A G E N D A

600 NORTHEAST GRAND AVENUE | PORTLAND, OREGON 97232 2736
TEL 503 797 1700 | FAX 503 797 1797

METRO

MEETING: Metro Solid Waste Advisory Committee

DAY: Wednesday

DATE: September 21, 1994

TIME: 8:30 - 10:30 A.M.

PLACE: Metro Headquarters, 600 N.E. Grand Avenue
ROOM 370

1. Approval of Minutes	**Ruth McFarland**
2. Updates	**Ruth McFarland** **Bob Martin**
3. Regional Solid Waste Management Plan	
A. Summary of SWAC Discussion At August Meeting: Who, What, When, Why of the Plan Update	**Terry Petersen**
B. Report of the Planning Subcommittee: Revised Goals & Objectives	**Jeanne Roy**
C. Report of the Planning Subcommittee: Management Alternatives Specification of Initial Alternatives Evaluation Methodology SWAC Discussion and Directions to the Subcommittee	**Merle Irvine** **Doug Anderson**
4. Other Business/Citizen Communications	**Ruth McFarland**
5. Adjourn	**Ruth McFarland**

Enclosures:

1. Minutes
2. Revised Goals and Objectives
3. Status Report on Alternatives

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SOLID WASTE ADVISORY COMMITTEE (SWAC)
Meeting Summary of August 24, 1994

MEMBERS PRESENT:

Councilor Ruth McFarland, Chair
Jeff Grimm, Grimm's Fuel
Estle Harlan, OSSI/Tri-C
Merle Irvine, Willamette Resources
Kathy Kiwala, City of Lake Oswego
Lynda Kotta, City of Gresham
Doug Coenen, OWS
James Cozzetto, Jr., MDC/ERI
Pete DuBois, Clark County
Jack Deines, Deines Sanitary
Emilie Kroen, City of Tualatin
Dave Kunz, DEQ
Jeff Murray, Far West Fibers
Jeanne Roy, Citizen
Lynne Storz, Washington County
Ken Spiegle, Clackamas County
Gary Hansen, Multnomah County
Steve Miesen, BFI

GUESTS:

Chris Taylor, OSPIRG
Diana Godwin, Regional Disposal Co.
Greg Token, Oregonian

METRO

Terry Petersen, Solid Waste Planning and Technical Services Manager
Marie Nelson, Solid Waste Planning Supervisor
Doug Anderson, Senior Management Analyst
Aletta Yantis, Administrative Assistant

The meeting was called to order by Terry Petersen at 8:35 a.m.

1. Approval of Minutes

The minutes were postponed to the next meeting.

2. Updates

A. A Metro Illegal Dumping Ordinance was adopted by the Metro Council.

B. A resolution was passed by the Metro Council that supports federal legislation that grants local governments flow control authority as currently defined in Chapter 5 of the Metro Code. Source separated recyclables are excluded.

C. The Council will be considering an Ordinance that will reduce the Excise Tax, establish a Construction Tax, and reduce the tip fee to $73.00 per ton.

3. Disaster Debris Management

Gerry Uba gave an update on the activities of the Regional Emergency Management Policy and Technical Committees. The purpose of the Committee is to plan for emergency measures in the event of a major natural disaster. One of the components is dealing with disaster debris.

4. **Regional Solid Waste Management Plan**

Purpose and Process of the 1994 Update:

Terry Petersen reviewed the purpose and process of updating the Regional Solid Waste Management Plan. Key elements of the RSWMP will be:

1. Regional goals and objectives related to solid waste.

2. The overall level of investment in programs and facilities needed to serve the region to the year 2005.

3. Regional priorities for improving the solid waste system to the year 2005.

4. Endorsement of the interrelated roles of investments in disposal capacity and waste reduction.

5. Identification of those parts of the solid waste system that are of regional interest.

6. Performance-based benchmarks with flexible implementation options.

There was considerable discussion on the schedule and the role of numeric benchmarks as part of the RSWMP. The SWAC decided that Merle Irvine and Terry Petersen should report the following recommendations to the Council Solid Waste Committee at their next meeting:

1. There needs to be sufficient time for adequate review and development of the draft plan. The SWAC did not believe that adoption of a new plan by December 1994 would allow sufficient time. The SWAC recommended that a working document be provided to the Council by December that summarizes work-to-date. By July 1995 the final plan would be developed and adopted.

2. The plan needs to be developed as an integrated plan that recognizes the interconnections between different elements of the system. The SWAC recommended that individual chapters (e.g. Facilities and Waste Reduction) not be adopted by the Council.

3. The SWAC recommended that careful attention be paid to the process for making future updates.

4. The SWAC recommended that the format and style of the plan should be based on the audience being targeted. There may need to be different documents for different audiences.

Report of the Planning Subcommittee: Goals and Objectives:

Jeanne Roy presented the draft goals and objectives that have been developed to date by the SWAC Planning Subcommittee. SWAC made several specific changes in the draft. These changes will be made by the Subcommittee and the revised goals and objectives will be distributed with the next SWAC agenda packet.

4. Other Business/Citizen Communication

Emilie Kroen discussed the plans for providing HHW service to Washington County and east Multnomah County. She reviewed the need for cooperation between Metro and local government staff. In particular, she said that the local governments like the Washington County Cooperative would like to have input into the criteria for delivering service and the sites and times that are best for the citizens of the jurisdictions.

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CHAPTER 2

Regional Solid Waste Policy

Introduction

This chapter presents the overall policy framework within which the specific solid waste goals, objectives, and actions contained in the RSWMP were developed. It also provides the basis for future planning and decision-making by the Metro Council, counties, and cities in the region.

The policies reflect the region's vision for managing solid waste. The goals, objectives, and policies are not mutually exclusive. That is, any decision regarding solid waste will need to be made with review of all applicable policies.

History

The adopted RSWMP is built upon the structure of solid waste decisions and plans during the past two decades. The most significant benchmarks of Metro and its predecessors include:

1973 Metro's predecessor, the Metropolitan Service District (MSD) requests funding of the state to develop a Solid Waste Management Plan for the metropolitan region.

1974 The MSD adopts a Solid Waste Management Plan (also called the "CORE-MET" plan).

1978 Metro is reconstituted as a directly elected metropolitan government with responsibility for solid waste management and authority to fund its activities through fees, bonds and borrowing state funds.

1986 A waste reduction plan is adopted by Metro.

1987 Formal revision of the 1974 Solid Waste Management Plan as a "functional" plan is initiated. The new document is called the Regional Solid Waste Management Plan (RSWMP).

1988 The Metro Council formally adopts the RSWMP. Included are goal, policies, and a chapter on general-purpose landfills. Other chapters are to be completed over time.

