities require a solid waste permit administered by the Health Department. To begin operation, the facilities must be in compliance with the State's *Minimum Functional Standards* (MFS) (WAC 173-304) or the *Criteria for Municipal Solid Waste Landfills* (WAC 173-351). From time to time, these regulations are amended or replaced by the State and superseded by new regulations. But in general, the regulations adopted by the State include siting and design requirements, a plan of operation, and other standards to protect ground and surface water and to prevent air pollution. When the State amends the WACs, the Health Department must conduct a public review adoption process to revise or adopt the new or superseding regulations.

Currently, permits for proposed solid waste facilities are site specific although this may change in the future for certain types of activities to be identified by the State. The applicant must show evidence of compliance with State environmental rules and include plans, reports, and other support information. The Health Department reviews the application and makes a determination as to whether or not the proposed facility meets all applicable laws and regulations, conforms with the most recently adopted Solid Waste Management Plan, and complies with all zoning requirements. If the application is not complete, the Health Department can deny the permit.

The standards include requirements for waste piles and outside storage but do not apply "to any facility that recycles or utilizes solid wastes in containers, tanks, vessels or in any enclosed building or to single family residents or farms engaged in composting their own wastes." (For more detailed information, the reader should refer to the appropriate WAC or any superseding regulations adopted by the State.)

Review process: Once the Health Department has determined the application is factually complete, the Washington Department of Ecology makes a technical review of the application and recommends either for or against issuance of the permit. Following Ecology's review and recommendation, the Health Department can either issue or deny the permit. However, Ecology may appeal the issuance of the permit to the State's Pollution Control Hearing Board (PCHB).

Permit requirements apply to any solid waste facility covered under the MFS no matter in which municipal jurisdiction it is to be located, other than on tribal land, but including the military reservations. The permits require annual reporting to the Health Department and, currently, are renewed annually after review for compliance.

In 1997, the Legislature passed a bill directing Ecology and the State SWAC to

conduct a comprehensive review of the permit system. The resulting study, *ESHB 1419 Report: Washington's Solid Waste Permit System*, identifies a number of definition and permitting issues and alternatives. The report may, ultimately, result in changes to the existing permitting system and facility requirements.

Facilities on tribal land: The U.S. Environmental Protection Agency (EPA) is the agency responsible for the permitting and enforcement of solid waste facilities on tribal land. Tribes must meet the EPA requirements under the Federal regulations (RCRA) for landfill design and siting. The permitting procedures are different from the State's regulations, but for landfills the requirements are essentially the same. For other facilities, tribes must also meet Federal environmental regulations.

However, for tribal "fee" land in Pierce County the regulations are not as clear. "Trust" land is property owned by a tribal member or the Tribe and placed in the trust of the United States and no taxes are paid on it. "Fee" land is property owned by a tribal member or the Tribe and requires payment of taxes. In the 1988 Puyallup Land Claims Settlement Agreement, the parties agreed to have the State and EPA have environmental regulatory authority on "fee" lands (about 95% of the land) while the tribe and EPA continue to have authority over trust land. It is not clear if solid waste or recycling facilities proposed on the Puyallup Tribe's "fee" land would be required to meet the State's Minimum Functional Standards (WAC 173-304) under this agreement. It appears that it applies, but has not yet been tested.

Land use permits: Solid waste and recycling facilities must be in compliance with the local jurisdiction's zoning requirements. Generally, in most municipalities, some facilities may be permitted outright, which means they don't need to go through a public hearing approval process as long as they are located in the appropriate zones, although they must meet standard building and other development permits. Other facilities may require a land use permit, which entails completing a public hearing process. Public hearings require public notification of the application and provide an opportunity for public testimony.

For unincorporated lands in Pierce County, the Hearing Examiner conducts the hearing on a land use permit under the procedures contained in the Pierce County Code (PCC). The Hearing Examiner can deny or approve the application and can condition approval upon the applicant meeting a number of development standards and other requirements to mitigate impacts.

Tacoma and other cities and towns have their own individual zoning regulations and adopted procedures with similar processes that allow facilities in certain zones, either permitted outright or though a public hearing permit process.

Coordinated review: Within recent years, the State adopted legislation that requires all jurisdictions who plan under the Growth Management Act to streamline the permitting process and State Environmental Policy Act (SEPA) review. In Pierce County regulations, the land use permit process provides for integration of environmental review and appeal. The analyses and design requirements that are needed for the solid waste permit can be used for the land use review process. Within

the review process there is also the option for a "consolidated permit review" which provides for reviewing the requirements of a number of types of permits, including those of other agencies, at the same time.

These new review processes are designed to reduce duplication and to allow for reports, analyses, and mitigations which are standard requirements of the solid waste permit to also be used for the environmental review and decision making during the land use permit review.

Pierce County zoning regulations: For the unincorporated areas, with the exception of the military reservations, zoning is established by the policies and regulations implementing the *Pierce County Comprehensive Land Use Plan*. The Plan's designations and policies provide for distinctly different types and densities of development between urban and rural areas. In general, rural areas are planned for low density residential, agricultural, and forest land with small commercial nodes to serve the immediate area. The rural residential zones also allow for many resource uses. The Development Regulations (PCC, Chapter 18.A) were adopted to implement the Plan. These zoning regulations identify in which zones facilities are allowed and by what type of process.

As directed by the 1989/92 Solid Waste Plan, the Solid Waste Division worked with the Planning and Land Services Department (PALS) to assure that all types of solid waste and recycling facilities are allowed under Pierce County regulations in unincorporated lands. Under this code, solid waste facilities / businesses may be allowed outright or through either of two types of permit processes which require a public hearing and allow for public testimony into the record, the Conditional Use Permit (CUP) or the Public Facility Permit (PFP).

The County established the PFP process to provide for the siting of public facilities in order to address policies of the *Comprehensive Land Use Plan*, the *Countywide Planning Policies*, and the GMA requirement for providing a process to site "essential public facilities."

The procedures for the two public hearing permits are similar; however, the PFP requires additional factors to be considered related to public ownership of the facility or the need for the facility as identified in a general utility comprehensive plan, such as the Solid Waste Plan. Its purpose is to recognize that "certain public facilities provide necessary services to other uses but are deemed unique due to factors such as: siting criteria, size, technological processes, and requirements for municipal comprehensive facility planning and budgeting." One of the findings for the permit requires that public facilities be consistent with the goals and policies of the Comprehensive Plan and the Solid Waste Plan. (Findings for a Public Facility Permit, as listed in Chapter 18A of the Pierce County Code, are in the Appendices.)

The Pierce County Development Regulations for unincorporated areas also contains buffering, landscaping, and fencing standards specific for solid waste and certain recycling facilities. These were developed to coordinate with and complement the requirements of the Health Department's Solid Waste Permit.

Commercial / industrial type of facilities: In general, the solid waste and recycling facilities are treated like any other industrial or commercial business and are allowed in zones which allow those types of activities. Some activities, such as home composting or recycling drop-off sites, are allowed in all

zones or as an accessory use in any zone. This is also true for those waste piles and surface impoundments, which require a solid waste permit. These last two facilities are generally recognized as a method for an industrial or agricultural business to properly handle their waste. If the industry is allowed in a zone, then these facilities are allowed as an accessory use.

Large-scale recycling businesses such as a materials resource recovery facility (a "clean MRF") are allowed outright in urban industrial areas. They are not allowed in the small rural commercial zones since the purpose of these zones is to provide only those commercial services needed to serve the rural residents of the surrounding area. Small buy-back businesses are allowed in many commercial zones, a mixed-use district, and rural commercial areas.

Composting facilities that do not compost municipal solid waste (MSW) are allowed in urban industrial areas, with a public hearing permit in most rural residential and forest land zones, and outright in the agricultural zone.

MSW facilities: Facilities which handle municipal solid waste, or are those types of recycling facilities which are essential to the County's waste management system, are allowed throughout the County in many zones because they provide an essential service. Transfer facilities, recycling facilities which separate recyclables from mixed municipal solid waste (a "dirty MRF"), composting facilities which compost municipal solid waste, landfills, and waste-to-energy facilities require a public hearing permit process (either a CUP or PFP). In urban zones they are only allowed in industrial areas unless they are a small-scale Drop-Box Transfer facility. Small drop-box transfer stations are allowed in all zones through a public hearing process.

In rural areas, facilities that handle municipal solid waste are allowed in most rural zones and in some limited commercial zones through the public hearing permit processes. The purpose of allowing these facilities in rural areas is to be enable them to be located on the same site of a municipal solid waste landfill or to provide an efficient transfer service system for rural residents and because they provide an essential service. The rural areas have been identified as the areas most likely to meet the environmental siting requirements under the state and federal siting regulations (*Phase I Landfill Siting Study*) for landfills. By allowing these facilities in rural zones through a public hearing process, the County has ensured that the County's regulations do not preclude siting of "essential public facilities" as required by RCW 36.70A. 200.

(Tables in the Appendices illustrate the zoning for solid waste and recycling facilities in the Pierce County Development Regulations, PCC, Chapter 18A.)

Handling system ordinance: Pierce County adopted a waste handling ordinance in 1990 (PCC, Chapter 8.30 Solid Waste Handling System) which is administered by the Solid Waste section of the Department of Public Works and Utilities. The ordinance applies to "the reduction, processing, recycling, and disposal of solid waste as well as solid waste facilities." It broadly defines solid waste to include almost any waste handling, composting, or recycling facility, or processing activity. It requires the County to designate solid waste facilities for waste originating within the unincorporated areas of the County or from any city using the

County's waste management system. It "makes unlawful for any person to dispose of or otherwise handle any solid waste originating in the county or elsewhere unless such disposal or handling is consistent with" the Solid Waste Plan or expressly allowed by County ordinance or contract.

The intended use of the ordinance was to "flow control" waste and also to assure that no waste was taken to facilities that were operating improperly without land use or solid waste permits. It has never been used to control the flow of waste to any facility. With the U.S. Supreme Court's decision in *C&A Carbone vs. Clarkstown* in 1994, flow control of waste is no longer a viable option for local governments and the ordinance might not be able to be used for this reason. (Flow control is discussed in more detail in Chapters 5, 6, 7, and 8).

While the ordinance hasn't been used for flow control, it has been used to officially notify the general public about facilities operating in Pierce County which have up-to-date permits. As required by the ordinance, the Solid Waste staff works with the Health Department each year to publish a list of all solid waste, composting, and recycling facilities operating under current permits from the Health Department. The staff reviews the status of each permit and whether or not the facility is meeting the requirements of other agencies' permits, and then publishes a legal notice.

The ordinance has some weak regulatory teeth that could be used to prevent a facility from operating if it doesn't meet Health Department standards. However, there has been no occasion to apply these enforcement rules; the Solid Waste Permit process has been sufficient to resolve issues with problem facilities.

10.5 Financing Systems

This section briefly outlines the funding mechanisms that support the solid waste management systems in Pierce County, the City of Tacoma, and the Tacoma-Pierce County Health Department. The solid waste management systems for Fort Lewis and McChord AFB are funded by the Department of Defense (DOD), just like any other federal military function.

Pierce County system: The primary funding source for the Pierce County management system is the tipping fee. It includes the cost of disposal plus the cost of other elements of the solid waste system. These other elements include: transfer stations, the cost to transfer waste between facilities, the County's Purdy composting facility, and administration. It also includes public outreach, planning, and education programs conducted by the County and the Tacoma-Pierce County Health Department. Table 10.3 provides a more detailed list of what the tipping fee paid for in 1999.

The tipping fee is established through Pierce County's contract with Land Recovery, Inc. (LRI) to provide waste handling and disposal services to residents and businesses of unincorporated Pierce County as well as to the residents and businesses of the 19 cities and towns who participate in the Pierce County disposal system. Waste export provisions of the contract were amended in 1997 to extend to the year 2011; and the entire agreement was revised in 1998. A new Pierce County LRI Waste Handling Agreement took effect January, 1, 1999. The contract directs the relationship between the County and LRI by setting out basic rates for waste disposal, transfer, recycling, and administration programs. It establishes a process to adjust those rates for inflation or compliance with new environmental law or standards.

According to the contract, the tipping fee is set administratively and "shall not require an ordinance or resolution of the governing bodies of the County. However, before implementation of any proposed rate increase, the County Executive shall report to the County Council the basis for such an increase."

Rate-setting process: LRI submits an informal rate increase proposal to the Solid Waste Division that works with LRI to finalize the proposal for submission to the County Executive. In turn, the Executive submits the proposal to the County Council for review. The Council may hold hearings on whether the proposed increase is consistent with the terms of the Pierce County-LRI contract. If the Council disputes the appropriateness of the increase, the contract outlines an arbitration process. If the Council does not object to the increase, tipping fees will increase as proposed.

When the tipping fee increases, the individual hauling companies must pay the higher rate each time a collection truck crosses the scales. Once the fee increase has been approved, the haulers must then go to the appropriate regulatory authorities, either a city council with which they contract or to the Washington Utilities and Transportation Commission (WUTC), to get their collection rates adjusted in accordance with the higher disposal fee.

The fee that the customer pays after approval from the WUTC or the city or town, includes the cost to pick-up waste and the cost of the tipping fee. Some cities attach the cost of municipal overhead, franchise fees, or taxes to the collection fee. Collection fees are stated on a dollars per container per month basis.

Through 1998 the County's share of the tipping fee remained a constant per ton rate of $5.83 per ton. This rates pays for the services of the Solid Waste Division and the Health Department's Waste Management Division and to pay the bonded debt on any capital facilities. It does not fund the Health Department's Compliance Program, which handles illegal dumping.

The only debt that the County has contracted for solid waste facilities was for $2.1 million in General Obligation Bonds to build the County's Yardwaste Composting Facility at Purdy. These bonds will reach maturity in December 2001. In a recent survey of Washington counties, Pierce County had the lowest per capita debt for solid waste facilities at $3 per person.

In using the County share of the tipping fee, the Solid Waste Division and the Health Department offer their solid waste programs to all county residents. The two agencies coordinate some functions with Tacoma, Fort Lewis, and McChord Air Force Base. This portion of the tipping fee is also used as the match for State grants, such as the Coordinated Prevention Grants (CPG).

The Solid Waste Division also receives some grant monies to support water education and pollution prevention programs from the State's Centennial Clean Water fund.

While the County's per ton share remained constant, the following changes occurred since 1991:

- the County's service area population increased over 16%;
- the percentage of waste being recycled increased from 36% to 50%;
- per capita waste disposed declined by 4%; and
- inflation raised urban consumer prices by 25%.

Figure 10.3 Services Funded Through Pierce County Tipping Fees (per the terms of 1998 Waste Handling Agreement which took effect on January 1, 1999)

Disposal Services

- Disposal of solid waste in a landfill (or landfills) permitted under Chapter 173-351 WAC[1]
- Federal, state, and local environmental regulatory compliance (closure, post-closure, etc.)
- Pierce County Litter and Clean-up Waste Disposal Credit

Transfer and Recycling Activities

- Solid waste transfer facilities at Anderson Island, Hidden Valley, Key Center, Prairie Ridge, and Purdy
- Recycling services at all transfer facilities
- Residential compostable yardwaste collection at transfer facilities and landfill
- Transportation of waste from transfer facilities to landfill
- Transportation of recyclables from transfer facilities to market
- Transportation of compostable materials from transfer facilities to shredding operation
- Pierce County Yardwaste Composting Facility at Purdy (capital & operations subsidy to provide low cost composting)
- Compostable waste shredding operation at Hidden Valley
- Transportation of shredded yardwaste from Hidden Valley to Purdy
- Provision of Curbside Recycling Bins for programs throughout Pierce County

Solid Waste Division and Health Department

Pierce County Public Works and Utilities, Solid Waste

- development, maintenance, and implementation of the Solid Waste Management Plan
- implementation of curbside recycling, yardwaste collection, and composting programs
- support/outreach to Pierce County recycling companies
- staff support to the Solid Waste Advisory Committee
- waste reduction and recycling public education programs (youth and adult)
- public information and outreach

Tacoma-Pierce County Health Department, Waste Management Division

- solid waste facility permitting
- solid waste enforcement
- development, maintenance, and implementation of the *Local Moderate Risk Plan* (household hazardous waste) coordination of household hazardous waste management programs

[1]For waste that is long-hauled to a landfill outside Pierce County, the following additional services are included:

- waste containers for shipment via truck and rail
- compaction of waste in preparation of shipment
- in-county transport of waste containers from private transfer stations to intermodal facility
- intermodal facility for transfer of waste containers from truck to rail
- rail or truck transportation to out-of-county disposal site

Tacoma: Disposal and collection rates for the City of Tacoma Solid Waste Utility are determined by the Tacoma City Council. Collection service fees and rates are calculated on a cost per service basis, with a variable fee schedule based on the frequency of service and the amount collected. Service fees are proposed by the Solid Waste Utility for review by the City Council and are established through City ordinances. The adoption of City ordinances requires readings at two City Council meetings. The reading at the first meeting includes a public hearing of the proposed rate ordinance. Each ordinance must also have a majority vote of the City Council.

Tacoma established a single rate for residential services which includes all curbside recycling services, taxes, and other related charges. In 1995, Tacoma established a Rate Advisory Group to help evaluate and steer Solid Waste Utility rates and charges.

Health Department: In addition to a portion of the tipping fee funneled through the Pierce County Public Works and Utilities Department, the Tacoma-Pierce County Health Department has other sources to help assist in solid waste permitting and enforcement activities and with illegal dumping compliance programs. These include: solid waste permit fees charged to applicants for each new facility and for annual renewal; matching grant programs such as the State Coordinated Prevention Grants (CPG); and funding from each of the cities and towns which pays for the Health Department's other programs.

Unlike the other solid waste related services, the Health Department Compliance Program's work on illegal dumping is funded through neither the Health Department's share of tipping fee, grants, nor permit fees, but from a portion of the contributions made by local governments to fund the general operations of the Health Department.

Figures 10.4 and 10.5 summarize existing funding mechanisms available for use by Pierce County, Tacoma, other cities and towns, and the Health Department.

Figure 10.4 Primary Financing Mechanisms
Collection Fees and Utility Rates
The funding sources most visible to the public are collection fees or utility rates assessed by the private waste collection companies, recyclers, the City of Tacoma, and those cities that contract for waste services but perform the billing themselves. The primary purpose of these fees is to assess each customer their share of collection and disposal costs. Other funding sources, discussed below, are often embedded within collection fees or utility rates.
Facility Tipping Fees
To fund solid waste handling and disposal operations, public and private transfer and disposal sites charge tipping fees. In the Pierce County/ cities and towns system, the County's contractor, Land Recovery Inc. (LRI), charges tipping fees to solid waste collection companies and self-haulers as authorized by its contract with Pierce County. The City of Tacoma charges self-haulers a tipping fee, which offsets disposal costs not covered in the customer's utility bills.
Tipping Fee Surchargers
Because Pierce County does not own or operate its own waste collection or disposal services, the County does not directly collect funds to finance its solid waste management responsibilities. Instead, LRI, per its contract with Pierce County, remits to the County a portion of tipping fees collected. The City of Tacoma imposes a surcharge on self-haulers to fund the Tacoma CARES program described elsewhere in this chapter.
Inter-Jurisdictional Transfers
The Pierce County Solid Waste Division transfers a portion of its tipping fee surcharge to the Tacoma-Pierce County Health Department. This provides the Health Department's match for grants. In addition, cities and towns each contribute monies to fund the Health Department's non-waste programs, including the Compliance Program, which handles illegal dumping.
Bond Financing
To provide up-front funding for capital facilities, jurisdictions often turn to debt financing. Pierce County built the Yardwaste Compost Facility at Purdy using Long Term General Obligation Bonds. The debt is being repaid as LRI remits to the County a portion of solid waste tipping fees equivalent to the County's annual debt obligations. The bond covenant was written to require the County to provide funds from the general fund if the tipping fee provides insufficient funds.
Grants
Pierce County, the City of Tacoma, and the Tacoma-Pierce County Health Department fund portions of their operations with Coordinated Prevention Grants awarded by the Washington Department of Ecology. Grant funding, however, must be matched by local funds. This means that systems or programs cannot be funded exclusively by grants. The Federal Emergency Management Agency also has awarded grants to offset some of the costs of emergency storm and flood debris removal.
Service/ Permit Fees
The Tacoma-Pierce County Health Department charges fees for the services it provides to regulated solid waste handling facilities.
Franchise Fees and Utility Taxes
Cities have two funding sources that are not available to the County. Cities which contract for waste collection services often include a franchise fee within the contract. Proceeds may assist the city in providing customer services, billing or Spring cleanup programs. In addition, cities can tax waste collection companies in much the same way they can tax other utilities.

Figure 10.5 Secondary Financing Mechanisms
Fund Balances and Interest
Over time, the County's Solid Waste Fund has accumulated a fund balance. The balance itself, and interest accrued on the balance, is included in each year's County budget. In recent years, the fund balance has helped the County fund programs such as emergency storm debris cleanups prior to the receipt of federal grants.
Reserve Accounts
Although ultimately funded through tipping fees, collection rates, or taxes, reserve accounts should be mentioned in their own right. By law, disposal facility operators must maintain closure and post-closure accounts to properly close and monitor landfills. Other funding sources are structured to ensure that these reserve accounts are properly funded. In the Pierce County/cities and towns system, Solid Waste acts as a trustee for the closure and post-closure accounts that LRI must maintain for its Hidden Valley Landfill.
Road Fund
The Transportation Services Division within Pierce County Public Works and Utilities earmarks a portion of road fund to offer the Adopt-A-Road program, which handles litter collection on the public rights-of-way in unincorporated Pierce County.
Host Fees
To offset impacts on the local community and to compensate County ratepayers for the longstanding contributions to the development and operation of the Hidden Valley Landfill and the Intermodal Facility, LRI remits to Pierce County host fees for every ton of waste it accepts that did not originate with the Pierce County/cities and towns disposal system. By contract and ordinances, host fees relating to waste coming into the Hidden Valley Landfill are earmarked for open space preservation programs.
Compost and Commodity Sales
Pierce County and LRI share revenues earned from the sale of compost produced at the Pierce County Yardwaste Composting Facility. Pierce County's share is contributed to open space and parks programs. LRI, the City of Tacoma, and private sector haulers and recyclers receive revenue from the sale of recyclable materials collected through their recycling programs. These revenues offset collection and tipping fees.
Department of Defense
The Department of Defense funds solid waste and recycling programs at McChord Air Force Base and Fort Lewis.

10.6 Illegal Dumping

Who, what, and why: For the purposes of this Plan, illegal dumping refers to the intentional dumping of solid waste on another person's property without their knowledge or consent and includes littering along road right-of-ways. The term does not apply to improper storage of waste or improper disposal of waste on one's own property. However, the Health Department reports that many of the illegal dumping complaints they receive and investigate turn out to be improper storage of waste by the individual who owns the property. Improper storage may be part of a larger County enforcement issue relating to illegal or non-conforming businesses, particularly junk and salvage yards. Enforcement agencies are looking at new ways to coordinate efforts to improve enforcement and resolve some of these problems. These are not the responsibility for solid waste planning but enforcement efforts for waste storage and handling might be coordinated with code enforcement of other issues.

It is unclear just how much illegal dumping is occurring and whether it is on the rise. There is a common perception among the general public and the media that it is increasing. It is difficult to document that there has been an increase. This is because

the many agencies and individual land owners in Pierce County which must deal with illegal dumping, litter, or improper storage don't pool information about the sites they investigate and cleanup, nor is there one source for how much is spent each year by all agencies and private landholders in resolving the problem.

The 1989/92 Plan did not describe illegal dumping in any detail. Records in the Solid Waste office indicate that the number of complaints have been higher than the complaints handled by the Health Department in 1996 and '97, which were 386 and 484, respectively. Past records are not comparable because the Health Department uses a different system to categorize complaints than in the past.

There is a common consensus among agencies, however, that a problem exists and has always existed. Everything from abandoned mobile homes, stripped and burnt vehicles, tires, appliances, animal carcasses, old furniture and organic debris, to general household garbage has been dumped.

Illegal dumpsites are not only eyesores but also can pose a number of problems. They can pollute air and water, breed insects, attract rats, and generally become a nuisance or a health risk. Once started, sites tend to attract other dumpers. The cost of disposing illegally dumped waste can be far greater than the original cost of proper disposal. The problem is that those who dump displace the costs onto the general society.

The Health Department reports that the most common materials illegally dumped are general trash, followed by old furniture and other household items, construction and demolition debris, yardwaste, tires, and appliances, in that order.

Is it really the cost of disposal? The "why" of illegal dumping is also not readily answerable. The general belief of the cause is that the cost of disposal is too high. Studies have been done elsewhere which indicate that when disposal rates go up, illegal dumping increases. However, these studies also show that, after a period of time, dumping decreases to its previous level. No studies have been done by the Health Department to document the effect of increased disposal rates in Pierce County.

People who dump general household trash could avail themselves of the many free alternatives to reduce the amount of waste they must dispose. Most residents are within a two- to five-mile driving distance of a drop-off recycling site or a buy-back business where they can recycle for free many items that are found in household trash. Household hazardous waste, such as oil-based paint or pesticides, can be taken free-of-charge to Tacoma's collection site at the City's landfill.

Recycling also offers other advantages. Within the Pierce County system, the curbside pickup of recyclables decreases the overall monthly garbage bill by $1 per garbage can. The monthly charge for weekly pickup of one can of waste is about the price of a cheap pizza or the cost of two movie tickets. Residents who are good recyclers can opt for the mini-garbage can with curbside recycling which costs even less. For those who don't want to pay a collection fee, there are opportunities to self-haul, as many do. Self-haulers can reduce their disposal costs by dropping off recyclables at the landfills, transfer stations, and recycling centers before crossing the scales with waste for disposal. There are reduced rates at the transfer stations for self-haulers to separate yardwaste from garbage. Also, residents can home compost yardwaste

or use a worm box to compost foodwaste. Both of these options provide a nutrient rich soil amendment for home gardens and lawns.

There is a one-time cost for the disposal of those larger items that residents don't generally discard on an annual or monthly basis, such as tires, furniture, and appliances. The cost for disposing of these items is comparable for the Puget Sound area. There are also many automotive-related stores that will take the tires for less and, generally, the tire is recycled into another product.

Appliances are more costly to dispose. Refrigerators, for instance, cost $20 for disposal by City residents in the Tacoma Landfill and $30 at the Hidden Valley Transfer Station. These fees pay for removal of refrigerant cooling to protect the environment before the metal is recycled. There are other alternatives. Working appliances and reusable furniture can be donated free to charities. Many appliance and furniture stores will pickup and recycle old appliances and mattresses when they deliver a new item. Some charities will pickup reusable furniture. There are also a number of "mosquito fleet" entrepreneurs who scavenge for recyclable metal.

Who is doing the dumping? The disposal of stripped and burnt cars is probably the result of a crime. This may also apply to cow carcasses where someone has butchered a stolen animal. Some dumping may be the result of illegal hauling where homeowners have paid someone to cleanup their property and the illegal hauler has dumped the material. As discussed in Chapter 9, illegal tire piles often start in this manner.

Some dumping of other materials may be directly related to disposal costs. Such things as roofing and construction debris, for instance, are examples of a builder or home remodeler avoiding the cost of doing business or an example of the individual homeowner being unwilling to be responsible for the remains of a construction project. A frequent complaint in letters to the newspapers is that some lawn and yard maintenance or pruning businesses have been responsible for dumping organic debris on vacant lots. There are many businesses in the county who will take and recycle these items for a fee, so it is not a lack of alternatives that drives illegal dumping.

Generally, however, illegal dumping may be the result of sheer carelessness, laziness, and an unwillingness on the part of some people to be responsible for their own waste. Some may believe, mistakenly, that certain materials will biodegrade. Others may dump on government-owned property thinking they pay too much in taxes without realizing that they are driving up government costs or who don't care. Some may dump on property owned by large timber companies, the Department of Natural Resources (DNR), or on Fort Lewis because they can get away with it.

Some people on limited incomes who dump may be tenants of landlords who do not supply sufficient garbage collection. Some illegal dumpers may be short-time residents of the County who do not care about the area, or are tourists who don't know where to properly recycle or dispose of their waste. Some studies have indicated that highway littering is the result of a specific age group, generally teenagers. Also, there have been frequent complaints in newspapers that hunters are not carrying out their waste, leaving both debris and animal remains at campsites or alongside trails.

The bottom line is that there are many people dumping illegally for many reasons which makes it difficult to come up with solutions that will resolve the problem.

Handling systems: Besides the Health Department's Compliance Program which is charged with handling illegal dumping, there are many agencies and large landholders in Pierce County that play some role in resolving illegal dumping problems on their own lands or in controlling roadside litter on county- or municipally-owned road right-of-ways. The following is a brief, illustrative description of some of their responsibilities and how they manage this waste.

Cities and towns: Park and public works departments of all cities and towns and Pierce County have programs in place to control litter along road right-of-ways or on municipally-owned land. Generally, this is a regular part of the road maintenance duties of public works crews. Roadside litter is usually composed of fast-food wrappings or drink containers, or things that have fallen out-of, off-of, or broken-from a passing vehicle; although some rural roads have become used as frequent dumping sites. Park departments usually budget for litter cleanup as part of maintenance programs for municipally-owned park properties. Generally, public works crews can not cleanup illegal material on private property.

Some cities and towns in Pierce County have additional laws to deal with illegal storage or dumping which they enforce through their police powers. For instance, Lakewood has adopted regulations about the improper storage of inoperable, wrecked, or damaged vehicles and is making a strong effort to resolve this eyesore.

Most Pierce County cities sponsor Spring cleanup days which allow residents to set out unwanted and bulky household items, including appliances, at the curb. These cities contract with their waste haulers for pickup and hauling of these materials to disposal sites with the cost absorbed within the haulers contract or they may fund these programs through their general fund. Such Spring cleanups may act as a deterrent to illegal dumping of those items that people generally need to dispose only once a year.

Some cities may contract for hauling illegally dumped materials found within their city limits as part of their regular contract with the haulers.

It is worth noting that the same state laws which prohibit Pierce County from contracting for or undertaking its own waste collection services constrain the County from contracting for programs, such as cleanup days, as implemented by the cities.

Tacoma: The City of Tacoma implements programs on illegal dumping and improper waste problems through a multi-department effort involving the Solid Waste Utility, Building and Land Use Services Division, and Legal Department. Most of the enforcement efforts related to improper waste disposal in Tacoma are performed under the Tacoma CARES Program. This is a City-run program which addresses litter cleanup and waste disposal, community restoration and beautification projects, property fix-up assistance, and other neighborhood programs. The CARES program is funded by the $3.00 per vehicle charge on residential tipping of solid waste at the Tacoma Landfill.

Different actions are implemented through Tacoma CARES depending on where the waste is found. If the waste is found on private property not near the right-of-way, enforcement is handled through the Building and Land Use Services Division and the Legal Department as an enforcement issue. If the waste is found near the City's right-of-way, the Solid Waste Utility will notify the property owner to remove the waste or the Solid Waste Utility will remove the waste and charge the property owner for labor and disposal costs. This is performed under the

authority of Tacoma's solid waste ordinance (Chapter 12.09). If waste is found on the City right-of-way, the Solid Waste Utility removes the material at the City's expense.

Pierce County: The Solid Waste Division does not manage an illegal dumping program. The Health Department is the primary agency charged with this responsibility for the unincorporated county. Like other municipalities, Pierce County's Public Works and Utilities Department has a Road Maintenance Division responsible for litter control along road right-of-ways. They coordinate with the Pierce County Sheriff's Prisoner Release Program to use prisoner crews to do some of the cleanup.

The County established an Adopt-A-Road Litter Control Program in 1992. Its purpose "is to enable volunteer organizations to supplement County litter control efforts by allowing such organizations to adopt portions of county roads for the purpose of picking up litter with the intent of increasing civic pride and reduction of roadside litter." Roadside litter picked up by the County is not charged a disposal fee at the landfill. It was estimated that, in 1996, about 375 road shoulder-miles were being monitored by citizen volunteers at a cost of $173.74 per mile. The Maintenance Division estimates that 75 tons of general litter, tires, and miscellaneous debris were picked up, saving the County about $57,000 dollars in 1996.

The Parks Department has a regular maintenance crew for County-owned properties and includes litter removal and cleanup of other types of illegal dumping as part of its regular garbage disposal costs.

