A G E N D A

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

METRO

*NOTE: Special Council meeting.

DATE: **January 20, 1994***
MEETING: Metro Council
DAY: Thursday
TIME: 4:00 p.m.
PLACE: Metro Council Chamber

Approx. Time*		Presented By
4:00	**CALL TO ORDER/ROLL CALL**	
	1. INTRODUCTIONS	
	2. CITIZEN COMMUNICATIONS TO THE COUNCIL ON NON-AGENDA ITEMS	
	3. EXECUTIVE OFFICER COMMUNICATIONS	
	4. RESOLUTIONS	
	REFERRED FROM THE SOLID WASTE COMMITTEE	
4:05 (90 min.)	**4.1 Resolution No. 94-1848,** For the Purpose of Authorizing the Executive Officer to Enter Into a Franchise Agreement with Willamette Resources, Inc., for Construction and Operation of the Metro West Station (Action Requested: Motion to Adopt the Resolution)	Moore
5:35 (10 min.)	**5. COUNCILOR COMMUNICATIONS & COMMITTEE REPORTS**	
5:45	**ADJOURN**	

For assistance/services per the Americans with Disabilities Act (ADA), dial TDD 797-1804 or 797-1534.

Council
1/20/94
4.1

Testimony to Metro Council
from Washington County Solid Waste Systems Design Steering Committee
Thursday, January 20
Regarding Wilsonville Transfer Station

Last fall the Council voted to reconsider its decision not to build the Wilsonville Transfer Station for the purpose of gathering additional information. At the final hearing on the station the key issues were: 1) The financial condition of the solid waste fund; 2) tonnage forecasts; and 3) the creditworthiness of the applicant. What do you know now about these three issues that you didn't know in the fall?

1. The financial condition of the solid waste fund.

During the hearings process last fall solid waste staff raised the specter of $10 to $15 tipping fee increases next year. It seems odd to us that we had not heard these figures either before or since. Last Friday the solid waste director told our Committee that he anticipated no tipping fee increase next year. The contract amendments with Oregon Waste Systems are a part of this. Perhaps the higher than forecasted waste tonnage (see below) which has generated approximately $3 million more revenue than estimated for this year is another. Canceling a transfer station that would result at most in about a 20 cent increase per garbage can because the Metro solid waste fund is allegedly teetering on the verge of a death spiral is not a persuasive argument.

2. Tonnage forecasts.

The final year-end waste tonnage numbers as reported at the transfer station gatehouses are now in. Tonnage for 1993 was 38,000 tons (5%) higher than last year and projected for this year. A study commissioned by the Metro Council by SRC has been made public. That study concludes tonnage will grow in the future, not stay constant or decline. A study by Reiter Northwest concludes that Metro's forecast is flawed for a number of reasons, and concludes that tonnage will increase between 1.4% and 1.7% annually. A recent study of tonnage projects in Marion County reaches similar conclusions for our adjacent neighbor to the south. Given the high growth rates projected for this area can anyone seriously believe that solid waste tonnages are not also going to continue to grow? Claims that recycling will completely offset the growth are wild. They are not supported by data from the experience of any other community in the country. There certainly are no adopted Metro plans which create a plausible case that those unprecedented recycling levels are realistically attainable.

3. Creditworthiness of applicant

WRI has received a new letter of credit from a prominent local bank at better terms than presented to Metro last fall.

So what has changed since September? Metro's solid waste fund appears to be in more stable, tonnages are headed up both presently and in the future, and the applicant has improved the financial backing for the project. We would hope that these facts would have some bearing on your final decision.

A decision to not build the proposed Wilsonville station will:

- Be directly counter to Metro's adopted Regional Solid Waste Management Plan, including the chapter on the west wasteshed and policies related to uniform levels of services throughout the region, regional partnerships, and honoring a preference for local solutions.

- Permanently commit Metro to a solid waste system founded on Washington County haulers travelling long distances and the costs this will impose on road maintenance, congestion, air pollution and time. Washington County rates at the can will be inequitably, artificially, and permanently higher than they would otherwise be if Washington County citizens and businesses had equal access to transfer facilities as other portions of the region.

- Box Metro into some combination of permanently high tonnages at Metro South and/or the imposition of flow control. Neither option is "in the bank" like the Wilsonville station, making both options a roll of the dice. What if Oregon City refuses to accept 400,000 tons annually after the current agreement expires next year? What if Metro lacks the political will or legal ability to impose flow control, and the haulers will not divert flows on a voluntary basis because of the high costs they will incur from going to Metro Central?

- Severely scar regional partnerships. Reassessing the merits of an adopted plan and updating it with solid data and a deliberate collaborative process with key stakeholders is one thing. We all do this constantly. Deciding to unilaterally, unexpectedly and quickly make a U-turn while leaving your partners behind is another. After the decade of work to get to this point the decision to completely abandon the Washington County plan cannot help but create serious damage to communication, relationships and trust. This is not a threat. It is simply a description of the unavoidable consequences of this kind of action.

We strongly urge you to authorize the construction of the Wilsonville transfer station.

Council
1/20/94
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RECYCLING ADVOCATES

2420 S.W. Boundary Street, Portland, Oregon 97201 (503)244-0026

Statement to Metro Council
Concerning Resolution 93-1848, a New Transfer Station
by Jeanne Roy, Chair, Recycling Advocates
January 20, 1994

I believe that transfer stations, of the type you are considering, are not the wave of the future.

Rather than siting large facilities that accept mixed waste, I think Metro should be focusing on smaller facilities that accept limited materials. For example, material recovery centers that sort dry loads high in recyclables; organic composting facilities that accept food, yard debris, and non-recyclable paper; and other sites that accept wood, masonry, and reusable building materials.

As long as tip fees remain high, it should be possible to encourage much more source separation and high grading than is occuring today.

REGIONAL SERVICE

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TEL 503 797 1700 | FAX 503 797 1797

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January 20, 1994

Mayor Daniel W. Fowler
Members of the Oregon City Council
320 Warner-Milne Rd
Oregon City, OR 97045

RE: Metro South Tonnage

Dear Mayor Fowler:

I just read a memo to you from Mayor Stolze of Tualatin which contains a total misrepresentation of my recent comments of the tonnage limits at the Metro South Transfer Station. I have repeatedly recognized that our current agreement contains a tonnage limit considerably below actual levels. I stated that we intend to discuss this issue more fully with Oregon City officials once the Metro Council decides whether or not to build the Proposed Wilsonville Transfer Station. In the event they decide not to build the Wilsonville facility, Metro has developed a detailed plan for diverting flow from Metro South to Metro Central. I told Mayor Stolze and others that we would be reviewing this plan with Oregon City officials, and that there appears to be increasing recognition that traffic levels rather than tonnage might be the real issue at Metro South. My hope would be that Oregon City and Metro will be able to work out a more detailed agreement involving all operating issues including tonnage levels. Mayor Stolze was told that if Oregon City requires a shift in flow, we are prepared to do it. I have never speculated on what revised flow level (if any) Oregon City might agree to. I have also never suggested that Oregon City is "hooked on the enhancement fees." Indeed I'm sure you remember from our meeting several months ago, I fully understand that enhancement fees are quite secondary to the necessity of the facility remaining a good neighbor.

Throughout the Wilsonville debate, I have avoided even the appearance of speaking for Oregon City. I would hope you would recognize that Mayor Stolze is nether speaking for me nor representing my comments accurately.

Sincerely,

Bob Martin /jc

Bob Martin
Metro Solid Waste Director

BM:jc
cc: Metro Council
Mayor Stolze, City of Tualatin

Council
1/20/94
4.1

BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF AUTHORIZING THE EXECUTIVE OFFICER TO ENTER INTO A FRANCHISE AGREEMENT WITH WILLAMETTE RESOURCES, INC. FOR CONSTRUCTION AND OPERATION OF THE METRO WEST STATION	)))))))	RESOLUTION NO. 94-1848 Introduced by Metro Council Solid Waste Committee

WHEREAS, In June 1990, the Council of Metro adopted Resolution No. 91-143B establishing policy for development of the "Metro West Transfer and Material Recovery System" as a chapter of the Regional Solid Waste Management Plan; and

WHEREAS, In October, 1991, the Metro Council adopted Ordinance No. 91-416 which amended the Regional Solid Waste Management Plan to include the chapter referenced above; and

WHEREAS, Ordinance No. 91-416 states that: "The primary method of facility procurement for transfer facilities in the west wasteshed will be through the issuance of a request for long-term franchises"; and,

WHEREAS, In May, 1992 the Metro Council adopted Resolution No. 92-1612 authorizing issuance of a "Request for the Provision of Transfer and Material Recovery Facilities and Services for Eastern Washington County" (RFF) to partially implement the adopted chapter referenced above; and

WHEREAS, In July, 1992, a franchise application was received in response to the RFF and found to be in compliance with the RFF; and

WHEREAS, A franchise agreement, attached as Exhibit "A", has been negotiated between Metro and Willamette Resources, Inc. which is in compliance with the RFF and the Regional Solid Waste Management Plan; now, therefore,

BE IT RESOLVED,

That the Metro Council authorizes the Executive Officer to execute the Service Agreement, in a form substantially similar to Exhibit "A" attached to the original only hereof, and hereby incorporated by reference.