1989 The Environmental Quality Commission orders Metro to implement either the work plan in Metro's 1986 Waste Reduction Plan or the EQC's alternative. A Waste Reduction chapter is adopted that replaces the 1986 Waste Reduction Plan and incorporates elements of the EQC Order.

1990 Chapters on plan development and special waste are adopted and added to the RSWMP.

1991 A Yard Debris Plan is adopted and incorporated into the Waste Reduction Chapter. A chapter on illegal dumping is adopted. A plan for transfer stations in Washington County is incorporated into the facilities chapter. A chapter on local governments solutions is adopted and added to the RSWMP.

1992 A chapter on hazardous waste is adopted and added to the RSWMP.

1993 The Metro Solid Waste Advisory Committee reviews the solid waste revenue system and makes recommendations to the Metro Council.

1994 Major revision of sections of the RSWMP related to waste reduction, facilities, hazardous waste and the solid waste revenues is initiated.

Regional Solid Waste Plan Goals and Objectives

Any plan of this scope must have a guiding vision. The preceding history clearly illustrates an evolving solid waste policy that recognizes the values inherent in protecting the region's environment, providing adequate levels of waste collection and disposal services, and efficiently allocating finite fiscal resources.

The vision of this plan can be summarized as follows:

Solid waste is viewed by citizens of the region as a resource to be managed for the remanufacture of goods. We understand that the conservation of natural systems -- soil, water, air and biological diversity -- sustain both economic prosperity and life itself, and that the protection of our natural systems requires changes in consumption of resources. In order to build a sustainable future together, we recognize the link between integrated waste management and the conservation of resources as an integral part of the regional decision-making process.

The overall goal of the RSWMP is:

Continue ~~T~~*to develop and implement a Solid Waste Management Plan that achieves a regionally balanced, cost-effective, technologically feasible, environmentally sound and publicly acceptable solid waste system.*

The remainder of this section presents the goals and objectives of the plan.

As used in this plan, *goals* are value-based statements about what is desirable to achieve in the long run. They are broadly worded and express ideals. The *objectives* are more focused milestones on the way toward a goal that help measure progress. *Performance criteria,* presented in Chapter 7, are measurable characteristics of the solid waste system that will be used to monitor the success or failure of objectives as they are acted upon.

System-Wide Goals and Objectives

Goal No. 1. Solid waste management practices that are environmentally sound, conserve natural resources, and achieve the maximum feasible reduction of solid waste being landfilled are implemented by the region.

Objective 1. The guiding policy for waste management in the region will be based on the following priorities:

1. **reduce the amount of solid waste generated;**
2. **reuse material for purpose for which it was originally intended;**
3. **recycle material that can not be reused;**

4. compost material that cannot be reused or recycled;
5. recover energy from solid waste that cannot be reused, recycled, or composted so long as the energy recovery facility preserves the quality of air, water and land resources; and
6. dispose of solid waste that cannot be reused, recycled, composted or from which energy cannot be recovered by landfilling.

Goal No. 2. Residents and businesses of the region are knowledgeable of the full range of waste management options, including waste prevention and reduction, that are available to them.

Objective 1. Provide for public education regarding the cost and benefits of alternative waste management practices in a coordinated fashion such that duplication is avoided and consistent information is provided to the public.

Objective 2. Develop a plan to involve the public in five-year updates of the Regional Solid Waste Management Plan. More frequent Plan revisions may be made as conditions warrant.

Objective 3. Standardize waste reduction services within the region to the extent possible to minimize confusion on the part of residents and businesses and make cooperative promotion campaigns that cross jurisdictional boundaries possible.

Goal No. 3. The costs and benefits to the solid waste system as a whole is the basis for assessing and implementing alternative management practices.

Objective 1. System cost (the sum of collection, hauling, processing, transfer, and disposal)is the primary criterion used when evaluating the direct costs of alternative solid waste practices, rather than only considering the effects on individual parts of the system.

Objective 2. The economic and environmental impacts of waste reduction and disposal alternatives are compared on a "level playing field" in order that waste reduction alternatives have an equal opportunity of being implemented.

Objective 3. After consideration of technical and economic feasibility, Metro and local governments will support a higher system cost for waste reduction practices to accomplish ~~the maximum feasible reduction of waste~~ the regional waste reduction and recycling goals.

Objective 4. Government and industry will work cooperatively to identify, explore, and confirm the cost and reliability of emerging solid waste technologies.

Objective 5. Implement a system measurement program to provide data on waste generation, recycling and disposal sufficient for informed decision making and planning.

~~Objective 6. Standardize waste reduction services within the region to the extent possible to minimize confusion on the part of residents and businesses and make cooperative promotion campaigns that cross jurisdictional boundaries possible.~~

Goal No. 4. A flexible solid waste system exists that can respond to rapidly changing technologies, fluctuating market conditions, and local conditions and needs.

Objective 1. Implement an integrated mix of waste management practices, to provide for stability in the event that particular alternatives become unviable.

Objective 2. Government regulation is the minimum ~~possible~~ necessary to ensure protection of the environment and the public interest without unnecessarily restricting the operation of private solid waste businesses.

Objective 3. Facilities that handle, process, buy and sell source separated recyclables remain in private ownership in order to maintain greater flexibility to rapidly respond to changing market conditions.

Objective 4. Integrate local solid waste solutions into the solid waste management system ~~to the extent they are compatible with the system and meet all other plan provisions~~.

Objective 5. Solid waste facilities may be publicly or privately owned, depending upon which best serves the public interest. A decision on ownership of a transfer and disposal facilities shall be made by Metro, case-by-case, and be based upon established criteria.

Goal No. 5. The annual performance of the solid waste system will be compared to measurable benchmarks ~~(methods to be developed)~~.

Waste Reduction Goals and Objectives

Goal No. 1. A waste reduction goal of ____ will be achieved. (The current goal is a 56% recycling rate. This goal will be reconfirmed or modified as part of this Solid Waste Plan Update process.)

Goal No. 2. Participation in waste ~~reduction~~ prevention and recycling is convenient for all households and businesses in the urban portions of the region.

[Objectives will be based on evaluation of alternatives for waste reduction]

Goal No 3. Secondary resource management is a self-sustaining operation.

Objective 1. Include both direct and indirect costs in the price of goods and services such that true "least cost options" are chosen by businesses, governments, and citizens when making purchasing decisions.

Objective 2. Markets for secondary material are stable and provide sufficient incentive for separation of recoverable material from other waste and/or the post-collection recovery of material.

Goal No. 4. Develop an integrated system of waste reduction techniques with emphasis on source separation, not to preclude the need for other forms of recovery such as post collection material recovery.

Facilities and Services Goals and Objectives

Goal No. 1. There is reasonable access to solid waste transfer and disposal services for all residents and businesses of the region.