Tonnages from cleanups, litter, and other removal programs that were taken to the Hidden Valley Landfill by the County and the State Department of Transportation is illustrated in Table 10.6. The State must pay a tipping fee.

Table 10.6 Tonnage for Roadside Cleanups

Year	County	State
1992	714	176
1993	784	148
1994	521	96
1995	460	59
1996	500	53
1997	591	78

The Code Enforcement office of Pierce County Planning and Land Services provides enforcement of County land use codes. Code Enforcement may act as the lead agency and coordinator related to illegal dumping on problem sites that have abandoned or run-down development and may be in violation of zoning or building standards. They may also address junk cars in relation to junk yards and illegal dumping in relation to illegal landfills.

Washington State: Retail grocers, packers, and manufacturers pay a tax which is used to fund litter control and other programs under the State's Model Litter Control Act (RCW 70.93). How the money is to be used has been the subject of a number of legislative proposals, most recently in 1997. Nearly all of the money has gone to the Washington Department of Ecology to fund Ecology Youth Litter Crews (50%), general waste reduction and recycling activities (30%), and local governments grants to assist with litter or illegal dumping abatement programs.

The Washington Department of Transportation (DOT) also receives a sum which is used for State Highway maintenance and the Adopt-A-Highway program for state roads. The State Parks and Recreation Department receives a small amount per year from the litter fund for in-park pickup.

The Washington Department of Ecology has revamped its Youth Corps operations and succeeded in doubling the collection rates along State highways in 1997. The Youth Corps also has been used to remove materials on other state or federal forests.

In response to the 1997 legislative session, Ecology formed a Litter Task Force to provide advice to the Legislature, local governments, and industry on administrative and legislative actions to more effectively implement the Model Litter Control Act. Ecology completed a survey of how litter and illegal dumping is handled by local jurisdictions and the Task Force has looked into how litter and illegal dumping is handled on State lands. Ecology's survey indicated that the three wastes most often dumped were general trash, with much fast food debris; furniture and household items; and appliances. According to Ecology, "Many of the counties contacted expressed frustration at their inability to deal more effectively with litter and illegally dumped materials."

The Litter Task Force made a number of recommendations to the Legislature. Among these were recommendations to establish a local government grant program for litter control by cities and counties, and for a statewide litter prevention campaign with local government and tax-paying businesses to raise awareness of litter issues and to encourage prevention. There was also a recommendation to conduct a statewide litter survey targeted at litter composition, sources, demographics, and geographic trends and to maintain an information base to guide prevention and pickup efforts.

Fort Lewis: It appears that the Fort, with its large reservation, bears the brunt of illegal dumping because it is located adjacent to large urban-density populations and Interstate 5. At various times, the Fort has performed cleanups of illegally dumped waste using troops to do the work. During the most recent cleanup in Spring 1998, 151 tons of debris was delivered to the landfill. The following illustrates the tonnage removed in previous years:

Spring 1993 - 75 tons
Fall 1993 - 114 tons
Fall 1994 - 22 tons
Spring 1995 - 108 tons
Fall 1995 - 106 tons

Everything from abandoned cars and mobile homes, clothing, household garbage, broken lawnmowers, and partially butchered cows and other dead animals, to roofing material has been found. The Fort's reservation may be a popular site for dumping stolen cars and demolition debris.

Besides cleanups, troops are assigned an area of responsibility they are required to police on a regular basis. The amount of tonnage and the types of materials removed in this way are not consistently recorded.

The easily accessible east side of the Fort's reservation and along the Nisqually River are where most of the dumping occurs. The Fort has tried a number of times to prevent entry including fencing. However, dumpers have repeatedly cut holes in the fences; repaired holes have been re-opened. A few dumpers have been caught. One was videotaped in the process but other than actually being caught red-handed the Fort has no other means of enforcement.

McChord AFB is less accessible to the general public and does not have the same illegal dumping problems caused by off-base residents.

Large timber or park land owners: Like Fort Lewis, the owners of large acreages of timber, or forest and park land have substantial problems with illegal dumping. In Pierce County this includes timber

companies such as Plum Creek, Weyerhaeuser, and Champion; the Washington State Department of Natural Resources (DNR); the Forest Service; the National Park Service (Mt. Rainier); Tacoma Public Utilities; and other miscellaneous private land owners, particularly Christmas tree farms.

All of them report similar types of materials as found by other agencies. Besides general household goods and garbage, their lists of items most commonly dumped include tires, stripped and burnt cars, and roofing materials.

Few of the timber companies keep accurate statistics about tonnages, types of materials, or the cleanup costs in Pierce County. Few report dump sites to local governments or health departments. One reason for their not reporting is that the companies know that most the time they'll have to cleanup the site because dumpers are rarely identified and, if identified, enforcement is a low priority in the court systems. Some county health departments, but not Pierce County's, use a lien against the property owner if the site is not cleaned up. Rather than do the paperwork and encounter a lien, many large timber companies just cleanup sites.

Another reason the timber companies don't have precise records segregated to their lands in Pierce County is because they don't group the data by county jurisdictions since their ownerships spread across county boundaries.

All of the large timber land owners have identified certain hot spots where dumping occurs most frequently. There seems to be some particular sites on lands located near the King County border, around Wilkeson and Carbonado, and along the Nisqually River on the southern border.

Most of the timber companies try to manage illegal dumping by closing off roads to vehicle traffic and posting large signs warning of fines and enforcement at past, frequently used sites. Some land managers indicate they feel that most backpackers and horseback riders pack out their debris and don't contribute to much of the problem. Restricting vehicle access on roads seems to be the key component to the timber companies' approach to reducing the amount of illegal dumping.

Some companies have aggressive programs. Plum Creek, for instance, hires off-duty police officers to randomly patrol their holdings during weekends, evenings, and on holidays. The company also places garbage collection containers in or adjacent to outlying towns like Carbonado and Wilkeson to encourage proper disposal. There have been particular problems with roofing, sheetrock and other remodeling materials, and stripped cars.

In the past, the Washington Forest Protection Association has surveyed the problem and recommended various solutions. The Association has worked with Pierce County in the past to resolve zoning issues adjacent to forest lands to encourage decreased densities around their lands.

The Department of Natural Resources (DNR) also has substantial problems with illegal dumping. Their lands are often located close to urban areas and it is difficult to restrict access. In fact, the sites are often subject to almost continual dumping. Besides general household garbage, materials most often include car bodies, appliances, tires, and yardwaste. A manager of DNR lands in Pierce County is familiar with receiving regular notices from the Health Department about the need to cleanup sites, particularly around Key Center near the County's drop-box transfer station, on lands in the Waller Road area, along Highway 7, and west of Ashford area on north side of the Nisqually River. When

Tacoma evicted transients (including convicted felons who were disturbing the peace) from Public Utility properties at Alder Lake Dam and closed off the site, the transients moved onto DNR land. Evicted from DNR land they moved closer to the entrance to Mt. Rainier National Park.

The Forest Service and the National Park Service experience similar problems. Debris from careless tourists constitutes a larger part of the problem in Mount Rainier National Park. The Park Service has instituted recycling collection.

The Tree Farm Association also reports similar problems with illegal dumping. Property owners have found roofing, dead horses and goats, refrigerators, batteries, and general garbage. Owners have posted signs, fenced their lands, and some even charge fees for access to discourage dumping.

10.7 Needs and Alternatives

This section is divided into a discussion of needs and alternatives to reduce illegal dumping and a discussion about issues and alternatives to consider with financing all programs.

10.7.1 Illegal Dumping

There is no *one* solution or combination of programs or enforcement actions that will resolve all illegal dumping problems in Pierce County because there will probably always be a segment of society who will dump waste. However, a more coordinated pro-active effort that includes both prevention programs as well as enforcement and cleanup programs could be put in place with the goal of *reducing* the extent of dumping on all lands, public or private. These could be coordinated with the County's other code enforcement efforts.

The following identifies five broad needs to implement a coordinated program effort and a number of action alternatives that could be used either individually or in combination depending upon the support of municipal jurisdictions, federal and state agencies, Fort Lewis, and private and public landowners of large properties. How to finance and how much financing is needed are the key issues for all of these.

The following action items are numbered for ease of reference and these numbers are not met to represent priorities.

- ***Need --- To identify the extent of the problem within the unincorporated areas***. The Health Department and the County need to know how much illegal dumping is occurring in the unincorporated areas. There is a need for information about the amount and type of materials, location, frequency of occurrence in same or adjacent sites, and when or what time of the year illegal dumping increases. It is possible that by identifying the type of materials that are dumped in certain spots and at what time of the year it most often occurs that the agencies can develop an improved understanding of who is doing the dumping and why. With that type of information it is easier to design prevention programs to target specific groups of people who dump or to activate broad public outreach and enforcement programs at times when illegal dumping may increase. Even without knowing who or why, agencies could design action programs to target hot spots and the particular materials that are being dumped.

Without this information it is difficult to design effective preventive public outreach programs; to justify financing of new or more efficient cleanup or enforcement programs; to apply for state grants or other funding; or to evaluate whether or not new programs actually need to be funded.

Cities probably need this information to a lesser extent than the County, although the information could be used to compare urban and rural areas to see if there is a connection between hot spot locations and nearby activities. Many cities, such as Tacoma, are already aware of the type and locations where problems most often occur within their incorporated city limits. Many cities and towns have already adopted and financed some preventive measures which may help to reduce and prevent illegal dumping, such as the Spring cleanup events. Also, the more urbanized nature and the smaller area within city limits to be monitored, generally results in city dump sites being more quickly noticed and reported by nearby residents. Thus, the sites are more likely to get cleaned up quickly than sites in unincorporated areas.

Information, however, about particular types of materials such as construction debris or yardwaste, may help the cities to develop and coordinate collection and public outreach programs with the County, the Health Department, or other agencies.

The State's Litter Task Force has also identified a need to "conduct a statewide litter survey targeted at litter composition, sources, demographics, and geographic trends" and to maintain an "information base to guide prevention and pickup efforts."

#1 Action -- Improved reporting system: The sheer size of the unincorporated area in the county and the multiplicity of large land holders makes it more difficult to police the unincorporated areas because dumping can occur out-of-sight of an enforcement agency or land owner. A small site can begin with one or two items, and grow unnoticed by agencies while attracting more dumpers, before a complaint is made and the Health Department takes action.

There are a number of ways to identify the extent of the problem. One is to more aggressively seek out sites and encourage reporting of problems by developing a more visible, public outreach program that encourages individual residents to report sites. Several incentives could be developed to encourage citizen reporting.

#2. *Action -- Develop a network of volunteer groups to monitor hot spots identified in past complaints:* Other than the County's Adopt-A-Road Program, no agency or volunteer group is seeking out or monitoring sites. The Health Department could work with local neighborhood groups in the cities and the county, the County's Adopt-the-Road Program, and any watershed monitoring organizations that are created to implement watershed action plans, to develop a program where local residents take on more responsibility for monitoring local sites identified from past reports and in identifying any new ones.

A system might be developed where these organizations also take on the responsibility of cleaning up the sites with disposal, but not collection costs, paid through a voucher system. Health Department employees spend time searching through the dumped materials to find three pieces of identification in order to identify the dumper and to implement enforcement actions. The volunteers, with an incentive program, might take on this role while they are cleaning up the sites. Using volunteers in this way, however, can be risky in terms of health and safety liability issues.

Snohomish County has developed such a program using grants as an incentive. Procedures and eligibility for the grants is prescribed by the Snohomish Health District. Basically, the sites must first be reported to and certified by the Snohomish Health District. Those groups which meet certain criteria apply for a disposal grant

which provides for a permit which allows for a reduced disposal rate. To limit the cost of such a program in Pierce County, an annual dollar amount could be set for each year and allocated on a first-come, first-served basis until the money is used up.

Using volunteer groups to monitor and cleanup sites has the advantage of freeing up agency staff time from investigating dump sites and using the limited staff for more productive efforts. Volunteer programs also help to build a general feeling of local responsibility among residents of an area for solving problems. Such volunteers generally become advocates in discouraging illegal dumping and supporting other programs. However, agencies must continue to fully support these programs and work with these groups to continue to be successful and that requires a substantial cost. It also should be recognized that citizen efforts wax and wane over time; other supportive public outreach efforts will be needed to make this system work continually and effectively.

#3. *Action -- Survey the county for illegal dumping sites:* Surveys about the extent of illegal dumping do not have to be complicated, formal reporting systems in order to provide more accurate information. For instance, the Snohomish County Solid Waste Division, when asked to become more involved in illegal dumping, identified a number of basic questions, such as "how many dump sites were there?" or "Was the problem rural or urban or both?" They designed and conducted a random, drive-by survey. One of the findings of their report was that sites are often located in close proximity to each other and there were definite patterns to the location of sites.

Such a survey could be conducted in Pierce County once each year. In addition, once more aggressive public outreach and enforcement programs are implemented, a sampling of the initial study sites could be re-visited to evaluate program effectiveness.

#4. *Action -- Annually interview large property owners and state and federal agencies about the hot spots on their properties in Pierce County:* This annual inventory would include: large timber companies, park or forest land holders such as the Forest Service and the National Park Service, Fort Lewis, state agencies such as the Department of Natural Resources, groups such as the Christmas Tree Association, or any other large land holding group that can be identified.

The inventory does not have to be complicated or require detailed reporting. The aim of the inventory should be to gather better information but also to set up a regular dialogue about illegal dumping problems with other agencies and landholders. These groups should not be made to feel their information will result in enforcement actions. They should be made to feel that government agencies are reaching out to them to help devise and participate in solutions to the problem.

The survey could take the form of an annual mail survey that asks for general hot spot information and types and amounts of material found. Before conducting the first survey, the Health Department could begin with a meeting of all groups to discuss the issue, asking them to bring whatever information they have and ideas about how to coordinate outreach programs and cleanup and enforcement programs. Many of these landowners already have programs in place. The question to answer is what programs can agencies develop to support and complement private owner' activities?

A similar group was set up in Lewis County, the Illegal Dumping Task Force, to explore solutions to the problem. The Task Force

determined that "the best method for dealing with the issue is to educate the public and encourage reporting of illegal dumping activities." They also implemented a number of other actions and "improvements in tracking illegal dumps and prosecutorial response have already been obvious."

#5. *Action -- Map and evaluate past sites handled by the Health Department:* The Health Department could work with the County's GIS program to map previous complaint sites. This information is available for 1996 and 1997. Mapping would help to identify hot spots. If the mapping could group sites by material type or when the site was first reported, the information could be used to develop other preventive public outreach and enforcement programs.

For improved mapping evaluations in the future, the Health Department would need to consider revising the information gathering system to better characterize what type of materials are being dumped. This type of information may be of importance to other enforcement agencies. For instance, if Pierce County is a dumping site for stolen cars, police enforcement agencies might be interested in identifying the hot spots for dumping the vehicles. Sites could be randomly visited or even staked out to catch the perpetrators. While this might not resolve the problem and dumpers may move to other sites, the pressure from the perceived increase in enforcement could make Pierce County less attractive to those who dump the vehicles. It would be helpful if other large landowners could also identify these types of material hot spots.

• ***Need - To identify and remove institutional or legal barriers that make enforcement programs too costly or ineffective:*** In order to speed the cleanup of individual sites and to make existing actions more cost-effective, each jurisdiction needs to identify what barriers exist to conducting cleanups and enforcement programs within their community. Tacoma is an example of a city which has already identified these actions and implemented the CARES program.

#6. *Action -- Develop a citation process by revising penalties*: Currently, the Health Department's existing enforcement program uses a criminal penalty system to target the people who do the dumping. More often than not, however, it is the owners of the properties who pay for and clean up the sites rather than the illegal dumpers. A citation system might be more cost-efficient.

#7. Action -- Identify all enforcement program costs and compare these with the costs for cleanup and disposal: Before implementing a citation program, the Health Department should identify the existing average enforcement cost to handle a complaint on an individual site. This should include the Compliance Program's costs to investigate sites and notify property owners, any follow-up costs to ensure sites are cleaned up, and any prosecuting or enforcement costs of both the Health Department and any other municipal agency. Often, the costs for prosecution are hidden in other agencies' budgets. Given the rising cost of law and enforcement in general, the question needs to be asked: is criminal prosecution an appropriate and cost-effective solution to illegal dumping when there are so many more serious priorities for the legal system?

The Health Department also needs to identify how many of the sites actually get cleaned up through prosecution.

The reason to identify the average site cost is to evaluate and compare the costs against the average cost to cleanup and dispose of materials from a given site. Are legal enforcement systems more costly than just going ahead and implementing other cleanup programs? Would it benefit the overall program, if owners where dumping has occurred, were to receive half of a heavy fine to defray their costs? Or all of the fine if they sort through the trash and find the three pieces of identification for the citation? Is this legal under Washington law?

• ***Need - To develop coordinated prevention and cleanup and enforcement programs.*** While improved information would be helpful, action programs that actually get sites cleaned up could be the first priority. Countywide programs supported by all jurisdictions, agencies, and land-owners working together may be a cost-efficient method to reduce illegal dumping in all of Pierce County.

#8. *Action -- Develop and implement a pro-active, countywide public outreach and education program:* The purpose of this preventive action program would be to raise the consciousness of the general public about illegal dumping and to make it a socially unacceptable practice. The countywide approach has been successfully used in Pierce County for other waste issues. For example, the County's programs about recycling focus all residents on the need to support recycling and smooth the way for new collection programs to be implemented. If jurisdictions pooled their efforts for coordinated outreach, each jurisdiction or private or public land holder may benefit from decreased dumping.

The County Solid Waste Division has substantial experience in using various public outreach delivery systems including such things as: newspaper inserts; radio, tv, billboard, and newspaper advertising; direct-mail newsletters; exhibits; and school education programs. The school education programs have been particularly effective when kids have taken the message home to their parents.

The State's Litter Task Force has also identified the need for a statewide prevention campaign working with local governments and tax-paying businesses. A countywide program could be coordinated with statewide efforts.

#9. *Action --- Develop a public education program which targets specific groups and materials:* A second aspect of a coordinated public outreach program would be to devise educational programs and materials which target those groups that are doing the dumping or to target specific geographic areas where the dumping is occurring most often. Such a program could also focus on specific materials and the alternatives for handling or disposing of these materials. It would be appropriate to combine this sort of program with new types of collection programs for specific materials.

As an example, outreach materials could be prepared and distributed throughout the Elbe-Ashford area and in coordination with the National Park Service to target tourists, if this is a group that can be identified as contributing to the illegal dumping problems in this area. The information should stress proper disposal but should also clearly identify sites where the tourists may recycle or dispose their materials correctly. This could be combined with the development of more drop-off recycling sites in the area which are clearly signed and obviously and easily accessible.

If hunters are identified as a problem group, the agency working on the public outreach program could work with local hunting group associations to engender a "carry-it-out" philosophy. The outreach media campaign could be timed to occur when hunting seasons begin and promoted in areas where hunting most often occurs. Again, more recycling drop-off sites in those areas might provide a partial solution.

If construction debris is a problem in all jurisdictions, a campaign could be developed to target the construction industry and home remodelers. It should identify alternative collection opportunities. It is possible this might be combined with a system that provides incentives to construction businesses to source-separate recycle materials before disposal.

#10. *Action -- Acquire matching grants or donated time and materials to match government funding and state grants:* If large timber companies and other land owners see the benefit of a countywide public outreach and education program to their properties, they may be willing to provide matching funds for outreach activities or other preventive actions. Generally, it takes three to five years to show the effects of a broad, public outreach program. To gather their support, detailed actions would need to be developed and jurisdictions would need to commit to aggressively implement the program for at least three years. A long-term maintenance program would also be needed.

#11. *Action --- Place signs at hot spot sites warning of fines and notifying dumpers that sites are monitored on a regular basis.* This inexpensive action may serve as a deterrent to dumping if the dumpers feel sufficiently pressured. When new dumpsites develop, new signs could be erected. To be most effective this program needs to be combined with more aggressive monitoring and enforcement programs.

Lewis County's Task Force joined with the local Crime Stoppers organization and designed "Dumpstoppers" signs notifying readers that dumping is illegal, that the lands would have to be fenced off if dumping continued, and a phone number to call to report violators. A publicity campaign was designed to coincide with the opening of hunting season, when access to public and private forest lands is in high demand.

#12. *Action -- Use existing staff or fund a new enforcement program to monitor hot spots:* Just as Plum Creek Timber Company has done, the Health Department and other jurisdictions could develop preventive enforcement programs that include regular random monitoring of hot spots during the hours that dumping is most likely to occur which is during the weekday evenings and weekends. Large landowners in the County, such as the timber companies, DNR, the Forest Service and the National Park Service, might be willing to contribute to the funding cost, if sites on their lands are included within the monitoring system.

Before developing this program it needs to be determined whether the cost of random monitoring and enforcement is a more efficient way to reduce illegal dumping than spending money on prosecution activities or a citation process.

Such a monitoring and enforcement program would probably work more effectively if there is a strong effort to develop a volunteer monitoring system as well.

#13. *Action -- Develop and fund new collection programs for large, bulky items such as furniture, appliances, tires, or used batteries:* As previously stated, cities have implemented Spring and Fall collection programs for some of these items and these

programs may act as a deterrent to illegal dumping. The County, however, does not contract for collection and thus has not had the means to develop a similar program.

The County, the Health Department, and the cities may want to rethink their programs and collaborate on new approaches, or the County and the Health Department could consider facilitating a program that would be complementary to the cities' Spring cleanups.

An option that could be used for unincorporated areas, would be for the County and the Health Department to develop a voucher system where residents could receive a voucher to defray the disposal cost of certain items. To control the overall cost of such a program, a set sum of money could be set aside each year. The system could be administered on a first-come, first-served basis; or limited to low-income residents; or issued in some other random manner. The vouchers could be issued throughout the year or they could be timed to be issued during the Spring and the County and the Health Department could activate a public outreach program to complement the cities' Spring cleanup programs.

For a more coordinated approach, the cities could consider revising their Spring cleanups and also use a voucher system in coordination with the County and the Health Department.

#14. *Action -- Institute mobile collection programs for bulky furniture items and appliances:* A more costly preventive approach that would require more administration would be for all jurisdictions in the County's system to go together to contract with haulers for mobile, on-call collection for certain large and bulky items. The system could require residents to defray a portion of the cost; limited to provide service only to low-income residents who have received a voucher; or limited through some other means. A pre-determined amount would need to be budgeted for each year to prevent escalation of the cost of such a program.

#15. *Action -- Lobby the State to provide funds to reinstate the tire tax or develop a new funding source to clean up tire piles, as was done in the past:* As indicated in Chapter 9, the source for funding cleanup of tire piles has been allowed to sunset and there are no monies to cleanup illegally dumped tires. All the jurisdictions in the county could join with other cities and counties to lobby the Legislature to devise new programs or reinstate this program which was successful in the past.

#16. *Action -- Enforce the existing tire pile storage requirements:* The Fire Marshal administers the tire pile storage requirements. The Health Department and the Fire Marshal should find ways to increase enforcement of these regulations. It needs to be determined if funding is an issue. One option to consider might be citing the property owner and developing a set time for the owner to complete the cleanup. If the cleanup is not completed by the owner, pay for the cleanup and institute a lien against the property to cover the costs.

#17. *Action -- Develop a public outreach program which focuses on reducing inappropriate use of drop-off recycling sites:* Throughout the county, and in urban areas particularly, haulers are encountering problems with the free drop-off recycling collection sites. People are using the sites to drop-off general garbage or large household items. In some cases the problem becomes so severe that property owners will no longer allow the collection containers on their properties. Policing the sites is

becoming a bigger expense. In addition, similar problems are found around recycling collection sites for large multi-family complexes. While this sort of dumping may not fit the traditional view of "illegal dumping," it may have more far-ranging effects on the whole management system. If recyclers must reduce the number of drop-off sites, then it will effect the overall recycling rate since there will be fewer, convenient alternatives to recycle.

These sites do not just serve residents. Many of these sites offer the many small businesses of the county with a way to reduce the amount of material they need to dispose. Perhaps a new and unique information program can be developed for all jurisdictions to help reduce the inappropriate use of the sites by making it socially unacceptable to misuse the sites.

#18. *Action -- Expand capabilities of drop-box transfer stations in outlying rural areas:* The County may want to consider modifications to the existing drop-box transfer stations which would provide more capability for collecting large, bulky items like furniture, appliances, tires, and construction debris. Some identified hot spots where such items regularly occur, particularly on DNR land, are located near the Key Center drop-box station. Anecdotal information explains these hot spots as resulting from frustrated residents of the area who are told to take the material to the Purdy Transfer Station and who don't want to take the time or who perceive the distance as a barrier. Whether or not this is true, the County may want to consider expanding the facility or sponsoring special drop-off days for these materials at the facility occurring two or three times a year. Another question to be answered: does the illegal dumping on DNR land near the Key Center facility coincide with the days the facility is closed? Other hot spots might be located close to other such transfer facilities. Improved information about illegal sites might suggest similar solutions. For instance, transfer and drop-box stations could provide bays for source-separated construction / demolition debris. An incentive system that allowed for a reduced rate for source-separation might help to decrease the illegal dumping of CDL. It also would provide a means to divert these materials for recycling.

#19. *Action -- The County could develop additional drop-box transfer stations in areas where illegal dumping occurs most frequently:* Although the information is not available to confirm this, some illegal dumping in southern Pierce County may be because of lack of nearby access to a solid waste transfer facility. Tourists passing through the area may have no idea where to dispose of their waste. Also, the area has a large number of vacation homes and these seasonal residents may also be a part of the problem. The perceived distance to the transfer stations may also contribute to the reasons for illegal dumping by local residents.

The County would need to study the situation and gather more information about where the dumping is occurring in this area and why. No one has studied the optimal driving distance for providing self-haulers with a transfer facility and the location of a new facility would need to take into consideration who may be contributing the most to the illegal dump sites. If tourists passing through area are main contributors to the problem, the County might want to work closely with the Elbe-Ashford community and the National Park Service to develop a facility in that area. However, the County could first try to see whether a strong public outreach campaign, coupled with increased information about recycling

drop-off sites might resolve most of the problem.

The County could also survey residents of the area about their perceptions as to why illegal dumping is occurring to gain insights as to whether a new drop-box facility would help to alleviate the problems.

• ***Need --- To develop a coordinated measurement system to monitor effects of preventive and enforcement programs.*** Other than the Health Department's record of complaints it handles each year, there currently is no way to measure the impact of any program. If new programs are developed, there needs to be some way to identify how well they worked and what may need changing to make them work more efficiently. It is likely that grant-funded projects will need to identify how successful they were in achieving results.

#20. *Action -- The Health Department and other jurisdictions should collaborate on an annual report about illegal dumping:* The report should identify what actions were taken during the year; the costs of the individual jurisdiction's' illegal dumping programs; the amount and type of materials collected through preventive programs or cleaned up at illegal sites; the number of sites investigated, etc. From this information, all jurisdictions should determine what programs need to be changed, what programs need continued support; what financing methods are available; and to set new, yearly goals.

• ***Need -- To find ways to coordinate the financing of new prevention or cleanup programs for illegal dumping, either by making existing programs more cost-effective or through new, or re-directed funding sources.*** A few of the previously described actions are inexpensive and could be done within the existing management and financing systems, such as conducting a survey or inventory, evaluating existing information about hot spots, or adding signs at hot spots. Other actions, such as a voucher system, monitoring hot spots, or public outreach, will need additional funding. The following are a few alternatives to consider about funding actions to support new illegal dumping programs

#21. Action -- Evaluate ways to redirect existing funding: As already indicated, a change from a penalty program to a citation system with heavy fines might make it possible for the Health Department to expand its services and assist property owners with the cleanup of their properties or to provide more incentives for volunteer cleanups. However, it may not be legal in Washington to use fines to support these programs. This would need study.

#22. Action -- Apply for State grants and develop matching grants from private sources: The Legislature may be developing a local government grant program to assist in litter and illegal dumping cleanup programs. If so, all jurisdictions in the County could pool the grant money to implement countywide preventive and enforcement programs. As discussed previously, large timber or park landholders may also be willing to provide matching grants or in-kind services if the programs can be shown to help decrease illegal dumping throughout the county.

#23. Action -- Increase the amount from the existing funding systems: The Health Department could request all jurisdictions to increase the amount of funding to be used for the Compliance Program. The Health Department could request that additional monies could also come from the tipping fee to fund programs for the unincorporated

areas and the 19 cities and towns of the Pierce County system. Part of the problem with increasing tipping fees is that such an action might increase illegal dumping. This may be particularly true if the tipping fees increase because of other needs to expand or provide other services for the solid waste management system.

#24. Action -- Establish a Disposal District to fund cleanup of illegal dump sites or a Collection District to make collection mandatory: To fund illegal dumping prevention and collection programs, the County could establish a Disposal District which may levy and collect an excise tax to fund solid waste disposal activities (RCW 36.58.140). As explained in Chapter 5, such a district is an independent taxing authority with the ability to implement charges or taxes to pay for the services provided "on the privilege of living in or operating a business in" the district. Whether or not sufficient funds could be obtained through this authority would depend upon whether cities would consent to participating.

Also, further study would be needed of the effects of the law's provision; "that any property which is producing commercial garbage shall be exempt if the owner is providing regular collection and disposal."

The purpose behind creating a Disposal District needs to be clear. A district will not prevent illegal dumping although it may provide the funds to cleanup sites. No community in the country has been able to prevent illegal dumping, even when their residents are offered free collection or drop-off services.

An alternative that does not require the formation of a junior taxing district is to require mandatory collection under the County's authority to form a Collection District for the unincorporated County. The idea behind this alternative is that everyone would pay for disposal, so there would be no incentive to illegally dump waste to save the cost of disposal. As discussed in Chapter 5, the County must determine that mandatory collection is in the public interest. Under the mandatory collection of a Collection District, a hauler may request that the County collect fees from delinquent customers. This alternative would also need to be studied regarding how enforcement would be carried out and whether or not there were exceptions allowed, such as for low-income senior citizens or for others.

#25. Action – Establish a revolving fund for clean-up of problem waste areas. The County could establish a special revolving fund, to provide up-front funding necessary to enable the abatement or clean-up of illegally dumped waste and junk cars. The initial contribution or loan may come from the Solid Waste Fund (i.e. tipping fee) or other funds.

Some departments and agencies have the authority to abate problem wastes on sites and to impose fees and fines on a property owner or liens on property to recoup costs of abatement. However, to date these tools have not proven to be efficient. Some enforcement codes lack clear procedural steps and coordination between agencies. This lack of coordination costs money and slows or prevents site clean-up. In addition, even if abatement can proceed and a site is cleaned up, the enforcement agency often has to wait a long time to recoup its costs via the fine or lien. In order to clean-up properties where all other enforcement actions have failed, an up-front source of funds is needed, though many of the costs could eventually be reimbursed to the fund when, for example, a lien is cleared.

Clean-up of junk vehicles, often one part of problem waste sites, adds another dimension to the issue. The State definition of "solid waste" includes "abandoned vehicles or parts thereof" (RCW 70.95.030), yet the authority and procedures for disposing of junk vehicles differ from that for solid waste in general. Title 46 RCW grants law enforcement (commissioned officers) most responsibility related to junk vehicles and vehicle towing and wrecking. With junk vehicles, up-front funding might furnish a means of or incentive for instigating the disposal process.

Clean-up of problem waste areas will require work on many fronts. However, a key problem has been no available disposal funds in the various departments that must coordinate enforcement. Establishment of a fund to specifically and fairly address difficult, problem waste areas would be a significant step in addressing illegal dumping. The details of the fund, the use of fund dollars, and proposed changes to enforcement codes and agency procedures would need to be developed and recommended by a coordinating group, including relevant County Departments and related agencies, and reviewed by the County Council.

Table 10.7 provides evaluation criteria comparing action alternatives to reduce illegal dumping.