ADOPTED by the Metro Council this _____ day of _____, 1993.

_____

Judy Wyers, Presiding Officer

January 2, 1994

Merle Irvine
Willamette Resources, Inc.
2215 N. Front Street
Woodburn, OR 97971

Dear Merle:

In the attachment, I have posed and answered a series of questions related to Metro's March 1993 forecast and the outlook for tonnage through 2000. As I indicated early in this project, the deficiencies in Metro's March 1993 forecasting methodology and forecast were such that there appeared to be no way to "repair" the March 1993 forecast by passing more appropriate assumptions through the model used to produce this forecast. Instead, I developed an independent outlook for Metro's tonnages through the end of the decade, described appropriate approaches to waste forecasting, and then used this information as a framework for illustrating the deficiencies in Metro's approach and forecast.

In the attached materials, I have repeatedly made the point that developing accurate forecasts of receipts/disposal in the 1990's really translates to developing accurate forecasts of recycling. This principle applies to my work as well. For this reason, the outlook that I have presented here should be regarded as a sketch of the future rather than a detailed picture. And this is as it should be. Developing such forecasts is not your responsibility but rather Metro's.

This outlook is built around the following key assumptions: that employment will grow at the rate specified in the forecast produced for Tri-Met by ECO Northwest, which is very reasonable by historical standards; that population and household grow in accordance with the historical relationships between population and employment in the Portland area; and, that the relationship of Metro's current prices to the competition remain relatively constant.

That said, the following seems clear -- tonnages will start climbing once again and will continue to do so through the end of the decade, barring a significant recession. The exact growth rate depends on the efficacy of recycling and on the actual rate of growth in the economy. Metro's share of this tonnage depends on their pricing and location vis-a-vis Hillsboro and other competitors. The system will probably hit capacity in the next three-five years. In the meantime, TST tonnages originating in the south end will be (and already are) beyond the rated capacity of the system.

Metro's March 1993 forecast misses the elements of this outlook completely, for the many reasons I have described in the document. The realization of a no TST-growth scenario (as suggested by Metro's forecast) would require the adoption of a number of additional policy measures, most of which are regarded as draconian (e.g., manadatory food waste recycling, cardboard bans, etc.).

Merle Irvine
Metro 1993 Forecast Review
January 2, 1994

Please call me if you have any questions.

Sincerely yours,

Paul D. Reiter
Reiter Northwest

cc: Carl Batten, ECO Northwest (with attachments)

1. What Factors Led to the Recent Declines in Metro Tonnages? Should We Expect More Declines in the Near Term?

Synopsis

As Figure 1-A illustrates, the recent slowdown in the receipts of system-wide and transfer station waste can be attributed to three primary factors:

- o the slowdown/recession in the Portland economy;
- o the ramp-up of residential curbside and hauler-based commercial recycling;
- o the substitution of lower priced non-Metro facilities and services for Metro operated facilities.

In combination, these factors produced declines in Metro's receipts and the region's overall disposal volumes over the 1991 to mid-1993 period. Beginning in 1993, tonnage began to grow sufficiently to overcome the effects of recycling. This growth in disposal volumes will accelerate in 1994-95 as the economy recovers, the growth in curbside volumes slows, and the relative price of Metro disposal stabilizes.

Over the 1994-2000 period, Metro's receipts of solid wastes should grow between 1.4 and 1.7 percent per year, once the affects of hauler-based and market-based recycling have been accounted for. This compares with a 3 percent rate of growth in receipts prior to the downturn in 1991.

How the Slowdown Affected Waste Generation

Metro's wastes are produced as a by-product of the activities of three broad classes of generators: residences, business/government/industry, and construction. Fluctuations in the activity level of any of these generators produces fluctuations in waste volumes.

By relating historical measures of the activity variables (e.g., restaurant employment) to waste generation factors (e.g., waste per restaurant employee), one can estimate how the downturn affected Metro receipts independent of recycling and the effects of rate differences between Metro and non-Metro facilities.

Using these concepts, it is clear that the economic slowdown in the Portland area resulted in a significant slowing of the patterns of rapid growth evident in the late 1980's. Of the three waste producing classes, the commercial/industrial class appears to have been the largest contributor to the slowdown in waste generation growth, as shown in Figure 1-B. The manufacturing sub-sector was actually in a recession during this period.

Overall, total waste generation grew less by only 1% per year between 1990 and 1993, after growing by more than 4% per year between 1986 and 1990.