Objective 1. Extend and enhance the accessibility of the infrastructure already in place.

Objective 2. Provide reasonable access through new transfer or reload facilities if it becomes evident that the least-cost waste reduction alternatives and existing infrastructure will be unable to keep pace with the future demand for disposal services.

Goal No. 2. A regionally balanced system of cost-effective solid waste recovery facilities provides adequate service to all waste generators in the region.

[Objectives will be based on evaluation of alternatives for recovery facilities]

Goal No. 3. The toxicity of mixed solid waste to the environment, residents of the region, and workers who collect, transport, process and dispose of waste is reduced by keeping hazardous waste out of the mixed solid waste collection and disposal system.

Objective 1. Manage hazardous waste based on the Environmental Protection Agency's hierarchy of "reduce, reuse, recycle, treat, incinerate and landfill."

Objective 2. Educate residents of the region about alternatives to the use of hazardous products and proper disposal methods for hazardous waste.

Objective 3. Provide convenient and safe disposal services for hazardous waste that remains after implementing prevention and reuse practices.

Revenue System Goals and Objectives

Goal No. 1. ~~Regional solid waste management services are financed in a stable, equitable and adequate manner.~~The Solid Waste revenue system should be adequate, stable and equitable and help achieve the goals of the Regional Solid Waste Management Plan.

Objective 1. Equity. Charges to users of the waste disposal system should be directly related to disposal services received. Charges to residents of the Metro service district who may not be direct users of the disposal system should be related to other benefits received.

Objective 2. Revenue Adequacy and Stability. There should be sufficient revenues to fund the costs of the solid waste system.

Objective 3. Management Goals. The revenue system should help the region accomplish management goals such as waste reduction and environmental protection.

~~Objective 1. Services that provide direct benefits to the customer using the services should be financed by usage charges based on the amount of service consumed. Usage charges should be set according to the cost of service.~~

~~Objective 2. Enterprises that benefit directly from activities of Metro which divert materials from disposal should contribute to the funding of these activities.~~

~~Objective 3. There are certain solid waste programs and services which benefit all residents and businesses of the region should share in the cost of these programs and services.~~

~~Objective 4. Metro should employ charges on specific products that make identifiable, extraordinary burdens on the disposal system; or which may be more valuable if reused or recycled.~~

~~Objective 5. Educate residents and businesses of the region on the goals and objectives of the solid waste revenue system.~~

Hazardous Waste Goals and Objectives

Goal No. 1. The toxicity of mixed solid waste to the environment, residents of the region, and workers who collect, transport, process and dispose of waste is reduced by keeping hazardous waste out of the mixed solid waste collection and disposal system.

Objective 1. Manage hazardous waste based on the Environmental Protection Agency's hierarchy of "reduce, reuse, recycle, treat, incinerate and landfill".

Objective 2. Educate residents of the region about alternatives to the use of hazardous products and proper disposal methods for hazardous waste.

Objective 3. Provide convenient and safe disposal services for hazardous waste that remains after implementing prevention and reuse practices.

Solid Waste Advisory Committee
September 21, 1994
1994 SOLID WASTE MANAGEMENT PLAN

Status Report on RSWMP Update

SWAC Planning Subcommittee

One element of the 1994 RSWMP update involves an examination of programs and facilities for solid waste management. This element was triggered by planning questions such as: Is the system currently geared up to meet regional recycling goals? Are additional disposal facilities needed in the future? Do answers to these questions change if the region experiences significantly different growth than expected? What if waste reduction programs do not perform as anticipated?

To help answer these questions, the SWAC Planning Subcommittee, supported by Metro staff and a consultant, Sound Resource Management Group, Inc. of Seattle, has specified a set of solid waste management alternatives which entail a mixture of programs, supporting services, and facilities. The current list of alternatives is shown in Table 1. These alternatives are conceptually organized according to the State solid waste management hierarchy.

The subcommittee is presently evaluating, modifying, and expanding this list of alternatives. One of the subcommittee's next set of tasks involves organizing the alternatives into comprehensive "portfolios" of planning options for management of the regional solid waste system.

Purpose of this Report

This document is a progress report on the subcommittee's evaluation of alternatives. This document is intended to provide members of SWAC with an overview of the solid waste management alternatives under consideration, and the subcommittee's approach to evaluation of these alternatives.

This document also contains preliminary findings and statistics which reflect the committee's progress as of September 7, 1994. As in any research and planning process, the numbers and conclusions are likely to change as ideas are refined and as more information becomes available. The reason for releasing these preliminary results at this time is to provide members of SWAC with insight as to the approximate tonnage impacts of various waste management options, and with an idea of the rough cost to implement these options. At this stage, the Planning Subcommittee is using the results of the economic analysis more as a guide to modifying the specifications of the various alternatives than for drawing conclusions about their performance if implemented.

The following chart may help put the tasks of the subcommittee in the broader context of the RSWMP process. Conceptually, RSWMP planning for facilities and programs begins with consideration of individual solid waste management alternatives (Step 1 on the list below). As these are analyzed and refined, they are built into portfolios of planning options (Step 2 below), which form the basis for revising RSWMP--in particular, facilities, waste reduction, and finance elements. As portfolios are refined, they are integrated within RSWMP in coordination with SWAC, Metro Council, and other regional players (Steps 3 to 5).

Evaluation Process for Programs and Facilities
RSWMP Update

1. Alternatives: Stand-Alone Options for Solid Waste Management
   - Analysis
   - Presentation to SWAC
   - Incorporate SWAC feedback

2. Portfolios: Comprehensive Solid Waste Management
   - Analysis
   - Cross-Check with Other RSWMP Elements
   - Implementation issues
   - Presentation to SWAC
   - Incorporate SWAC feedback

3. Incorporate in RSWMP
   - Development of Criteria for Goals
   - Plan Measurement System for Criteria
   - Link to Other RSWMP Elements
     - Roles for the Private Sector, Local Governments, Metro
     - Other implementation issues
     - Metro Budget Impacts

4. Public Review

5. Presentation to Council

This status report is an element in the first step, above. One purpose of these periodic updates is to give members of SWAC an opportunity to provide direct input to the Subcommittee in its ongoing work.

Evaluation Method for Programs and Facilities

An initial list of alternatives was introduced to SWAC last Spring, and has been refined and expanded by the Planning Subcommittee as result of ongoing analysis. The current list of alternatives is shown in Table 1.

The Planning Subcommittee is undertaking two integrated approaches to evaluation of alternatives: (1) qualitative analysis of *indirect* costs and benefits, and (2) quantitative analysis of *direct* costs and benefits.