Table 10.7 Evaluation of Illegal Dumping Alternatives	**PROS**	**CONS**
NEED --- Identify extent of the illegal dumping problem. Why: Improved information may help to design public outreach programs; to justify financing of new or more efficient cleanup or enforcement programs; to apply for state or other matching grant funds; or to evaluate whether or not new programs actually need to be funded.		
#1 Improved reporting system-- by aggressively encouraging residents to report sites.	• Using a public outreach program to ask citizens to report more sites is one way to raise consciousness about the problem. • More citizen reports would identify sites of which Health Department is currently unaware. • If all sites are identified and cleaned up, then the less likely that existing sites would continue to attract other dumpers. • Individual landowners might take more responsibility for care, maintenance, and prevention of illegal dumping on their property if they thought enforcement actions were more aggressively pursued and if they were more aware of the illegal dumping problem.	• Health Dept. does not currently have, nor planned for, any funding for a public outreach program about illegal dumping/improper storage. Estimated cost for a minimal public outreach program to encourage citizen reporting: $5,000. • Citizens could become cynical if sites are reported and no action is taken. • More identified sites would require increased enforcement action which would cost money in terms of Health Department staff and court enforcement. • Unless coupled with other actions, just getting more sites identified will not prevent illegal dumping from occurring or cleanup the sites, particularly if the dumpers don't feel they will be penalized. To be effective this would need to be part of a package of actions. • Requiring more citizens, who have been victimized, to cleanup their property and foot the cleanup costs might raise the ire of property owners.
#2 Use a network of volunteer groups to monitor hot spots and / or clean up some dump sites. [Pierce County's Adopt-A-Road Program uses this format as part of a package of actions to address cleanup of litter on road-right-of-ways.]	• Publicity about using volunteer groups to monitor hot spots might help to act as a deterrent. • Volunteer monitoring program could be a simple system using existing groups who organize themselves (as in Snohomish Co.); are already organized (watershed groups, Adopt-A-Road groups); or more complex with staff aggressively organizing volunteer groups throughout the county. (Not all of the county needs to be covered.) • Volunteer monitoring groups could more quickly identify illegal sites when they occur resulting in quicker enforcement or cleanup action which might prevent these sites from attracting other dumpers. • Sites would get cleaned up; maybe more efficiently and quickly than under current system. Frequently used sites might decrease. • Using volunteer groups is one way to develop a feeling of responsibility for their local area within the general citizenry.	• An aggressive program to develop volunteer monitoring groups would require a full time staff person to work with the groups and to help them maintain enthusiasm. This is currently not a Health Department staff assignment. Estimated costs: $40-60,000. • The interest of volunteer groups typically waxes and wanes and is difficult to maintain. • A more aggressive program to use volunteers to cleanup sites would require additional staff and would require additional financing to pay for disposal of waste materials. • No funding has been identified to pay for actual cleanups in the unincorporated area. Use of the tipping fee to fund an aggressive cleanup program could increase illegal dumping, particularly when the tipping fee increases when the landfill closes in 1998. • There are issues that need to be resolved about risk liability of using/ allowing volunteers to cleanup sites.

Table 10.7 Evaluation of Illegal Dumping Alternatives	**PROS**	**CONS**
#3 Survey the county for illegal dumping sites.	• Surveys can be simple or complex but would establish a baseline of information to measure the effectiveness of future actions.	• A survey might require up to ½ FTE to complete, depending upon complexity of survey. Estimated costs: $40,000 for ½ FTE for one-time project. (Yearly follow-up costs would be less once system was standardized.) • This is currently not a Health Department staff assignment. • No funding has been identified.
#4. Survey large property owners and state and federal agencies annually about hot spots on their properties. This task could be enlarged to form an Illegal Dumping Task Force among agencies and large property owners.	• A survey of large property owners would help to identify hot spots and the actions owners may already be taking to reduce illegal dumping. A mail survey would be an inexpensive way to acquire information. A phone survey would gather less accurate information than a mail survey but would also help identify hot spots. • Forming an Illegal Task Force would broaden base of support for future actions. • A Task Force may identify other more effective actions to take and may help in gathering support for matching grants from private industry.	• The cost for a mail survey would be for staff time to mail out questionnaire and tabulate responses. A phone survey would require approximately 2 full weeks of staff time. Surveys are not currently a Health Department staff assignment. • Forming and staffing meetings of Illegal Dumping Task Force would require approximately ½ FTE at a cost of approximately $40,000. This is currently not a Health Department staff assignment.
#5 Map and evaluate past sites handled by Health Department's Compliance Program. This task could result in revisions to the information gathering system to facilitate future mapping.	• Mapping could identify hot spots. Capabilities are available in both the Health Department and through Pierce County's GIS system. • Revisions to data gathering could help to pinpoint types of materials, time of year, and amounts which may lead to improved public outreach program which could target specific sites and or people who are doing the dumping. • Identification of hot spots could be used in coordination with volunteer or other monitoring and enforcement programs.	

Table 10.7 Evaluation of Illegal Dumping Alternatives	**PROS**	**CONS**
NEED --- To identify and remove institutional or legal barriers that make enforcement programs too costly or ineffective. Why: Inadequate information exists about costs to all agencies to cleanup sites and to enforce existing system through prosecution.		
#6 Develop a citation process by revising penalties. This could include a revision of the amount of the fines. It could include publicizing the names of those fined.	• Courts appear reluctant to enforce current criminal prosecutions. De-criminalizing the enforcement process by changing to a citation for illegal dumping may speed up enforcement action. • Heavier fines may act as a deterrent. • Publicizing names of those fined might act as a deterrent.	• Health Department's citation system for improper storage of waste does not seem to have resulted in improved enforcement through court system. • Using fines received to defray cleanup costs may not be legally possible under State law.
#7 Identify all enforcement program costs and compare these with the costs for clean up and disposal This includes Health Department costs and prosecution costs of all agencies.	• This action would provide a baseline to compare future enforcement actions and effectiveness. • This could be used to identify an average per ton cost for enforcement and/or a per ton cost for cleanup which would provide a basis for making funding decisions for additional programs.	• Evaluating all enforcement costs, including prosecution costs, and estimating a per ton cleanup cost is not currently a Health Department staff assignment. Estimated costs for a one-time evaluation project using 1/4 to 1/2 FTE: $40,000.
NEED - To develop coordinated prevention, cleanup, and enforcement programs. Why: Prevention programs that are countywide, involving all jurisdictions, may be cost-efficient and effective at reducing illegal dumping and/or cleaning up sites.		
#8 Develop and implement a pro-active, countywide public outreach and education program. (See #9)	• Other jurisdictions around the country and in Washington have also determined that public outreach and education is one of the most effective tools to reduce illegal dumping. • A countywide public outreach program may be the most cost-efficient approach, if all jurisdictions participate. There is a successful history of using countywide public education programs to promote recycling in Pierce County. • Grant applications may be more acceptable to granting agencies if a public outreach/education program is countywide and supported by all jurisdictions. • A low-key outreach program could be developed with minimal cost by using the Solid Waste Division's existing public outreach delivery system of newsletters, exhibits, and school education activities.	• An aggressive public outreach program that goes beyond using the existing public outreach activities could be expensive. No financing support has been identified. *(See #9)* • Public outreach programs about illegal dumping are not a current Health Department staff assignment. • Under the Solid Waste Plan policies, it has not been the responsibility of the Solid Waste Division to conduct illegal dumping public outreach programs.

Table 10.7 Evaluation of Illegal Dumping Alternatives	**PROS**	**CONS**
#9 Develop a public education program which targets specific groups and materials.	• An intense, three-year program, followed by continued, long-term public outreach may be an effective way to reduce illegal dumping. • A public outreach program would publicly support and make more effective any increased enforcement activities. • Targeting specific groups of people who dump and/or specific materials that are dumped might lead to identification of other solutions, such as providing more opportunities for disposal or recycling in areas where materials are dumped or working with specific groups to ensure they have opportunities and know where to recycle. • Targeting specific groups, hot spots, and materials and then timing the information programs to occur when dumping most often occurs may be an appealing approach to a variety of groups--such as large timber land owners, state and federal agencies, etc. Such a specific program might encourage more cross-jurisdictional support and funding.	• There needs to be more information about where illegal dumping occurs, when, and by whom in order to develop an effective, aggressive outreach program which targets groups and or types of materials. • An aggressive outreach program using tabloid inserts, radio/tv ads, billboards, etc. could cost between $71,000 to $207,000. • No financing support has been identified. Increases in tipping fee to pay for aggressive outreach programs may have the detrimental effect of increasing illegal dumping, particularly when tipping fees go up because of long-haul costs when the landfill closes in 1998. • Public outreach programs about illegal dumping are not a current Health Department staff assignment. • Under the plan policies, it has not been the responsibility of the Solid Waste Division to conduct public outreach programs about illegal dumping.
#10. Acquire matching grants or donated time and materials to match government funding and state grants.	• A concerted effort to involve all jurisdictions, large property owners, and state agencies in matching funding could result in more aggressive and effective programs to reduce illegal dumping or to cleanup existing sites.	• Requires administrative staff time to pursue grant funding and matching grants. Depending upon degree of effort desired, staff funding needs could range from ½ to 1 FTE position. Estimated costs for ½ FTE: $40,000. • This activity is not a current Health Department staff assignment.
#11. Place signs at hot spot sites warning of fines and notifying dumpers that sites are monitored on a regular basis.	• This action could act as a deterrent and may be inexpensive. • Signs are available from the Health Department and funding exists for creating signs. • This activity would be most effective if there is actually some random monitoring of hot spot sites. • Watershed groups have requested such signs. Timber companies use signs at their illegal dumping hot spots.	• There would be some staff costs for erecting signs. • Vandalism of signs may occur.

Table 10.7 Evaluation of Illegal Dumping Alternatives	**PROS**	**CONS**
#12. Use staff to randomly monitor hot spots. Timber companies hire off-duty police to randomly monitor hot spots on their properties in evening and weekend hours.	• This action would be most effective if coupled with public outreach programs, volunteer monitoring, and an aggressive enforcement program. • Hiring staff to monitor all hot spot sites in the County and publicizing the fact may act as a deterrent. • Timber companies and other agencies may be amenable to assist with matching grants to help fund this pro-active approach; particularly if hot spots on their property were included in the monitoring system.	• This activity requires funding of 2 or more FTE--equivalent positions. Estimated costs for 2 FTE: $80,000. No funding has been identified. • This is not currently a Health Department staff assignment.
#13 Develop and fund new collection programs for large, bulky items such as furniture, appliances, tires, or used batteries. Cities, with their collection authority, contract for Spring cleanups of such items. This action could include either collection events or voucher systems. The County and/or Health Department might consider a reduced fee voucher system funded by an annual set amount to issue vouchers to low-income or others for one-time drop-off of items. (*See #14)*	• One-time collection events have proved popular. • Collection events can ensure proper disposal or recycling of the particular waste collected. • A voucher system aimed at low-income groups would provide a financial resource for those who may legitimately find disposal costs too high. • A Spring collection program or voucher system could be promoted in coordination with the cities' Spring cleanups so that residents of the unincorporated area were receiving the same promotional messages about proper disposal and options. • Collection events or voucher systems might be most effective if timed with a public outreach program about illegal dumping and strengthened enforcement. • Cities might be interested in replacing existing cleanup programs with a voucher system to reduce costs.	• One-day events are expensive and involve substantial staffing and publicity. One-day collection events can cause substantial traffic problems. • Collection events attract out-of-county residents who try to abuse the system. Evidence from past events indicates that out-of-county people turned away from the event, often dump the materials illegally. Events are difficult to police. • There is no evidence that collection events actually target those people who illegally dump. • Neither the Health Department nor the Solid Waste Division contract for collection nor have the authority to contract for collection in the unincorporated areas. Therefore, there are no existing fee systems that could be increased to provide one-time collection services. • Voucher systems can be expensive, if not limited to a set dollar amount. • Increases in the tipping fee to pay for these actions could lead to increased dumping. Increasing the tipping fee would increase the costs for those people who are already paying for services, which could be viewed as a penalty upon those who are disposing correctly. • This is not a current Health Department staff assignment. • Voucher systems can be used unscrupulously by people who trade them or fabricate them. A voucher system for use only for residents of unincorporated areas could cause perception problems with residents of cities and towns in terms of promotional confusion and, perhaps, resentment. • Once started, collection events are difficult to stop and costs can increase.

Table 10.7 Evaluation of Illegal Dumping Alternatives	**PROS**	**CONS**
#14 Develop a mobile collection program for bulky furniture items and appliances.	• A mobile collection system could be developed instead of collection events and would be more cost-efficient than collection events. • A set sum could be budgeted each year for mobile collection to prevent increases in cost. • In the unincorporated areas, a mobile collection system could be offered only to low-income residents, thus providing the service to those who may find disposal costs too high and reducing the possibility of misuse of the system by those who can afford disposal costs. • A voucher system could be used to administer the system. This would also prevent out-of-county people from trying to abuse the system. • It may be possible to contract for a certain amount of collection with minimal increase to any jurisdiction's staff costs to administer the program.	• Charity groups already have informal systems set up for working appliances and reusable furniture. A mobile collection system should be aimed only at collecting those items that need disposal so as not to infringe upon charity activities. • Many appliance dealers already will deliver new appliances and pickup old ones. A mobile collection system should not replace any existing systems as this would just replace free-enterprise system with government costs for the service. • Cities have collection funding systems in place. Neither the County nor the Health Department are authorized to collect items and, thus, have no developed funding system. • Increases in tipping fee to provide for mobile collection could lead to increased illegal dumping. • This is not a current Health Department staff assignment nor a Solid Waste Division staff assignment. • Administrative staff costs to administer a voucher/mobile collection system are estimated to be up to ½ FTE.
#15. Lobby the State to reinstate the tire tax or to develop a new funding source to cleanup tire piles, as was done in the past.	• The $1 per tire tax efficiently collected monies to cleanup illegal tire piles. A large number of tires were removed from Pierce County to appropriate disposal or recycling facilities. • Lobbying the State would not cost any additional funding. It's a matter of whether this is a priority with elected officials. • Anecdotal evidence indicates the public would support reinstatement of the tax.	• Legislature is always reluctant to pass a tax, even one that has worked well in the past.
#16. Enforce existing tire pile storage requirements	• This would require no new action. It's a matter of re-prioritizing staff assignments. • Increased penalties might be effective in reducing improper storage of tires.	• Some businesses may stop accepting tires, which might cause an increase in illegal dumping of tires. • If there is not enough staff to enforce current regulations, additional staff may be needed.
#17 Develop a public outreach program which focuses on reducing inappropriate use of drop-off-recycling sites.	• Drop-off sites provide substantial opportunities for citizens and small businesses to recycle. Encouraging proper use of the sites may help retain these sites which have become an essential adjunct to Pierce County's recycling system. • A public outreach program could probably fit within the Solid Waste Division's existing budget and outreach activities.	• A public outreach program may not reach those who are abusing the sites and, thus, may not solve the problem. • The Solid Waste Division and other County agencies may be in danger of communicating too many messages, which reduces the effectiveness of each.

Table 10.7 Evaluation of Illegal Dumping Alternatives	**PROS**	**CONS**
#18 Pierce County could expand capabilities of drop-box transfer stations in outlying rural areas. This could include expanding facilities to take appliances and furniture and other large items or sponsoring special days during the year to take these items.	• A financing system is already in place to include expansion of facilities, as necessary. • This is already an assigned Pierce County Solid Waste Division responsibility. • Collection of appliances, furniture, and tires at rural drop-box transfer stations might reduce illegal dumping of these materials in the general area surrounding the facility. • Special collection events might help reduce dumping and would keep the public focused on illegal dumping and proper methods of disposal.	• Access to drop-box facilities may not be related to illegal dumping and, therefore, may not have much effect on the problem. • The cost, or perceived cost, of disposal may be the issue and increased access would not resolve the problem unless these activities were accompanied by reduced fees. • The average cost for disposal of waste at rural drop-box facilities is higher than the rest of the system. Tipping fees would have to be raised throughout the system to solve what may be a local, rural problem.
#19 Pierce County could develop additional drop-box transfer stations in rural areas where illegal dumping occurs most frequently.	• If access is the issue in some parts of Pierce County, then additional drop-box stations might reduce some illegal dumping. • A system is in place, funded by the tipping fee, for Pierce County to establish additional drop-box facilities.	• Information is insufficient to determine location for new drop-box stations. Hot spots are not identified. It is not known what types of people are illegally dumping or why. • Access to drop-off stations may not have much effect on illegal dumping if cost, or perceived cost, may be driving the illegal dumping. • There is no identified funding system to provide a reduced fee. • There are annual costs for maintaining and operating new drop-box stations which would cause an increase to the entire system funded by tipping fees. The actual average cost for disposal at rural transfer stations is higher than the rest of the system. Other counties have tried charging fees based on actual cost which has resulted in rural residents unwilling to pay the fees or use the drop- boxes.
NEED --- To develop a coordinated measurement system to monitor effects of preventive and enforcement programs. Why: There is no mechanism in place to measure the effectiveness of existing or future programs.		
#20. The Health Department and other jurisdictions should collaborate on an annual report about illegal dumping.	• An annual report could identify the effectiveness of various actions to decrease illegal dumping. It would provide back up information for grant applications.	

Table 10.7 Evaluation of Illegal Dumping Alternatives	**PROS**	**CONS**
NEED -- To find ways to coordinate the financing of new prevention or cleanup programs for illegal dumping, either by making existing programs more cost-effective or through new, or re-directed funding sources. Why: Any aggressive combination of the alternatives listed above will need additional funding dedicated to reducing illegal dumping.		
#21. Evaluate ways to redirect existing funding.	• Re-evaluating priorities may identify some small funding amounts that may be used to reduce illegal dumping. • Heavier fines might be created and re-directed to support cleanup programs. • A coordinated funding system to handle illegal dumping between cities and towns, Health Department, and Pierce County, rather than the current piece-meal jurisdictional approach might result in stronger, more effective programs.	• Re-prioritizing funding programs may short-change other, essential programs. It would require a determination that some programs no longer need as much funding. The County, cities, and other agencies would have to re-prioritize other goals and policies. • It may not be legal, under State law, to direct fines toward cleanup programs. • Individual jurisdictions are unlikely to want to change their funding priorities and redirect some of their monies to a countywide system.
#22. Apply for State grants and develop matching grants from private sources. (See #10)	• State litter grants are becoming available for use in resolving illegal dumping problems. *(See #10.)*	• Requires administrative staff time to pursue grants. The amount may be small and cause administrative problems for disbursing to all jurisdictions who want it. *(See #10.)*
#23 Increase the amount from the existing funding systems.	• Increases in the tipping fee might pay for programs.	• Large increases in the tipping fee may increase illegal dumping, particularly when the tipping fee increases because of closure of the landfill in 1998.
#24 Establish a Disposal District to fund cleanup of illegal dump sites or a Collection District to make collection mandatory.	• A Disposal District could levy an excise tax to fund solid waste activities. • A Disposal District would be able to provide what would appear to be free disposal costs to self-haulers. • If collection is mandated by a Collection District, there is no cost impediment to disposing of solid waste appropriately rather than illegal dumping.	• Disposal Districts are designed for unincorporated areas. Unless cities agree to a District, it is unlikely that enough money could be generated to have much effect. • Disposal Districts have been politically unpopular. • Provisions of the law may exempt commercial businesses which would put the burden upon rural residents. • There would be substantial costs to developing, passing, and administering a Disposal District. • Property taxes would increase. There would need to be a fundamental change to the property tax system, A complete in-depth analysis would be needed to identify the potential benefits and effects of a Disposal District. • Enforcement of a Collection District may be difficult. • With a Collection District, the County may end up trying to collect fees from delinquent customers.

Table 10.7 Evaluation of Illegal Dumping Alternatives	**PROS**	**CONS**
#25 Establish a revolving fund for cleanup of problem waste areas and a coordinating group to recommend how the fund is used	• This task could provide a means to jump-start the clean-up of problem sites that affect citizens' health and safety and community well being. • The coordinating group could analyze needs and recommend updates to enforcement codes. • Getting sites cleaned-up quickly helps to prevent the sites from attracting additional illegal dumping. • Publicizing a proactive clean-up program might be a useful public information tool for calling attention to the problem and creating an atmosphere that illegal dumping is "socially unacceptable." • Records of clean-up could better help define the problem and identify solutions.	• If enforcement codes are not updated and coordinated and made more effective, there may be few funds available to replenish the revolving fund. • Replenishing the fund will also require commitment from the justice system. • The clean-up of junk vehicles could quickly drain the fund unless limitations are set. • The poor coordination between the County's regulations and State licenses for the handling of junk vehicles, hulk hauling, and vehicle restoration activities provides loopholes which could work against resolving the junk vehicle problems. • If not carefully managed, the loan fund could be abused by repeat offenders. • There would be a staffing cost to admininster the program.

10.7.2 Other Financing Issues

The funding sources described in Section 10.5 adequately fund existing programs. In the coming years, however, all three waste management systems will face changes in the way they do business. In addition, there may be changes in consumer/citizen behavior, law, and state government regulations and policies. These changes may impact the long-term adequacy or viability of the funding sources tapped today. This section identifies changes which may be on the horizon and potential actions that may be of assistance in determining a future direction.

Issue #1 --- If Pierce County and LRI fail to negotiate a new contract, or if Pierce County is unable to negotiate a contract with a disposal vendor that provides for a sharing of tipping fee revenue to benefit County programs, the County will need to explore alternative means to fund core solid waste management programs. In 1998, Pierce County and LRI entered into a new thirteen-year waste handling agreement. Until December 2011, LRI will provide waste disposal services to the County and access to the Hidden Valley Transfer Station. The company will also operate the County-owned Yardwaste Composting Facility and the County's four publicly-owned transfer stations. And, among other programs, the company will remit a portion of tipping fees to the County for use in education, recycling, and administrative programs (i.e., the County Administrative Cost component of the tipping fee).

- *Explore using the Solid Waste Collection surcharge*: State's laws authorize counties to impose fees on solid waste collection services. The revenue generated by this fee, which can be set by the County Council on the customers of haulers serving the unincorporated areas of the County, can fund the "administration and planning expenses that may be incurred by the County in complying with the requirements in RCW 70.95.090." (RCW 36.58.045)

The County could set a per customer fee to fund just Solid Waste Division management functions or expand the scope of the fee to offset some of the costs of County-owned facilities. On the down side, state law allows the County to impose this fee only on customers within unincorporated service areas. City residents and self-haulers to facilities other than those owned by the County would not pay the fee. To overcome these obstacles the County could consider formation of a solid waste collection district through which subscription to waste collection services becomes mandatory (thus expanding the base of customers paying the fee) and/or request the cities and towns to impose an equal surcharge within their jurisdictions.

- *Set tipping fees so transfer stations pay for themselves:* To avoid having ratepayers in one part of the County subsidize transfer stations they don't use, the County could set tipping fees at each transfer station which more accurately reflect the specific costs of each facility. Alternatively, the County may have to consider privatizing or closing the transfer stations.

- *Form a Solid Waste Disposal District:* As discussed in Chapter 5, a solid waste disposal district is a governmental entity authorized by RCW 38.58. Disposal districts may collect taxes to fund solid waste disposal activities. City and towns may choose to participate in a disposal district formed by the County, but state law places all administrative and legislative control of such a district under the County Council.

***Issue #2 --- If cities and towns discontinue association with Pierce County for disposal services, the County will need to take steps to ensure an equitable distribution of (public and private sector) costs*:** Pierce County's cities and towns, other than Tacoma and Ruston, have voluntarily joined with the County for the provision of disposal services. If one, or all, of the cities were to choose to contract for waste disposal services without the County's involvement, the total tonnage entering the County system under the aegis of the Pierce County-LRI Waste Handling Agreement would decline. The County would lose revenue associated with the County Administrative Cost component of the tipping fee, but would presumably be able to discontinue providing services for, or to, the cities and towns. The real financial impact would be that the remaining ratepayers would be responsible for the fixed costs of the composting facility (capital costs through 2001 and ongoing operations and maintenance costs thereafter) and operations and maintenance costs for the publicly owned transfer stations. The Interlocal Agreement provides an important role.

- *Audit Contracts and Strictly Allocate Costs*: The County would need to exercise its contractual rights to audit LRI's books to ensure that costs, risk, and liabilities are appropriately allocated between County and city customers. The County could also explore setting higher fees at publicly-owned transfer stations for residents or businesses located in cities which are no longer part of the disposal system.

Issue #3 --- If haulers or generators decide to flow waste outside the established Pierce County system, the County will need to take steps to ensure an equitable distribution of (public and private sector) costs and to explore alternative means to fund core solid waste management programs. Because Pierce County may be limited in its ability to enact or enforce "flow control" (see Appendix F) it is possible that one or more of the solid waste haulers, or large customers of those companies, could choose to haul wastes to facilities other than those operated as part of the Pierce County system. This would create a financial issue even more complicated than if cities were to leave the system. Pierce County would remain responsible for planning and providing services to all residents and businesses within the unincorporated area and within cities and towns that are part of the County system. But, not all those generators would be directing waste to the facilities which provide the fees to fund the required services.

- *Seek reduction in responsibilities:* In addition to all the actions detailed above, the County would need to consider asking the County Council and /or Legislature to reduce its planning and service responsibilities for the customers of haulers which no longer participate in a County-managed solid waste disposal system.

Issue #4 --- If waste reduction and recycling programs become "too successful" in diverting waste, the County may need to find ways to make recycling services pay for themselves so that the tipping fee funds only waste transfer and disposal services which cannot be funded alternatively: With an increasing population and moderate inflation, the Solid Waste Division is generating less revenue per capita from the County Administrative Cost component of the tipping fee than at any point since implementing the County's waste reduction and recycling programs. Befitting a program that has reached a certain level of "maturity", per capita spending has decreased from $5.06 per capita in 1991 and $5.26 in 1993 to an estimate of $4.29 in 1999; an 18 percent

decline from the peak year. Inflation magnifies the decrease. The County's inflation adjusted per capita spending on these services has declined by 34 percent since 1991.

So far, this has not been much of a problem because conservative budgeting has taken this reality into account. If tonnage declines, however, the fixed costs of providing services, such as transfer stations and composting facilities, must be spread over a smaller rate base, resulting in a need to increase per ton fees.

- *Restructure the tipping fee:* The total cost for recycling services and yardwaste processing services could be placed within the subscriber charges for those services, thus eliminating them from the tipping fee. To accomplish this, the County could: 1) negotiate with LRI to remove recycling and composting related costs from the tip fee and negotiate with the haulers to raise recycling and composting charges to fully fund those systems; or 2) negotiate with LRI and directly contract for residential recycling and yardwaste collection services as allowed by law.

If these solutions do not resolve the problem, the County may need to consider broadening the rate base through formation of a disposal district or a collection district, or consider the further privatization or elimination of programs.

Issue #5 --- If long-haul related tipping fee increases result in tonnage declines, the County may need to find replacement funding sources: The long-haul of all the County's waste will trigger a 15 to 30 percent rate increase. Large commercial, industrial, and institutional waste generators may choose to direct their haulers to bypass the established disposal system, or they may choose to self-haul materials to out-of-county disposal sites. Fee increases may also lead to an increase in the amount of illegal dumping. Tonnage reductions impact the County's ability to pay its fixed costs (as explained above).

- *Explore the alternative funding mechanisms explained above.*

Issue #6 --- If there is public pressure to discontinue subsidies for non-disposal programs, the County will need to find replacement funding sources for non-disposal programs which continue to equally distribute costs among all beneficiaries: Since Pierce County implemented recycling and composting programs earlier in the 1990s, these programs have been subsidized by users of the waste disposal system. In the future, high waste disposal costs may force public sentiment to turn against having an integrated solid waste management system in which disposal and recycling are funded together.

- *If this situation happens, the County will need to explore using the alternative funding mechanisms explained above.*

Issue #7 --- If the State changes the way it gives out grants, the County may need to identify alternative ways to pay for programs now funded by grants, new programs that would meet revised eligibility criteria, or identify which grant-funded programs have accomplished desired tasks and could be eliminated:

- *The County should consider monitoring and / or participating in legislative and agency actions which concern grants.*

10.8 Recommendations

Reports to County Council

#10-1 The Pierce County Solid Waste Division shall report to the Pierce County Council on a semi-annual basis about: 1) significant solid waste disposal decisions made by other Pacific Northwest jurisdictions; 2) the development, implementation, and consequences of new, innovative and unusual approaches to solid waste management; and 3) the current status of long-haul alternatives, particularly with the cost impact of fuel generated from waste.

WUTC coordination

#10-2 The Pierce County Solid Waste Division should coordinate with and regularly present the interests of Pierce County citizens to the Washington Utilities and Transportation Commission.

#10-3 For services to be provided within unincorporated Pierce County, the County should continue to work with the Washington Utilities and Transportation Commission to carry out and implement the adopted recycling minimum service levels through approval of the franchised haulers' rates.

Interlocal Agreements

#10-4 When Pierce County and the Cities and Towns (excepting Tacoma and Ruston) enter into Interlocal Agreements to implement this plan, those Agreements shall require the planning partners to work cooperatively in a common solid waste transfer and disposal system. This is necessary to: provide economies of scale; avoid unnecessary and costly duplication of services; and minimize the number of solid waste related facilities which must be developed and permitted to implement this plan.

Open competitive procurement processes

#10-5 Where practical, the solid waste management system should be advanced through an open competitive procurement process to benefit the public interest.

Investigate impact of future changes to flow control

#10-6 If future changes to federal law allow local governments to ban waste imports or to engage in "flow control," the County shall investigate the impact a ban on waste imports (either by Pierce County or by other jurisdictions) or new flow control authority would have on solid waste disposal rates and services, and publicize its findings for citizen review and comment.

Solid waste regulations – public notice and comment

#10-7 When state and federal solid waste regulations are revised, the Comprehensive Solid Waste Management Plan and applicable local solid waste regulations should be amended to, at a minimum, meet the new state and federal regulations.

#10-8 The Tacoma-Pierce County Health Department shall implement ways to increase public notice, input, and involvement in the solid waste handling facility permit application review process. The following issues were identified as particular areas the Health Department should review:

- Formal public notice and comment periods when issuing and modifying solid waste handling facility permits.
- Public meetings on the basis of requests, a significant degree of public interest, or to clarify one or more aspects important to compliance with the requirements of applicable permit; and
- Identification of impacts which may occur across jurisdictional boundaries.

#10-9 When an applicant applies for a Solid Waste Permit, the Tacoma-Pierce County Health Department shall notify the property owner(s) and verify that the owners understand they will be responsible for clean-up of any waste left by any solid waste facility or activity on their property.

#10-10 When state or local solid waste regulations are revised, staff of the Solid Waste Division should work with the Tacoma-Pierce County Health Department and the SWAC to review zoning for the solid waste and recycling facilities. The SWAC will submit proposed code amendments to the Council for consideration.

Enforcement, illegal dumping, and neighborhood clean-up programs

#10-11 Agencies should work together to develop effective enforcement capabilities to address the illegal dumping of solid waste and non-compliant solid waste handling facilities. In implementing a coordinated program, agencies could consider:

- Developing a new interagency enforcement group.
- One standardized reporting form and a phone number for citizens to call and report illegal dumping or to check on the status of follow-up actions.
- New codes with more teeth, higher fines, liens, and provisions for recovering both clean-up and disposal costs.
- Prioritization of enforcement actions.
- Eliminating access to abandoned properties that have debris or which have been condemned in order to prevent illegal access and to reduce risk to public safety.

#10-12 Local and state enforcement agencies should work together to develop effective code enforcement capabilities to address the handling and management of junk or abandoned vehicles.

#10-13 Implementing agencies should pursue additional and / or new grant funding to support illegal dumping enforcement, clean-up and educational efforts. Additionally, grant money should be sought to support local community groups' neighborhood clean-up programs.

#10-14 Pierce County and all participating municipalities should support and encourage the implementation of the volunteer litter control programs, such as Adopt-the-Road, Adopt-a-Stream, and Adopt-a-Trail programs.

#10-15 Pierce County, the Health Department, and others should work together to develop a process to share illegal dumping information. Such an information sharing system would be used to support and aid enforcement, educational, and prevention activities.

Funding

#10-16 The current funding mechanism used to support the Tacoma-Pierce County Health Department and the County's solid waste programs should continue to be used.

#10-17 Pierce County and its cities and towns should develop adequate funding for illegal dumping enforcement programs, which could include:

- budget solutions for enforcement agencies;
- the costs of disposal of solid waste within any associated nuisance or enforcement programs, including the removal of junk or abandoned vehicles; and
- new codes with higher fines, liens, abatement requirements, and penalties for non-compliance.