Figure 1-A - Metro System-Wide Disposal Tonnage Under Two Scenarios

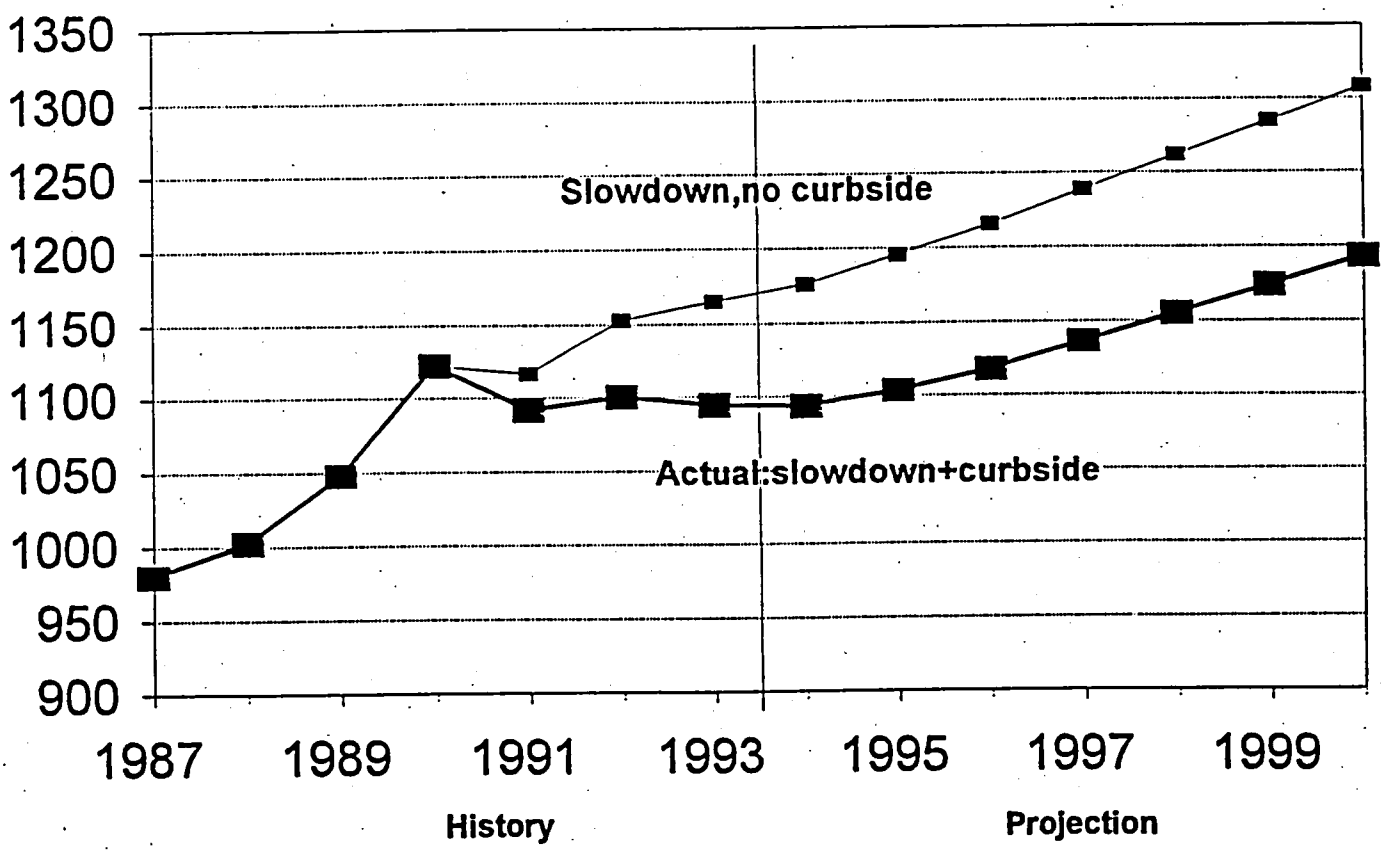
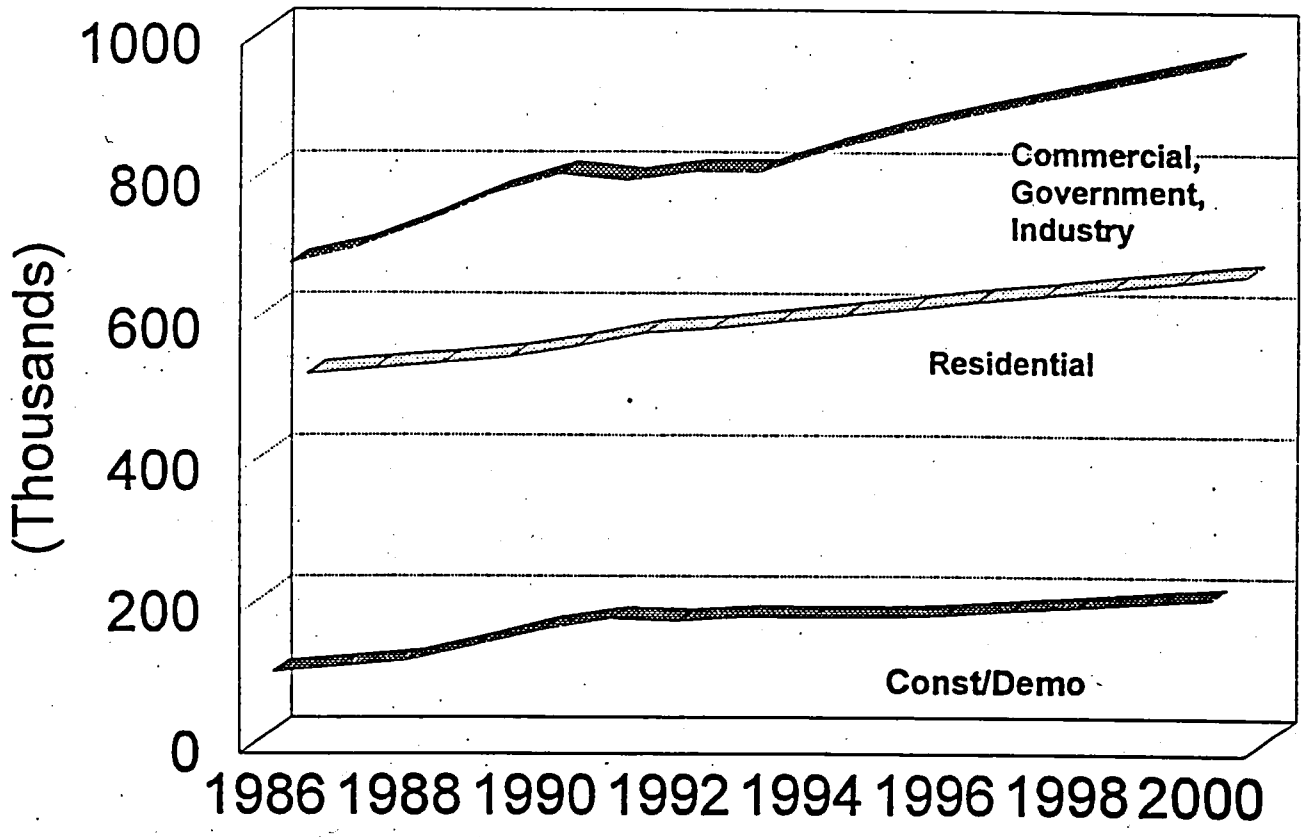


Figure 1-B - Metro System-Wide Waste Generation by Class



The Impact of Curbside Recycling

Many of the hauler-based recycling activities were coincidentally introduced and at their period of maximum increase at precisely the same time (1990-92) as the Portland area economy was slowing. Curbside programs typically display a logarithmic pattern of growth in tonnage following their introduction. Examples from Seattle and Snohomish County in Washington State are illustrated in Figure 1-C.

Accordingly, during the period 1991-92, the growth in recycling volumes actually exceeded the growth in generated wastes. Not surprisingly then, Metro system-level receipts slowed to a trickle over this period, as the affects of "upstream" recycling began to drive a wedge between generation and disposal, as shown in Figure 1-A. In 1993, the growth in generation appears to have exceeded recycling-related decline in disposal, as the economy began to recover and as the recycling program tonnages began to level out.

The Role of Rising Relative Prices

Coincident with the slowdown in the growth of waste generation and the loss of tonnage to curbside recycling was a 63% increase in the Metro's nominal tip fee prices between January, 1990 and January, 1993. The significance of these price increases were a result of Metro's relative price position vis-a-vis competitive non-Metro suppliers of recycling and disposal services.

Figure 1-D compares disposal prices at Metro's facilities with prices for comparable services at the Hillsboro landfill over the 1988-93 time period. As Figure 1-D illustrates, following the 1991 rate increase, Metro's prices *exceeded* the price of its major competitor, the Hillsboro landfill. Thereafter, Metro's share of system wide receipts fell. Unfortunately, these price changes coincided with the closure of St.John's landfill, making it difficult to disentangle the effects of the price changes.

The gap between Metro's prices and Hillsboro prices narrowed in mid-1992., and stabilized in 1993. Subsequently, Metro's share of regional receipts stabilized and appears to have grown in 1993.

The Comparable Experience of Snohomish County, Washington

These oscillations in tonnage are not unique to Metro. Snohomish County, Washington had a very similar experience to Metro, as illustrated in Figure 1-E – rapid growth in disposal volumes followed by declining tonnages that were the consequence of steep relative price increases, the introduction of curbside recycling, and policies that discouraged CD-type wastes.

Tonnages bottomed out in 1992/93 as the curbside programs matured and a new supply/demand equilibrium was realized in the market. Disposal tonnages are projected to grow over the 1994-2000 period, but at a slower rate than in the pre-curbside recycling era, both due to continuing growth in market recycling and due to slower economic growth.