Qualitative Evaluation

A qualitative evaluation of alternatives is important because no quantitative analysis will ever be able to capture all costs and benefits of a program. The subcommittee expects to submit each planning alternative to qualitative evaluation to ensure that hard-to-quantify features are given consideration.

Examples of qualitative criteria are: air quality and other environmental impacts; technical feasibility, impacts on markets for recovered materials, and the extent to which the alternative supports the 3Rs ethic. To support qualitative evaluation, Metro staff is presently setting up a matrix of alternatives and benefits, and developing a qualitative scoring system.

Results of qualitative evaluation will be reported to SWAC in future updates. In principle, a (quantitatively) cost-effective management option may be changed or rejected on the basis of qualitative considerations. Similarly, an "expensive" option may be considered for implementation if its indirect benefits are judged to exceed direct costs.

Table 1
Solid Waste Management Alternatives

	Solid Waste Prevention
I.A	Home Composting
1.B	Commercial Waste Prevention
	Source Separated Recycling
	Residential
II.A.1	Expand Curbside
II.A.2	Selective Commingling
II.A.3	New Collection Technologies
	Commercial
II.B.1	Expanded Source Separation
II.B.2	Commingled Collection
	Construction & Demolition
II.C	On-Site Source Separation
	Mixed Waste Processing/Recovery
III.A	Mixed Dry Waste Processing
III.B.1	Organics Recovery from Food Businesses
	"High Tech": Anaerobic Digester Processing
	"Low Tech": Windrow Processing
III.B.2	Residential Organics Recovery
	"High Tech": Anaerobic Digester Processing
	"Low Tech": Windrow Processing
	Transfer & Disposal System
	Existing System
IV.A.1	Modify Design and/or Operation
IV.A.2	Managed Flow
	New Facilities
IV.B.1	Transfer Station(s)
IV.B.2	Reload(s)

Quantitative Evaluation

The quantitative evaluation of alternatives entails a system-wide analysis of direct, quantifiable costs and benefits. "System-wide" means that the total cost of solid waste management, from collection to disposal or sale of recovered materials, is considered.

The results have been calculated from a system cost model developed by Metro staff, and a set of technical specifications developed by Metro staff with assistance from its consultant, Sound Resource Management Group. Documentation of the model and of the technical specifications are being prepared for review by SWAC.

The system model focuses on the total cost of handling waste which is currently delivered to disposal facilities, plus curbside recyclables and yard debris. The model estimates the cost of collection, hauling, processing, transfer, and disposal of materials. It accounts for revenues from material sales, and administrative costs of both the private and public sectors. Wastes which are currently excluded from analysis are industrial process waste, special waste (e.g., petroleum contaminated soils), inerts, hazardous, and liquid waste.

In order to examine the performance of solid waste management alternatives under a variety of conditions, each alternative is analyzed under four scenarios, representing the combination of two regional growth scenarios (base case and high), and two program performance scenarios (lower and higher). The **base case growth** scenario is the same as the current base case for population and employment change in Metro's Region 2040 project; the **high growth** scenario is double the growth increment of the Region 2040 base case. The **higher performance scenario** is usually specified to be above or well above average performance (in terms of program capture or efficiency) when compared with similar programs in other areas of the United States. The **lower performance scenario** is specified to be a fraction (from one-half to three-quarters) of the higher program performance specification.

From this analysis have emerged a number of concepts and summary measures that will be used before SWAC in the future:

- **System cost**: an estimate of the total cost of the solid waste system, from collection to landfilling, including the net cost or benefit of recycling programs. The **system cost per ton** is the average cost of handling a ton of material.

- **Program cost**: an estimate of the *net* cost of a change to the system; for example, implementing a home composting program or construction of a new disposal facility. The **program tonnage** is the amount of material expected to be handled by the program. The **program cost per ton** is the average *net* cost of handling each ton through the program.

- **Target, capture, performance**. Target tonnage is the type of material that a program or facility is designed to handle; the *amount* of target tonnage is the "size of the universe" for the program. The **capture rate** is the proportion of the target which is expected to be actually handled by the program. The capture rate is the ratio: program tonnage / target tonnage, and is a measure of **program performance**.

- **Market Price per Ton**. This figure approximates the actual per-ton price faced by a generator for disposing of waste that is targeted by a waste management alternative. It is the per-ton cost of current practice.

The subcommittee is evaluating each alternative by several criteria. The above concepts provide a quick screening process for evaluation. Specifically:

- If the **program cost per ton** is less than the current **system cost per ton**, then the alternative is cost effective *to the region as a whole*.

- **If the program cost per ton is less than the market price per ton, then the alternative may be implementable by the private sector. If, however, the program cost per ton is more than the market price, implementation--if agreed by regional players--may require special efforts such as subsidization or regulation; or the public sector may be called upon for implementation.**

The balance of this memorandum provides more detail on each alternative, and draft results of the economic analysis. Preliminary findings are shown in Table 3. Tables 4 through 6

summarize program tonnage, program costs per ton, and system costs per ton for each alternative.

As a point of comparison with solid waste management options, Table 2 illustrates some statistics for the current system as estimated by the system cost model.

Table 2
Statistics for the Current System

Annual Tonnage

	Initial	Baseline Growth		High Growth	
	Year 1994	Year 2005	Change	Year 2005	Change
Tonnage					
Waste	1,024,307	1,236,171	211,864	1,448,040	423,733
Recyclables*	139,863	166,791	26,928	193,719	53,856
Yard Debris*	29,550	36,077	6,527	42,604	13,054
Total	1,193,720	1,439,039	245,319	1,684,363	490,643

*Tonnage reported on "curbside" reports submitted by franchised and/or licensed haulers from all sources.

Levelized Cost per Ton

Growth:	Baseline	High Growth
System Cost / Ton	$154.38	$152.99

Results as of 9/7/94. For definitions of terms see glossary.

Table 3
Preliminary Findings

- *Several alternatives appear to result in lower per-ton system costs than under the current system.* These are: home composting, collection of commingled recyclable paper from businesses, and on-site source separation of C&D debris.

- *Several alternatives appear to result in higher per-ton system costs than under the current system.* These are: small-scale commingled plastics collection, and organics programs.

- *Two of the lower-cost alternatives may potentially handle significant quantities of materials:* commingled collection of recyclables from businesses, and on-site source separation of C&D debris.

It should be emphasized that these findings are subject to the assumptions of the economic analysis, and--as importantly--by the way in which the alternatives are specified. A change of specification can make important differences in the economic performance of the program. A good or poor economic showing in this analysis may be less a function of the merits of an option than of its particular specification. For this reason, the Planning Subcommittee has utilized the results of the economic analysis more as a guide to modifying the specifications of the program than for drawing conclusions on the desirability of implementing the alternative.