#10-18 As one aspect of its enforcement efforts, Pierce County should establish an illegal dumping abatement revolving fund. This fund would enable the clean-up or abatement of illegally dumped waste and junk cars when other enforcement actions have failed. The initial contribution or loan may come from the Solid Waste Fund (i.e. tipping fee) or other funds. Funds would be reimbursed from collections and fees and when liens imposed on the cleaned-up property are cleared. The details of the fund, the use of the fund dollars, and proposed changes to related enforcement codes and agency procedures will be developed and recommended by a coordinating group, convened by the Solid Waste Division, and including representatives of relevant County Departments, related agencies, the Solid Waste Advisory Committee, and cities and towns. The fund shall not be used for funding FTEs. The coordinating group shall provide its recommendations to the Council for its review, no later than six months following adoption of this Plan by the County Council.

#10-19 Pierce County should study and may form a Disposal or Collection District pursuant to Chapters 36.53 or 36.58A RCW. The study should assess whether the County should consider formation of a Disposal or Collection District for funding all or certain portions of the solid waste management system, such as to address illegal dumping. The study should consider the issues related to coordination with local cities and towns, applicability to properties producing commercial garbage, possible adoption of an excise tax and how that affects the taxing structure, the experiences of other counties, and other related concerns.

Household hazardous waste

#10-20 Pierce County, Tacoma, and the Tacoma-Pierce County Health Department should continue their coordinated services to provide all residents of the county with opportunities to dispose or recycle household hazardous wastes.

Public outreach

#10-21 A general public education program should be developed to coordinate with all project specific public relation efforts (e.g. waste reduction, landfill siting, etc.) and to coordinate with other related solid waste issues such as litter, illegal dumping and increased disposal fees.

State and Federal actions

#10-22 The County should identify and support initiatives or actions which legislative bodies could undertake that, in Pierce County's judgement, would assist Pierce County and the cities and towns to achieve the goals within the Plan, including the authority to control the flow of waste.

Tacoma's role

#10-23 Under this Solid Waste Management Plan, the City of Tacoma will retain control over all aspects of solid waste management within its corporate city limits, such as collection and disposal rates, minimum service levels, and waste management programs.

CHAPTER 11

SOLID WASTE MANAGEMENT SYSTEM

There are three separate solid waste management systems in Pierce County – the County/Cities and Towns System; the Tacoma/Ruston System; and the Fort Lewis/McChord Air Force Base System. Each has its own collection, disposal, and funding mechanisms. Chapters 4 through 10 examine the solid waste management systems by their key facilities, programs, and management functions. This chapter provides an overview of the systems as a whole, with an emphasis on how the recommendations of the Pierce County Solid Waste Advisory Committee (SWAC) provide a systematic means to meet changing needs over time. This chapter also provides a schedule of activities and associated initial and ongoing capital and administrative costs necessary to implement the SWAC's recommendations.

11.1 Pierce County/Cities and Towns Management System

System description: The Pierce County system serves all of Pierce County except for Tacoma, Ruston, Fort Lewis and McChord Air Force Base. All the waste from this system is disposed according to the County's disposal contract. Many of the changes which have occurred in the system were the direct result of implementing the goals and recommendations contained in the 1989 Plan and the waste reduction and recycling amendments of 1992. These changes are fully described in the preceding chapters.

The principal focus of the 1989/1992 Plan and related accomplishments are summarized in the following:

1989/92 Plan --- Waste Reduction and Recycling: Establish policies and programs to promote waste reduction and recycling and meet the WRR goal of 50 %.

Accomplishments: A countywide 50% recycling rate was achieved in 1995. The public and private sectors improved special collection of recyclables; developed curbside recycling programs throughout the unincorporated county and in all cities and towns; created the curbside and drop-off yardwaste collection program; and developed strong and effective countywide public outreach and school education programs. Pierce County adopted procurement policies and employee recycling programs; and instituted a data collection program to measure the effects of the recycling strategies.

1989/92 Plan --- Collection: Through cooperative public/private efforts, ensure all residents have access to refuse collection service, and ensure compatibility of collection service with other elements of the solid waste system.

Accomplishments: Integrated single-family and multi-family recycling and collection programs; refuse and recycling collection service available across the county; many new alternatives for drop-off of recyclables exist.

1989/92 Plan --- Processing: Investigate solid waste processing technologies and develop programs/facilities which are consistent with statewide priorities, environmental and public health protection, and are cost-effective.

Accomplishments: Pierce County completed evaluation of numerous waste processing technologies including waste-to-energy and composting; solicited cost proposals for promising alternatives; and compared impacts of costs. The County decided to achieve material recovery/waste diversion through source separation recycling collection programs with reliance upon private processing and marketing of recyclables, and development of a County-owned yardwaste composting facility. Tacoma completed expansion of Steam Plant No. 2 and RDF facility and built a new drop-off recycling center. The private sector developed substantial processing and marketing capacity for many types of recyclables, particularly CDL and compostable organics.

1989/92 Plan --- Transfer Capacity: Provide convenient waste transfer locations with opportunities for recycling; utilize transfer facilities, long-haul, or waste export wherever and however appropriate to provide cost and operational efficiency to the waste disposal system.

Accomplishments: The County built the Purdy Transfer Station and modified existing transfer stations to meet recycling system needs. The private sector built a new transfer station at Hidden Valley and a intermodal facility for rail export out-of-county. Tacoma built a transfer station and a household hazardous waste collection facility which is available to all county residents.

1989/92 Plan --- Landfilling: Ensure sufficient disposal capacity for 20 years. Develop a strategy that promotes efficient use of landfill capacity; upgrade existing landfills; and construct new landfills in compliance with all regulations.

Accomplishments: The Purdy, McNeil Island, and Hidden Valley landfills were closed. Pierce County renegotiated the disposal contract with Land Recovery Inc., providing for continued disposal service and long-haul for County waste to 2011; and completed Phases I and II of a landfill siting study. The private sector completed siting and permitting of a private landfill and began construction. Tacoma began closure of a portion of the Tacoma Landfill.

1989/92 Plan --- Special Wastes: Provide guidelines and strategies for special waste handling that ensure proper disposal follows the State best management strategies as well as the state priorities.

Accomplishments: Private sector programs and facilities developed substantial capacity to meet special waste handling and disposal needs for CDL, woodwaste, petroleum contaminated soils, and other special wastes. The Tacoma-Pierce County Health Department (TPCHD), with coordination and funding provided by the Washington Department of Ecology, cleaned-up and closed the largest illegal tire piles. The Health Department adopted stringent infectious waste handling regulations.

Interlocal agreements: The County/Cities and Towns Management System is governed by policy recommendations contained within the Plan and Interlocal Agreements executed by Pierce County and each of 19 cities and towns.

In the late 1980's and early 1990s, the County and the cities and towns recognized that a long-term outlook was necessary in order to develop and finance waste reduction and recycling programs and to achieve the economies of scale which would result in a cost-effective waste disposal system. Because the Solid Waste Plan is updated every five years, the parties sought a longer-term solution and agreed to enter into 20-year Interlocal Agreements.

The Interlocal Agreement is the means through which the County, cities, and towns jointly agreed to:

- implement the Plan;
- work cooperatively to carry out the waste reduction and recycling policy recommendations contained within the Plan;
- commit to a twenty-year system for the management and disposal of solid waste in Pierce County; and
- meet or surpass applicable environmental standards with regard to the solid waste management system facilities by the cooperative management of an integrated solid waste system that will serve both the County and the cities and towns.

Specifically, the County agreed to:

- prepare the solid waste management plan, the cost of which is financed by a portion of the disposal fees paid by waste collected from city residents and businesses;
- provide county-wide solid waste management services, including the designation of disposal sites; and
- take responsibility for managing transfer, processing, and disposal facilities, including the closure and post-closure responsibilities for landfills which handled waste for the cities and towns and the unincorporated areas.

For their part, the cities and towns agreed to:

- adopt the County disposal system and authorize the County to designate sites for the disposal of all solid waste collected within the corporate limits of the cities or towns; and
- not divert solid waste collected with the cities or towns from the designated disposal sites, or from other elements of the County solid waste system, without prior County approval.

The current Interlocal Agreements took effect on June 21, 1993 and will be revised upon adoption of this Plan Update.

Special wastes: The 1989 Plan included recommendations related to the proper handling and disposal of sewage sludge (biosolids), septage, inert and demolition waste, woodwaste, tires, dredging waste, and incinerator ash. This Plan Update addresses these and other special waste handling and disposal needs in the County, recognizing both the technological changes, State Best Management Practices (BMP's), and the adoption of new regulatory standards for incinerator ash.

Biosolids, dredge spoils, vactor waste, and agricultural practices, while discussed in this Plan Update, do not fall solely within the authority of solid waste management planning. Per State regulations, surface water management, sewer, or other public works agencies, serve as the primary regulators of these wastes. However, because state regulations currently identify most of these as "wastes" and because some processing facilities for these wastes may require solid waste permits, Chapter 9 discusses the handling methods and types of

facilities to provide guidance for coordinated planning between municipal jurisdictions, the Tacoma-Pierce County Health Department, and the Washington Department of Ecology when these facilities are proposed in Pierce County.

The conditions with respect to special waste handling and disposal in Pierce County have changed substantially in the past decade and many of the recommendations in the 1989 plan are no longer relevant to the current situation. Most of the earlier recommendations focused on the need to provide additional municipally-owned disposal facilities for these wastes.

One of the most significant developments that has occurred with the handling of woodwaste, petroleum contaminated soils, waste oil, and construction, demolition, and landclearing debris (CDL) is the participation of the private sector in developing programs and facilities to provide special waste handling and disposal services. Substantial private sector capacity for recycling these materials now exists within Pierce County.

Tires remain a problem; although many illegal piles were cleaned-up and removed in the prior decade, state funding for clean-up has now ended. New piles are now starting.

Responding to the 1989 Plan discussion about the need for improved medical waste handling, the Tacoma-Pierce County Health Department adopted stringent infectious waste handling regulations. An updated description is also in Chapter 9.

System update: As a result of the current planning process, new recommendations were developed to refine existing programs or redirect current efforts and services. In total, these new recommendations build upon the existing system and carry forward many of the goals, policies, and priorities of the 1989/92 system. The new recommendations can be summarized in the following categories: overall policy, waste reduction and recycling, collection, solid waste processing technologies, transfer systems, and landfilling. In addition, they focus on new administration and enforcement issues, taking into account financing limitations and the effects of the U.S. Supreme Court's and other courts' decisions impacting the legality of "flow control." These recommendations are summarized below.

Overall policy approach

- No major changes of direction for collection, transfer, or disposal.
- Continue to fund and develop public outreach and education.
- Continue inter-jurisdictional coordination system.
- Rely upon the private sector to provide recycling, composting, and other processing capacity.
- Ensure long-term disposal capacity and continue to evaluate out-of-county and in-county landfill disposal alternatives.
- Develop effective enforcement and public outreach programs to reduce litter/illegal dumping.
- Recognize that Tacoma will continue to use WTE facilities as part of its system.

Waste reduction and recycling

- Continue and expand existing public outreach and educational programs; provide adequate funding.
- Explore opportunities to add recyclables to curbside collection programs.
- Review and revise residential collection programs using strategies that keep participation rates high.
- Develop new outreach programs for businesses and self-haulers.
- Expand drop-off opportunities.
- Provide source-separation of plastics, batteries, CDL, and woodwaste at transfer stations.
- Encourage job-site source-separation of recyclable CDL.
- Encourage expansion of private sector processing capacity.
- Ensure up-to-date standards are adopted for composting facilities which incorporate design and siting requirements coordinated with State regulations, and which ensure public health and environmental issues are addressed.
- Work to attract businesses which use recyclables to make products and promote the existing collection and recycling infrastructure.
- Develop a county-wide program to increase diversion and recycling of foodwaste and compostable organics.

Solid waste collection:

- Ensure that all residents have access to refuse and recycling collection services which are compatible with other elements of the solid waste system.
- Transfer stations should be operated/ sited to meet self-haul needs.
- Continue, and revise as necessary, the Minimum Service Levels for single-family, multi-family, and yardwaste curbside recycling.
- Continue to support haulers' rate requests to the WUTC to implement recycling programs consistent with the Plan.
- Recognize Tacoma's role in collection within city limits.

Solid waste processing technologies

- Rely on private sector recycling processing or composting facilities for paper, yardwaste, CDL, foodwaste, plastics, and other recyclables.
- Support the expansion of existing and the development of new private sector processing facilities.
- Encourage the private sector to reserve processing capacity for Pierce County needs.
- Pierce County should maintain its understanding of existing and new technologies and all available alternatives to in-county landfills. Pursue alternatives that enhance the existing waste reduction and recycling programs and that are protective of human health and the environment.
- Work to achieve regulatory consistency and standards.
- Continue to support Tacoma's Steam Plant and Resource Recovery Facility.

Transfer facilities and systems

- Continue refuse transfer and recycling collection services to rural residents.
- Investigate patterns of usage to determine future needs for transfer station capacity and review ownership options for new transfer stations.
- Ensure there is sufficient intermodal capacity to ship waste out-of-county.
- Encourage the private sector to reserve transfer capacity for Pierce County waste.
- Tacoma should continue to evaluate transfer needs.

Landfilling

- If there is lack of in-county landfill capacity or if out-of-county disposal options are cost-effective, the County may contract for out-of-county disposal.
- County government should maintain Phase 1 of the Landfill Siting Study in conjunction with updates to the Plan.
- Efforts to site, develop, and operate new regional landfills, or expand existing landfills, or decisions to long-haul waste, must include assessments of: the effect on public health and safety; protection of the environment; forecasted needs; competition for disposal services; emergency needs; and the costs of alternatives.
- The expansions of MSW landfills located in unincorporated Pierce County shall undergo a permitting process with adquate public notice and opportunity for public comment.
- The Council shall require, to the extent allowed by law, that private MSW disposal companies located within unincorporated Pierce County reserve in-county private MSW disposal capacity for waste generated within the solid waste management systems in Pierce County and the County should negotiate to reserve 20 years of disposal capacity in the private MSW in-county facility.
- No municipal solid waste landfills located within unincorporated Pierce County shall accept waste from outside Pierce County waste management systems without addressing the impacts of that action in the facility's conditional use and solid waste permits. The reviews of these permits shall be conducted as a public process, follow the applicable laws and regulations governing the conditional use permit and the solid waste handling permit, and the results of the review shall be reported at a Pierce County Council meeting.
- Nothing in the Plan specifically authorizes or specifically prohibits the importation of solid waste from outside the County solid waste management systems to MSW landfills in the County.
- Before approving the acceptance of MSW from outside the Pierce County solid waste management systems or before approving a substantial change in the design or operation of a municipal solid waste landfill within unincorporated Pierce County, the TPCHD shall give the public notice of the issue and provide the public an opportunity to be heard.
- Continue to make improvements at the City of Tacoma Landfill.
- To reduce the amount of waste going to the Tacoma Landfill, the City may implement long-haul disposal or use the 304th Street Landfill.

Special waste streams:

- Increase diversion of CDL. Support alternatives to encourage source-separation from commercial waste stream.
- Other County agencies and the Washington State Department of Transportation (DOT) should consider the need for siting a vactor waste facility. Agencies need to resolve methods required to handle vactor and street cleaning wastes.
- Find a funding means to clean-up tire piles and develop educational programs about proper disposal. Lobby Legislature for re-instatement of funding.
- Support / encourage composting of agricultural wastes and biosolids.
- Tacoma-Pierce County Health Department should evaluate the need to regulate medical waste from veterinarian sources and animal waste, other than manures, from other sources.

Enforcement and administration

- Continue existing coordinated systems.
- Maintain eligibility for existing funding mechanisms and seek new funding sources.
- Provide regular reports to County Council on disposal decisions by other jurisdictions, new approaches to waste management, and the current status of long-haul alternatives.
- Continue reliance upon interlocal agreements to provide "economies of scale."
- Tacoma-Pierce County Health Department should increase public notice and involvement in the solid waste permit application review process.
- When an applicant applies for a Solid Waste Permit, the Tacoma-Pierce County Health Department shall notify the property owners of their responsibilities for cleaning up any waste left on the property.
- Agencies should identify illegal dumping problems; remove legal barriers; and develop coordinated prevention and enforcement programs.
- Support volunteer litter control programs.
- Local and State enforcement agencies should work together to develop effective code enforcement capabilities to address the handling and management of junk or abandoned vehicles.
- Pierce County and its cities and towns should develop adequate funding for illegal dumping enforcement programs and establish an illegal dumping abatement revolving fund.
- The County should identify and support initiatives or actions which legislative bodies could undertake which would assist the County and cities to achieve the goals of the Plan, including the authority to control the flow of waste.
- Pierce County should study and may form a Disposal or Collection District to help the County address illegal dumping issues.

11.2 Tacoma / Ruston Waste Management System

System description: Tacoma operates its own collection, processing, transfer, and disposal system through the Solid Waste Utility Division. Tacoma funds the activities of the Solid Waste Utility through user fees. The Town of Ruston operates and funds its own collection utility and has an interlocal agreement with Tacoma for waste disposal. Tacoma has chosen to be a joint participant in the Plan.

The collection programs currently provided by Tacoma include automated collection of MSW and curbside collection of yardwaste and recyclables. Tacoma also collects commercial and industrial waste with service for fork boxes and roll-off boxes, and recyclable material from small commercial businesses. Through the Solid Waste Utility, Tacoma provides disposal / transfer facilities for Tacoma's collection vehicles, commercial self-haulers, and residential self-haul customers.

Tacoma operates a waste processing facility to process MSW into fuel, an electricity generating steam plant to use the fuel, and MSW landfill. Tacoma provides opportunities for recycling at its main recycling center at the Tacoma Landfill and at various locations throughout the City, depending on the material.

Some of the most significant actions taken by the City of Tacoma and Ruston since the adoption of the 1989/1992 Plan include:

- Completion of the Tacoma Steam Plant No. 2 modifications and operation of that facility as an electricity generating plant since 1991.
- Started production of RDF for use at the Steam Plant No. 2 and the diversion of MSW to outside landfills to maintain capacity of Tacoma's landfill.
- Implementation of an award-winning curbside collection program for residential recyclables and yardwaste.
- Development and operation of the Recycling Center located at the Tacoma Landfill.
- Development and operation of the Household Hazardous Waste facility at the Tacoma Landfill and implementation of an interlocal agreement with Pierce County to best utilize this resource.
- Implementation of new collection services to improve efficiency, provide the customer with more recycling and garbage collection options, and increase recycling rates and participation.
- Closure of the unlined areas of the Tacoma Landfill and implementation of programs and systems to address environmental issues.
- Ruston has also implemented a curbside recycling system.

System update: As a result of the current planning process, new or revised recommendations were developed to refine existing programs or redirect current efforts and services. In total, these new recommendations build upon the existing system and carry forward many of the goals, policies, and priorities of Tacoma and the Plan's current system.

Overall, many of the goals, policies, and recommendations that apply to the Pierce County system, also apply to the City of Tacoma as described in the Plan. In addition to those recommendations, the following recommendations are specific to the City of Tacoma.

Waste reduction and recycling

- Continue and expand the Tacoma waste reduction and recycling recommendations as indicated in Chapter 4, which relate to land use, building and site design, school education programs, public outreach programs, waste reduction, curbside collection, and yardwaste collection.

Solid waste collection

- The City will continue to provide solid waste collection and disposal services within the corporate city limits, and shall determine service level rates through the Tacoma City Council process.

Solid waste processing

- Continue to evaluate the need for organic waste processing or composting facilities. Proceed with the development of such facilities should the evaluation identify that a facility is needed.
- Continue to operate Steam Plan No. 2 under its current permits. If the evaluation currently under way identifies possible improvements in fuel uses (or types of fuels used), permits or operations, pursue necessary permitting changes to implement those improvements.
- Continue to operate the existing Resource Recovery Facility and improve or expand the facility as needed to supply Steam Plant No. 2 with sufficient fuel.
- If Steam Plant No. 2 is permanently closed, Tacoma may investigate using the Resource Recovery Facility to extract other usable recyclable materials.

Transfer facilities and systems

- Evaluate the need for additional or expanded transfer facilities and export options for solid waste. Implement as necessary.

Landfilling

- Continue improvements to the Tacoma Landfill and evaluate available options to obtain additional capacity.

11.3 Fort Lewis / McChord Air Force Base Management System

Fort Lewis and McChord Air Force Base jointly use the Fort Lewis disposal system with separate but coordinated collection systems for solid waste. Management and planning for the two military bases is independent of the County through the *Solid Waste Management Plan for the Fort Lewis Military Reservation*. That plan is currently being updated and Fort Lewis is looking at new ways to reduce or recycle the waste it is generating to meet Federal directives.

Discussion about the military system is included within this Plan so that it may act as an "umbrella document" for the military to coordinate with the local communities on public outreach and education, recycling objectives, and with the Tacoma-Pierce County Health Department on the siting of solid waste facilities.

Since 1989, a number of significant changes have occurred in the Fort Lewis / McChord AFB system:

- Expansion of the Fort Lewis Landfill and closure of the old fill areas.
- Construction of a solid waste transfer station at the Fort Lewis Landfill.
- Implementation of long-haul and disposal of Fort Lewis and McChord wastes to a remote landfill site.
- Implementation of curbside pickup and the development of a recycling center and other extensive waste reduction and recycling programs on McChord AFB.

The current long range approach is to rely entirely on long haul for waste not otherwise diverted from disposal or recycling.

11.4 Implementation Schedule

Implementation of the SWAC's recommendations will require completion of a wide range of activities, some of which are short-term, needing to be addressed prior to the next five-year update; others long-term, to be dealt with over the next 20 years; and some continuous from year-to-year. These activities are identified in Table 11.1.

The Table is presented in four parts in a two-page spread format which means the reader should follow the rows across two pages. The table lists projects or activities down the left column. Estimated costs for years 2000 through 2005 are listed across the top, along with funding sources, and if anything is planned to occur during the years 2006 – 2020.

The first four pages are about the responsibilities of the Pierce County Solid Waste Division to implement the proposed recommendations. These are labeled as **11.1–A and 11.1-B.**

The next two pages are about the responsibilities assigned to the Tacoma-Pierce County Health Department to implement the new recommendations and are labeled **11.1-C.**

The responsibilities of the City of Tacoma are found on the last two pages which are labeled **11.1-D.**

Table 11.1-A PROPOSED IMPLEMENTATION SCHEDULE
based on the Solid Waste Advisory Committee's Recommendations

Programs, Activities, or Projects	SHORT-TERM					
	2000	2001	2002	2003	2004	2005
PIERCE COUNTY SOLID WASTE DIVISION RESPONSIBILITIES [1] **(on behalf of 19 cities and towns and the unincorporated areas)**						
STUDIES to be completed						
1) Transfer Station Needs Study	$20,000					
2) Study need for intermodal facility						
3) Update Solid Waste Plan	$60,000	$62,000	$64,000	$66,000	$68,000	$145,000
4) Update the *Phase I Landfill Siting Study*						
5) Waste Characterization Audit						
6) Evaluate landfill alternatives						
CAPITAL PROJECTS						
7) Modify Transfer Stations for Source-Separation	$50,000	Unknown until Transfer Station Needs Study completed				
8) Maintain Transfer Station Capacity	Ongoing requirement					
ADMINISTRATIVE ACTIONS AND REGULATORY PROGRAMS to be coordinated with other agencies	$1.086 million	$1.118 million	$1.130 million	$1.164 million	$1.199 million	$1.232 million
9) Maintain and update disposal contracts	Ongoing requirement					
10) Evaluate new technology alternatives	Ongoing requirement					
11) Evaluate funding mechanisms and system impacts	Ongoing requirement					
12) Maintain Interlocal Agreements and coordinate services with cities and towns	Ongoing requirement					
13) Semi-annual overview reports to County Council	Ongoing requirement					
14) Revise local development regulations	Complete when State revises WAC 173-304					
15) Upgrade compost facility standards	Complete when State revises WAC 173-304					
16) Implement State's outside storage container standards for commercial & industrial development	Complete in coordination with other public outreach programs					

[1] See APPENDIX J -- WUTC Cost Assessment for a complete cost analysis of the Pierce County system.

Table 11.1-A	**PROPOSED IMPLEMENTATION SCHEDULE based on the Solid Waste Advisory Committee's Recommendations**	
FUNDING for proposed Programs, Activities, or Projects		**LONG -TERM**
Six-year Total	**Sources [2]**	**2006-2020**
PIERCE COUNTY SOLID WASTE DIVISION RESPONSIBILITIES (on behalf of 19 cities and towns and the unincorporated area)		
STUDIES to be completed		
1) $20,000	CAC component of tipping fee	
	CAC component of tipping fee	**2)** Future cost to be determined
3), 4), 5) & 6) $465,000	CAC component of tipping fee Grants – Coordinated Prevention Grants	
CAPITAL PROJECTS		
7) $50,000	CAC component of tipping fee	Future cost to be determined
8) --------	CAC component of tipping fee, Bonds	Future cost to be determined
ADMINISTRATIVE ACTIONS AND REGULATORY PROGRAMS to be coordinated with other agencies		
9) through 16) $6,929,000	CAC component of tipping fee (Solid Waste Administration)	**9)** Ongoing requirement Future cost to be determined
		10) Ongoing requirement Future cost to be determined
		11) Ongoing requirement Future cost to be determined
		12) Ongoing requirement Future cost to be determined
		13) Ongoing requirement Future cost to be determined
		14) Ongoing requirement Future cost to be determined
		15) As needed Future cost to be determined
		16) Completed
Sub-total: $7,464,000		

[2] For a complete list of all funding mechanisms see Figures 10.4 and 10.5 and discussion in Chapter 10.
CAC --- County Administrative Cost component from the tipping fee.
Grants --- Primarily the Coordination Prevention Grants awarded by the Washington Department of Ecology.
Bonds --- Long term General Obligations Bonds issued by the County and repaid through tipping fees.
Transfers --- A portion of the CAC from the tipping fee transferred to the Health Department.

Table 11.1-B PROPOSED IMPLEMENTATION SCHEDULE
based on the Solid Waste Advisory Committee's Recommendations

Programs, Activities, or Projects	SHORT-TERM					
	2000	2001	2002	2003	2004	2005
PIERCE COUNTY SOLID WASTE DIVISION RESPONSIBILITIES (on behalf of 19 cities and towns and the unincorporated areas)						
WASTE REDUCTION AND RECYCLING PROGRAMS for Pierce County system	$715,000	$735,000	$756,000	$778,000	$800,000	$746,000
17) Expand and refine existing programs and outreach activities - single-family curbside program - multi-family public outreach program - procurement policies - in-house collection program - data monitoring - school education program - yardwaste and home composting - beneficial uses of compost - general WRR public outreach programs, including: exhibits, brochures, multi-media activities, and workshops	Timing of programs to be determined in annual budget process by County Executive and County Council					
18) Evaluate expansion of collection programs and public outreach efforts for plastics, foodwaste, batteries, CDL, paper, and compostable organics.						
19) Evaluate impacts and feasibility of landfill bans on recycling						
20) New at-home composting public outreach program						
21) New drop-off site program						
22) New business community outreach program						
23) New public outreach about job-site recycling						
24) New economic development outreach program						
25) Evaluate variable collection / disposal rates						
26) New industrial generators outreach program						
27) Expand and revise household hazardous waste collection and outreach program.	$193,000	$199,000	$205,000	$211,000	$217,000	$223,000

Table 11.1-B	**PROPOSED IMPLEMENTATION SCHEDULE based on the Solid Waste Advisory Committee's Recommendations**	
FUNDING for proposed Programs, Activities, or Projects		**LONG -TERM**
Six-Year Total	**Sources**	**2006-2020**
PIERCE COUNTY SOLID WASTE DIVISION RESPONSIBILITIES (on behalf of 19 cities and towns and the unincorporated areas)		
WASTE REDUCTION AND RECYCLING PROGRAMS for Pierce County system		
17) through 26) $4,530,000	CAC component of tipping fee (1. Public Information, Education, and Outreach for Waste Reduction and Recycling Programs 2. Recycling Data Collection Programs 3. In-House Recycling Programs to Pierce County Employees) Grants – Coordinated Prevention Grants (CPG)	**17) through 26)** Programs to be evaluated annually and every five years. Status to be determined. Future cost unknown.
27) $1,248,000	CAC component of tipping fee (Household Hazardous Waste Management) Grants – Coordinated Prevention Grant (CPG)	**27)** Ongoing requirement Future costs to be determined

TOTAL for Pierce County: $13,242, 000	

Table 11.1-C	**PROPOSED IMPLEMENTATION SCHEDULE based on the Solid Waste Advisory Committee's Recommendations**					
Programs, Activities, or Projects	**SHORT-TERM**					
	2000	**2001**	**2002**	**20003**	**2004**	**2005**
TACOMA-PIERCE COUNTY HEALTH DEPARTMENT	$448,000	$461,000	$475,000	$489,000	$504,000	$518,000
28) Work with State and other agencies on vactor waste facility standards.	Ongoing requirement					
29) Assess veterinarian medical waste handling methods.	Timing to be determined					
30) Revise public review process for Solid Waste Permits.	To be completed					
31) Notify landowners of closure requirements.	Ongoing requirement					
32) Evaluate need for financial assurance requirements for solid waste facilities.	Ongoing requirement					
ALL ENFORCEMENT AGENCIES --- Tacoma-Pierce County Health Department, Cities and Towns, and Pierce County						
33) Enforce program for illegal tire piles.	Ongoing requirement Funding sources to be identified					
34) Increase and coordinate enforcement capabilities for illegal dumping	Ongoing requirement Extent of activities must be identified to determine cost					
35) Develop adequate funding to support illegal dumping enforcement programs.	Identify funding sources and allocate		To be determined			
36) Develop coordinated program to share information and provide public outreach activities about illegal dumping.	Ongoing requirement Extent of activities must be identified to determine cost					
ALL SEWER AGENCIES						
37) Investigate accepting septage at Chambers Creek Wastewater Treatment Plant --- Pierce County Public Works and Utilities.	Incorporate within sewer planning functions					
38) Consider biosolids composting	Incorporate within sewer planning functions					

Table 11.1-C	**PROPOSED IMPLEMENTATION SCHEDULE based on the Solid Waste Advisory Committee's Recommendations**	
FUNDING for proposed Programs, Activities, or Projects		**LONG -TERM**
Six –Year Total	**Sources**	**2006-2020**
TACOMA-PIERCE COUNTY HEALTH DEPARTMENT		
28) through 32) **TOTAL:** $2,895,000	Transfers – a portion of the CAC component from the tipping fee	**28)** Completed
		29) Completed
		30) Ongoing requirement Future cost to be determined
		31) Ongoing requirement Future cost to be determined
		32) Completed
ALL ENFORCEMENT AGENCIES --- **Tacoma-Pierce County Health Department, Cities and Towns, and Pierce County**		
33) To be determined	Funding source lost in 2000. New source to be identified	**33)** Ongoing requirement Future cost to be determined
34) Extent of activities must be identified to determine cost	Funding source lost in 2000 New source to be identified	**34)** Ongoing requirement Future cost to be determined
35) Amount to be determined	Funding sources to be identified	**35)** Ongoing requirement. Future cost to be determined
36) Extent of activities must be identified to determine cost	Funding sources to be identified	**36)** Ongoing requirement. Future cost to be determined
ALL SEWER AGENCIES		
37) Amount to be determined	Pierce County Utility planning budget	**37)** Completed
38) Amount to be determined	Sewer Utilities' planning budget	**38)** Completed

Table 11.1-D	**PROPOSED IMPLEMENTATION SCHEDULE based on the Solid Waste Advisory Committee's Recommendations**					
Programs, Activities, or Projects	**SHORT-TERM**					
	2000	**2001**	**2002**	**2003**	**2004**	**2005**
CITY OF TACOMA SOLID WASTE UTILITY	$30.8 million	$38.7 million	$32.7 million	$33.7 million	$34.7 million	$35.7 million
39) Continue to provide solid waste collection and disposal services	Ongoing requirement					
40) Evaluate the need for organic waste processing or composting facilities; proceed with the development of such facilities if needed.	Timing is unknown until Facilities Plan and needs assessment is completed.					
41) Operate Steam Plant No. 2 under its current permits, or pursue needed changes to permits.	Ongoing requirement					
42) Operate the existing Resource Recovery Facility and improve or expand the facility as needed.	Ongoing requirement					
43) Investigate using the Resource Recovery Facility to extract other usable or recyclable materials, if needed.	This recommendation depends on the outcome of the Steam Plant and Resource Recovery Facility upgrade.					
44) Evaluate the need for additional or expanded transfer facilities and export options for solid waste.	Ongoing requirement					
45) Continue improvements to the Tacoma Landfill and evaluate available options to obtain additional capacity.	Ongoing requirement					

Table 11.1-D	**PROPOSED IMPLEMENTATION SCHEDULE based on the Solid Waste Advisory Committee's Recommendations**	
FUNDING for proposed Programs, Activities or Projects		**LONG -TERM**
Six-Year Total	**Sources**	**2006-2020**
CITY OF TACOMA SOLID WASTE UTILITY		
39) through **45)** **TOTAL:** $206,300,000	Solid Waste Collection fees; Tipping Fees at the Tacoma Landfill, Ecology CPG Grants, Revenue Bonds	**39)** through **45)** Ongoing activities. Future cost unknown

11.5. System Implementation Costs

RCW 70.95.090(3)(d) requires "a plan for financing both capital costs and operational expenditures for the proposed solid waste management system." This section outlines the cost of implementing the recommendations to be carried out by the Pierce County Solid Waste Division, the Tacoma-Pierce County Health Department, and the Tacoma Solid Waste Utility.