Figure 1-C - Residential Curbside Program Ramp Rates

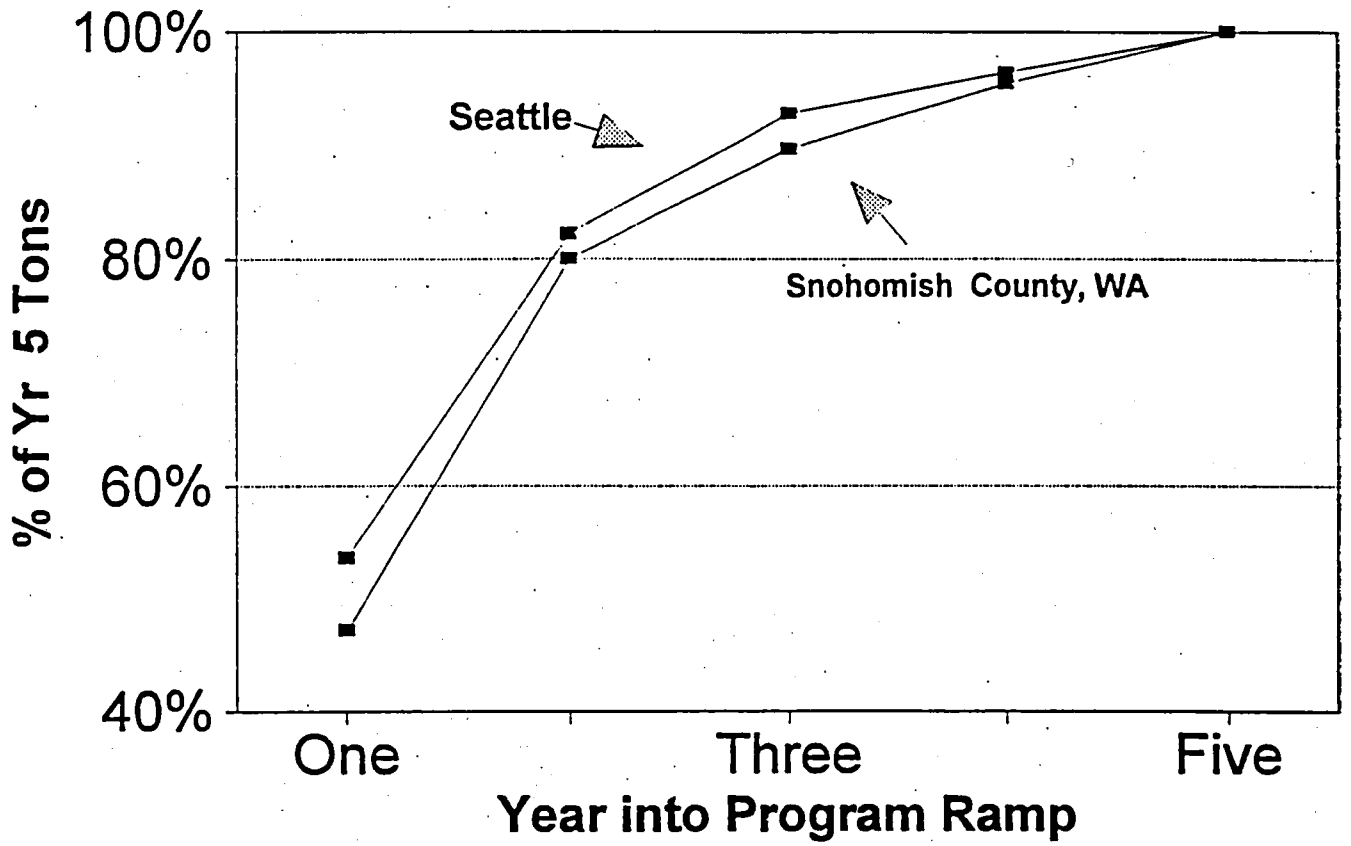


Figure 1-D - Relative Prices and Metro Facility Share of Disposal

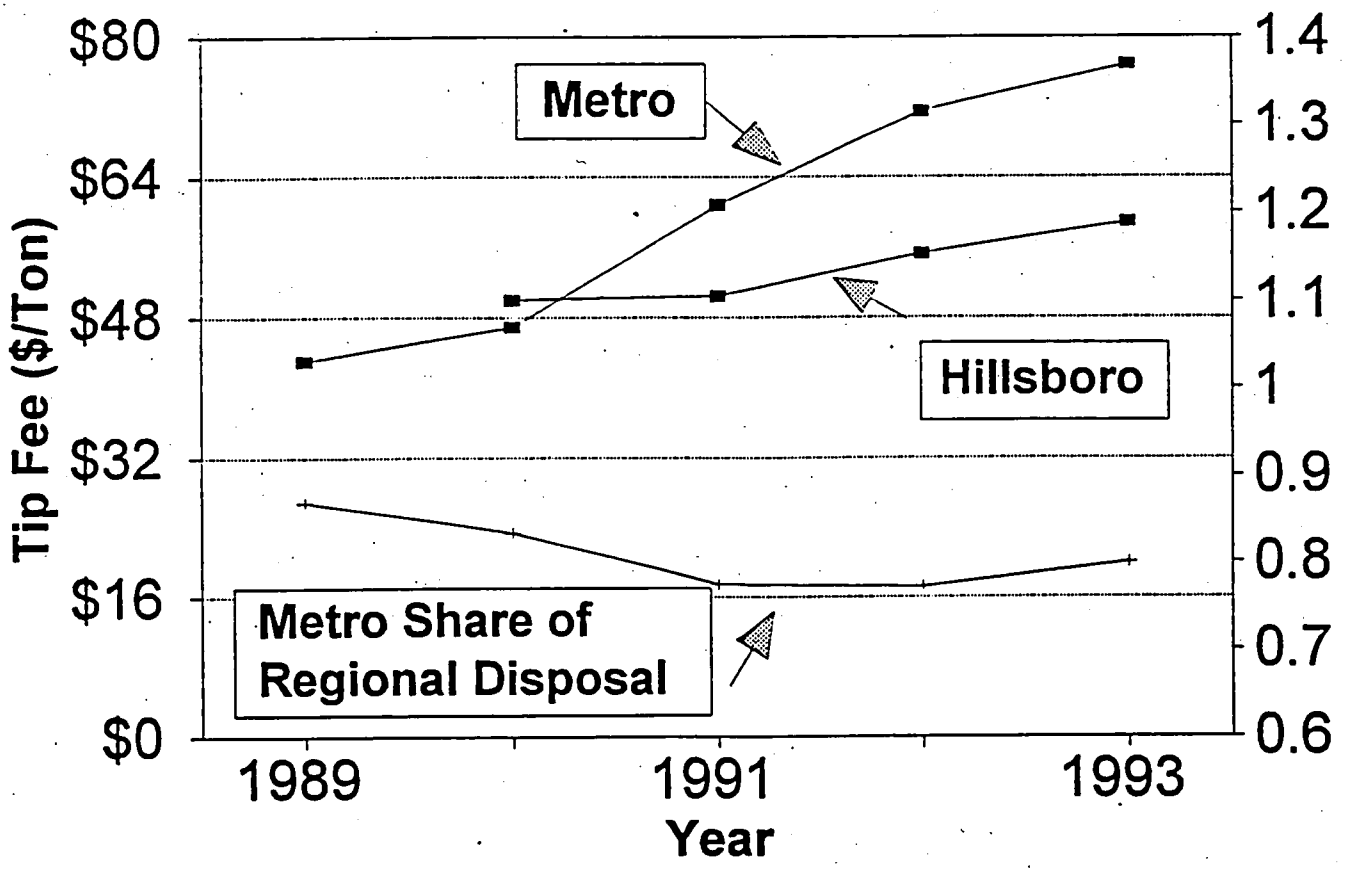
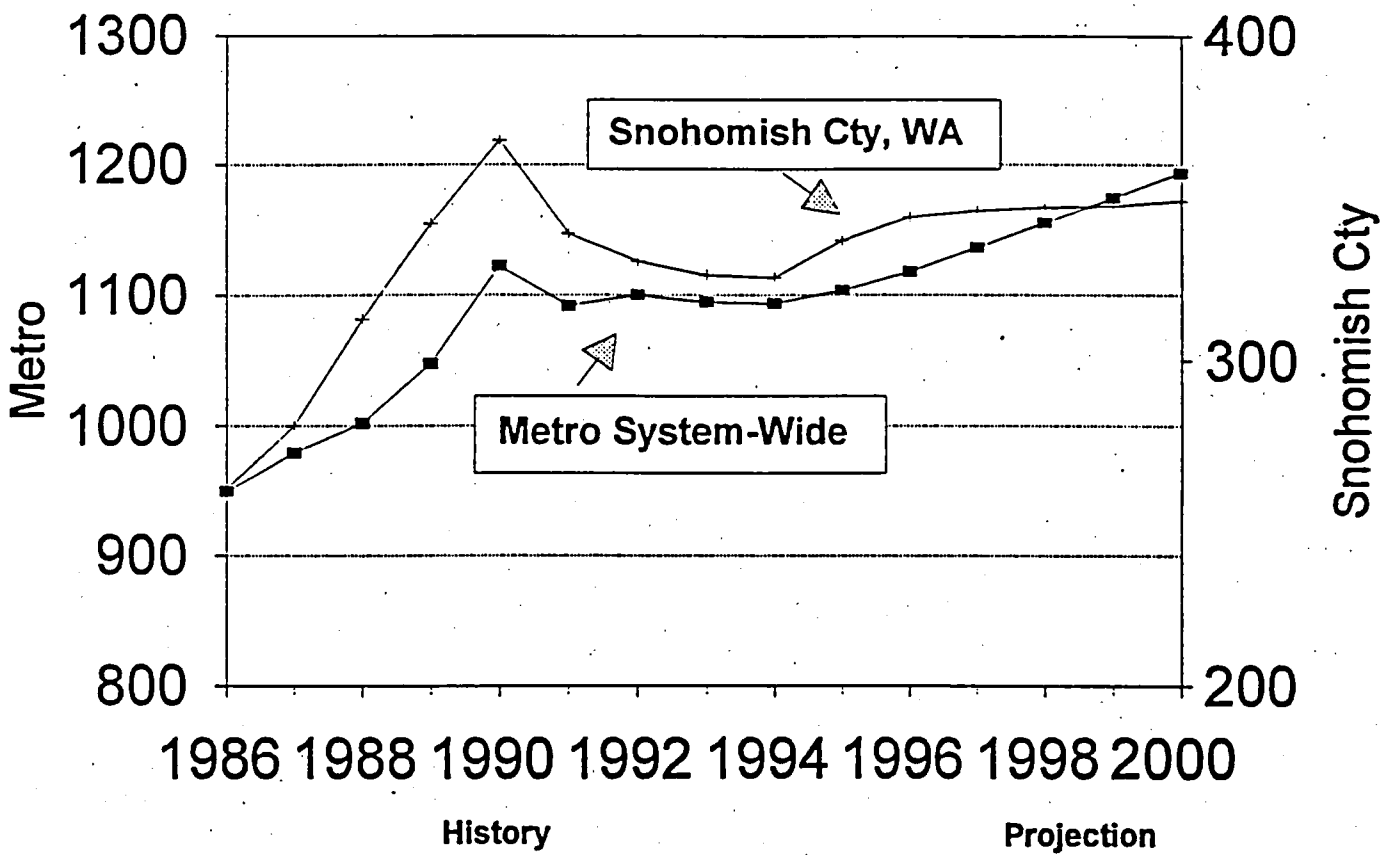


Figure 1-E - Metro and Snoho Cty, WA Historic/Projected Disposal Patterns



2. What is the Outlook for Regional and TST Tonnage through 2000? When will Metro Reach Capacity for Handling TST wastes?