Table 4

Program Tonnage
(Tons Handled Annually by Each Alternative)
Two Growth Scenarios: Baseline and High
Two Levels of Program Performance: Lower and Higher

Note: figures are averages of annual tonnages over the 12-year planning horizon.

No.	Name of Alternative	Baseline Growth		High Growth	
		Lower Perform.	Higher Perform.	Lower Perform.	Higher Perform.
	Current System (waste only)	1,130,238		1,236,171	
	Waste Prevention				
I.A	Home Composting	7,234	14,648	8,017	16,034
1.B	Commercial Waste Prevention	4,575	9,149	5,026	10,052
	Source Separated Recycling				
	Residential				
II.A.1	Expand Curbside	9,409	18,817	10,098	20,196
II.A.2	Selective Commingling	3,154	6,307	3,463	6,927
	Commercial				
II.B.1	Expanded Source Separation	40,069	60,103	44,024	66,035
II.B.2	Commingled Collection	34,808	52,212	38,223	57,334
	Construction & Demolition				
II.C	On-Site Source Separation	67,714	86,430	74,029	94,490
	Mixed Waste Processing/Recovery				
III.A	Mixed Dry Waste Processing	150,971		165,450	
III.B.1	Food Business Organics Recovery	11,337	22,674	12,304	24,607
III.B.2	Residential Organics Recovery	49,272	65,696	53,944	71,925
	Transfer & Disposal System				
	New Facilities				
IV.B.1	Transfer Station(s)	153,011		170,579	
IV.B.2	Reload(s)	21,858		36,552	

Note: figures are averages of annual tonnages over the 12-year planning horizon; or, approximately mid-plan (1999-2000) tonnages. Results as of 9/7/94. For definitions of other terms see glossary.

Table 5

Program Cost per Ton

Two Growth Scenarios: Baseline and High
Two Levels of Program Performance: Lower and Higher

No.	Name of Alternative	Baseline Growth		High Growth	
		Lower Perform.	Higher Perform.	Lower Perform.	Higher Perform.
	Current System	$154.38*		$152.99*	
	Waste Prevention				
I.A	Home Composting	$18.10	$1.24	$16.15	($0.48)
1.B	Commercial Waste Prevention	$142.62	$96.96	$138.93	$94.37
	Source Separated Recycling				
	Residential				
II.A.1	Expand Curbside	$182.60	$139.69	$180.43	$138.15
II.A.2	Selective Commingling	$588.22	$343.70	$565.86	$331.69
	Commercial				
II.B.1	Expanded Source Separation	$160.90	$151.47	$158.32	$149.32
II.B.2	Commingled Collection	$122.03	$114.25	$119.25	$111.97
	Construction & Demolition				
II.C	On-Site Source Separation	$135.04	$132.64	$133.16	$130.89
	Mixed Waste Processing/Recovery				
III.A	Mixed Dry Waste Processing	$115.86		$114.43	
III.B.1	Food Business Organics Recovery	$268.91	$228.81	$263.67	$225.51
III.B.2	Residential Organics Recovery	$343.14	$335.92	$340.45	$333.51
	Transfer & Disposal System				
	New Facilities				
IV.B.1	Transfer Station(s)	$161.56		$159.69	
IV.B.2	Reload(s)	$153.33		$151.89	

* System cost for all tonnage reported on "curbside" reports submitted by franchised and/or licensed haulers from all sources.

Note: figures are levelized costs per ton, based on a 6% discount rate and 12-year planning horizon. Results as of 9/7/94. For definitions of terms see glossary.

Table 6

System Cost per Ton

Two Growth Scenarios: Baseline and High
Two Levels of Program Performance: Lower and Higher

No.	Name of Alternative	Baseline Growth		High Growth	
		Lower Perform.	Higher Perform.	Lower Perform.	Higher Perform.
	Current System	$154.38		$152.99	
	Waste Prevention				
I.A	Home Composting	$153.62	$152.68	$152.23	$151.28
1.B	Commercial Waste Prevention	$154.34	$153.98	$152.94	$152.58
	Source Separated Recycling				
	Residential				
II.A.1	Expand Curbside	$154.55	$153.71	$153.15	$152.33
II.A.2	Selective Commingling	$155.42	$155.29	$153.99	$153.85
	Commercial				
II.B.1	Expanded Source Separation	$154.58	$154.25	$153.15	$152.82
II.B.2	Commingled Collection	$153.53	$152.79	$152.10	$151.36
	Construction & Demolition				
II.C	On-Site Source Separation	$153.28	$152.73	$151.86	$151.32
	Mixed Waste Processing/Recovery				
III.A	Mixed Dry Waste Processing	$149.96		$148.56	
III.B.1	Food Business Organics Recovery	$155.37	$155.66	$153.93	$154.23
III.B.2	Residential Organics Recovery	$161.45	$163.44	$160.02	$162.01
	Transfer & Disposal System				
	New Facilities				
IV.B.1	Transfer Station(s)	$155.21		$153.78	
IV.B.2	Reload(s)	$154.36		$152.96	

Note: figures are levelized costs per ton, based on a 6% discount rate and 12-year planning horizon. Results as of 9/7/94. For definitions of terms see glossary.

Alternative I.A. Home Composting

This program would entail distribution of bins for composting yard debris and food waste (excluding meat) to 15 percent of single family households in urban and suburban areas. The program would be phased in over a five year period. Bins would be distributed at a subsidized cost of $25 each, and would target households that are not already composting. The program would be supported by workshops, demonstration sites and a Composting Hot Line.

As an additional option for this alternative, the Subcommittee intends to examine the impact of a disposal ban on yard debris.

Findings

- Although diverted tonnage is low, the cost of those tons is considerably less than the current system cost.
- Distinct economies of scale begin to show up at about 10,000 tons per year; thus, it would be important to support programs which capture at least this amount if the program is to move forward into design.

Summary Results for Alternative

Program Tonnage

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Initial Year (1994)				
Target Tonnage	125,611	125,611	125,611	125,611
Captured	1,326	1,989	1,326	1,989
%Captured	1.1%	1.6%	1.1%	1.6%
Final Year (2005)				
Target Tonnage	151,842	151,842	178,092	178,092
Captured	8,017	16,034	9,403	18,807
%Captured	5.3%	10.6%	5.3%	10.6%

Levelized Cost per Ton

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Market	*tbd**	*tbd**	*tbd**	*tbd**
Program	$18.10	$1.24	$16.15	($0.48)
System	$153.62	$152.68	$152.23	$151.28

**tbd*: to be determined

Results as of 9/7/94. For definitions of terms see glossary.

Alternative I.B. Commercial Waste Prevention

This program is intended to achieve approximately 15 percent reduction in paper and packaging by businesses through provision of extensive waste audits and other educational and promotion efforts. The program is designed to reach about 80 percent of all businesses within a 5 year period. Provision of the educational and audit services could be by either the public or private sector.