Rather than presenting a year-by-year estimate, this section estimates the total that would be spent on the recommendations over the planning period. The reason for this is simple logistics. This Plan Update does not recommend that actions be carried out in a given year because that decision is rightfully made by the County Council and the County Executive during the annual budget process, or by the Board of Health, or the Tacoma City Council during their budget processes.

Chapter 10 of this Plan Update introduced the financing structures in place to fund solid waste programs. The discussion throughout this section assumes that the funding mechanisms identified within Chapter 10 remain in place. Any major change in funding mechanisms or sources would be addressed through an amendment or subsequent update to the Plan.

Table 11.2 Prognosis for Selected Funding Mechanisms for the Pierce County / Cities and Towns system (See Tables 10.4 and 10.5, Chapter 10)
Collection Fees
The major portion of the cost of recycling and yardwaste collection programs are passed on to customers in the form of user collection fees. This Plan Update has not identified any instability in this funding source, nor has it identified specific, new programs that would impact user collection fees. Adding new commodities to recycling programs however could result in increased fees.
Facility Tipping Fees
This Plan Update has not identified new programs which would need to be directly funded out of the tipping fee. [1]
Tipping Fee Surcharges
Many of the recommendations contained within this Plan Update are to be accomplished through the efforts of the Solid Waste Division. The major source of funding for the Division [2] is a component of the tipping fee. If proposed programs require an expansion of the Division's services, the CAC may need to increase. Note, however, that the CAC is capped at 10 percent of the base rate (the tipping fee minus the CAC). In 1999, this CAC equates to 8.2 percent of the base rate, thus only limited increases are possible.
Inter-jurisdictional Transfers
Some of the recommendations contained with this Plan Update would impact the work of the Tacoma-Pierce County Health Department. If Health Department funding diminishes, or if proposed programs require an expansion of the Department's services, local jurisdictions may be asked to contribute more of the Health Department's operations. Given the limits on the CAC (which serves as the source of this funding), it is questionable whether the Division could support increased Health Department functions. The County would need to explore other options.
Bond Financing
None of the recommendations anticipate that the County would utilize bonds.
Grants
Many of the program recommendations contained within the Plan Update may be eligible for grant funding. When grants are available and consistent with this Plan, grants will be sought. If grant funds diminish over time, the Division will need to explore replacement funding mechanisms

[1] It is anticipated, however, that the solid waste tipping fee would continue to support the waste transfer system, recycling opportunities at transfer sites, recycling bin acquisition, and the County's yardwaste composting programs.
[2] The County Administrative Cost (CAC)

11.5.1 Pierce County Solid Waste Division

This section is arranged to closely parallel the Implementation Schedule presented in Table 11.1. Please refer to the Implementation Schedule and each substantive chapter for specifics on the alternatives and recommendations. All costs are in 1999 dollars and do not account for future inflation. (For additional information, please refer to Appendix J –The Washington Utilities and Transportation Commission Cost Assessment.)

Solid Waste Division studies: The SWAC recommends that the Solid Waste Division undertake a series of studies of the solid waste management system. These costs would be funded by the Solid Waste Division of the Pierce County Public Works and Utilities Department through its existing funding resources, primarily the County Administrative Cost Component of the tipping fee. Approximately $465,000 would be needed to accomplish the recommended tasks.

- The Solid Waste Division has already proposed $20,000 in its Year 2000 budget to fund a consultant to study the County's transfer system.
- The trans-shipment or intermodal facility study, scheduled as a "long-term" project, would likely cost out similarly to the transfer station study proposed for the Year 2000.
- A Solid Waste Plan Update similar in scope to this Update would cost approximately $180,000.
- A Waste Characterization Audit modeled after the 1995 audit would cost approximately $225,000.

Capital projects: This Plan Update recommends two capital projects. To complete enhancements at the Prairie Ridge Residential Transfer Station, the Solid Waste Division budgeted $200,000 in FY 1999 and $50,000 in FY 2000. Changes at other transfer stations will not be planned or budgeted until the Division undertakes its Transfer Station Needs Study (see above).

Improvements to modify transfer stations to provide for additional source-separation may occur. Improvement costs would need to be offset by operational savings. No additional commitment of County resources would be necessary to accomplish the recommended tasks.

Administrative actions for Pierce County system: The day-to-day administration of the Pierce County Solid Waste Management System is funded by the County Administrative Cost component of the tipping fee. This Plan Update does not recommend administrative programs over and above those already accomplished by the Division within its existing resources. On an annual basis, the Division spends approximately $1.2 million on administrative functions.

Waste reduction and recycling programs: This Plan Update recommends a number of refinements or enhancements to existing waste reduction and recycling programs, particularly the public outreach and education programs offered by the Division. Annually, the Division commits between $700,000 and $800,000 to the County's waste reduction and recycling programs. A portion of those costs are funded through the State of Washington's Coordinated Prevention Grants Program.

If the Solid Waste Division continues its historic practice, the Division would seek to add the proposed programs to the existing

array of programs by staging the enhancements over a number of years using the existing funds. Certain aspects would be emphasized in each year.

As the Division continues to explore the efficacy of adding new commodities to the recycling system, there may be an impact on recycling collection costs. Any cost increases would be borne by curbside recycling customers through higher collection user fees.

Regulatory programs to be coordinated with other agencies and municipalities: Another of the Division's continuing tasks is to work with other regulatory agencies to ensure that regulations promote waste reduction and recycling and other sound and cost-effective waste management practices. The Plan Update recommendations in this area can be melded into existing operations without additional cost.

11.5.2 Tacoma-Pierce County Health Department

The Source Protection / Waste Management Program of the Tacoma-Pierce County Health Department relies heavily on an inter-fund transfer from the Solid Waste Division. In recent years, the Solid Waste Division contribution to the Health Department has been approximately $450,000. All of this comes from the County Administrative Cost component of the tipping fee. Given the limits on this cost component, further increase in the amount the Solid Waste Division contributes to the Health Department may be limited.

In order to accomplish the tasks recommended in the Plan Update, the Health Department will need to explore additional funding options. These could include re-prioritization of workload and budgets as a management tool, raising permit fees, seeking out new sources of grant funding, or seeking greater financial assistance from the County general fund or its member cities.

This Plan Update also recommends increased enforcement against illegal dumping. The enforcement programs currently undertaken by the Health Department are not funded through the Solid Waste Division's contribution. Rather, other Health Department funding sources pay for this program. Enhancements to the enforcement program are the responsibility of the Health Department and will need to be funded by the Health Department.

11.5.3. City of Tacoma

Ongoing costs for operation and maintenance of all of Tacoma's programs are financed through user fees. Tacoma sets rates for collection of residential, commercial and industrial wastes. Tipping fees at the Tacoma transfer / disposal site are also assessed to self-haul customers. These fees pay for a majority of Tacoma's expenses beyond operation and maintenance costs, including debt service and capital. Grants are used to supplement the user fees for such activities as recycling coordination, hazardous waste business inspections, and other related activities. Revenues from agreements and partnerships are used to cover costs associated with those agreements and may cover capital costs if a partnership is formed to operate Steam Plant No. 2. Bonds may be used to fund large capital facilities improvements.

Studies and evaluations: The studies and evaluations described in the Plan for City of Tacoma have been assigned to existing staff of the Solid Waste Utility or Utility Services Engineering. The existing funding mechanism and process will be sufficient to fund these activities, and no impact to Tacoma's overall rate structure is anticipated as a result of conducting the studies or evaluations.

Capital projects: The scope and cost of Tacoma's planned capital facility efforts will depend on the ultimate fate of Steam Plant No. 2. Assuming the Plant will operate with upgrades provides the highest capital costs estimates for the Tacoma system. This will result in facility upgrades to Steam Plant No. 2, Tacoma's Resource Recovery Facility, and the transfer facilities at the Tacoma site.

The following provides a summary of the facility upgrades and the costs associated with those upgrades.

- *Steam Plant No. 2:* To increase the economic viability of Steam Plant No. 2, over 7.5 million dollars of improvements have been identified. This one-time expenditure for capital improvements will not be funded by the City of Tacoma's Solid Waste Utility. If Steam Plant No. 2 is to remain in operation, it will be operated as a partnership between the City of Tacoma Public Works Department and a private company. The terms of the agreement will state that the additional capital expenditures will be the responsibility of the private entity. The private entity will be able to market the power for their benefit. With this arrangement, these is no impact to Tacoma's overall rate structure as a result of these capital expenditures.
- *Resource Recovery:* To maximize the volume and improve the quality of the fuel produced for Steam Plant No. 2, upgrades to Tacoma's Resource Recovery Facility have been identified. Included with the plans for the Resource Recovery improvements is the funding for the improvements to the Transfer and Compaction facilities. The cost of the improvements identified have been estimated at 4.5 million dollars. The funding source for the improvements to the Resource Recovery Facility will be funded from the capital facilities budget of the Tacoma Solid Waste Utility. With this arrangement, there is no impact to Tacoma's planned rate structure as a result of these capital expenditures.

11.5.4 Fort Lewis / McChord Air Force Base

The military system is funded through the Department of Defense and implementation programs are not tied to either the Pierce County SWAC's recommendations or to any County funding source.

APPENDIX A ACRONYMS

AFB	Air Force Base (McChord)
ASARCO	American Smelting and Refining Company
BACT	Best Available Control Technology
Btu	British thermal unit
CCC	Clover-Chambers Creek Basin
CDL	Construction, Demolition, and Landclearing Debris
CUP	Conditional Use Permit (land use permit)
DNR	Department of Natural Resources
DOD	Department of Defense
DOE or Ecology	Washington Department of Ecology
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAZ	Forecast Analysis Zone
GIS	Geographic Information System
GMA	Growth Management Act (RCW 36.70A, land use planning)
HDPE	High Density Polyethylene plastic (#2)
LRI	Land Recovery, Inc.
MFS	Minimum Functional Standards, WAC 173-304
MRF	Material Resource Recovery Facility (Murf)
MRW	Moderate Risk Waste (household hazardous waste)
MSW	Municipal Solid Waste
NPDES	National Pollution Discharge Elimination System
NRC	National Recycling Council
NWI	National Wetlands Inventory

OFM	Office of Financial Management (State)
PSAPCA	Puget Sound Air Pollution Control Agency
PCC	Pierce County Code
pcd Rate	Pounds per capital per day
PCRC	Pierce County Regional Council
PETE	Polyethylene Terephthalate plastic (#1)
PFP	Public Facility Permit (land use permit)
PREP Compost	Pierce Recycled Earth Products (yardwaste compost)
PSRC	Puget Sound Regional Council
RCA	Recycled Concrete Aggregate
RCRA	Federal Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RDF	Refuse Derived Fuel
RFP	Request for Proposal
SEPA	State Environmental Policy Act
SWAC	Solid Waste Advisory Committee
TPCH or Health	Tacoma-Pierce County Health Department
USPS	U.S. Postal Service
WAC	Washington Administrative Code
WORC	Washington Organic Recycling Council
WRA	Washington Recycling Association
WRR	Waste Reduction and Recycling
WTE	Waste-to-Energy
WUTC	Washington Utilities and Transportation Commission

APPENDIX B GLOSSARY

Terminology Used in the Plan

Aerobic: Occurring only in the presence of oxygen-used in relation to providing air to accelerate composting. (Chapter 6).

Anaerobic: A condition occurring without oxygen. In composting facilities the condition can cause odor problems. (Chapter 6).

Ash Landfill: A landfill used for the disposal of incinerator ash which is classified as non-hazardous as defined by Federal and applicable state regulations. Disposal of incinerator ash is regulated under Washington State Special Incinerator Regulations (WAC 173-306). (Chapter 8).

Biosolids: Municipal sewage sludge that is a primarily organic, semisolid product resulting from the wastewater treatment process, that can be beneficially recycled and meets all requirements under chapter 70.95J RCW. Biosolids include septic tank sludge, also known as septage, that can be beneficially recycled and meets all requirements of chapter 70.95J RCW. (Chapter 9).

Composting: This term means the controlled aerobic degradation of organic waste materials to make a product for use as a soil amendment, conditioner or mulch. Natural decay of organic wastes under uncontrolled conditions is not composting. Organic materials include, but are not limited to, such things as yardwaste, foodwaste, woodwaste, biosolids, paper, or any of the bio-degradable portion of mixed municipal solid waste. (Chapters 4 and 6).

Demolition Waste Landfill: A landfill used to dispose of demolition waste which is defined as largely inert solid waste resulting from the demolition of razing of buildings, roads, and other man-made structures. (Chapters 8 and 9).

Fluff: The non-metallic fraction that results from the shredding of cars and the separation of the recyclable metal scrap. (Chapter 3).

Fort Lewis/McChord Air Force Base System: The Fort Lewis disposal system which provides for disposal for the Fort and for McChord Air Force Base (AFB). (Chapter 10).

Geology/Soils: (Chapter 2)

- Glacial till: A fine clay containing pebbles and rocks which was left behind after the melting of glaciers. It is generally highly compacted and exhibits low permeability which provides a natural protection to groundwater from surface infiltration.
- Glacial outwash: Areas of sand and gravel which has been transported by streams of water coming from glaciers. It is highly permeable.
- Alluvium: Sedimentary material deposited by flowing water consisting of mud, sand, and gravel.
- Aquifer: An underground bed or layer of earth, gravel, or porous stone that yields water.

Goals, Policies, & Recommendations:
Goal: A broad statement of what ought to exist or what is desired to be achieved in the future.
Policy: A statement, more specific than a goal, which describes a particular course of action to accomplish the purpose of the plan.
Policy Recommendation: A new policy recommended to the County Council.
Implementation Actions: These are the detailed actions to implement the Plan. They are in the form of specific programs adopted by ordinance or studies completed at the direction of Plan policies. The ordinances are more detailed than the Plan policies and may be amended outside the plan amendment process. (Chapter 1).

Inert Waste Landfill: A landfill used to dispose of inert waste which is defined as non-combustible, non-dangerous solid wastes that are likely to retain their physical and chemical structure under expected conditions of disposal, including resistance to biological attack and chemical attack from acid rainwater. (Chapters 8 and 9).

Integrated Management System: A solid waste management system which deals with all issues relating to collection, processing, and disposal of solid waste, including waste reduction and recycling.

Interlocal Agreements: Agreements between the County and cities and towns about adoption and implementation of the Solid Waste Management Plan. (Chapter 10).

Limited Purpose Landfill: A landfill used for the permanent disposal of one specific type of waste of limited, known, and consistent composition such as an ash monofill, a landspreading disposal facility for biosolids, problem waste landfill, or any facility other than those permitted for the disposal of woodwaste, garbage, inert waste, demolition, or municipal waste.
(Chapters 2, 8, and 9).

Municipal Solid Waste Landfill: A landfill used for the disposal of a combination of commercial and residential waste generated within urban, suburban, and rural areas. MSW landfills constructed after 1985 and prior to 1991 were regulated under the requirements of WAC Chapter 173-304. New landfill cells receiving MSW waste after October 1991 are regulated under WAC Chapter 173-351. (Chapters 2 and 8).

Pierce County System: County government's management system which provides planning for a disposal and recycling system for 19 of 21 cities and towns, and unincorporated areas.
(Chapter 10).

Pounds per Capita per Day (pcd): Disposal, recycling, or generation rates reflecting the number of pounds disposed, recycled, or generated per person per day. (Chapter 3).

Pre-consumer/Post-consumer: Post-consumer refers to a product made from collected recycled materials. Pre-consumer means a product made from materials recovered at the manufacturing plant and run back through the manufacturing process. (Chapter 4).

Recycling: The collection of recyclable materials in order to transform or remanufacture the materials into usable or marketable products. In the Pierce County management system, the adopted residential and yardwaste collection ordinances specify the minimum types of materials to be collected. The haulers may add other materials to their collection programs. (Chapter 4).

Source-Separation Recycling Programs: These are recycling programs which collect a variety of recyclable materials at the place where the recyclable waste is first generated, such as a residence or a business. The materials may be collected either in separate bins or in a co-mingled recyclables bin. The separated bin system reduces the need for processing by relying on the generator to sort the materials where the co-mingled bin system requires additional processing at a material recovery facility. (Chapter 4).

SWAC: The state requires that counties establish a Solid Waste Advisory Committee (SWAC) "to assist in the development of programs and policies concerning solid waste handling and disposal..." By law, the SWAC is established to report to the Pierce County Council. (Chapters 1 and 10).

Tacoma-Pierce County Health Department (TPCHD): The Health Department is a separate agency from the County serving the County, Tacoma, and cities. It has its own, separate Board of Health and staff. It implements programs to ensure solid waste handling complies with state and local solid waste codes and ordinances. This includes the permitting process and enforcement of the solid waste permit regulations in WAC 173-304 and 173-351; monitoring; and coordination with the County and the cities on all aspects of special collections and public information programs. (Chapters 1 and 10).

Tacoma/Ruston: Tacoma's system which provides planning, collection, and disposal for Tacoma residents and businesses and disposal for the Town of Ruston. (Chapters 1 and 10).

Vermicomposting: The use of worms to achieve controlled composting of organic wastes. (Chapter 6).

Waste Disposed: All waste disposed at in-county MSW landfills, diverted to municipally or federally owned MSW waste-to-energy facilities, or exported under contract to out-of-county MSW landfills. (Chapter 3).

Waste Generated: The sum of all waste disposed in mixed municipal waste (MSW) landfills, diverted for energy recovery or composting, and materials collected and recycled by both public and private entities. It does not include special wastes which are generally handled outside the municipal waste stream collection system of transfer stations, MSW landfills, and municipally or federally owned waste-to-energy facilities. Special wastes are those which are disposed in privately owned, limited purpose inert landfills, soil bio-remediation facilities, or used to produce industrial hog fuel. (Chapter 3).

Waste Recycled: Materials collected for recycling or diverted from disposal by composting to public and private facilities. Materials not included are pre-consumer recyclables or those specialty wastes that would not generally, or only incidentally, enter the municipal waste stream collection system. (Chapter 3).

Waste Reduction: Sometimes referred to as "source" reduction, this term means reducing the amount or toxicity of waste which is generated or reusing materials. Waste reduction can be accomplished by "precycling" which means considering the type of products or packaging before it is bought, such as buying products in bulk or with little or recyclable packing, or products made of concentrated solutions or materials. (Chapter 11).

Yardwaste: Organic yard debris that can be composted or ground-up for mulch, such as grass clippings, brush, leaves, and tree limbs. (Chapters 4 and 6).

APPENDIX C DEFINITIONS

From RCW 70.95 or WAC 173-304 or 173-351

"ACTIVE AREA" means that portion of a facility where solid waste recycling, reuse, treatment, storage, or disposal operations are being, are proposed to be, or have been conducted. Buffer zones shall not be considered part of the active area of a facility. (WAC 173-304).

"AGRONOMIC RATES" means the rates of application of sludges, manures, or crop residues in accordance with rates specified by the appropriate fertilizer guide for the crop under cultivation. (WAC 173-304).

"AQUIFER" means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs. (WAC 173-304).

"BUFFER ZONE" means that part of a facility that lies between the active area and the property boundary. (WAC 173-304).

"BUY-BACK RECYCLING CENTER" means any facility which collects, receives, or buys recyclable materials from household, commercial, or industrial sources for the purpose of accumulating, grading, or packaging recyclable materials for subsequent shipment and reuse, other than direct application to land. (WAC 173-304).

"CITIZEN" for the purposes of SWAC membership, means a resident of the planning area who does not have a vested interest in the waste management industry. (RCW 70.95).

"CITY" means every incorporated city or town (RCW 70.95).

"CLEAN SOILS AND CLEAN DREDGE SPOILS" means soils and dredge spoils which are not dangerous wastes or problem wastes as defined in this section. (WAC 173-304).

"CLOSURE" means those actions taken by the owner or operator of a solid waste site or facility to cease disposal operations and to ensure that all such facilities are closed in conformance with applicable regulations at the time of such closures and to prepare the site for the post-closure period. (WAC 173-304).

"COMPOSTING" means the controlled degradation of organic solid waste yielding a product for use as a soil conditioner (WAC 173-304).

"CONTAINER" means a device used for the collection, storage, and/or transportation of solid waste including but not limited to reusable containers, disposable containers, detachable containers and tanks, fixed or detachable. (WAC 173-304).

"COVER MATERIAL" means soil or other suitable material that has been approved by the jurisdictional health department as cover for wastes. (WAC 173-304, -351).

“DANGEROUS WASTES” means any solid waste designated as dangerous waste by the department under chapter 173-303 WAC.

“DEMOLITION WASTE” means solid waste, largely inert waste, resulting from the demolition or razing of buildings, roads, and other man-made structures. Demolition waste consists of, but is not limited to, concrete, brick, bituminous concrete, wood, and masonry, composition roofing and roofing paper, steel and minor amounts of other metals like copper. Plaster (i.e., sheetrock or plaster board) or any other material, other than wood, that is likely to produce gases or a leachate during the decomposition process and asbestos wastes are not considered to be demolition waste for the purposes of WAC 173-304 (WAC 173-304-100). (Please note that this definition does not include treated wood or asbestos.)

“DISPOSAL SITE” means the location where any final treatment, utilization, processing, or deposit of solid waste occurs (RCW 70.95).

“DROP BOX FACILITY” means a facility used for the placement of a detachable container including the area adjacent for necessary entrance and exit roads, unloading and turn-around areas. Drop box facilities normally serve the general public with loose loads and receive waste from off-site. (WAC 173-304).

“ENERGY RECOVERY” means a process operating under federal and state environmental laws and regulations for converting solid waste into useable energy and for reducing the volume of solid waste (RCW 70.95).

“HOLOCENE FAULT” means a fracture along which rocks on one side have been displaced with respect to those on the other side and that has occurred in the most recent epoch of the quaternary period extending from the end of the Pleistocene to the present. (WAC 173-304).

“INCINERATION” means a process of reducing the volume of solid waste operating under federal and state environmental laws and regulations by use of an enclosed device using controlled flame combustion (RCW 70.95).

“INDUSTRIAL SOLID WASTES” means waste by-products from manufacturing operations such as scraps, trimmings, packing and other discarded materials not otherwise designated as a dangerous waste under Chapter 173-303 WAC (WAC 173-304).

“INERT WASTES” means noncombustible, non-dangerous solid wastes that are likely to retain their physical and chemical structure under expected conditions of disposal, including resistance to biological attack and chemical attack from acidic rainwater (WAC 173-304).

“INTERIM SOLID WASTE HANDLING SITE” means any interim treatment, utilization or processing site engaged in solid waste handling which is not the final site of disposal. Transfer stations, drop boxes, baling and compaction sites, source separation centers, and treatment are considered interim solid waste handling sites. (WAC 173-304).

“LANDFILL” means a disposal facility or part of a facility at which solid waste is permanently placed in or on land and which is not a land treatment facility (RCW 70.95).

“LANDSPREADING DISPOSAL FACILITY” means a facility that applies sludges or other solid wastes onto or incorporates solid waste into the soil surface at greater than vegetative utilization and soil conditioners/immobilization rates. (WAC 173-304).

“LEACHATE” means water or other liquid that has been contaminated by dissolved or suspended materials due to contact with solid waste or gases therefrom. (WAC 173-304).

“LEGISLATIVE AUTHORITY” means the applicable city or designated county commission/ council or special purpose government formed to carry out solid waste planning and management in the planning area. (RCW 70.95).

“LIMITED PURPOSE LANDFILLS” means a landfill that receives solid waste of limited types, known and consistent composition, other than woodwastes, garbage, inert waste, and demolition waste. (WAC 173-304).

“MEDICAL WASTE” means all the infectious and injurious waste originating from a medical, veterinary, or intermediate care facility (WAC 173-304).

“MINIMUM FUNCTIONAL STANDARDS” refers to Chapter 173-304 WAC, the “Minimum Functional Standards for Solid Waste Handling.”

“PILE” means any noncontainerized accumulation of solid waste that is used for treatment or storage. (WAC 173-304).

“ PLAN OF OPERATION” means the written plan developed by an owner or operator of a facility detailing how a facility is to be operated during its active life and during closure and post-closure. (WAC 173-304).

“PLANNING AREA OR JURISDICTION” means the geographical location designated by a local solid waste management plan as the plan’s legal boundaries. (RCW 70.95).

“POST-CLOSURE” means the requirements placed upon disposal sites after closure to ensure their environmental safety for at least a twenty-year period or until the site becomes stabilized (i.e., little or no settlement, gas production, or leachate generation). (WAC 173-304, -351).

“PUBLIC INTEREST GROUP” means an organization which reflects a civic, social, recreational, environmental, or public health perspective in the area and which does not directly reflect the economic interests of its membership. It is not a trade association or an organization whose purpose is to promote business interests, such as the Chamber of Commerce.
(RCW 70.95).

“PROCESSING” means an operation to convert a solid waste into a useful product or to prepare it for disposal (WAC 173-304).

“PYROLYSIS” means the process in which solid wastes are heated in an enclosed device in the absence of oxygen to vaporization, producing a hydrocarbon-rich gas capable of being burned for recovery of energy. (WAC 173-304).

“RECLAMATION SITE” means a location used for the processing or the storage of recycled waste. (WAC 173-304).

“RECYCLING” means transforming or remanufacturing waste materials into usable or marketable materials for use other than landfill or incineration. (WAC 173-304).

“RUN-OFF” means any rainwater, leachate or other liquid which drains over land from any part of the facility. (WAC 173-304).

“RUN-ON” means any rainwater or other liquid which drains over land onto any part of a facility. (WAC 173-304).

“SEPTAGE” means a semisolid consisting of settled sewage solids combined with varying amounts of water and dissolved materials generated from a septic tank system (WAC 173-304).

“SOLE SOURCE AQUIFER” means an aquifer designated by the Environmental Protection Agency pursuant to Section 1424e of the Safe Drinking Water Act (PL 93-523).

“SOLID WASTE” or “WASTES” means all putrescible and nonputrescible solid and semisolid wastes, including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, demolition and construction wastes, abandoned vehicles or parts thereof, and recyclable material (RCW 70.95.030). This includes all liquid, solid, and semisolid materials which are not the primary products of public, private, industrial, commercial, mining, and agricultural operations. Solid waste includes, but is not limited to, sludge from wastewater treatment plants and septage from septic tanks, woodwaste, dangerous waste, and problem wastes (WAC 173-304).

“SOLID WASTE HANDLING” means the management, storage, collection, transportation, treatment, utilization, processing, and final disposal of solid wastes, including the recovery and recycling of materials from solid wastes, the recovery of energy resources from solid wastes, or the conversion of the energy in solid wastes to more useful forms or combinations thereof. (RCW 70.95).

“SOURCE SEPARATION” means the separation of different kinds of solid waste at the place where the waste originates (RCW 70.95).

“STORAGE” means the holding of solid waste materials for a temporary period. (WAC 173-304).

“SURFACE IMPOUNDMENT” means a facility or part of a facility which is a natural topographic depression, man-made excavation or diked area formed primarily of earthen materials (although it may be lined with man-made materials), and which is designed to hold an accumulation of liquids or sludges. The term includes holding, storage, settling, and aeration pits, ponds, or lagoons, but does not include injection wells. (WAC 173-304).

“SURFACE WATER” means all lakes, rivers, ponds, streams, inland waters, salt waters and all other water and water courses within the jurisdiction of the state of Washington. (WAC 173-304).

“TIPPING FEE” means the price paid per cubic yard or other measurement to dispose of waste at a transfer station, incinerator, or landfill.

“TRANSFER STATION” means a permanent, fixed, supplemental collection and transportation facility, used by persons and route collection vehicles to deposit collected solid waste from off-site into a larger transfer vehicle for transport to a solid waste handling facility. Transfer stations may also include recycling facilities. (WAC 173-304).

“TREATMENT” means the physical, chemical or biological processing of solid waste to make such solid wastes safer for storage or disposal, amenable for energy or material resource recovery or reduced in volume. (WAC 173-304).

“USED OIL” means oil which through use, storage, or handling has become unsuitable for its original purpose due to the presence of impurities or the loss of original properties.

“VECTOR” means a living animal, insect or other arthropod which transmits an infectious disease from one organism to another. (WAC 173-304).

“WASTE REDUCTION” means reducing the amount or toxicity of waste generated or reusing materials (RCW 70.95).

“WETLANDS” means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, estuaries, and similar areas. (WAC 173-304).

“WHITE GOODS” means used major household appliance such as washers and dryers, and refrigerators. (WAC 173-304).

“WOODWASTE” means solid waste consisting of wood pieces or particles generated as a by-product or waste from the manufacturing of wood products, handling and storage of raw materials and trees and stumps. This includes, but is not limited to, sawdust, chips, shavings, bark, pulp, hog fuel, and log sort yard waste, but does not include wood pieces or particles containing chemical preservatives such as creosote, pentachlorophenol or copper-chrome arsenate (WAC 173-304).

APPENDIX D 1989/1992 PLAN GOALS AND RECOMMENDATIONS

These include the recommendations from the 1989 plan which were also adopted in the 1992 Plan with the exception of the waste reduction and recycling recommendations. The 1992 Plan waste reduction and recycling (WRR) recommendations are included.

CHAPTER 1 INTRODUCTION

Goal: In recognition of the priorities set forth by the Washington State Legislature in RCW 70.95.010, it shall be the goal of the Pierce County Solid Waste Management Plan to implement, to the fullest extent possible and in descending order of priority, solid waste management processes that reduce the waste stream, promote recycling, and provide for the separation of waste prior to incineration or landfilling.

Goal: Develop a solid waste program that promotes and maintains a high level of public health and safety, and which protects the natural and human environment of Pierce County.

Goal: Promote input and ensure the representation of the public in the planning process.

Goal: Promote the conservation of energy.

Goal: Develop economically responsible means of solid waste management that recognizes the cost and need for environmental protection and services to the citizens of the County.

Goal: Promote the use of private industry expertise to carry out the components of the Solid Waste Management Plan. This does not mandate the use of private industry, nor does it preclude the involvement of Pierce County in implementing the Plan.

Goal: Be consistent with all existing resource management plans.

CHAPTER 3 WASTE REDUCTION

Goal: To promote waste reduction through the use of strong, coordinated educational and public outreach programs which can be used for models by the cities and towns of Pierce County.

Goal: To continue implementing programs to reduce the amount of waste material discarded by the County and other municipal governments, either by reusing materials or avoiding their generation.

Goal: To support state and national waste reduction measures by promoting them locally.

Goal: To reduce Pierce County's solid waste stream and achieve a 50% recycling rate by 1995.

Recommendation 3-1. Pierce County and its municipalities should plan to achieve or exceed the Washington State goal of a 50% recycling rate by 1995 through waste reduction and recycling measures prescribed in this Plan.

Recommendation 3-2. The County should continue to implement the existing and developing programs, as well as new waste reduction programs. Pierce County Utilities Solid Waste Division should coordinate waste reduction and recycling activities in Pierce County. Municipalities that develop independent waste reduction and recycling programs should coordinate their efforts and explore areas of mutual concern with the County, whenever possible. The Pierce County waste reduction program should include the projects described in this Plan.

Recommendation 3-3. Pierce County should continue and expand its Data Collection Program. The program should be used to measure waste reduction to the extent it is possible. Pierce County should develop data gathering projects as part of its waste reduction programs designed specifically to measure waste reduction and its indicators. This information should be designed for incorporation into the Data Collection Program, if possible. Results should be used to modify programs to achieve the greatest practical impacts and provide more accurate estimates of the impact waste reduction has on the waste stream.