Synopsis

Regional deliveries should grow between 1.4 and 1.7% per year between 1994 and 2000. The range in growth rates is dependent primarily on two factors: the success of curbside/hauler based recycling, and the performance of the economy over this period.

Transfer Station type tonnage (TST) levels should exceed system capacity between 1996 and 1998, as illustrated in Figure 2-A. This assuming that the capacity for Transfer Station type tonnage (TST) is 871,000 tons through the year 2000, and that Metro's prices maintain their current relationship with alternative suppliers of recycling and disposal services.

Projections based on the new forecasting model produced for Metro by Synergic Resources Corporation also suggests that Metro will reach TST capacity in the next five years, perhaps as early as 1996. However, the impacts of curbside recycling are not fully incorporated into this model.

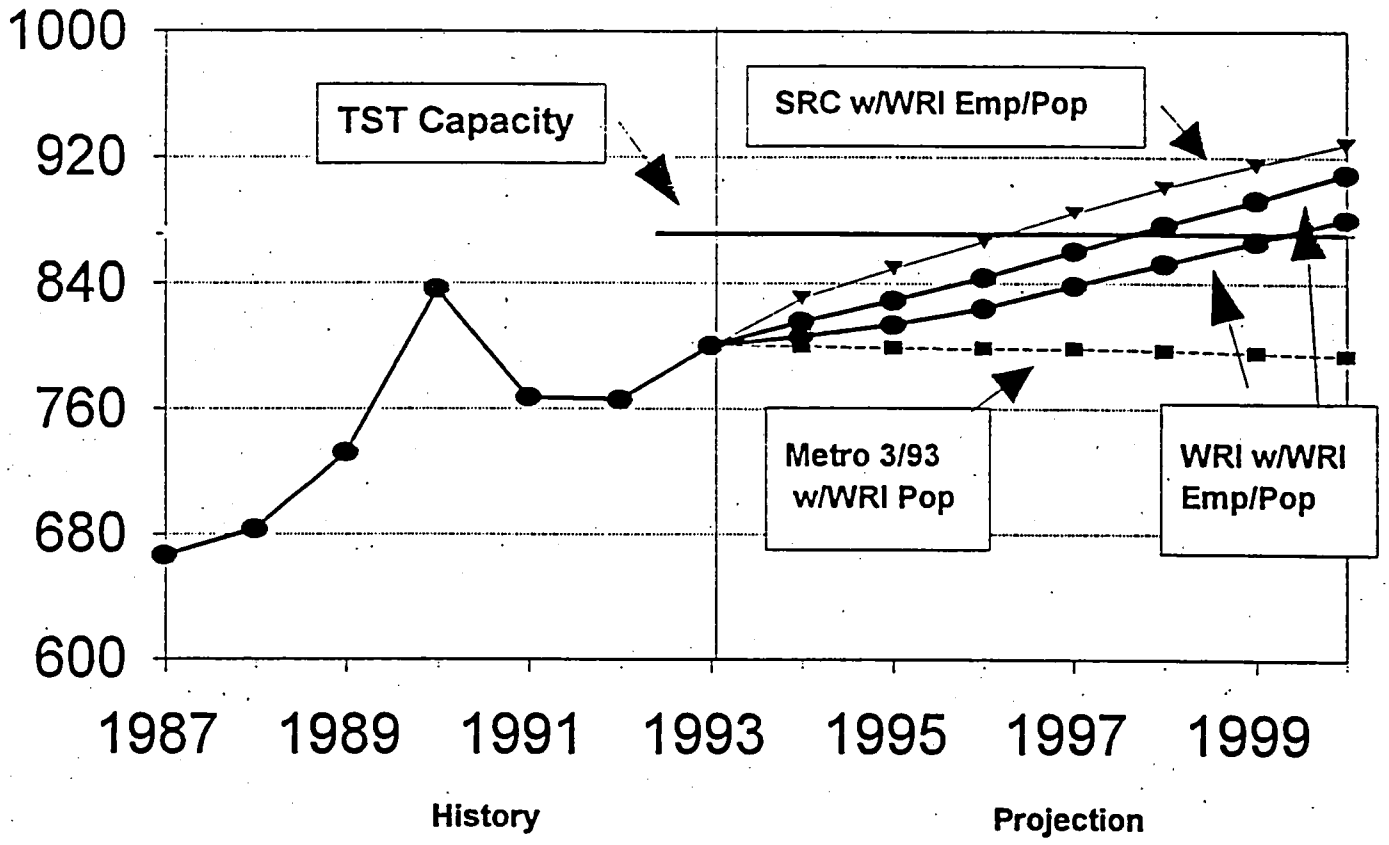
Expectations for Regional Deliveries

Regional deliveries are projected to grow between 1.4 and 1.7% per year between 1994 and 2000. During this same period, waste generation is projected to grow at approximately 2% per annum. The lower rate of growth in deliveries is attributable to growth in curbside/hauler based recycling and other market-driven recycling activities, particularly through 1994/95.

Optimistically, the curbside/hauler based programs will achieve results comparable with Seattle, which has a municipally-based system and is therefore capable of aligning rate and collection policies. In this case, total recycling would grow approximately at a rate of approximately 4% per annum. Disposal would grow approximately 1.4% per annum. Conversely, if the curbside/hauler based programs achieve 60-70% of Seattle's recovery rates, the growth in disposal would obviously be higher – in the range of 1.7% per annum.

The new model developed for Metro by SRC suggests higher growth rates for regional deliveries over the 1994-2000 period. Although Metro has not formally developed a forecast using this model, application of the equations documented in SRC's report to Metro suggests growth in regional deliveries in excess of 3% per annum between 1994 and 2000. This model does not fully incorporate the impacts of curbside recycling and thus overstates the likely growth in deliveries through 2000.

Figure 2-A - Alternative Outlooks for Metro TST Tonnage



Projected Tonnage and TST Capacity

The capacity for TST-type tonnage is assumed to be 871,000 tons through 2000. This capacity figure is comprised of the following elements:

Facility	Capacity
Metro Central	548,000 TPY
Metro South	255,000 TPY
Forest Grove	68,000 TPY
All Facilities	871,000 TPY

The Metro South capacity level conforms to the legal operating level for the facility, per agreement with the City of Oregon City.

Given these capacity assumptions, and assuming that waste could be shuttled throughout the region, Metro will likely reach its capacity for handling TST waste between 1996 and 1998, as illustrated in Figure 2-A.

It is important to note however, that it is not costless to move tonnage around the region, either by haulers, or in a consolidated form. Such movements will need to be an essential part of the Metro system well before 1996, because the majority of the growth in tonnage will originate in the southern crescent of Metro's service area. To illustrate this point, note that growth in the number of households throughout the 1980's was almost 5 times higher in Washington County than in Multnomah County.

3. What are the Key Factors to Consider in Forecasting Waste Volumes?

Synopsis

The two measures of waste that are of crucial importance to projecting revenues -- deliveries and disposal - are simply the residual of waste generation and recycling, as shown below:

Generated Waste - Pre-Delivery Recycling - Out Migration = Deliveries

Deliveries - Post-Delivery Recycling = Disposal

Accurate projections of waste deliveries and disposal are thus entirely dependent of well specified and detailed representations of the process by which waste is generated and recycled. The fact that recycling volumes are entirely dependent on the type and quantity of waste generated makes the waste generation modelling process crucial to the forecasting process.

From a causal standpoint, recycling activities are the product of both market and legislative/policy forces. Therefore, in projecting recycling activities and the waste diverted through this process, one must consider both market and non-market forces. Until recycling matures, the process of projecting recycling volumes will remain difficult.