Findings

- Diverted tonnage is low, but the cost of those tons is only marginally less than the current system cost. This is due to the cost of the extensive waste audits.
- Mild economies of scale begin to show up at about 10,000 tons per year.

Summary Results for Alternative

Program Tonnage

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Initial Year (1994)				
Target Tonnage	38,906	38,906	38,906	38,906
Captured	825	1,649	825	1,649
%Captured	2.1%	4.2%	2.1%	4.2%
Final Year (2005)				
Target Tonnage	47,420	47,420	55,934	55,934
Captured	5,026	10,052	5,929	11,858
%Captured	10.6%	21.2%	10.6%	21.2%

Levelized Cost per Ton

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Market	*tbd**	*tbd**	*tbd**	*tbd**
Program	$142.62	$96.96	$138.93	$94.37
System	$154.34	$153.98	$152.94	$152.58

**tbd*: to be determined

Results as of 9/7/94. For definitions of terms see glossary.

Alternative II.A.1 Expand Residential Curbside

This program is intended to improve participation in curbside programs and extend mixed scrap paper, milk jugs and weekly yard debris collection to all single family residences. The program would also extend collection of principal recyclables to all multifamily residences beginning in 1995. Half of all multifamily residences would also have collection of mixed scrap paper.

Findings

- This program has the potential to extract 10,000 to 20,000 more tons of curbside material.
- It appears that economies of scale are crucial for expansion of the residential curbside programs. At 10,000 tons, the per-ton cost of this program is higher than the current system cost ($180), but at 20,000 tons it is lower ($140).

Summary Results for Alternative

Program Tonnage

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Initial Year (1994)				
Target Tonnage	10,604	10,604	10,604	10,604
Captured	2,004	4,008	2,004	4,008
%Captured	18.9%	37.8%	18.9%	37.8%
Final Year (2005)				
Target Tonnage	37,749	37,749	43,178	43,178
Captured	10,709	21,417	12,058	24,175
%Captured	28.4%	56.7%	28.0%	56.0%

Levelized Cost per Ton

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Market	*tbd**	*tbd**	*tbd**	*tbd**
Program	$182.60	$139.69	$180.43	$138.15
System	$154.55	$153.71	$153.15	$152.33

**tbd*: to be determined

Results as of 9/7/94. For definitions of terms see glossary.

Alternative II.A.2 Curbside Residential Commingled Plastics

This alternative is intended to examine the impact of adding a number of new materials to the region's curbside collection systems. The initial program specification is roughly consistent with a commingled plastics curbside program developed by the American Plastics Council. The program provides for collection of rigid plastic containers from all single and multifamily residences.

An additional program specification for this alternative is under study. Under this option, haulers will employ extensive on-truck commingling techniques. Additional processing capacity or facilities are expected to be necessary to prepare the materials for market.

Findings

- The per-ton cost of this program is very high, at 2 to 3 times the current system cost. This is because new high capital costs for collection (compactor mounted on truck) and expansion of local processing are spread over a very small tonnage base of only 3,000 to 6,000 tons. It should be kept in mind, however, that the program costs below are the *marginal* costs of adding plastics to curbside programs, and may not be comparable with conventional measures of curbside costs by material, which are usually *average* costs. It is likely that a marginal analysis of other light recyclables (*e.g.*, aluminum) would yield comparably high marginal costs per ton.

Summary Results for Alternative

Program Tonnage

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Initial Year (1994)				
Target Tonnage	6,318	6,318	6,318	6,318
Captured	2,844	5,688	2,844	5,688
%Captured	45.0%	90.0%	45.0%	90.0%
Final Year (2005)				
Target Tonnage	7,678	7,678	9,037	9,037
Captured	3,464	6,927	4,083	8,166
%Captured	45.1	90.2	45.2%	90.4%

Levelized Cost per Ton

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Market	*tbd**	*tbd**	*tbd**	*tbd**
Program	$588.22	$343.70	$565.86	$331.69
System	$155.42	$155.29	$153.99	$153.85

**tbd*: to be determined

Results as of 9/7/94. For definitions of terms see glossary.

Alternative II.B.1 Commercial Collection of Commingled Paper

This program is designed to capture recyclable paper in the commercial waste stream not currently being collected by other efforts. The program would provide for commingled collection of mixed paper at all businesses and would be supported by strong education and promotion efforts.

An additional option--to provide collection of source-separated principal recyclables to small businesses--is being considered by the subcommittee. Under this option, collection service would be included with single family routes.

Findings

- The program is estimated to capture an additional 40,000 to 60,000 tons of material.
- The per-ton cost of this program is very close to the current system, ranging from $150 to $160--in part due to the fact that only relatively clean, valuable material is being extracted for resale.

Summary Results for Alternative

Program Tonnage

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Initial Year (1994)				
Target Tonnage	91,678	91,678	91,678	91,678
Captured	36,114	54,171	36,114	54,171
%Captured	39.4%	59.1%	39.4%	59.1%
Final Year (2005)				
Target Tonnage	111,649	111,649	131,620	131,620
Captured	44,024	66,035	51,933	77,900
%Captured	39.4%	59.2%	39.5%	59.2%

Levelized Cost per Ton

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Market	*tbd**	*tbd**	*tbd**	*tbd**
Program	$160.90	$151.47	$158.32	$149.32
System	$154.58	$154.25	$153.15	$152.82

***tbd: to be determined**

Results as of 9/7/94. For definitions of terms see glossary.

Alternative II.B.2 Two-Stream Commercial Collection of Commingled Paper and Containers

This program is designed to collect two streams of commingled recyclable materials from all types of businesses. The first stream is mixed paper as specified in the previous alternative (II.B.1). The second stream is primarily composed of glass, tin, aluminum, PET and HDPE containers. The program would be supported by strong education and promotion efforts.

Findings

- The program is estimated to capture an additional 35,000 to 50,000 tons of material.
- The per-ton cost of this program, $115 to $120, is below the current system cost. A variety of factors contribute to this:
  - Relatively clean, valuable materials are being extracted for resale
  - The two-stream, commingled aspect increases capture and reduces collection costs
  - Relatively low cost, low-tech processing is assumed.

Summary Results for Alternative

Program Tonnage

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Initial Year (1994)				
Target Tonnage	79,539	79,539	79,539	79,539
Captured	31,393	47,089	31,393	47,089
%Captured	39.5%	59.2%	39.5%	59.2%
Final Year (2005)				
Target Tonnage	96,223	96,223	113,936	113,936
Captured	38,223	57,334	45,053	67,579
%Captured	39.5%	59.3%	39.5%	59.3%

Levelized Cost per Ton

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Market	*tbd**	*tbd**	*tbd**	*tbd**
Program	$122.03	$114.25	$119.25	$111.97
System	$153.53	$152.79	$152.10	$151.36

**tbd*: to be determined

Results as of 9/7/94. For definitions of terms see glossary.