Recommendation 3-4. Pierce County and its municipalities should coordinate the continued development of its public waste reduction education and outreach programs. Pierce County should continue to use its defined methodology for designing and evaluating its education and outreach programs, including setting clear, obtainable program objectives and establishing mechanisms for measuring program success. Program emphasis should include waste reduction options that individuals can use and should also stress the economic and environmental benefits of waste reduction. Pubic outreach components currently include the following:

- Curbside recycling education
- School programs
- Environmental Education Exhibit
- Speakers bureau
- Solid waste videos
- Articles for newspapers and magazines
- Newspaper tabloids
- Locally developed brochures
- Pierce County in-house waste reduction and recycling program
- Pierce County Procurement Policy.

New informational methods should be developed as the program matures, while existing messages and effective methods should continue to be sent and used. Public education for both waste reduction and recycling should be expanded with new messages, especially about pre-cycling (consumer awareness regarding excess packaging) and yard waste management, and the benefits of reuse and refillables. Other topics should include backyard composting, multi-family recycling, and household hazardous waste management. Informational programs should be coordinated with the original recycling programs to provide a comprehensive waste management message to the public.

Recommendation 3-5. Pierce County should continue and expand its school education curriculum program and place new emphasis on middle and high school programs rather than only on K-6. The County should develop the ability to give more presentations and should examine the need, periodically, to develop expanded presentations for students who have previously seen the current presentation. Pierce County should work with public and private schools in the County to help them design and implement school waste management plans. The County's goal is to help establish waste management programs in 50% of the schools in Pierce County by 1995. Pierce County should also continue to keep abreast of developments in waste reduction education so this information can be incorporated in presentations or otherwise passed onto school administrators, teachers and students.

Recommendation 3-6. Pierce County should continue its in-house waste reduction program to show the benefits of waste reduction and set an example and provide a model for cities and towns, residents and businesses. The program should continue to look for opportunities to expand by implementing more waste reduction and recycling strategies. Publicly owned buildings and governmental operations in Pierce County should undergo waste audits to determine additional opportunities for waste reduction and recycling beyond the established in-house measures. Practical, easy-to-use, cost-effective programs should be established to address waste reduction and recycling opportunities identified in the audits. The evaluation should address the needs of particular governmental operations as well as economies of scale that might exist for the County overall. For example, a County in-house materials bank may be able to take advantage of such economy of scale.

Recommendation 3-7. Pierce County should continue to expand the Procurement Policy to include purchasing of manufactured products with recycled content and fully implement the Policy in all departments. This would include the purchasing of not only paper products but also other products such as yard waste compost for park programs, office equipment, and other items identified by the State in its procurement policy contracts. The current procurement policy sets recycled paper purchasing goals of 10% by 1991, 20% by 1992, and 60% by 1993 for all County departments. The Solid Waste Division will work with the County's Purchasing Agent to identify additional methods for modifying County purchasing activities to encourage waste reduction, recycling, and the use of recycled products. The County's procurement policy should be evaluated and grow over time to respond to County needs and to meet state procurement program requirements developed in the future.

Recommendation 3-8. Pierce County should continue to develop its commercial and industrial business waste reduction and recycling education program in coordination with other County and local government officials as well as Ecology's Office of Waste Reduction and Recycling. Initially, the program may include the development and distribution of locally applicable materials, the establishment of a resource library, and an awards and incentive program for recognizing and rewarding local businesses that achieve significant waste reduction and recycling goals. The County may use the Recycling Roundtable and other business and industry representatives to advise Pierce County on educational and outreach activities. The Roundtable will help the County to target educational efforts at businesses that may be considering a move away from reusable, recyclable, or durable goods, or at businesses that could significantly benefit themselves and the community through increased waste reduction and recycling. In addition, the Roundtable

may assist the County in reviewing the need for other services such as waste audits, additional technical assistance, and facilitating waste exchange or materials banks activities.

Recommendation 3-9. Pierce County should encourage home composting of yard waste and examine the feasibility of establishing a Master Composter program in cooperation with the WSU Extension Services Master Gardener Program. The project could be used to train residents to teach home composting techniques and to provide public education and outreach services to other residents in coordination with other yard waste composting alternatives. The County should ask the cities and towns to become direct supporters of this program.

Recommendation 3-10. Pierce County should consider disposal bans once appropriate and adequate waste management alternatives are available in the County. For example, when the yard waste composting facility has been built and is capable of running at the necessary capacity, then the County should consider banning the disposal of yard waste at County and private solid waste disposal facilities. In conjunction, the educational activities outlined in Recommendation 3-3 should inform residents about disposal bans and alternatives. In the example, education could identify the County composting facility and home composting as alternatives for complying with the ban, giving information about how to use each option.

Recommendation 3-11. The County should track state and federal waste reduction and recycling legislation and programs. Local government officials should lobby state and federal governments in support of waste reduction and recycling laws that are consistent with this Plan. Pierce County and its municipalities should consider, after July 1993, adopting local waste reduction and recycling ordinances such as beverage container deposit or packaging legislation consistent with this Plan. The County should examine unilateral actions with surrounding counties, particularly if state or national legislation is not adopted by 1993.

Recommendation 3-12. Pierce County should continue to pursue the use of rate-based incentives in promoting waste reduction and recycling. The County should work closely with private collection companies serving the County to identify equitable, implementable rate strategies that will be acceptable to the Washington Utilities and Transportation Commission. Pierce County should also continue to work directly with the Commission to identify and implement these types of alternatives.

Recommendation 3-13. Private sector waste reduction activities should be encouraged to continue and expand in Pierce County. The County should examine its existing and new programs to evaluate their impacts on private reduction activities.

Recommendation 3-14. Pierce County should continue to provide adequate funding to support waste reduction programs, especially public and school education.

CHAPTER 4 RECYCLING

Goal: To reduce Pierce County's solid waste stream and achieve a 50% recycling rate by 1995.

Goal: To provide appropriate levels of collection and recycling opportunities so that the greatest number of citizens can participate and the fullest practical recycling potential for each material can be realized.

Goal: To continue existing recycling activities and expand the local recycling program.

Goal: To establish model programs for Pierce County communities to adopt or modify to suit their needs and to support the communities in this effort.

Goal: To maintain a data collection program as a service to the County and its municipalities, which will aid in tracking and evaluating the waste stream and recycling program impacts.

Goal: To foster a sense of personal responsibility among residents for solid waste management, particularly in accomplishing waste reduction and recycling goals.

To support these goals, Pierce County has identified the following policies:
#1. Source separation of waste should become a fundamental strategy of solid waste management pursuant to RCW 70.95.010.

#2. Each recycling effort should be ranked based on consideration of waste stream contribution, maximum diversion potential, market opportunities, and environmental impacts.

#3. Avoided cost of disposal and appropriate environmental cost savings should be factors in evaluating the success of recycling programs.

#4. Governments and industries should cooperate to carry out recommended recycling programs. Private firms are encouraged to participate in the development and implementation of these programs through contractual arrangements, shared services, grants, and promotion and education.

#5. The County should use financial subsidies equal to the avoided cost of transportation and disposal to encourage a higher level of participation.

Recommendation 4-1. Pierce County and its municipalities should continue to plan to achieve or exceed the Washington State goal of a 50% recycling rate by 1995.

Recommendation 4-2. The Solid Waste Division of the Pierce County Utilities Department should serve as a focus for waste reduction and recycling activities, educational efforts and outreach, technical assistance, and program evaluation. Efforts among Pierce County and its municipalities should be coordinated through the Solid Waste Division.

Recommendation 4-3. Pierce County and the franchised collection companies should continue the single-family curbside collection program and the drop-off collection program for urban and rural residents. The County and the collection companies should continue to implement strategies for keeping participation rates high, which includes continuing to promote a recycling rate incentive with a lower rate for those who recycle and higher rate for those who do not recycle. Opportunities for collecting other types of waste should be examined for their technical and economic feasibility. Also, the County and the collection companies should examine other opportunities to make collection services even more convenient. In conjunction with the single-family curbside collection program, Pierce County should continue its buy-back center sticker program to provide additional opportunities and incentives for residents to participate. Multi-material drop-off sites should also continue to be conveniently located, such as at solid waste facilities serving the public. The County should review program activities annually to ensure that recycling goals are being met and implement new programs that are feasible.

Recommendation 4-4. Pierce County, the franchised collection companies, and the cities and towns should continue to implement the multi-family residence collection program. A variety of options should be utilized including, but not limited to, curbside collection for smaller buildings, multiple container and/or multi-material collection, and special collection days at complexes. The County should continue to support differential and higher tipping fees for non-participating complexes, recycling design requirements for new complexes, including parking and container space that should adequately allow for recycling, and other incentives or mandates that encourage multi-family residence recycling. The County should review program activities annually to ensure recycling goals are being met. The cities and towns should consider using or adapting the County's model ordinance for multi-family recycling for their communities.

Recommendation 4-5. Pierce County collection companies should continue to give a price preference to processing facilities located in the County for the processing and marketing of recyclables. County government should also continue to explore ways of encouraging the expansion of in-county processing capabilities by encouraging support and expansion of the buy-back centers and non-profit organizations. Existing and new recycling programs should be evaluated by Pierce County for their impacts on private sector recycling and the County should continue to provide information to the public about the private recycling services.

Recommendation 4-6. City, town and County governments should continue to work together to develop and implement a public education program for residents about recycling opportunities. Current public education and outreach activities sponsored by Pierce County should continue and expand where appropriate. These activities include curbside recycling education, recycling education in schools, displays and advertising, speakers bureau, news and article distribution, the use of outside resources, and in-house waste reduction and recycling programs. Pierce County should also continue to implement new public education and outreach programs including, but not limited to, topics such as pre-cycling, yard waste disposal, backyard composting, multi-family recycling, and household hazardous waste management. The County should continue to investigate ways to measure the effects of education on public attitudes and behaviors.

Recommendation 4-7. City, town and County governments should continue to work together with other local governments and the private sector to educate business and industry and facilitate their waste reduction and recycling. Pierce County's plans to develop a commercial and industrial education program should be pursued. Planned educational and outreach activities may include developing and distributing locally developed educational information, promotional materials, news letters and fact sheets, holding workshops for local businesses, establishing a resource library, and instituting an award and incentive program. The County should evaluate the usefulness of these programs as they are implemented as well as investigate opportunities for other business education services, such as waste audits.

Recommendation 4-8. Pierce County should establish a comprehensive yard waste management program which would include drop-off site opportunities, curbside collection, and support for home composting, at a minimum. Each year, as the program is evaluated, additional or modified opportunities for increasing the convenience of the program and the quantity of yard waste should be explored. Cities and towns should complete the development of their comprehensive yard waste collection systems and all municipalities should support permitting facilities consistent with this program.

Recommendation 4-9. County government should continue to explore ways to promote the use of recycled materials to expand the market potential in the County. One method to do this is for County and municipal governments to promote the use of recycled products.

Recommendation 4-10. Pierce County should continue to use the Data Collection Program to monitor the quantities and types of wastes that are being collected and recycled throughout the County. Efforts to improve the quantification of commercial, single-family, and multi-family recycling rates should continue. The County should additionally organize such data collection by cities and towns, if feasible, and make that information available on a regular basis so that the cities and towns can evaluate progress on their recycling programs and plan future needs. All recycling programs should be designed to include data gathering for program evaluation. Evaluation of programs should be ongoing. By 1993, the cities, towns and County should conduct a comprehensive examination of recycling and adjust programs to meet the 1995 goal of a 50% recycling rate.

Recommendation 4-11. Pierce County and the haulers and recyclers should continue to examine ways to make recyclables more marketable, such as improving the purity of collected materials and implementing all feasible methods.

Recommendation 4-12. Pierce County should work to develop and implement incentives or controls that encourage in-county processing of recyclables collected in Pierce County. Examples of processing activities include, but are not limited to, bailing, sorting, crushing, packaging or other such processing as necessary to properly prepare material for market or use.

Recommendation 4-13. County government should continue to investigate and encourage throughout the planing area the design of equitable variable collection rate structures and disposal rates that encourage maximum waste reduction and recycling. In developing new rate structures, consideration should be given to the possible impacts of illegal dumping and littering. Pierce County, franchised collection companies, recyclers, and the WUTC should work together to

develop specific recycling rate proposals. These rate proposals should address both residential and commercial waste sources.

Recommendation 4-14. Pierce County should continue to provide adequate funding to ensure a continued high level of participation and the diversion of significant quantities of solid waste away from landfill disposal.

Recommendation 4-15. City, town and County governments should cooperate to lobby state and federal governments in support of recycling laws, regulations, and practices that are consistent with the Solid Waste Management Plan. In particular, lobbying efforts should emphasize the need for state and federal leadership in developing markets for recyclables, packaging legislation, labeling of plastics, and a bottle deposit option.

Recommendation 4-16. The County should provide adequate funding and staffing to assist cities and towns in implementation of the actions mandated in the Plan. City, town, and County governments should continue to audit waste handling and disposal practices, where feasible, to determine possible recycling strategies in publicly owned buildings and in those commercial buildings where the service is mandated.

Recommendation 4-17. The municipal and County governments should pursue the development or modification of state regulations concerning the flow control and rate structure for collecting recyclables produced by business and industry. Methods should be developed to give municipal and County governments some incentive options for directly promoting commercial recycling in their jurisdictions.

Recommendation 4-18. Pierce County should continue and expand, where appropriate, its in-house waste reduction and recycling programs. The County should continue to set an example for other jurisdictions and the private sector of the successes that can be achieved through in-house programs.

Recommendation 4-19. The urban and rural boundaries should be reviewed periodically and revised as necessary to reflect changes in demographics, community needs, Department of Ecology requirements, and land-use urban boundaries adopted under the County's growth management planning process to meet the requirements of RCW 36.70A.

Recommendation 4-20. The list of designated recyclables should be expanded, as appropriate, to include additional items as new programs come on line, or existing programs are modified, or when new markets appear. Pierce County is now considering including household batteries, plastics, and magazines. Other special wastes such as Christmas trees and used oil should be continued to be included in recycling management programs.

Recommendation 4-21. Pierce County should continue to use its defined methodology for designing and revising programs. This methodology includes 1) scoping the project, 2) researching similar programs, 3) developing a comprehensive plan that sets clear objectives, 4) establishing methods to measure success, and 5) assessing the performance of the program. Programs should be designed to use and report to the Data Collection Program, if possible.

Recommendation 4-22. As County and municipal governments and private entities work to design recycling programs, they should coordinate their programs and public messages to every extent possible, so that the public is not confused by conflicting information and program instructions.

Recommendation 4-23. The Utilities' Solid Waste Division should work closely with the Planning and Land Services Department to adopt development standards for composting facilities and to expedite the permitting of composting facilities/sites by removing barriers in existing codes.

Recommendation 4-24. Pierce County should work with local and state economic development groups to promote enhanced markets through efforts to site new re-manufacturing facilities.

CHAPTER 5 REFUSE COLLECTION

Goal: Ensure that all residents of Pierce County have access to refuse collection services.

Goal: Ensure the compatibility of collection service levels with the other elements of the solid waste system established by the Plan.

Recommendation 5-1: Records of the complaints received from Pierce County residents regarding lack of collection service should be reviewed to evaluate the need for mandatory collection or County intervention in refuse collection at the time of 5-year updates to the Plan.

Recommendation 5-2: Transfer station and disposal site locations are currently meeting the needs of self-haul residents. Any changes in these locations, replacement facilities or closures should be evaluated in terms of the effect on self-haul residents, which could impact the refuse collection system.

Recommendation 5-3: Minimum service levels for both urban and rural areas shall be adopted by the County by July 1, 1991. After minimum service levels are set, the County government shall decide whether to take authority over collection of recyclables based on an evaluation of administrative costs and control of rates and program.

Recommendation 5-4: The County and involved local Governments should support efforts by the haulers to receive rate approval from the WUTC for the development of recycling programs and acquisition of equipment.

Recommendation 5-5: The City of Tacoma will continue to provide solid waste collection and disposal services within its corporate city limits. The City shall retain the right to determine all minimum service levels and collection and disposal rates as adopted by the Tacoma City Council, pursuant to RCW 35.21.120.

CHAPTER 6 SOLID WASTE PROCESSING TECHNOLOGIES

Goal: Consider statewide priorities, particularly recycling goals and programs and their effect on alternative processes and landfill development in the County.

Goal: Provide an environmentally safe and reliable disposal system(s) that protect human health and reduces dependency on landfills.

Goal: Develop a mixed waste processing, and/or WTE program that will be cost effective for county residents.

Goal: Recover resources that are otherwise not available with conventional municipal solid waste disposal methods.

Recommendation No. 6-1. County government should include a waste-to-energy (WTE) facility as part of the integrated Pierce County solid waste management system, as well as alternative technologies. The County should study alternate technologies that they determine to be worth consideration within the comprehensive solid waste management system. All technologies should be designed to complement the recycling and waste reduction efforts in the County. A front end material recycling facility(s) (MRF) should be considered with all technologies. Recycling and waste reduction have been evaluated as to the size and BTU value of the waste stream (Appendices D and E). The County should consider that data in selecting and sizing facilities. A thorough environmental review, according to SEPA guidelines, and a technical review, through the independent engineering assessment (Recommendation No. 6-3), is necessary to determine that the technology meets environmental standards, is efficient and dependable as a method of solid waste management. The first step in the environmental review process was completed with the issuance of the programmatic FEIS in July, 1989.

In addition to these technological options, Pierce County and/or private companies should proceed with siting:

1. Landfills that meet all legal and environmental requirements and that are capable of disposing of whatever waste requires disposal (separated municipal solid waste, ash, demolition waste, etc.)
2. Yardwaste composting facilities.

Recommendation No. 6-2. County government should pursue development of information gathering for alternative processing technologies in order to provide performance data and economic data roughly comparable to that which is currently available on the WTE project. The purpose of this recommendation is to ensure equivalent information is available to provide a basis for future decisions.

Recommendation No. 6-3. County Government should complete negotiations with a WTE vendor to establish the cost and risk associated with proceeding with the project. An independent engineering assessment should then assess how contract commitments affect the waste stream, particularly in regard to size of the facility. County waste reduction and recycling programs (including composting programs), and other solid waste management methods the County is

considering. A WTE facility shall not be operated prior to the completion of a project specific environmental impact statement.

Recommendation No. 6-4. County government should continue to study alternate solid waste processing technologies for consideration within the County's integrated solid waste management system. A front end material recycling facility(s) (MRF) should be considered in conjunction with all technologies. In selecting and sizing technologies, the County should consider the data contained in Appendices D and E, which evaluate the effects of recycling and waste reduction on the size and BTU value of the waste stream. A thorough environmental review will be conducted consistent with the requirements of SEPA. The first step in the environmental review process was completed with the issuance of the programmatic FEIS in July 1989.

In addition to these technological options, Pierce County and/or private companies should proceed with siting:

1. Landfills that meet all legal and environmental requirements and that are capable of disposing of whatever waste requires disposal (separated municipal solid waste, ash, demolition waste, etc.)
2. Yardwaste composting facilities.

Recommendation No. 6-5. All future County government procurement processes to select qualified solid waste systems vendors should be constructed to encourage input from the SWAC on the scope and criteria for evaluation of said vendors.

City of Tacoma:

Recommendation No. 6-6. The City of Tacoma should continue with the planned development of WTE facilities as part of its comprehensive solid waste management plan. The City should continue to expand its existing waste reduction and recycling programs to limit the amount of waste that must be processed through these facilities. The City shall operate all solid waste processing and disposal facilities consistent with existing and future regulatory requirements.

General Recommendations:

Recommendation No. 6-7. All future City procurement processes to select qualified solid waste systems' vendors will be determined by each City Council.

Recommendation No. 6-8. Based on the 1987 energy market survey, WTE facilities for cities, towns, and County government should consider electricity generation a primary source of energy sales revenue to the facility.

Recommendation No. 6-9. Any WTE plant or ash landfill should be sited in such a way as to provide protection against air and water pollution, and to maintain the existing quality of life in and around any neighboring County residents. The operating plan shall ensure the same high standards through regular monitoring and staff training.

Recommendation No. 6-10. A citizen advisory panel should be established to participate with the Tacoma-Pierce County Health Department in reviewing environmental and health impacts associated with solid waste facilities in Pierce County. Members appointed to this panel should be selected based on background and demonstrated expertise on the issues they will be called upon to review.

Recommendation No. 6-11. Only technologies with demonstrated reliability will be implemented as the primary processing and disposal alternative of a local government's solid waste processing system. However, the local governments may wish to examine alternative technologies, conduct pilot programs, and explore new and innovative ideas, as part of their process of selecting solid waste processing technologies. It must, however, be recognized by each local Government that it is responsible, along with the Health Department and the Department of Ecology, for determining whether or not its chosen technology meets the requirements of this Solid Waste Management Plan.

Recommendation No. 6-12. With any alternative technology project, the operating vendor must provide sufficient financial assurances to minimize financial risk to the public for environmental and technical performance. Each City, Town, and County Council will independently determine the level of financial and environmental assurances that will be required for projects under their own jurisdiction.

Recommendation No. 6-13. Plant compliance with State and Federal Standards for environmental protection shall include specific protocol that will protect the health and safety of plant employees and communities.

CHAPTER 7 TRANSFER, LONG HAUL, AND THE EXPORT OF WASTE

Goal: Utilize transfer facilities, long haul, or the export of waste wherever and however appropriate to provide cost and operational efficiency to the waste disposal system.

Goal: Provide convenient waste transfer locations for public and commercial needs.

Goal: Provide opportunities for recycling to the public and commercial haulers at transfer locations.

Goal: Comply with applicable local, state, and federal laws when transfer, long haul, or the export of waste is utilized.

Recommendation 7-1: Transfer service to the public through rural transfer facilities should be continued.

Recommendation 7-2: Transfer facilities shall be developed to incorporate recycling and where feasible, separate handling of other materials (i.e. demolition).

Recommendation 7-3: If a countywide waste-to-energy facility is implemented, transfer facilities should be utilized as an initial separation point for non-processible and processible waste. This processing could also take place at the WTE facility.

Recommendation 7-4: Pierce County government, either through public agencies or through contracting with private parties, should construct or obtain the use of a transshipment facility(s) and as an interim measure or as a backup, contract for disposal of Pierce County waste at out-of-county facilities. To implement this option, vendors should be selected on a competitive basis, should be required to provide cost-effective service to Pierce County residents and should demonstrate that their facilities have been designed, constructed and are operated to meet applicable local, state and federal regulations.

Recommendation 7-5: The City of Tacoma should continue to evaluate the need for transfer facilities, along with export of waste options, both as primary and supplementary solid waste disposal option for the City. The City may implement any of these options in order to meet its solid waste disposal needs.

CHAPTER 8 LANDFILLING AND VOLUME REDUCTION

Goal: Provide a strategy for procuring landfill capacity (including possible ash fill capacity) through the planning period. The strategy should promote efficient use of landfill capacity and minimize disposal costs.

Goal: Upgrade existing landfills and construct new landfills to be in full compliance with all local, state, and federal regulations concerning solid waste disposal.

Goal: Provide for maximum protection of the environment and support cleanup activities for facilities with existing environmental problems.

Recommendation 8-1: Continued landfill improvements at the City of Tacoma Landfill are recommended. The City should continue to evaluate all available options to obtain additional landfill space. The City must coordinate with Pierce County if the disposal site is located within Pierce County.

Fort Lewis and McChord Air Force Base

Recommendation 8-2: Continued landfill improvements and expansion of the Fort Lewis Landfill as planned by U.S. Army officials is recommended.

Pierce County

Recommendation 8-3: Continued landfill improvements at the Hidden Valley Landfill are recommended.

Recommendation 8-4: Private parties' efforts to site, develop and operate new regional landfills in Pierce County should be encouraged and continue so that the County's residents are assured of landfill capacity of waste generated in Pierce County throughout the planning period. A regional landfill would have the capacity to serve the entire County.

Recommendation 8-5: If there is a lack of landfill capacity in Pierce County for solid waste generated in Pierce County in the future, and if out-of-county disposal options are cost effective, then the County Government should contract for the use of a landfill sited out-of-county and should design and construct, or otherwise obtain from public or private sources, a transshipment point for movement of solid waste to out-of-county disposal sites.

Recommendation 8-6: County Government should immediately begin the public siting process for a landfill.

Recommendation 8-7: Current plans to construct a transfer station at the Purdy Landfill and divert waste to a regional landfill or waste-to-energy facility should be continued.

McNeil Island Landfill

Recommendation 8-8: The Department of Correction's current plan to install a drop box facility and divert waste to a Pierce County landfill should be incorporated into this Plan.

Recommendation 8-9: Solid waste haulers currently providing service in Pierce County through certificates issued by the Utilities and Transportation Commission under RCW 81.77, or by contract with any city or town other than the City of Tacoma, are required to haul solid waste collected in Pierce County to the Hidden Valley and Purdy landfills or transfer stations as appropriate until Pierce County adopts an ordinance directing solid waste to another designated facility.

CHAPTER 9 ENFORCEMENT AND ADMINISTRATION

Goal: Ensure that the Health Department's permitting, monitoring and enforcement programs for solid waste are adequately funded, staffed, and managed in a cost-effective manner.

Goal: Ensure that disposal service levels are maintained consistent with the Plan and that rates charged are equitable and reflect cost effective management and operation practices.

Goal: Ensure that the organizational structure facilitates interjurisdictional cooperation and the orderly, cost effective, and environmentally sound management of the solid waste system.

Goal: Ensure thorough public discussion on proposed waste management projects including waste-to-energy facilities, by providing balanced information, review, and comparison of alternatives, and analysis of potential environmental impacts and benefits, in accordance with state and local statutory guidelines.

Recommendation 9-1: The County should establish a working group of waste managers which includes managers from both public and private solid waste programs who meet on a regular basis to keep each other informed, share new discoveries, and brainstorm on problem issues.

Recommendation 9-2: The current funding mechanism used to support the TPCHD and the County's solid waste programs should continue to be used. Increased program costs resulting from implementation of Plan recommendations should be factored into the flat fee received from the landfill operators.

Recommendation 9-3: The household hazardous waste program initiated by TPCHD should be continued until new recommendations are developed in the 1990 hazardous waste management planning process.

Recommendation 9-4: A general public education program should be developed to coordinate with all project specific public relations efforts (e.g., waste reduction, waste-to-energy, landfill siting, etc.) and to coordinate with other related solid waste issues such as litter, illegal dumping and increased disposal fees.

Recommendation 9-5: The County must establish minimum service levels for recyclables, and determine whether to a) by ordinance award a contract to collect source separated recyclable materials from residences within unincorporated areas, or b) notify the WUTC in writing to carry out and implement the provisions of the waste reduction and recycling element of the Comprehensive Solid Waste Management Plan.

Recommendation 9-6: Under this Solid Waste Management Plan, the City of Tacoma will retain control over all aspects of solid waste management within its corporate city limits, such as collection and disposal rates, minimum service levels, and waste management programs.

Recommendation 9-7: Pierce County should limit the importation of out-of-county solid waste to the extent that there is an established short term need for additional solid waste for processing system efficiencies and/or to provide waste quantities necessary for financial guarantees of put-or-pay provisions of operating contracts.

Recommendation 9-8: Municipalities should utilize the authority under RCW 36.58 and 39.34 to adopt a countywide flow control ordinance to implement the recommendations of this plan. Municipalities in Pierce County should also utilize their flow control authority to adopt ordinances and/or enter interlocal agreements to implement the recommendations of this plan.

Recommendation 9-9: The Pierce County Planning Commission is responsible for addressing all land use concerns related to solid waste facilities. The SWAC should submit the proposed Zoning Code amendments to the Council so that the Council can forward them to the Pierce County Planning Commission.

CHAPTER 10 SOLID WASTE MANAGEMENT SYSTEMS

Recommendation 10-1: The County should begin preliminary siting efforts to identify locations in the county that may be suitable for a landfill. A landfill site will be required in any solid waste management strategy the County chooses.

Recommendation 10-2: The County should seek an expedient determination on whether or not Hidden Valley site life can be expanded to 1998.

Recommendation 10-3: The County should ascertain the costs and implementation details of the out-of-country landfill alternatives.

Recommendation 10-4: The County should continue negotiations with Wheelabrator, evaluating the compatibility of arrangements for the "put-or-pay" commitments with WRR goals. The advantage of continuing negotiations is that the project would be able to proceed directly to site evaluation, environmental review, and permitting, if the Wheelabrator proposal is acceptable to the County and all applicable recommendations in the plan have been followed.

Recommendation 10-5: If recycling levels are falling below anticipated goals and if markets are favorable, the County should consider implementing some level of mixed waste processing to recover marketable materials, depending on the effectiveness of the source separation programs.

Recommendation 10-6: Tacoma and Fort Lewis should proceed to implement their current solid waste management programs.

CHAPTER 11 SPECIAL WASTE STREAMS

Goal: Provide guidelines and strategies for disposal of all special waste types.

Goal: Ensure that special wastes are disposed in a manner that complies with all local, state, and federal regulations applicable to the specific waste type.

Goal: Ensure that management strategies for special wastes follow the state best management strategies as well as state priorities of waste reduction, recycling incineration or landfilling of separated wastes before incineration or landfilling of mixed wastes.

Recommendations:

- Pierce County should actively proceed with a public awareness and education program for sludge utilization in land application.
- Pierce County should actively endorse the development of a disposal/application site for sludge in Pierce County. If a permit application for such a facility has not been received by January 1989, Pierce County in cooperation with and supported by the jurisdictions operating treatment plants, should initiate a siting, permitting and development process.

- Pierce County should endorse the development of disposal or treatment facilities for the management of septage wastes. The County Recycling/Solid Waste Coordinator should work with septage haulers to investigate possible disposal alternatives and provide support during the siting and permitting process.
- Pierce County should support the active development of at least one demolition and inert waste landfill in Pierce County. The County should cooperate with other jurisdictions or private entities in the siting, permitting and development process.
- If the wood products industry experiences a revitalization, the permitting and enforcement programs which are the responsibility of the Health Department should be in place to handle this special waste stream. In addition, the County Recycling/Solid Waste Coordinator should develop a program to inform woodwaste generators of their disposal options and permitting responsibilities.
- The County should develop a program to inform industrial waste generators of their options for disposal/treatment of their liquid wastes in the event that new secondary treatment facilities increase industrial pretreatment requirements.
- Continued prosecution of illegal tire haulers and illegal disposal site operators.
- Investigate incineration of tires and encourage the development of a tire shredding/ recycling operation in the County. State grant programs should be investigated.
- Pursue state grants for the cleanup and recycling of existing tire piles, and for the enforcement of disposal restrictions.
- The County should evaluate the recommendations of Ecology's Multiuser Confined Disposal Sites Program Study, and then proceed to develop a dredge disposal program for the County.
- A facility to dispose of ash from operating WTE Facilities should be sited, constructed and operated in Pierce County to accept ash from WTE facilities located in Pierce County.
- Any ash monofill or treatment facilities shall be sited and designed in such a way as to provide protection against air and water pollution, and to maintain the existing quality of life in and around the facility, for the protection of all of Pierce County and neighboring County residents. The operating plan shall ensure the same high standards through regular monitoring and staff training.

APPENDIX E REFERENCE ORDINANCES AND DOCUMENTS

Prior to 1988 • ***Solid Waste Collection and Disposal Regulations***, Pierce County code, Chapter 8.32, Tacoma Pierce County Health Department (consolidates older regulations).

1988: • **Negotiated contract** with resource recovery project vendor (WTE) in Ordinance #90-67 (not approved) as directed by Resolution #88-28S Authorizing Commencement of Negotiations, 1988.

1990: • ***Solid Waste Handling System*** (Ordinance #90-4), Pierce County Code, Chapter 8.30, January 1990.

• ***Report on Alternative Solid Waste Processing Technologies***, Pierce County Utilities Department, consultant - R.W. Beck, February, 1990.

• ***Minimum Service Levels for Curbside Collection for Single-Family Residents and Urban and Rural Boundaries*** (Ordinance. #90-14), Pierce County, March 1990.

• ***Tacoma-Pierce County Local Hazardous Waste Management Plan***, Tacoma-Pierce County Health Department, consultant- Ch2M Hill, April 1990

• ***Procurement Policy – Recycled Paper and Paper Products Procurement Program,*** (Ordinance #90-19s), Pierce County, Code, Chapter 8.26, December 1990.