A Conceptual Framework for Waste Forecasting

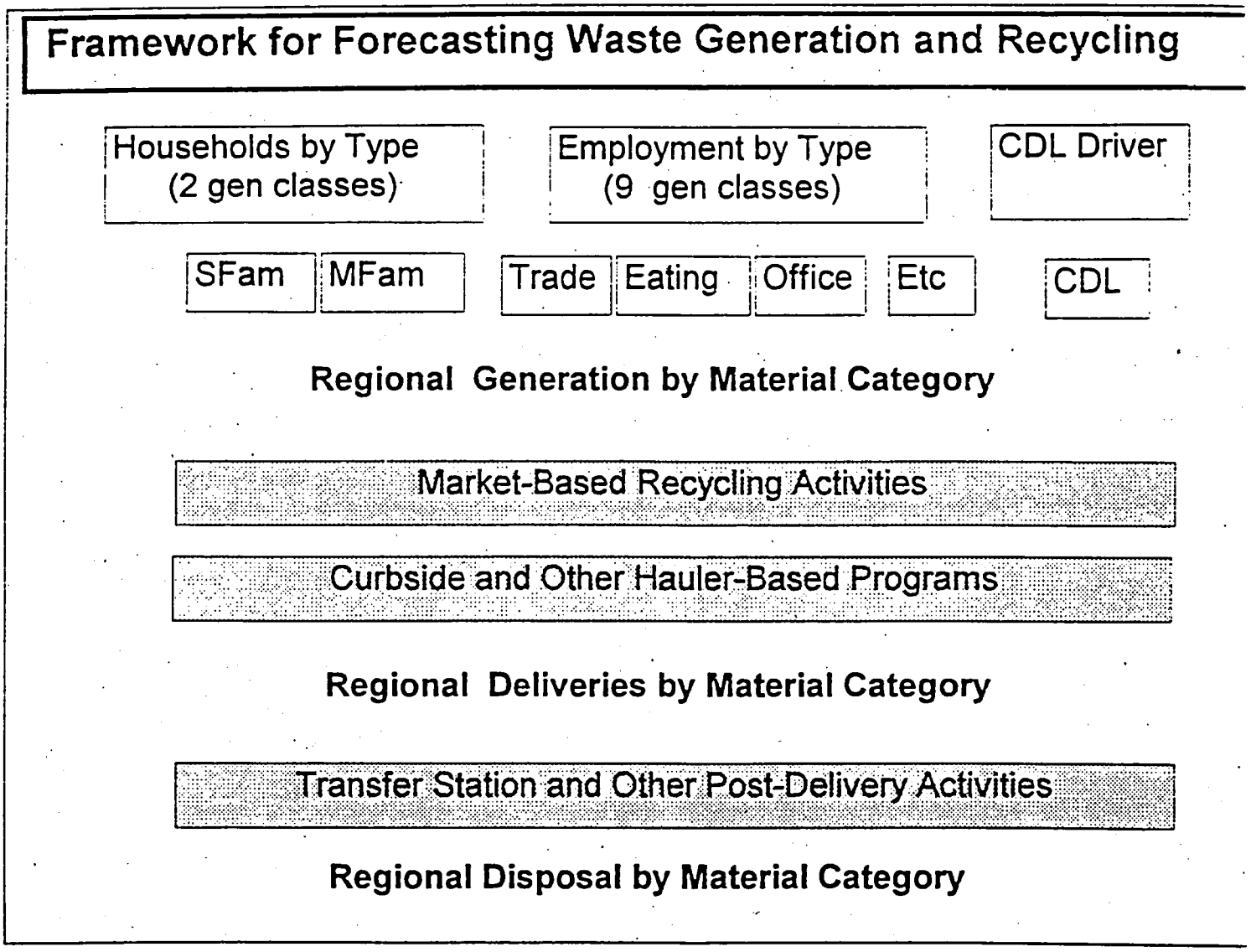
Figure 3-A illustrates a simplified conceptual framework for considering the flow of waste from cradle to grave. The basic waste concepts within this framework are generation, pre-delivery (curbside/hauler and market) recycling, waste deliveries, post-delivery recycling and finally, disposal. Each of these concepts is briefly described below.

Waste Generation

Waste is ultimately the by-product of residential, commercial, industrial and construction activities. In order to anticipate how changes in the level of residential, business and construction activities affect waste volumes, a model is used which relates a standard measure of activity for each class of waste generator to waste volumes.

The standard measure of residential activity is the number of households of the single and multi-family type. The standard measure of business/government/industry activities is employment, distinguishing between different types of businesses (e.g., restaurants, office, hospitals). The standard measures of construction activity are either construction employment or building permits.

FIGURE 3-A


Framework for Forecasting Waste Generation and Recycling
Households by Type (2 gen classes)
Employment by Type (9 gen classes)
CDL Driver
SFam
MFam
Trade
Eating
Office
Etc
CDL
Regional Generation by Material Category
Market-Based Recycling Activities
Curbside and Other Hauler-Based Programs
Regional Deliveries by Material Category
Transfer Station and Other Post-Delivery Activities
Regional Disposal by Material Category

In this process, distinguishing between different types of businesses and households is important. Both the material composition and per employee/household waste quantities are known to vary substantially between these sub-classes (e.g., restaurants vs. offices, single family vs. multi-family dwellings). Because these sub-classes grow at different rates over time, making the distinction allows overall unit waste volumes and material compositions to evolve. In addition, these distinctions are crucial to the assessment of recycling volumes.

Pre-Delivery Recycling

A variety of recycling activities are "positioned" to capture generated waste prior to disposal. The first tier of these activities are market-based recycling vendors (a.k.a. high graders). They handle traditionally recycled materials such as scrap metal, cardboard and newsprint and often pick up these materials. Both the vendor and recycler are motivated by economic forces.

The second tier of recycling, which represents the dominant force in the *growth of recycling* in the Metro area over the 1990-94 time period (Figure 3-B), is "curbside" and other hauler-based programs. These programs are often legislatively prescribed and from the consumers standpoint, provide convenient and costless options for recycling.

Projecting pre-delivery recycling volumes in general, requires a detailed picture of waste volumes by material, for each of the sub-classes described above. This is true because the type and quantity of materials that could be recycled and the feasibility/cost of recycling these materials vary enormously across different classes and sub-classes.

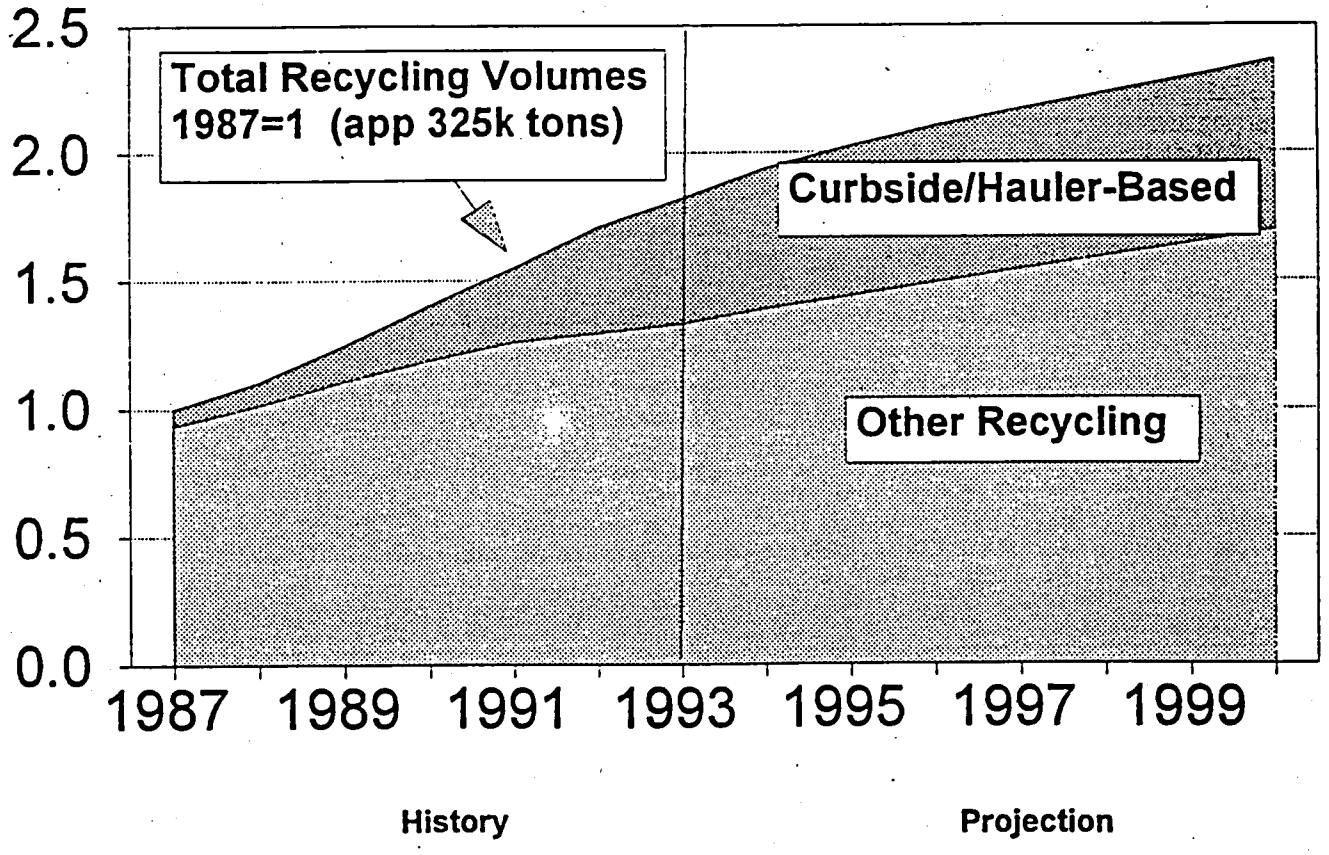
Estimating curbside/hauler based program impacts entails projecting the rate at which individuals will sign up for these programs, and the share of various materials that will be set out for recycling. Note that the curbside programs compete with, and often supplant some market-based activities (e.g., residential newspaper collection activities). The failure to recognize this interaction can lead to double counting of recycling tonnages for affected materials.