Alternative II.C On-Site C&D Source Separation

This program is designed to implement on-site, source-separation recycling practices at construction and demolition debris where feasible. Where space permits at commercial sites, drop boxes will be provided for between 2 to 6 individual materials. At residential sites, the methods will be those currently employed by clean-up contractors since they do not require individual drop boxes for each material.

Findings

- The per-ton cost of this program, $130 to $135, is below the current system cost. Some factors that contribute to this are:
  - Site separation reduces contamination, allowing low-tech recovery of relatively high-valued materials with low residuals.
  - This option capitalizes on existing processing capacity.

Summary Results for Alternative

Program Tonnage

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Initial Year (1994)				
Target Tonnage	120,556	120,556	120,556	120,556
Captured	61,399	78,370	61,399	78,370
%Captured	50.9%	65.0%	50.9%	65.0%
Final Year (2005)				
Target Tonnage	145,354	145,354	170,530	170,530
Captured	74,029	94,490	86,659	110,611
%Captured	50.9%	65.0%	50.9%	65.0%

Levelized Cost per Ton

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Market	*tbd**	*tbd**	*tbd**	*tbd**
Program	$135.04	$132.64	$133.16	$130.89
System	$153.28	$152.73	$151.86	$151.32

**tbd*: to be determined

Results as of 9/7/94. For definitions of terms see glossary.

Alternative III. A Mixed Dry Waste Processing

This program is design to provide capacity processing for mixed dry waste throughout the region. The facilities would be open to all commercial and self-haulers and process only dry nonputrescible waste from both construction and demolition sites and general commercial activities. The facilities are generally modeled after the new ERI facility.

Findings

Evaluation of this alternative outside a portfolio is of limited value because the size of the target tonnage, and capture rate assumptions, are closely tied to assumptions about supporting services and collection technologies. For example, we can identify the amount of "dry" waste that is currently delivered to various facilities, and assume this waste would be delivered instead to processors. Essentially, this models a "zero-sum game" between limited purpose landfills (and transfer stations to a limited extent), and dry waste processors. In reality, the interesting question is: how much of the current "wet" waste can be dried out sufficiently for processing at a mixed waste facility. As the answer to this question depends on upstream activity with generators and haulers, the meaningful evaluations of this alternative will emerge from analysis of comprehensive portfolios that include both front- and back-end options.

Summary Results for Alternative

Program Tonnage

Growth:	Base Growth	High Growth
Initial Year (1994)		
Target Tonnage	183,663	183,663
Captured	136,492	136,492
%Captured	74.3%	74.3%
Final Year (2005)		
Target Tonnage	222,728	261,793
Captured	165,450	194,408
%Captured	74.3%	74.3%

Levelized Cost per Ton

Growth:	Base Growth	High Growth
Market	*tbd**	*tbd**
Program	$115.86	$114.43
System	$149.96	$148.56

**tbd*: to be determined

Results as of 9/7/94. For definitions of terms see glossary.

Alternative III.B.1 Organics from Food-Related Businesses

This program is designed to collect food waste and non-recyclable paper from retail, wholesale, and food-related businesses. Under the original specification, a "high tech" facility (an anaerobic digestor) would be employed for processing.

See the next section (III.B.2) for a description of additional options being developed by the Planning Subcommittee.

Findings

- At $230 to $270 per ton, the cost of this program is considerably above current system costs. Because this may be more a function of the original specification of the program than due to the inherent merits of this alternative, the subcommittee is developing additional options for this alternative. Specific causes for the high costs are:
  - The conservative capture specification results in very low tonnages.
  - Separation of organics increases collection costs.
  - The economics of anaerobic digestion--a relatively high tech, expensive solution--indicate that considerable economies of scale set in at approximately 50,000 tons and up, at which point the per-ton processing costs range from $20 to $30. At the low tonnages extracted by this program, processing costs are over $60 per ton.

Summary Results for Alternative

Program Tonnage

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Initial Year (1994)				
Target Tonnage	39,500	39,500	39,500	39,500
Captured	10,370	20,740	10,370	20,740
%Captured	26.3%	52.5%	26.3%	52.5%
Final Year (2005)				
Target Tonnage	46,714	46,714	53,928	53,928
Captured	12,304	24,607	14,237	28,474
%Captured	26.3%	52.5%	26.4%	52.8%

Levelized Cost per Ton

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Market	*tbd**	*tbd**	*tbd**	*tbd**
Program	$268.91	$228.81	$263.67	$225.51
System	$155.37	$155.66	$153.93	$154.23

**tbd*: to be determined

Results as of 9/7/94. For definitions of terms see glossary.

Alternative III.B.2 Organics Recovery from Single Family Households

This alternative is designed to collect food waste and non-recyclable paper from single family households. As with commercial organics, the original specification calls for an anaerobic digestor for processing

Additional options for this alternative (and the previous, III.B.1) are under study. These options will entail changes both to collection methods (e.g., collection routes that include both residential and commercial), and to the types of processing facilities employed (e.g., "low tech" windrow methods that handle a mixture of yard debris and organics).

Findings

- This is one of the more expensive options, at approximately $340 per ton. This cost is a function of the high tech processing solution noted above; but more fundamentally, because of very high collection costs. Food waste is assumed to be source separated and collected by special equipment. High costs are exacerbated by the necessity for frequent collection coupled with very low quantities per stop.

Summary Results for Alternative

Program Tonnage

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Initial Year (1994)				
Target Tonnage	99,111	99,111	99,111	99,111
Captured	44,600	59,467	44,600	59,467
%Captured	45.0%	60.0%	45.0%	60.0%
Final Year (2005)				
Target Tonnage	119,876	119,876	140,640	140,640
Captured	53,944	71,925	63,288	84,384
%Captured	45.0%	60.0%	45.0%	60.0%

Levelized Cost per Ton

Growth: / Performance:	Base Growth Lower Perf.	Base Growth Higher Perf.	High Growth Lower Perf.	High Growth Higher Perf.
Market	*tbd**	*tbd**	*tbd**	*tbd**
Program	$343.14	$335.92	$340.45	$333.51
System	$161.45	$163.44	$160.02	$162.01

**tbd*: to be determined

Results as of 9/7/94. For definitions of terms see glossary.