1991: • ***Pierce County Mixed Waste Municipal Solid Waste Composting Facility Procurement-Final Report***, consultant - R.W. Beck, May 1991.

• ***Pierce County Solid Waste Export Services Procurement-Final Report***, Pierce County Utilities Department, consultant - Ch2M Hill, June 1991.

• ***Report to the County Executive on Comparison of Alternative Disposal Technologies***, Pierce County Utilities Department, June/July 1991.

• ***An Ordinance Reaffirming Waste Reduction and Recycling as a County Priority; Selecting a Local Landfill Option as part of an Integrated System for the Disposal of Pierce County Solid Waste and Requiring Annual Reports*** (Ordinance #91-126), Pierce County, August 1991.

• ***Minimum Service Levels for Multi-Family Complexes, Condominiums, and Mobile Home Parks*** (Ordinance #91-86), Pierce County, August 1991.

- ***Report on Proposed 1992 Solid Waste Rates***, Pierce County Utilities Department, December 1991.

- ***Pierce County Compostable Waste Diversion Report***, Pierce County Utilities Department, consultant-SCS Engineers, December 1991.

1992: • ***Minimum Service Levels for Yard Waste Collection for Single-Family Residents***, (Ordinance #92-22), Pierce County, April 1992.

1994: • ***Pierce County Landfill Siting, Phase I: Countywide Screening***, Pierce County Department of Public Works and Utilities, Solid Waste Division, April 1994.

- **Fort Lewis Final Environmental Impact Statement,** ***Implementation of a Solid Waste Management Program***, Department of the Army Headquarters, I Corps and Fort Lewis, 1994.

- ***Chase Economic Analysis***, consultant - Robert Chase, 1994

- ***Infectious Waste Management***, (Ordinance #94-99), Pierce County, Tacoma-Pierce County Health Department, 1994

- ***Solid Waste Disposal – Unsecured Load Fees***, (Ordinance #94-109), Pierce County Code, Chapter 8.33, Tacoma-Pierce County Health Department.

1995: • ***Pierce County Landfill Siting Phase II: Site-specific Screening***, Pierce County Department of Public Works and Utilities, Solid Waste Division (2 volumes, Preliminary Economic Analysis and Final Report), consultant - Parametrix, Inc., 1995

- ***Solid Waste Management Plan for the Fort Lewis Military Reservation***, Department of the Army I Corps & Fort Lewis Public Works, 1995

- ***Public Nuisances,*** Pierce County Code, Chapter 8.08, Tacoma-Pierce County Health Department.

1996: • ***Waste Characterization Audit***, Pierce County Department of Public Works and Utilities, Solid Waste Division, consultant - R.W. Beck, February 1996

1999: • ***Litter and Clean-up Disposal Credit***, (Ordinance #99-36S), Pierce County Code, Chapter 8.31, July 1999.

- ***Annual Reports***, Pierce County Department of Public Works and Utilities, Solid Waste Division, 1990 -1997

APPENDIX F SOLID WASTE FLOW CONTROL

What is Flow Control?

Flow control is a legal provision that allows governments to designate the places where municipal solid waste and recyclables are taken for processing, treatment, or disposal. Governments engage in flow control for *environmental* reasons (to direct waste or recyclables to legally permitted facilities) and for *economic* reasons (to direct waste or recyclables to facilities that collect fees or earn profits through which the government gains a benefit). A common avenue to implement flow control is through passage and enforcement of a *flow control ordinance*.

What is a Flow Control Ordinance?

A flow control ordinance mandates that waste generated within a certain area be sent to a specific facility for handling. By maximizing the amount of waste entering a facility, the local government or operator could spread costs over a larger base, thereby minimizing per ton costs. These ordinances proved especially helpful in communities which needed to collect tipping fees on a maximum of waste to repay bond debt.

Does Pierce County Flow Control?

Technically, no. Chapter 8.30 of the Pierce County Code requires that waste bound for disposal be handled at designated facilities. These facilities include solid waste landfills, transfer stations, some recycling centers, woodwaste processing facilities, composting facilities, and inert waste landfills.

Location is not a bar to designation. Pierce County's waste designation policies do not discriminate against in-county or out-of-state facilities.

Service level ordinances affecting single-family and multi-family residential recycling indicate a policy preference for processing recyclable materials within the County.

Pierce County has no ordinance or designation policy affecting non-residential or commercial recyclables.[1]

Why Do We Have These Rules?

The 1989 Solid Waste Plan recommended waste designation to assist financing of *publicly-owned* facilities developed as part of an integrated waste management system.

As a *control* mechanism, the ordinance has proven unnecessary. Rather, designation serves as a method for tracking and publicizing which facilities handle which types of waste.[2]

Isn't Flow Control Illegal?

No. The United States Supreme Court, in 1994, invalidated a *Flow Control Ordinance* of Clarkstown, NY. The Town had

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[1] Court cases and Congressional action have invalidated flow control of commercial recyclables.

[2] An ordinance has not been necessary to compel waste to the disposal system in Pierce County. As of 1998, there are no other facilities in the regional marketplace willing or able to accept Pierce County waste at a lower cost to the consumer. Also, waste generated within the County system is collected by haulers affiliated with LRI or a hauler under contract with a city or town which has entered into an Interlocal Agreement with the County.

guaranteed a minimum waste flow to a private transfer station that a contractor agreed to build in the Town. To make good on its promises, the Town passed an ordinance to compel waste haulers to deliver all waste to the private transfer station. When a local hauler refused to comply with the ordinance and delivered waste to a lower cost facility outside Clarkstown, the Town sued. This case eventually reached the Supreme Court: *C & A Carbone Inc. v. Town of Clarkstown NY*.

The Supreme Court found that the Town's ordinance violated the Commerce Clause of the United States Constitution.[3] The Court, however, did not invalidate all forms of flow control. Courts have upheld cases in which municipalities direct flow through contracts for collection services and where the local government is viewed as a "market participant" purchasing disposal services.

This ruling has severely impacted those communities which relied on flow control of waste to generate revenue to repay bonds or meet minimum waste guarantees with processing and disposal firms.

Subsequent federal court decisions have refined the *Carbone* decision by holding that flow control is not an undue burden on interstate commerce where the municipality is actually performing the solid waste collection with its own employees or via contract. Washington law gives Tacoma, as well as other cities and towns, clear authority to engage in solid waste collection; to exclude other providers of solid waste collection service from collecting municipal solid waste within municipal boundaries; and to determine where the waste that has been collected will be disposed (*Article 7, Section 7 of the Washington Constitution* and *RCW 35.67.020*.)

More recent decisions of the U.S. Court of Appeals for the Second Circuit support the authority of a municipality to require use of a particular disposal facility through its involvement in solid waste collection. In one case, *SSC Corp v. Town of Smithtown* (66F.2nd 502, (1995)), the court confirmed that a town has authority to include in a contract for solid waste collection by a private company a provision requiring such a company to deliver such solid waste to a facility specified by the town. This contractual designation of a disposal site did not violate the Commerce Clause because in contracting for solid waste collection service the town acted as a market participant rather than a market regulator. In *USA Recycling v. Town of Babylon* (66 F.2d 1272 (1995), a town's decision to provide municipal collection, funded by taxes, through a single contractor constituted market regulation and therefore was subject to the limitations of the dormant Commerce Clause. Nevertheless, there was no Commerce Clause violation because the town's action did not discriminate against interstate commerce; rather the town had eliminated the market entirely.

Relevancy to the Solid Waste Plan

The Plan recognizes that Federal and State Law and the Pierce County Development Regulations establish minimum standards for the siting of solid waste facilities. These regulatory instruments work to ensure that wastes flow only to legally permitted facilities.

Design factors which are necessary to comply with those regulations have made all solid waste facilities -- from a rural drop box to recycling centers to a large landfill -- more expensive. Without a flow control ordinance to compel waste into the system, financing

[3]The Court ruled that the Ordinance had the effect of discriminating against in-state and out-of-state businesses.

new facilities is more risky, although not impossible.

The Plan update identifies four things Pierce County has done to reduce risk and maintain control over the waste system:

- provide the least expensive disposal system so that markets dictate flow;
- design facilities to reduce system costs and/or increase the value of recyclables;
- rely upon the private sector to provide processing capacity for recyclables;
- enter into voluntary agreements with waste haulers, other municipalities and large waste generators.

By taking these steps, pulling together the unincorporated County and 19 cities and towns, Pierce County has used "economies of scale" and "market clout" to:

- provide local residents and businesses the lowest per ton rates for the long-haul of waste in Western Washington;
- fund waste reduction and recycling education and public outreach programs;
- develop a nationally recognized yardwaste composting system;
- fulfill the County's long-term legal and environmental liabilities at closed waste disposal sites; and
- fund household hazardous waste collection, education, and outreach programs.

As explained in the Plan, this on-going partnership is more important than allaying fears brought on by the changing nature of flow control. While other counties in Washington State have been in Olympia lobbying for *new taxing and funding authorities* to finance waste management systems, Pierce County continues to rely on a share of the tipping fee that has not increased since 1991, despite declining tonnage, increased population, and inflation.

Pierce County Solid Waste Division, 8/98

APPENDIX G CITY AND COUNTY COMPREHENSIVE LAND USE PLAN POLICIES

The following is a list of the goals, policies, or objectives from the individual city, town, or county comprehensive land use plans. Also included is a policy statement from the *Countywide Planning Policies* adopted by all jurisdictions in 1992. This list only includes those goals or policies that are specific to solid waste or recycling. Not all cities or towns include goals or policies about solid waste or recycling in their land use plans.

CITY OF BONNEY LAKE, ***Comprehensive Plan (1995)***

Goal: Solid Waste

Create an effective solid waste and recycling system that will control waste disposal within the Bonney Lake urban growth planning area.

12: Coordinate public service efforts

Coordinate the financial resources that are available of Bonney Lake, Pierce County, and franchised solid waste operators in order to realize a more effective, equitable and fiscally solvent solid waste disposal system.

13: Joint use facilities

Consider joint venturing possible solid waste disposal and recycling equipment, facilities, and services to provide a greater response and recycling capability than would be accomplished by Bonney Lake or franchise operators alone or otherwise within the urban growth planning area.

CITY OF BUCKLEY, ***Comprehensive Plan (May, 1995)***

Solid Waste Policies

Policy SW-1

Promote the recycling of solid waste materials by providing opportunities for convenient recycling, waste reduction, and source separation.

Policy SW-2

Materials remaining after effective waste reduction and source separation shall be handled in accordance with the Tacoma-Pierce County Solid Waste Management Plan.

Policy SW-3

The city shall develop recycling programs, including educational materials on recycling, composting, and other waste reduction methods.

Policy SW-4

Encourage and actively participate in a uniform regional approach to solid waste management.

Policy SW-5

Utilize the public review process in the selection and approval of any disposal facility, considering sensitivity to aesthetics, health effects, and environmental conditions.

Policy SW-6

Manage solid waste collection to minimize litter and neighborhood disruption.

Policy SW-7

Provide uniform collection service to areas annexed to the city as soon as can reasonably be arranged in accordance with service contracts.

TOWN OF CARBONADO, ***Comprehensive Land Use Plan (September, 1995)***

Goal C 3: **The Town of Carbonado shall actively influence the future character of the Town by managing land use change and by developing Town facilities and services in a manner that directs and controls land use patterns and intensities.**

Policy C 3.4: The Town shall use the following Level of Service standards in reviewing the impacts of new development and redevelopment upon public facility provision:

d. Solid Waste: Collection service for garbage shall be available to all properties within the Town.

CITY OF DUPONT, *Comprehensive Plan (1995*)

GOALS:

To facilitate the development and maintenance of all utilities at levels that ensure adequacy to meet DuPont's projected population and employment growth.

To ensure provision of reliable utility services in a manner that balances the public concerns over safety and health impacts of utility systems; consumers' interest in paying no more than a reasonable price for utilities' products and services; DuPont's natural environment and the impacts that utility development may have on it; and the community's desire that utility projects be aesthetically compatible with surrounding land uses.

U-2 The City should actively promote programs for the reduction of solid wastes and establish a city-wide recycling program.

CITY OF FIFE, ***Comprehensive Plan (May, 1996)***

Goal 4 **Recycling and reduction of solid waste.**

Policy 4.1 Educate the public on how to reduce their solid waste output and how to participate in waste reduction and recycling programs.

Implementation 4.1.1 *Provide appropriate levels of collection and recycling opportunities so that the greatest number of citizens can participate and the fullest practical potential of recycling can be realized.*

CITY OF EDGEWOOD, ***Comprehensive Plan (1997)***

GOAL: Achieve an adequate distribution of utilities throughout the plan area with the provision that new utilities do not encourage land use that is inconsistent with the suburban character of the North Hill.

Objective C: Reduce residential and commercial solid waste within the Plan Area.

Policy 1. Encourage recycling programs and facilities including drop-off sites and curbside recycling to reduce solid waste in Plan Area.

Policy 2. Encourage home composting as a means of reducing solid waste in the Plan Area.

<u>CITY OF LAKEWOOD</u>, *Comprehensive Plan (July 2000)*

Goal U-15: Provide for an economical, convenient, environmentally balanced, and integrated solid waste reduction, recycling, and disposal system.

Policies:

U-15.1 Develop and implement comprehensive residential and commercial recycling and composting programs that are convenient and efficient, and that divert the broadest possible range of materials from the landfill.

U-15.2: Promote public and private recycling efforts and organizations.

U-15.3 Support and participate in interagency cooperative efforts with governments, businesses, and institutions in planning and implementing solid waste management programs.

U-15.4 Develop and implement a safe, convenient, and environmentally sound residential hazardous waste collection, recycling, and disposal program.

<u>CITY OF ORTING</u>, *Comprehensive Plan (January, 1996)*

Goal 1

To ensure that the energy and communication facilities and services needed to support current and future development are available when they are needed.

Pol. 1.4 The City of Orting adopts the following level of service guidelines:

a. Collection service for solid waste shall be available to all properties within the City.

Goal 2

To minimize impacts associated with the siting, development, and operation of utility services and facilities on adjacent properties and the natural environment.

Pol. 2.3 Establish a process for identifying and siting essential public facilities, such as solid waste or recycling handling facilities. Cooperatively work with surrounding municipalities and Pierce County during the siting and development of facilities of regional significance.

Goal 3

To maintain an adequate and effective solid waste and recycling program to serve the needs of Orting residents, which maintains public health, environmental and land use quality.

Pol. 3.1 The City should strive to reduce their solid waste stream and achieve a 50% recycling rate by 1995.

Pol. 3.2 Continue existing recycling activities and work with Pierce County and solid waste haulers to expand the local recycling program, including collection of plastics.

Pol. 3.3 Establish and maintain a data collection program which will aid in tracking and evaluating the waste stream and recycling program impacts in the City.

Pol. 3.4 Encourage private and public sector involvement in recycling programs and in the use of recycled products.

CITY OF PUYALLUP, ***Comprehensive Plan (1994)***

Goal X: Solid Waste Management

The City shall promote reliable and cost-effective solid waste management services.

Objectives and Policies

X.1 To cooperate in the *Countywide* systems for the disposal of solid waste.

a. The City shall continue to work with Pierce County in solid waste disposal, including participation in the Hidden Valley Landfill and future landfill solutions.

X.2 To promote solid waste practices that minimize environmental degradation.

a. The City shall seek to implement solid waste management processes that reduce the waste stream, promote recycling and provide for the separation of waste prior to incineration or landfilling.

b. The City shall seek to expand its recycling programs to include commercial recycling in addition to single family and multiple family residential recycling.

c. The City shall seek to implement additional waste diversion programs, such as plastics recycling and yard waste collection for composting. Implementation of a curbside pick-up service for plastics shall be considered at such time that it has become economically attractive.

d. The City shall consider changing trash pick-up frequency from weekly to bi-weekly.

<u>TOWN OF STEILACOOM</u>, *Comprehensive Plan (1994)*

Goal 1: Provide cost effective service

Policy 1.4 Promote recycling, energy conservation, yard waste, and other demand management programs to reduce the need for rate increases and new facilities created by future growth.

<u>CITY OF SUMNER</u>, *Comprehensive Plan (April, 1994)*

Policy 1.9 Consistent with adopted Solid Waste Management Plans, provide solid waste collection and disposal services to the community.

1.9.1 Support recycling within the community through a curb-side program, education and using recycled products for city purposes wherever feasible.

1.9.2 Implement programs for waste reduction in accordance with the adopted Solid Waste Plan.

<u>TOWN OF WILKESON</u>, *Comprehensive Land Use Plan (June 1995)*

Goal C 3: The Town of Wilkeson shall actively influence the future character of the Town by managing land use change and by developing Town facilities and services in a manner that directs and controls land use patterns and intensities.

Policy C 3.4: The Town shall use the following Level of Service standards in reviewing the impacts of new development and redevelopment upon public facility provision:

d. Solid Waste: Collection service for garbage shall be available to all properties within the Town.

PIERCE COUNTY, *Comprehensive Land Use Plan* (1994)

19A.90.060 Solid Waste Management

A. UT-SW Objective 16. Provide reliable and cost-effective service.

1. Pierce County shall consider privately owned transfer stations as private facilities providing a public service. (UT 16.1).
2. Evaluate new technologies for disposal of solid waste produced by Pierce County residents. (UT 16.2).
3. Review the following previously adopted plans, correct deficiencies and inconsistencies which appear, and adopt and amend portions of such plans which are consistent with the Comprehensive Plan: (UT 16.3).
   a. *Tacoma-Pierce County Solid Waste Management Plan* (UT 16.3.1)
   b. *Pierce County Hazardous Waste Management Plan* (UT 16.3.2)
4. It shall be the goal of the Pierce County Solid Waste Management Plan to implement, to the fullest extent possible and in descending order of priority, solid waste management processes that reduce the waste stream, promote recycling, and provide for the separation of waste prior to incineration or landfilling. (UT 16.4)
5. Provide for adequate waste disposal capacity on a regional basis, considering backup or provisional needs as well as planned regular disposal needs. (UT 16.5).

B. UT-SW Objective 17. Encourage recycling and reduction of solid waste.

1. Educate the public on how to reduce their solid waste output and how to participate in waste reduction and recycling programs. (UT 17.1)
2. Reduce Pierce County's solid waste stream and achieve a 50 percent recycling rate by 1995. (UT 17.2)
   a. Provide appropriate levels of collection and recycling opportunities so that the greatest number of citizens can participate and the fullest practical potential for each material can be realized. (UT 17.2.1).
   b. Recycling centers should have the ability to process recyclable materials, as acceptable under appropriate regulations, in order to help alleviate the need to stockpile materials. (UT 17.2.2)
   c. Provide opportunities for recycling to the public and commercial haulers at transfer locations. (UT 17.2.3).
   d. Reduce the solid waste stream by encouraging manufacturers and retailers to reduce packaging waste at the retail level. (UT 17.2.4)

C. UT-SW Objective 18. Provide solid waste service in support of population densities.

1. Siting of proposed public/private facilities should conform to County and State land use policies and regulations. (UT 18.1).
2. Ensure that all residents of Pierce County have access to refuse collection services. (UT 18.2)
3. Provide convenient waste transfer locations for public and commercial needs. (UT 18.3)

D. UT-SW Objective 19. Protect the environment while providing for solid waste facilities.

1. Design and locate solid waste disposal facilities with proper consideration for present and future health and environmental impacts, while recognizing the need to provide these

facilities within the County. (UT 19.1)

2. Promote pretreatment of industrial wastes. (UT 19.2)

3. Provide an environmentally safe and reliable disposal system(s) which protects human health and reduces dependency on landfills. (UT 19.3)

4. Provide for maximum protection of the environmental and support clean activities of facilities with existing environmental problems. (UT 19.4)

5. Incorporate WAC 173-351, Criteria for Municipal Solid Waste Landfills, into the Tacoma-Pierce County Solid Waste Management Plan to supersede and replace municipal solid waste landfill siting requirements and location criteria derived from WAC 173-304. (UT 19.5).

E. UT-SW Objective 20. Provide for adequate disposal of special wastes.

1. Provide guidelines and strategy for disposal of all special waste types. (UT 20.1)

2. Ensure that management strategies for special wastes follows the State Best Management Strategies. (UT 20.2)

(Ord. 95-132S § 2 (part), 1995; Ord. 94-82S § 2 (part, 1994)

COUNTYWIDE PLANNING POLICIES FOR PIERCE COUNTY, WASHINGTON (1992)

5. Urban Development Standards

5.2 The following development standards shall be the minimum required for urban developments and shall apply to all new development in urban growth areas, except as provided in Section 5.6 below.

5.2.7 Solid Waste and Recycling. Garbage pick-up shall be provided weekly, and recycling and yard waste pick-up biweekly, consistent with federal and state laws and regulations.

TACOMA LAND USE MANAGEMENT PLAN — Policies, Goals and Recommendations

This document provides the solid waste related policies, goals, and recommendations of Tacoma's Land Use Management Plan. The Tacoma's Land Use Management Plan has numerous different elements. Each element with a solid waste related component is listed here, along with the specific policy or goal.

Environmental Policy Plan – Critical Areas and Natural Resource Lands Element
The Environmental Policy Plan describes the following two goals for solid waste recycling related activities:

a) Support programs designed to seek solutions for disposal problems, to develop means of recycling waste material in order to relieve the problems of waste disposal and to lessen the drain on our natural resources

b) Support programs designed to recycle waste material, thus relieving the problems of waste disposal and lessening the drain on natural resources.

Generalized Land Use Plan
The Generalized Land Use Plan provides the following language for high intensity, medium intensity, and low intensity residential development:

> Encourage building and site development design which accommodates and facilitates recycling by building residents.

The Generalized Land Use Plan provides the following language for commercial and industrial development:

> Encourage building and site development design for all commercial developments which accommodates and facilitates recycling by employees.

Utilities Plan
The Utilities Plan incorporates the following policies for solid waste management.

Facility Siting	1. Continue to work agencies, Pierce County and regulatory agencies, as appropriate, to achieve siting and construction of a new landfill or other disposal means within Pierce County or within a reasonable distance.
Cost of Service	2. Pursue cost of service reduction measures
Operating Agreements	3. Establish equitable operating agreements with existing private haulers that are in the best interest of the City of Tacoma.
Consumer Awareness	4. Encourage greater participation in residential recycling.
Consumer Awareness	3. Encourage minimization of excessive waste generating packaging through consumer awareness.

Consumer Awareness	4. Promote Source Separation
Consumer Awareness	5. Minimize industrial/commercial waste streams.
Coordination	6. Work with other city departments, regulatory agencies, and other utilities for the objective of putting the landfill gas resource to beneficial use.
Recognize Plans	9. Recognize the Tacoma-Pierce County Solid Waste Management Plan and Tacoma's Recycling Plan.

APPENDIX H PIERCE COUNTY ZONING

This appendix includes definitions used for the permitting of solid waste and recycling land uses in the zoning code. It also includes tables illustrating the zoning for solid waste facilities as established in Pierce County Code, *Title 18A Development Regulations - Zoning* (August 1997). The tables illustrate zoning for both urban and rural areas of unincorporated Pierce County.

I. Waste Disposal Facilities

■ Landfill --- "Landfill" shall mean a solid waste facility for the permanent disposal of solid wastes in or on the land and which needs a Solid Waste Permit under RCW 70.95.

- Demolition Landfill --- "Demolition Landfill" shall mean a solid waste facility for the permanent disposal of demolition wastes resulting from the demolition or razing of buildings, roads, and other man-made structures. Demolition waste consists of, but is not limited to, concrete, brick, bituminous concrete, wood and masonry, composition roofing and roofing paper, steel, and minor amounts of other materials. Plaster or other materials likely to produce leachate is not demolition waste.
- Inert landfill --- "Inert Landfill" shall mean a solid waste facility for the permanent disposal of inert materials which are non-combustible and non-dangerous wastes likely to retain their physical and chemical structure including resistance to biological and chemical attack from acidic rainwater.
- Municipal Solid Waste (MSW) Landfill --- "Municipal Solid Waste (MSW) Landfill" shall mean a solid waste facility for the permanent disposal of mixed household, commercial, or industrial waste from municipal sources delivered by hauling companies or self-hauled by residents or businesses.
- Woodwaste Landfill --- "Woodwaste Landfill" shall mean a solid waste facility with 2,000 cubic yards or more of capacity for the permanent disposal of woodwaste that does not contain chemical preservatives. This does not include woodwaste landfills on forest lands regulated under the Forest Practices Act but does include facilities which use woodwaste as a component of fill.
- Special Waste Landfill --- "Special Waste Landfill" shall mean a solid waste facility for the permanent disposal of one specific type of waste of limited, known and consistent composition such as an ash monofill, a landspreading disposal facility for biosolids, problem waste landfill, or any facility which is not previously defined but is permitted with a Solid Waste Permit as a "limited purpose landfill."

■ Waste-to-Energy (WTE) Facility --- "Waste-to-Energy Facility" shall mean any solid waste facility designed as a combustion plant to dispose of solid waste or to recover energy in a useable form from mass burning, refuse-derived fuel incineration, pyrolysis or any other means of using the heat of combustion of solid waste and which requires a Solid Waste Permit under RCW 70.95.

- Municipal Solid Waste-to-Energy Facility --- "Municipal Solid Waste-to-Energy Facility" shall mean a combustion plant specializing in disposal of or energy recovery from mixed waste from municipal sources.

- Special Waste-to-Energy Facility --- "Special Waste-To-Energy Facility" shall mean a combustion plant designed to burn more than 12 tons per day and specializing in disposal of or energy recovery from a single type of waste of known and consistent composition, other than municipal waste, such as tires or infectious waste.

II. Waste Transfer Facilities

■ Waste Transfer Facility--- "Waste Transfer Facility" shall mean any solid waste facility where solid waste is collected or subjected to interim processing before being transported to a permanent disposal site.

- Drop-Box Transfer Station --- "Drop-Box Transfer Station" shall mean a solid waste facility needing a Solid Waste Permit which is used for placement of a detachable container including the area adjacent for necessary entrance and exit roads, unloading and turn-around areas. The facility normally serves the general public with loose loads and receives waste from off-site.
- Transfer Station --- "Transfer Station" shall mean a solid waste facility needing a Solid Waste Permit which is a permanent, fixed supplemental collection and transportation facility, used by person and route collection vehicles to deposit collected solid waste from off-site into a larger transfer vehicle for transport to a disposal facility. It may include baling or compaction activities or recycling facilities.
- Waste Separation and Recovery Facility --- "Waste Separation and Recovery Facility" shall mean a solid waste facility needing a Solid Waste Permit where mixed solid waste is collected and processed to segregate recyclable components from that portion of the waste stream which is to be permanently disposed. It may be referred to as a Materials Resource Recovery Facility (MRF) or as a "dirty MRF."
- Recycling Collection Site --- "Recycling Collection Site" shall mean a site with collection boxes or other containerized storage where citizens can leave materials for recycling.
- Moderate Risk Waste Fixed Facility --- "Moderate Risk Waste Fixed Facility" shall mean a solid waste facility needing a Solid Waste Permit which specializes in the collection of household hazardous waste for packaging for transport to a disposal facility or for recycling. It may collect limited amounts of hazardous waste from Small Quantity Generators (SQG's) who are businesses that generate hazardous waste in quantities below the threshold for regulation under Washington Dangerous Waste Regulations (RCW 70.105).
- Tire Pile --- "Tire Pile" shall mean a solid waste facility needing a Solid Waste Permit which stores more than 800 discarded tires.

III. Organic Waste Processing Facilities

■ Organic Waste Processing Facilities -- "Organic Waste Processing Facilities" shall mean any solid waste facility specializing in the controlled decomposition of organic solid waste and which requires a Solid Waste Permit under RCW 70.95.

- Municipal Solid Waste (MSW) Composting Facility --- "Municipal Solid Waste (MSW) Composting Facility" shall mean a solid waste facility specializing in the composting of mixed waste from municipal sources to reduce the waste for final disposal or to produce a marketable product.

- Composting Facility --- "Composting Facility" shall mean a solid waste facility specializing in the composting of one or more organics of a known and consistent composition, other than mixed municipal waste, to produce a marketable product for reuse or as a soil conditioner. Feedstocks may include, but are not limited to yardwaste, biosolids, or foodwaste.
- Soil Treatment Facility --- "Soil Treatment Facility" shall mean a solid waste facility which utilizes bioremediation, a thermal desorption process, or similar processes to treat petroleum contaminated soil or vactor waste for reuse or final disposal.

IV. Accessory Uses

■ Solid Waste Surface Impoundment --- "Solid Waste Surface Impoundment" shall mean a solid waste facility which is a natural topographic depression, manmade excavation, or dike area formed primarily of earthen material that is designed to hold an accumulation of liquids or industrial sludges. This includes holding, storage, settling and aeration pits, and ponds, or lagoons which need a Solid Waste Permit.. It does not include injection wells or stormwater retention basins or impoundments for the storing of hazardous waste.

■ Waste Piles --- "Waste Piles" shall mean any non-containerized accumulation of solid waste, not previously identified, that is used for treatment or storage and which needs a Solid Waste Permit.

■ Small Composting Facility --- Facility which is 40 cubic yards or less and uses only one or two feedstocks and not mixed waste.[1]

V. Recycling Businesses

■ Buy-Back Recycling Center --- "Buy-Back Recycling Center" shall mean any small business without industrial activity which collects, receives, or buys recyclable materials from household, commercial, or industrial sources for the purpose of sorting, grading, or packaging recyclables7 for subsequent shipment and marketing.

■ Recycling Processor --- "Recycling Processor" shall mean any large scale buy-back recycling business or other industrial activity which specializes in collecting, storing, and processing any waste, other than hazardous waste or municipal garbage, for reuse and which uses heavy mechanical equipment to do the processing. It may be a facility where commingled recyclables are sorted, baled or otherwise processed for transport off-site which is referred to as a "clean" materials resource recovery facility (MRF).

[1] This ensures that home composting is allowed. Home composting facilities do not need a Solid Waste Permit.

Zoning for Solid Waste or Recycling Facilities in Pierce County Development Regulations [2] 1/98		
FACILITY OR BUSINESS	**URBAN ZONES**	**LAND USE PERMIT PROCESS**
Organic Waste Processing Facilities		
Soil Treatment Facilities (Such as a petroleum-contaminated soils or vactor waste facility)	**Employment Center** [3] Not allowed in other commercial or residential zones.	• Privately owned facility is permitted outright. [4] • Publicly-owned facility requires a Public Facility Permit (PFP). [5]
Composting Facility [6] --- 40 cubic yards or larger		
MSW Composting Facility		• Requires a Public Facility Permit (PFP) with a public hearing.
Small-scale Composting Facility - less than 40 cubic yards	**All zones** --- allowed in all, including residential	• Allowed as an accessory use.
Waste Transfer Facilities		
Recycling Collection Sites	**All zones** --- allowed in all, including residential	• Permitted outright
Drop-Box Transfer Station	**All zones** --- allowed in all, including residential	• Either a Conditional Use Permit (CUP) or a Public Facility Permit (PFP).
Transfer Station, Waste Separation Recovery Facility, [7] **and Moderate Risk Waste Facility**	**Employment Center** Not allowed in other commercial or residential zones.	• Either a Conditional Use Permit (CUP). or a Public Facility Permit (PFP).
Tire Piles --- Piles of 800 tires or larger and / or those requiring a Solid Waste Permit.	**Employment Center** Not allowed in other commercial or residential zones.	• Requires a Conditional Use Permit (CUP).

[2] Definitions used for the purposes of land use permitting are those identified in the Pierce County Code, Title 18A
[3] The Employment Center zone is for industrial and heavy commercial uses.
[4] A facility that is "permitted outright" must meet development and other permit or building standards but does not require a public hearing review process.
[5] A Public Facility Permit (PFP) or a Conditional Use Permit (CUP) requires a public hearing review process. The two permits are similar but there are additional factors to be considered related to the PFP.
[6] A "Composting Facility" is one that does not compost mixed municipal solid waste.
[7] A Waste Separation Recovery Facility is a "dirty MRF" as described in Chapter 6 of the *Tacoma-Pierce County Solid Waste Management Plan*. It is a facility where recyclables are separated from mixed municipal solid waste.