Deliveries

Absent the migration of waste to unauthorized disposal facilities, "deliveries" are simply what is left over after generated waste passes through the various pre-delivery recycling activities. The great majority of deliveries are made by haulers who have limited choices about where these wastes can be taken. Haulers carrying construction wastes, self-haulers, and producers of special wastes can choose amongst a variety of facilities, some of which provide recycling services in addition to disposal services.

For those that can choose between facilities, the choice appears to be based on two primary factors: the comparative price of one facility versus another facility, and travel cost. Thus modelling this choice process necessitates inclusion of both of these factors. Convenience, including queing times, is also frequently cited as a variable in the facility choice decision process.

Figure 3-B - Recycling Volumes by Source



The fact that one facility achieves it lower prices through recycling or through some other mechanism does not appear to be a significant factor in the decision process. Therefore, the facility choice process does not appear to be bound to the post-delivery recycling options outside of price.

Post-Delivery Recycling

Post-delivery recycling is conducted in the course of delivering/processing materials for disposal. Dump and pick lines and MRFs provide examples of post-delivery recycling activities.

Reliable projections of the types and quantity of materials that can be recovered as a percentage of receipts are dependent both on a careful accounting of the sources of waste delivered to the facility, and accurate assessments of pre-delivery recycling.

Disposal

Disposal is simply the residual or left-over of the process described above.

In an era of rapid advances in the practice of recycling, the disposal forecast is only as good as the generation and recycling forecast. Yet suprisingly, many still attempt to project disposal volumes using simplistic models which relate historical disposal volumes to tip fees, and to population or employment.

4. What Went Wrong with Metro's March 1993 Forecast?

Synopsis

In developing the March 1993 waste forecasts, Metro appears to have confused correlation with causality, and short-run changes with long run expectations. While this confusion may be understandable in the aftermath of the revenue shortfalls of the late 1980's and falling tonnages of the early 1990's, the forecasts and underlying methodology predict a highly improbable path for Metro waste volumes.

The methodology that was used to develop the March 1993 waste projections is flawed in two fundamental ways. First, the causal model underlying the projections is overly simplistic, omitting many *fundamental* determinants of waste generation, recycling, and facility choice. Second, the model was estimated using only four years of historical data (FY89/90-FY92/93)..a four year period which was characterized by an economic slowdown, the ramp-up of curbside recycling, and rapid increases in Metro's price via a vis competitors.

In combination, the misspecified model and the inadequate/inappropriate estimation period lead to projections that are theoretically indefensible and intuitively implausible. These projections are believed to underestimate future TST delivery quantities by approximately 60,000 tons 1996 and by 120,000 tons in 2000.

The Regional Deliveries (Step One) Forecast

The first step in Metro's waste forecasting process is to project deliveries to regional facilities that are either Metro-operated or Metro-franchised. To accomplish this objective, it is necessary to first describe the causal relationships which results in waste deliveries to regional facilities.

As we described above, waste is ultimately the by-product of residential, commercial, industrial and construction activities These wastes are then subjected to a variety of recycling activities including curbside recycling, and commercial high grade recycling prior to delivery to a facility for further recycling and disposal.

Given this causal framework and the dramatic expansion of recycling mandates, experience has proven that the only reliable method for modelling waste deliveries is to:

- o estimate waste generation quantities for each class of generator;
- o estimate pre-delivery recycling quantities for each class;
- o compute deliveries as the difference between generation and recycling.

If Metro's model was of the nature described above, it would have led to a better understanding of how changes in the economy, recycling practice and Metro tip fees

were affecting regional delivery volumes between 1990 and 1993. Unfortunately, in the absence of this knowledge, Metro appears to have confused correlation with causality, and short-run changes with long run expectations.

In developing the regional delivery projections Metro appears to have greatly oversimplified the causal relationships described above and in so doing, developed a "reduced form" equation which will not provide reliable projections of regional deliveries, either in the short run or in the long run for the reason described below.

The equation used by Metro to project regional deliveries is as follows:

Deliveries = f(Population, Const Emp, Metro Price)

The causal assumptions implied by this equation are that generation quantities can be predicted by population alone and that Metro's price, coupled with construction employment, acts as a surrogate for pre-delivery recycling quantities. Both of these premises are unfortunately inaccurate.

First, as Figure 4-A illustrates, population responds only very slowly to economic fluctuations, such as the recent slowdown in the Portland economy. For example, while trade, manufacturing and construction activities slowed between 1990 and 1993 (as did the waste generation associated with these activities), population continued to grow at a faster pace.

Thus if population is used to predict the overall quantity of waste generated, the short run predictions are likely to be too high going into a recession (as was the case in 1991/92 when Metro experienced budget shortfalls), and too low coming out of a recession (as will be the case in 1993/94). In the long run, this equation will under forecast tonnage growth because employment will grow in the Portland area even after the Metro service area begins to reach capacity in its ability to accommodate more population.

Second, the ramp-up of curbside recycling was obviously not "caused" by the fact that Metro increasing its rates from $45 to $75. As discussed above, the quantity of tons recycled through curbside and market activities is the product of a myriad of market, legislative and social forces, producing the growth pattern illustrated in Figure 4-B.

However, given the parameters used in Metro's specification, the equation produces forecasts of future tonnage as though future Metro price increases *are the sole determinant* of further increases in recycling tonnage. Thus, if Metro's prices fell next year, this equation would suggest that recycling would decrease immediately.

All other things being equal, this specification leads to an underestimate of recycling as curbside ramps up, and an overestimate of recycling after curbside is in place. In the long run, this specification will lead to substantial underestimates of delivery tonnages in the post-ramp period, beginning in 1995.