Other Alternatives

The following alternatives are not accompanied by detailed tables as are the preceding alternatives. Some of these (II.A.3, IV.A.1, IV.A.2) are better considered as sub-options for other alternatives. Their primary concern is operational efficiency of collection routes and transfer stations. As such, no tonnage numbers or diversion rates are associated with these alternatives. Results for the others, transfer stations and reload facilities, are most meaningful in portfolio analysis.

Alternative II.A.3 Residential Curbside--New Collection Technologies

This alternative is intended to lower the cost of collecting materials in the residential sector by adopting new collection technologies. The program is specified as a two truck residential collection system: Truck #1: Dual collection of yard debris and garbage in separate compartments. New trucks would be required. Truck #2: Recyclables. Existing recycling collection trucks would continue to be used.

Alternative IV.A.1 Modify Design and/or Operation of Existing Transfer System

The program is designed to improve the ability of the existing transfer facilities to handle additional growth in the solid waste stream. Performance of the system would be improved through methods such as improved traffic flows or limiting access times for self-haul customers.

Alternative IV.A.2 Manage Flow of Existing Transfer System

The program is designed to improve the ability of the existing transfer facilities to handle additional growth in the solid waste stream through redirecting haulers from Metro South to Metro Central as tonnage capacities are reached at Metro South.

Alternative IV.B.1 New Transfer Station

This alternative is designed to provide transfer station services in areas least served by existing transfer facilities. As currently specified, this alternative puts a single transfer station on the Wilsonville site. Under status quo conditions, initially it draws over 130,000 tons per year, which rises to approximately 170,000 tons by the end of the planning horizon. It has a somewhat higher per-ton cost than the current system. This is due to the finding that the costs of new capital, O&M, and so forth do not fully overcome haul-time savings. See Tables 5 and 6 for cost summaries for this alternative.

Alternative IV.B.2 New Reload Facilities

This alternative is designed to provide reload services in areas least served by existing transfer facilities. The facilities would have a 10,000 to 30,000 ton per year capacity. The intent is to increase access to disposal sites, reduce ton-miles accumulated in hauling waste from collection

routes to transfer facilities, and to free up traffic capacity at existing transfer stations. Achieving these objectives would presumably entail new capital investment and incurring new O&M whose cost may overcome any haul and tip time savings.

An alternative specification which capitalizes on existing investment and traffic patterns would be to add reload capacity at existing dry waste processing facilities--for example, Wastech, ERI, Tualatin Valley Waste Recovery, East County Recycling, and perhaps others.

The finding that the system cost is marginally below the current cost is somewhat self-fulfilling, because this option is specified to make sense only if haul cost savings overcome the capital costs. See Tables 5 and 6 for cost summaries for this alternative.

Glossary of Terms

Note: Terms in the body of a definition which are defined elsewhere in the glossary are *italicized.*

Alternative. A *solid waste management option* that targets a particular type of waste and/or generator. Alternatives may encompass a set of programs, practices, and/or facilities. In the RSWMP update, alternatives are the building blocks of a comprehensive solid waste management system.

Base Case Growth. One of the *scenarios* under which the performance of *solid waste management options* is analyzed. The base case growth scenario is the same as the current base case for Region 2040.

Captured Tonnage. That portion of the *target tonnage* which is actually handled by the *alternative*. For example, under one *scenario* the home composting program is estimated to handle 6,631 tons of the 125,600 *target tons* "available" to it in 1994.

High Growth. One of the *scenarios* under which the performance of *solid waste management options* is analyzed. The high growth scenario is double the growth increment of the Region 2040 base case.

Higher Program Performance. One of the *scenarios* under which the performance of *solid waste management options* is analyzed. The higher performance scenario is specified to be in the third or fourth quartile of performance (in terms of program capture or efficiency) when compared with similar programs in other areas of the United States.

Levelized Cost. A kind of weighted average which takes financial discounting into account. The levelized cost is a single number which summarizes a time series of different costs. It is calculated by taking the net present value of a series of costs, then amortizing this net present value back to the original time horizon, resulting in a constant dollar figure which represents the same time-value of money as the original series of costs. In this analysis, the same discount rate is employed to calculate both the net present value and the amortization.

Lower Program Performance. One of the *scenarios* under which the performance of *solid waste management options* is analyzed. The lower performance scenario is specified to be a fraction (from one-half to three-quarters) of the *higher program performance* specification.

Market Price per Ton. This figure approximates the real price faced by a generator for disposing of solid waste that is targeted by a solid waste management *alternative*. The market price per ton is a summary measure that indicates the feasibility of implementation. If the market price per ton is at least as much as the *program cost per ton*, then the *alternative* may be successfully implemented by the private sector. If, however, the market price is less than the *program cost per ton*, private-sector implementation may require special efforts such as subsidization or regulation; or the public sector may be called upon for implementation.

Option. The same as a solid waste management *alternative*. See *alternative.*

Percent Captured Tonnage. The ratio: *captured tonnage / target tonnage*, expressed as a percentage.

Program Cost per Ton. This figure approximates the net cost of handling each ton of waste by means of one of the solid waste management *alternatives*. Basically, it is calculated by taking the difference between the *system cost* with and without the solid waste management *alternative*, and then dividing this difference by the tons handled by the *alternative*. The philosophy behind this calculation is: if there is a shift in *system cost* due to implementation of a *solid waste management option*, then the difference in *system cost* should be allocated to the tons managed by the option. The program cost per ton can be viewed as the marginal cost of a waste management *alternative*. In general, if the program cost per ton is less than the *system cost per ton*, then the *alternative* is more cost-effective to the region as a whole than the average under the current system.

Program Performance. A *scenario* under which the performance of a waste management *alternative* is analyzed. Two program performance *scenarios* are specified: *lower program performance*, and *higher program performance*. These *scenarios* are specific to each *alternative*.

Scenarios. In order to examine the performance of waste management *alternatives* under a variety of conditions, each *alternative* is analyzed under four scenarios, representing the combination of two regional growth scenarios (*base case*, and *high*), and two program performance scenarios (*lower* and *higher*).

System Cost. The total cost of collecting, hauling, processing, transporting, and disposing of *system tonnage*.

System Cost per Ton. The ratio: *system cost / system tonnage*. This figure is the average cost to the system of managing a ton of solid waste.

System Tonnage. Waste which is currently delivered to disposal facilities, plus materials (including yard debris) reported by franchised/licensed haulers as collected through curbside programs from all generators. Excluded are industrial process waste, special waste (e.g., petroleum contaminated soils), inerts, hazardous, and liquid waste.

Target Tonnage. The solid waste stream, in tons, on which the *alternative* is focused. It is usually specified by material and generator type. For example, the target waste stream for the home composting program is yard debris (leaves, grass, and small prunings), and food waste from single family generators, estimated to be approximately 125,600 tons disposed in 1994.

Waste Management Option. The same as a waste management *alternative*. See *alternative*.

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