Pierce County Zoning	URBAN ZONES	LAND USE PERMIT PROCESS
Waste Disposal Facilities		
Inert Landfill	**Residential --- Moderate Density Single Family**	• Allowed as an accessory use to a mineral extraction site through either a Conditional Use Permit (CUP) or a Public Facility Permit (PFP).
	Employment Center	• Permitted outright or as an accessory use to mineral extraction sites.
Woodwaste or Demolition Landfill		• Privately-owned facility is permitted outright. • Publicly-owned facility requires a Public Facility Permit (PFP).
MSW, Ash, or "Limited Purpose" Landfill		• Requires a Public Facility Permit (PFP)
Special Waste-to-Energy Facility[8] burning more than 12 tons per day.		• Permitted outright.
Waste-to-Energy Facility --- of less than 12 tons per day.	**All zones**	• Allowed as an accessory use.
MSW Waste-to-Energy Facility	**Employment Center**	• Requires a Public Facility Permit (PFP).
Recycling Businesses		
Buy-Back Recycling Center (Small-scale recycling business)	**Employment Center** **Urban Centers** --- all commercial zones Mixed Use District	• Permitted outright
Recycling Processor (Industrial type/ size business)	**Employment Center** Not allowed in other commercial or residential zones.	• Permitted outright
Other facilities that are required to meet standards of the Minimum Functional Standards WAC 173-304		
Solid Waste Surface Impoundments	**All zones --- Urban or Rural**	• Permitted as an accessory use to the principal use of the property.
Waste Piles authorized by a Solid Waste Permit		

[8] A "Special Waste-to-Energy Facility" does not burn municipal solid waste (MSW).

Pierce County Zoning	RURAL ZONES	LAND USE PERMIT REVIEW
Organic Waste Processing Facilities		
Soil Treatment Facilities (Such as a petroleum-contaminated soils or vactor waste facility)	**Rural Activity Center**	• Privately-owned - permitted outright. • Publicly-owned facility requires a Public Facility Permit (PFP)
	Residential --- all zones; **Forest Lands**	• Either a Conditional Use Permit (CUP) or a Public Facility Permit (PFP)
	Agricultural	• Requires a Public Facility Permit
Composting Facility --- 40 cubic yards or larger	**Rural Activity Center**	• Privately-owned - permitted outright. • Publicly-owned facility requires a Public Facility Permit (PFP).
	Residential --- all zones; **Forest Lands**	• Either a Conditional Use Permit (CUP) or a Public Facility Permit (PFP).
	Agricultural Land	• Privately-owned - permitted outright. • Publicly-owned facility requires a Public Facility Permit (PFP).
MSW Composting Facility	**Rural Activity Center; Residential --- all zones; Forest Lands; Agriculture**	• Requires a Public Facility Permit (PFP)
Small-scale Composting Facility - less than 40 cubic yards	**All zones**	• Allowed as an accessory use.
Waste Transfer Facilities		
Recycling Collection Sites	**All zones**, except Agriculture	• Permitted outright.
Drop-Box Transfer Station, Transfer Station, Waste Separation Recovery Facility, and Moderate Risk Waste Facility	**Rural Activity Center; Gateway Community; Residential --- all zones; Forest Land**	• Requires either a Conditional Use Permit (CUP) or a Public Facility Permit (PFP) Not allowed in Agriculture zone
	Rural Neighborhood Center	• Requires a Public Facility Permit (PFP).
Tire Piles		Not allowed
Waste Disposal Facilities		
Inert Landfill; Woodwaste or Demolition Landfill; MSW, Ash, or "Limited Purpose" Landfill; MSW Waste-to-Energy Facility	**Residential** --- all zones **Forest Lands**, **Agriculture** Not allowed in rural commercial.	• Requires either a Conditional Use Permit (CUP) or a Public Facility Permit (PFP).
Special Waste-to-Energy Facility		Not allowed
Recycling Businesses		
Buy-Back Recycling Center	**Rural Center** --- all commercial zones	• Permitted outright.
Recycling Processor		Not allowed.

APPENDIX I SOLID WASTE ADVISORY COMMITTEE

MEMBERSHIP			
Ex-officio representation Pierce County Council Pierce County Executive / Solid Waste Division Tacoma-Pierce County Health Department Land Recovery, Inc. Port of Tacoma			
1992 - 1993			
Citizens	Carl Hupman Robert LeSchack Nancy White	**Business**	Ray Johnson James Mirous
Waste Management Industry	Mark Buntjer Don Hawkins	**Public Interest Groups**	William Giddings Karen Harding
Local Governments	Gary Bietz	**Tacoma**	Phill Ringrose
1993 - 1994			
Citizens	Carl Hupman Robert LeSchack Nancy White	**Business**	Ray Johnson James Mirous
Waste Management Industry	Mark Buntjer Paul Henderson	**Public Interest Groups**	William Giddings Karen Harding
Local Governments	Shan Vipond	**Tacoma**	Phill Ringrose
1994 - 1995			
Citizens	Ben Bettridge Carl Hupman Robert LeSchack	**Business**	Bob O'Neal -vacant-
Waste Management Industry	Paul Henderson Chris Paulson	**Public Interest Groups**	William Giddings Karen Harding
Local Governments	Shan Vipond	**Tacoma**	Phill Ringrose
1995 - 1996			
Citizens	Ben Bettridge Barbara Krogstad Robert LeSchack	**Business**	Bob O'Neal Calvin Palmer
Waste Management Industry	Paul Henderson Chris Paulson	**Public Interest Groups**	William Giddings Gregory Jacoby
Local Governments	Shan Vipond	**Tacoma**	Karen Larkin
1996 - 1997			
Citizens	Ben Bettridge Barbara Krogstad Robert LeSchack	**Business**	Calvin Palmer Caryn Woodhouse
Waste Management Industry	Paul Henderson Chris Paulson	**Public Interest Groups**	William Giddings Gregory Jacoby
Local Governments	William Larkin	**Tacoma**	Karen Larkin

MEMBERSHIP 1997 - 1998			
Citizens	Barbara Krogstad Joe Quaintance Karen Sable	**Business**	Calvin Palmer Caryon Woodhous Keith Warner
Waste Management Industry	Paul Henderson Chris Paulson	**Public Interest Groups**	William Giddings Gregory Jacoby
Local Governments	William Larkin	**Tacoma**	Karen Larkin Terry Morrow
MEMBERSHIP 1998 - 1999			
Citizens	Barabara Krogstad Joe Quaintance Karen Sable	**Business**	Gregory Jacoby Keith Warner
Waste Management Industry	Paul Henderson Chris Paulson	**Public Interest Groups**	Jim Akers
Local Governments	William Larkin	**Tacoma**	Terry Morrow

Meetings conducted by the SWAC on update of the Plan, 1995-1999 [1]

1995	
March 15	SWAC reviewed the Scope of Work for the update of the Plan
November 1	Solid Waste Division staff presentation overview of waste reduction and recycling sections and a presentation on the school education program.
November 15	Staff presentation on public education and outreach programs and discussed urban vs. rural designations
December 13	Staff presentation on composting
1996	
February 21	Plan update: procurement; in-house recycling, private sector activities
March 20	Plan update: single-family and multi-family residential recycling programs
April 3	Plan update: Non-residential recycling programs; municipal programs
April 17	Plan update: Waste Characterization Audit, data measurement
June 19	Chapters 1 Introduction, 4 Waste Reduction and Recycling, and 9 Special Wastes presented in draft form
October 2	Plan update: Overview of status
October 16	Chapters 1 Introduction and 5 Solid Waste Collection updated
December 18	Chapter 9 Special Wastes updated
1997	
January 15	Chapter 3 Waste Characterization
February 5	Chapter 4 Waste Reduction and Recycling
February 19	Chapter 4 discussion continued
March 5	Chapter 4 discussion continued
April 2	Chapter 4 discussion continued
April 16	Chapter 7 Transfer Facilities and Systems

[1] The list of meetings is from the *Annual Reports* published by the Solid Waste Division. This list does not include all of the SWAC meetings nor all of the topics, only those dates in which draft chapters were discussed. For further information, refer to the *Annual Reports*.

Meetings conducted by the SWAC on update of the Plan, 1995-1999 [1]	
1997 (cont.)	
April 30	Chapter 8 Landfilling
May 14	Chapter 4 revisions discussed
June 18	Chapters 4 and 8 revisions discussed
September 3	Chapters 2 Background and 3 Waste Characterization revisions discussed
October 1	Chapters 3 and 8 revisions discussed
October 15	Chapters 2 and 8 revisions discussed
October 29	Chapters 2, 8, and 9
November 19	Chapters 8, 9, 10 revisions completed
December 3	Chapter 10 Enforcement and Administration
1998	
January 21	Chapter 10
February 5	Chapter 10
February 18	Chapter 10 complete
May 20	Distribute Technical Assistance Draft
June 17	Comments on Technical Assistance Draft
July 1	Draft Recommendations
July 15	Draft Recommendations
August 19	Draft Recommendations
September 15	Draft Recommendations
September 23	Draft Recommendations Complete
1999	
January 20	Progress Report on Meetings with Cities and Towns
February 17	Progress Report on Meetings with Cities and Towns
April 21	Report on Cities' and Towns' Comments
July 21	Chapter 11
November 17	Review of Preliminary Draft Plan – issues to revisit
December 1	Review of Preliminary Draft Plan – issues to revisit
December 15	Review of Preliminary Draft Plan – issues to revisit
2000	
January 5	Public comment meeting
January 19	Public comment meeting
February 2	Public comment meeting
February 16	Public comment meeting
February 23	Review of public comment – make revisions
March 1	Review of public comment – make revisions
March 8	Review of public comment – make revisions
March 15	Review of public comment – make revisions
March 22	Review of public comment – make revisions
April 12	Finalize report to County Council

APPENDIX J COST ASSESSMENT QUESTIONNAIRE PREPARED FOR WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION ADVISORY REVIEW

RCW 70.95.090 (8) "requires an assessment of the plan's impact on the costs of solid waste collection . . . prepared in conformance with guidelines established by the utilities and transportation commission."

RCW 70.95.096, however, limits the Commission's review to ". . . the plan's assessment of solid waste collection cost impacts on rates charged by solid waste collection companies regulated under chapter 81.77 RCW. . ." and requires the Commission to "advise the county or city submitting the plan and the department of the probable effect of the plan's recommendations on those rates."

This Cost Assessment is prepared to solicit the advice of the Washington Utilities and Transportation Commission as to how this Plan Update may impact the rates charged by Commission-regulated haulers. Other readers may wish to review the Cost Assessment in tandem with Chapter 10 of the Plan Update which includes a description of the County's solid waste management systems and Chapter 11 which provides a cost and financial review.

Summary of Findings

1. The *Tacoma-Pierce County Solid Waste Management Plan* does not propose policies or programs which would impact the rates charged by Commission-regulated haulers.

2. The Plan does not recommend changes to waste collection, recycling, or yardwaste systems that would result in rate changes to residential, commercial, or industrial customers.

3. The only anticipated increases in solid waste tipping fees (which in turn are passed on to customers via the regulated haulers) will occur due to inflation, as allowed per the *1998 Pierce County – Land Recovery, Inc. Waste Handling Agreement*. Tipping Fees for the period 1999 to 2005 (assuming 3 percent annual inflation) are summarized below.

   1999.....$92.53 per ton
   2000.....$92.53 per ton
   2001.....$90.07 per ton – rate decrease due to scheduled completion of programs and removal of program components from rates
   2002.....$91.21 per ton
   2003.....$93.41 per ton
   2004.....$95.66 per ton
   2005.....$97.99 per ton

4. If a new in-county landfill opens during the period covered by this plan, it is expected that tipping fees and collection fees will **decrease** to account for reduced transportation costs to a more proximate disposal site.

5. Pierce County does not plan to increase its share of solid waste tipping fees, the $7.00 per ton County Administrative Cost Component.

COST ASSESSMENT QUESTIONNAIRE

PLAN PREPARED FOR THE COUNTY OF: **Tacoma-Pierce County**

PREPARED BY: **Pierce County Solid Waste Division**
Steve Wamback, Interim Administrator
Sally Sharrard, Senior Planner

CONTACT TELEPHONE: **(253) 798-4050** DATE: **9/1/99**

Definitions

1. Throughout this document:
   BASE shall refer to **January 1 to December 31, 1999**
   YR. 1 shall refer to **January 1 to December 31, 2000**
   YR. 3 shall refer to **January 1 to December 31, 2002**
   YR. 6 shall refer to **January 1 to December 31, 2005**

2. Data and dollar figures are rounded to the nearest thousand

3. Base year costs are adapted from mid-year review of the adopted 1999 Solid Waste Division budget

4. Year 1 costs are from the Solid Waste Division's proposed Year 2000 budget (submitted July 1999)

5. Cost projections for years 3 and 6 are adjusted on an assumed 3 % inflation rate.

1. DEMOGRAPHICS

1.1 Population

1.1.1 What is the total population of your County/City?

700,000	**711,000**	**737,000**	**773,000**
Base – 1999	2000	2002	2005

1.1.2 For counties, what is the population of the area under your jurisdiction? (Exclude cities choosing to develop their own solid waste management system.)

493,000	**505,000**	**528,000**	**565,000**
Base – 1999	2000	2002	2005

1.2 References and Assumptions

- The response to item 1.1.1 is the 1999 population of Pierce County as calculated by the Washington State Office of Financial Management on April 1, 1999 and reported on July 1, 1999.

- The response to item 1.1.2 excludes the populations of the City of Tacoma, Town of Ruston, and the residential population of Fort Lewis and McChord Air Force Base. These jurisdictions have developed waste disposal systems which, while consistent with, and part of the Plan Update, are independent of the Pierce County waste disposal system. Please refer to Chapters 1 and 3 of the Plan Update for more detail.

- Projections for the years 2000, 2002 and 2005 are derived from Tables 3-13 and 3-14 of the Plan Update.

2. WASTE STREAM GENERATION

This first data set estimates tonnage generated by all three waste management systems within the County: the Pierce County/Cities and Towns System, the Tacoma/Ruston System, and the Fort Lewis/McChord AFB System. The population of these three areas was tabulated in the response to question 1.1.1.

2.1 Tonnage Recycled

500,000	**529,000**	**586,000**	**671,000**
Base – 1999 (est)	2000	2002	2005

2.2 Tonnage Disposed

620,000	**627,000**	**649,000**	**681,000**
Base – 1999 (est)	2000	2002	2005

This second data set estimates tonnage generated just within the Pierce County/Cities and Towns System. The population of this area was tabulated in the response to question 1.1.2.

2.1 Tonnage Recycled

350,000	**370,000**	**410,000**	**470,000**
Base – 1999 (est)	2000	2002	2005

2.2 Tonnage Disposed

387,000	**394,000**	**409,000**	**432,000**
Base – 1999 (est)	2000	2002	2005

2.3 References and Assumptions

- Tonnage figures include municipal solid waste collected by certificated, contract and municipal haulers, self-hauled materials, and automobile fluff (the non-metallic portion of scrapped automobiles which has traditionally been included in definitions of the Pierce County waste stream). All other special wastes are excluded.

- Projections for the years 2000, 2002, and 2005 are derived from Tables 3-13 and 3-14 of the Plan Update.

3. SYSTEM COMPONENT COSTS:

Rather than utilizing the format contained within the Cost Assessment Questionnaire, Pierce County will describe its ongoing and recommended programs in the format and order in which they appear in the Plan Update. The County believes this will allow for a more accurate presentation of the Pierce County system, and will make the Cost Assessment a more useful tool to the County, the Utilities and Transportation Commission, the solid waste industry, recyclers, and the public.

- The following presentation on Chapter Four: Waste Reduction and Recycling includes all of the information requested by Sections 3.1 and 3.2 Cost Assessment Questionnaire.

- The following presentation on Chapter Six: Solid Waste Processing Technologies presents information not specifically requested, but which could have been included in Section 3.7 of the Cost Assessment Questionnaire.

- The following presentation on Chapter Seven: Transfer Facilities and Systems presents information not specifically requested, but which could have been included in Section 3.7 of the Cost Assessment Questionnaire.

- The following presentation on Chapter Eight: Landfilling presents information requested by Sections 3.5 and 3.7 of the Cost Assessment Questionnaire.

- The following presentation on Chapter Nine: Special Waste Systems presents information not specifically requested, but which could have been included in Section 3.7 of the Cost Assessment Questionnaire.

- The following presentation on Chapter Ten: Enforcement and Administration presents information requested by Section 3.6 of the Cost Assessment Questionnaire.

While we have diverted from the WUTC suggested format, you will find <u>at a minimum</u>, the same information requested by the WUTC. This approach is consistent with the instruction on page 7, paragraph 2 of the Cost Assessment Guidelines, 2nd Edition, January 1997.

This (revised) System Component Cost section will be followed by the required detail on:
- Energy Recovery and Incineration Programs (section 3.4);
- Land Disposal Programs (section 3.5); and
- Waste Collection Programs (section 3.3)

Chapter Four: Waste Reduction and Recycling

Current and Continuing Programs:

1. Public Information, Education, and Outreach for Waste Reduction and Recycling

$594,000	**$677,000**	**$718,000**	**$708,000**
Base – 1999	2000	2002	2005

2. Recycling Data Collection Program

$13,000	**$8,000**	**$8,000**	**$8,000**
Base – 1999	2000	2002	2005

3. In-House Recycling Programs to Pierce County Employees

$50,000	**$30,000**	**$30,000**	**$30,000**
Base – 1999	2000	2002	2005

Total for Current and Continuing Programs

$657,000	**$715,000**	**$756,000**	**$746,000**
Base – 1999	2000	2002	2005

❖ Funding Mechanisms

This component of the Pierce County solid waste system is presently funded by the **County Administrative Cost** (CAC) component of solid waste tipping fees and the **Department of Ecology Coordinated Prevention Grant** (CPG).

We propose to use the same funding mechanisms in the year 2000.

We propose to continue allocating part of the **CAC** to Waste Reduction and Recycling Programs in the years 2002 and 2005. At this time, however, we do not know whether the **CPG** program will be available in those years. If the **CPG** is not available, the programs can be funded from **Reserves** maintained by the County within its Solid Waste Enterprise Fund.

Please refer to the Funding Mechanism Summary Charts for more detail on the specific allocation of revenues and expenses.

Proposed New Programs:

All new initiatives proposed within Chapter Four of the Plan Update must be implemented within the existing financial resources of the Solid Waste Division.

Chapter Six: Solid Waste Processing Technologies

Current and Continuing Programs:

1. Yardwaste Composting Facility Debt Service

$293,000	**$293,000**	**N/A**	**N/A**
Base – 1999	2000	2002	2005

2. Yardwaste Composting Facility Operations

$1,705,000	**$1,705,000**	**$1,863,000**	**$2,028,000**
Base – 1999	2000	2002	2005

Total for Current and Continuing Programs

$1,998,000	**$1,998,000**	**$1,863,000**	**$2,028,000**
Base – 1999	2000	2002	2005

❖ Funding Mechanism

Pierce County's Yardwaste Composting Facility and composting system are funded by the **Yardwaste Composting** component of the solid waste tipping fee. The same funding will be tapped in the years 2000, 2002, and 2005.

Please refer to the Funding Mechanism Summary Charts for more detail on the specific allocation of revenues and expenses.

Proposed New Programs

The Plan Update does not recommend that the County or the public solid waste management system commit resources to new processing technologies.

Chapter Seven: Transfer Facilities and Systems

Current and Continuing Programs:

1. Hidden Valley Transfer Station

$948,000	**$948,000**	**N/A**	**N/A**
Base – 1999	2000	2002	2005

2. Prairie Ridge Residential Waste Transfer Site

$200,000	**$50,000**	**N/A**	**N/A**
Base – 1999	2000	2002	2005

3. Pierce County Public and Private Waste Transfer and Recycling Systems

$9,255,000	**$9,255,000**	**$10,068,000**	**$10,953,000**
Base – 1999	2000	2002	2005

Total for Current and Continuing Programs

$10,403,000	**$10,253,000**	**$10,068,000**	**$10,953,000**
Base – 1999	2000	2002	2005

Proposed New Program:

1. Transfer Station Study

$N/A	**$20,000**	**N/A**	**N/A**
Base – 1999	2000	2002	2005

Total for Current, Continuing , and Proposed Programs

$10,403,000	**$10,273,000**	**$10,068,000**	**$10,953,000**
Base – 1999	2000	2002	2005

❖ Funding Mechanism

In 1999, the primary funding mechanism for this component of Pierce County's system is the **Transfer Facilities, Recycling, and Transportation** (TFRT) component of the solid waste tipping fee. Capital construction at Prairie Ridge in 1999 is funded from **Reserves**.

We propose to use a combination of the **TFRT** and the **CAC** in the year 2000.

The **TFRT** is the sole funding source in 2002 and 2005.

Please refer to the Funding Mechanism Summary Charts for more detail on the specific allocation of revenues and expenses.

Chapter Eight: Landfilling

Current and Continuing Programs:

1. Solid Waste Longhaul Services

$12,270,000	**$12,270,000**	**$13,176,000**	**$14,148,000**
Base – 1999	2000	2002	2005

2. Hidden Valley Landfill Closure and Post Closure Care; Purdy Post-Closure Care

$2,932,000	**$1,529,000**	**$1,014,000**	**$615,000**
Base – 1999	2000	2002	2005

3. Hidden Valley Operations (per 1998 waste agreement costs postponed from 1997-98)

$1,038,000	**$1,038,000**	**n/a**	**n/a**
Base – 1999	2000	2002	2005

Total for Current and Continuing Programs

$16,240,000	**$14,837,000**	**$14,190,000**	**$14,763,000**
Base – 1999	2000	2002	2005

❖ Funding Mechanism

In 1999, the primary funding mechanism for this component of Pierce County's system is the **Long Haul Services** (LHS) component of the solid waste tipping fee. This will continue to be the main mechanism for waste which is long-hauled to the Roosevelt Landfill in Klickitat County.

The Pierce County – LRI Waste Handling Agreement allows for the use of an in-County landfill should one open within Pierce County. If this occurs, lower cost in-county landfilling would be substituted for the higher costs associated with transporting waste to the east side of the Cascades.

Closure activities and Post-Closure care are funded entirely from **Dedicated Reserve Accounts**. These accounts have sufficient reserves to provide all long term care which may be required by the Hidden Valley Landfill closure permit or a Cleanup Action Plan and Consent Decree executed for the Hidden Valley site.

The costs postponed from 1997-98 to the 1999 and 2000 rate period are funded through the **1997-98** component of the solid waste tipping fee.

Please refer to the Funding Mechanism Summary Charts for more detail on the specific allocation of revenues and expenses.

Chapter Nine: Special Waste Systems

Current and Continuing Program:

1. Household Hazardous Waste Management Program

$168,000	**$193,000**	**$205,000**	**$223,000**
Base – 1999	2000	2002	2005

❖ Funding Mechanisms

This component of the Pierce County solid waste system is presently funded by the **County Administrative Cost** (CAC) component of solid waste tipping fees and the **Department of Ecology Coordinated Prevention Grant** (CPG).

We propose to use the same funding mechanisms in the year 2000.

We propose to continue allocating part of the **CAC** to Special Waste Programs in the years 2002 and 2005. At this time, however, we do not know whether the **CPG** program will be available in those years. If the CPG is not available, the programs can be funded from **Reserves** maintained by the County within its Solid Waste Enterprise Fund.

Please refer to the Funding Mechanism Summary Charts for more detail on the specific allocation of revenues and expenses.

Proposed New Program:

1. Construction, Demolition and Landclearing Debris diversion programs

All new initiatives proposed within Chapter Nine of the Plan Update (that are the responsibility of the Solid Waste Division) must be implemented within the existing financial resources of the Division.

Chapter Ten: Enforcement and Administration

Current and Continuing Programs:

1. Solid Waste Planning Functions

$147,000	**$60,000**	**$64,000**	**$145,000**
Base – 1999	2000	2002	2005

2. Tacoma-Pierce County Health Department Source Protection – Waste Management Program

$443,000	**$448,000**	**$475,000**	**$518,000**
Base – 1999	2000	2002	2005

3. Solid Waste Administration

$1,283,000	**$1,056,000**	**$1,119,000**	**$1,220,000**
Base – 1999	2000	2002	2005

4. Litter and Clean-Up Waste Disposal Credit

$150,000	**$150,000**	**$156,000**	**$168,000**
Base – 1999	2000	2002	2005

Total for Current and Continuing Administration Programs

$2,023,000	**$1,714,000**	**$1,814,000**	**$2,051,000**
Base – 1999	2000	2002	2005

Proposed New Program:

Consultant services to assist in Solid Waste contract compliance

$N/A	**$30,000**	**$11,000**	**$12,000**
Base – 1999	2000	2002	2005

Total for Current, Continuing, and Proposed Administration Programs

$2,023,000	**$1,744,000**	**$1,825,000**	**$2,063,000**
Base – 1999	2000	2002	2005

❖ Funding Mechanisms

This component of the Pierce County solid waste system is presently funded by the **County Administrative Cost** (CAC) and **Litter and Cleanup Disposal Credit** (litter) components of solid waste tipping fees, the **Department of Ecology Coordinated Prevention Grant** (CPG) and **Interest** earned on the reserves maintained within the Solid Waste Enterprise Fund. We propose to use the same funding mechanisms in the year 2000.

We propose to allocate the **CAC**, **Litter**, and **Interest** to Enforcement & Administration in 2002 and 2005. At this time, however, we do not know whether the **CPG** program will be available in those years. If the **CPG** is not available, the programs can be funded from **Reserves** maintained by the County within its Solid Waste Enterprise Fund.

Please refer to the Funding Mechanism Summary Charts for more detail on the specific allocation of revenues and expenses.

Energy Recovery & Incineration Programs (Cost Assessment Section 3.4)

There are no waste to energy or incinerator facilities handling waste generated within the Pierce County/Cities and Towns Management System.

The City of Tacoma Solid Waste Utility owns Tacoma Steam Plant No. 2 which utilizes waste from the City of Tacoma system. State certificated haulers do not deliver waste to this facility.

Land Disposal Program (Cost Assessment Section 3.5)

All waste generated within the Pierce County/Cities and Towns Management System is long-hauled to the Roosevelt Regional Landfill located in Klickitat County.

The City of Tacoma Solid Waste Utility owns and operates the City of Tacoma Sanitary Landfill which provides disposal for a portion of the City waste stream. State certificated haulers do not deliver waste to this disposal site.

Fort Lewis Military Reservation operates the Fort Lewis Landfill which provides disposal for a portion of the Fort Lewis and McChord Air Force Base waste streams. State certificated haulers do not deliver waste to this disposal site.

Solid Waste Collection Programs
(Cost Assessment Section 3.3)
Certificated Haulers

American Disposal, G-37 & Murrey's Disposal, G-9
(subsidiaries of Waste Connections, Inc.)

	Base - 1999	Year 1 - 2000	Year 3 - 2002	Year 6 - 2005
Residential Customers	38,023	38,783	40,335	42,755
Commercial Customers	2,993	3,053	3,175	3,365
Estimated Annual Tonnage	66,187	66,849	68,186	70,232

Pierce County Refuse, G-98
(subsidiary of Harold LeMay Enterprises, Inc.)

	Base - 1999	Year 1 - 2000	Year 3 - 2002	Year 6 - 2005
Residential Customers	28,600	29,170	30,340	32,160
Commercial Customers	6,100	6,220	6,470	6,860
Estimated Annual Tonnage	86,001	86,861	88,598	91,256

Lakewood Refuse, G-18
(subsidiary of Harold LeMay Enterprises, Inc.)

	Base - 1999	Year 1 - 2000	Year 3 - 2002	Year 6 - 2005
Residential Customers	1,447	1,480	1,540	1,630
Commercial Customers	485	500	520	550
Estimated Annual Tonnage	6,011	6,071	6,192	6,378

Solid Waste Collection Programs
(Cost Assessment Section 3.3)
Non-Certificated Haulers

DM Disposal and Superior Refuse (providing service to cities)
(subsidiaries of Waste Connections, Inc.)

	Base - 1999	Year 1 - 2000	Year 3 - 2002	Year 6 - 2005
Residential Customers	14,351	14,638	15,224	16,137
Commercial Customers	1,076	1,098	1,141	1,210
Estimated Annual Tonnage	24,476	24,721	25,215	25,972

University Place Refuse and Westside Disposal
(providing service to cities)

	Base - 1999	Year 1 - 2000	Year 3 - 2002	Year 6 - 2005
Residential Customers	8,400	8,570	8,910	9,450
Commercial Customers	485	500	520	550
Estimated Annual Tonnage	12,964	13,093	13,355	13,756

Pierce County Refuse (providing service to cities)
(subsidiary of Harold LeMay Enterprises, Inc.)

	Base - 1999	Year 1 - 2000	Year 3 - 2002	Year 6 - 2005
Residential Customers	4,500	4,590	4,770	5,060
Commercial Customers	800	820	850	900
Estimated Annual Tonnage	12,028	12,148	12,391	12,763

Lakewood Refuse (providing service to cities)
(subsidiary of Harold LeMay Enterprises, Inc.)

	Base - 1999	Year 1 - 2000	Year 3 - 2002	Year 6 - 2005
Residential Customers	9,621	9,810	10,200	10,810
Commercial Customers	1,080	1,100	1,150	1,220
Estimated Annual Tonnage	19,784	19,982	20,381	20,993

Solid Waste Collection Programs
(Cost Assessment Section 3.3)
Data Summary

Total Certificated Haulers

	Base - 1999	Year 1 - 2000	Year 3 - 2002	Year 6 - 2005
Residential Customers	68,070	69,433	72,215	76,545
Commercial Customers	9,578	9,773	10,165	10,775
Estimated Annual Tonnage	**158,199**	**159,781**	**162,977**	**167,866**

Total Non-Certificated Haulers

	Base - 1999	Year 1 - 2000	Year 3 - 2002	Year 6 - 2005
Residential Customers	36,872	37,608	39,104	41,457
Commercial Customers	3,441	3,518	3,661	3,880
Estimated Annual Tonnage	**69,252**	**69,944**	**71,343**	**73,484**

Total Certificated and Non-Certificated Haulers

	Base - 1999	Year 1 - 2000	Year 3 - 2002	Year 6 - 2005
Residential Customers	104,942	107,041	111,318	118,002
Commercial Customers	13,019	13,290	13,826	14,655
Estimated Annual Tonnage	**227,451**	**229,725**	**234,320**	**241,349**

FUNDING MECHANISMS

Please refer to the attached spreadsheets.

Solid Waste Tipping Fee

Pierce County entered into a Waste Handling Agreement with Land Recovery, Inc. (LRI) in 1998. LRI operates five solid waste facilities owned by Pierce County:

- Purdy Transfer Station
- Anderson Island Residential Waste Transfer Site (Drop Box)
- Key Center Residential Waste Transfer Site (Drop Box)
- Prairie Ridge Residential Waste Transfer Site (Drop Box)
- Pierce County Yardwaste Composting Facility (at Purdy)

LRI makes available its Hidden Valley Transfer Station for the use of Pierce County residents, businesses, and haulers.

LRI also provides the following additional services:

- Transportation of waste from the Drop Boxes to a Transfer Station
- Containerization of waste at Transfer Stations
- Intermodal and Long Haul services
- Arrangement for disposal at the Roosevelt Regional Landfill in Klickitat County
- Participation in a Litter and Cleanup Waste Disposal Credit
- Participation in Emergency Management Programs
- Funding for the County's solid waste management responsibilities through the County Administrative Cost component of tipping fees
- Closure of the Hidden Valley Landfill
- Post Closure Maintenance of the Hidden Valley and Purdy Landfills

The Pierce County – LRI Waste Handling Agreement establishes the solid waste tipping fee. There are six components to the tipping fee:

- Transfer Facilities, Recycling, and Transportation Component (TFRT)
- Yardwaste Composting Component (Yardwaste)
- Long Haul Services Component (LHS)
- Litter and Cleanup Programs Component (Litter)
- Obligations from Original Agreement Component (1997-98)
- County Administrative Cost Component (CAC)

In 1999, the tipping fee is $92.53 per ton, broken into the components as follows:

TFRT.....$34.01	LHS $40.90	1997-98.....$3.46
Yardwaste.....$6.66	Litter.....$0.50	CAC.....$7.00

Rates may be adjusted annually on March 1, per formulas contained within the Rate Setting Guidelines Appendix to the Waste Handling Agreement.