Figure 4-A - Metro Area
Population and Employment Growth

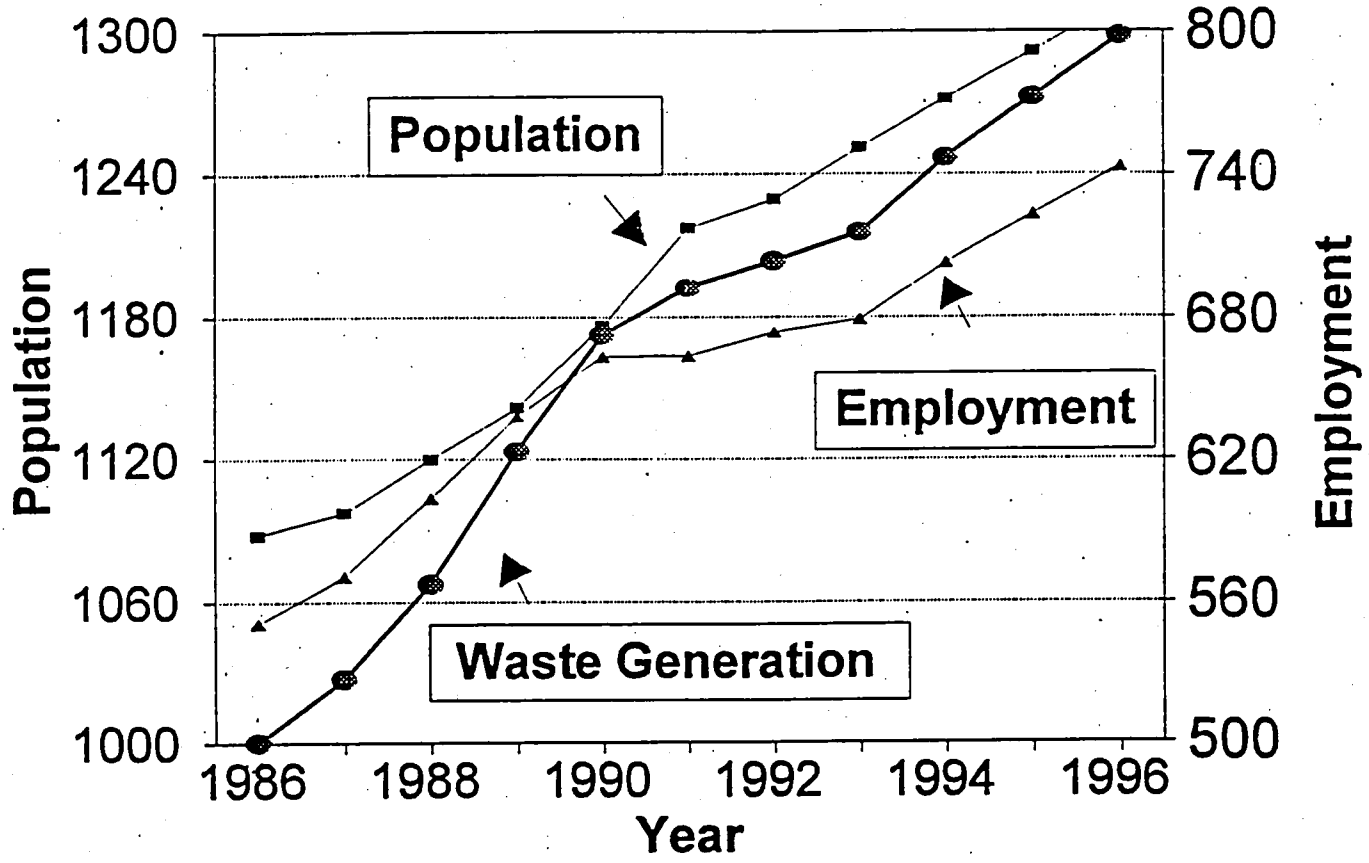
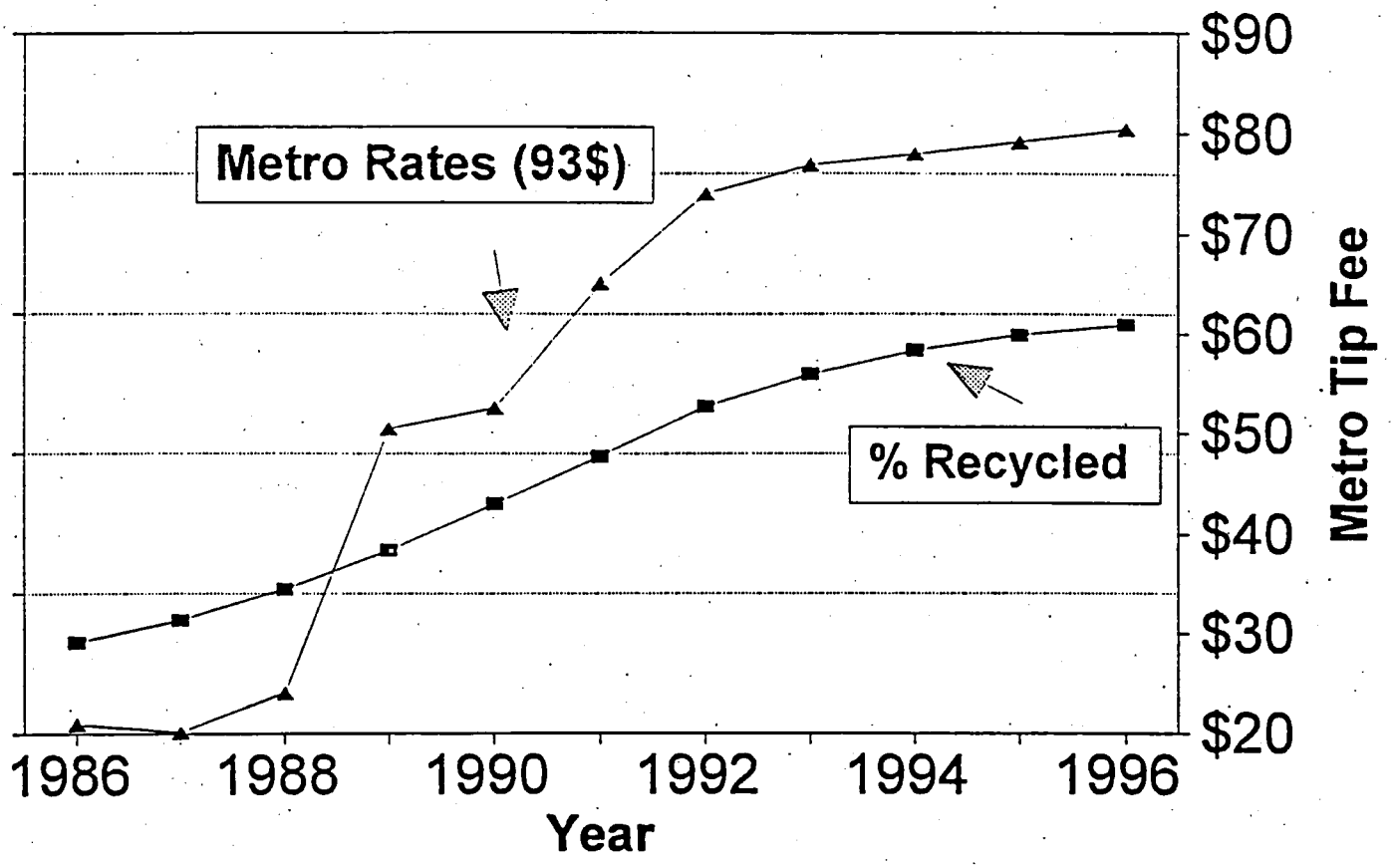


Figure 4-B - Historical Comparison of Recycling Rates and Metro Tip Fee



While it laudable that construction employment was included as an explanatory variable in the equation (presumably to capture variations in waste associated with construction activity), it is equally unfortunate that this variable has a negatively-signed coefficient in the estimated form of the equation. Simply put, the delivery equation predicts that increases in construction employment/activity will produce *decreases* in waste volumes. And since construction employment slowly increases over then entire horizon of Metro's forecast, waste volumes keep decreasing as a result.

The wrong sign of the construction employment coefficient represents one symptom of the most troubling aspect of Metro's delivery forecast, and the source of many of the aberrant results noted above -- that is, the selection and length of the period used to estimate the first and second stage forecast equations.

Only 4 years of historical data (FY89/90 through FY92/93) were used to estimate an equation used to project regional deliveries for 25 years..four years in which the economy was in a slide and curbside recycling was being introduced through legislative mandate. During these years of declining or nearly declining deliveries, the omission of key predictor variables such as recycling volumes in the equation meant that the those variables that *were* included had to "explain" the declines in tonnage. This accounts for aberrant results, such as rising construction activities leading to a decline in tonnages. If the estimation period had been expanded, these chance correlations would have disappeared.

The Transfer Station Tonnage Share (Step Two) Forecast

The second step in Metro's waste forecasting process is to project the share of regional deliveries that are in the category of transfer station tonnage (TST). Stated another way, the transfer station tonnage share forecast describes the share of regional deliveries ending up at Metro South, Metro Central and Forest Grove..

Many of the haulers are not free to select a facility other than a Metro operated facility or Forest Grove, because of the type of waste they carry. Others with certain types of special wastes cannot use Metro facilities or Forest Grove, at all. This leaves a pool of generator/haulers who *can* "shop" for disposal and recycling options amongst the regional alternatives. These generators/haulers include self-haulers, and firms hauling construction and demolition wastes.

Clearly, for those who are free to choose between recycling and disposal facilities, the decision process of where to go and whether to recycle or dispose involves many considerations. Travel time, the cost of sorting materials for recycling, and the cost of disposal and recycling are all important factors in this decision process.

Experience in Snohomish County, Washington has revealed the importance of two factors in this decision process. First, it appears that generator/haulers choose between equivalent services based on relative prices (i.e., Facility A's prices compared with Facility B's prices). The absolute price of either facility alone appears to be of tertiery important. Second, that convenience, including factors such as travel time and queing, is also an important consideration in this choice process.

While the Snohomish County experience is both intuitive and consistent with economic theory, these concepts are not included in Metro's specification for the TST share projection. Instead, Metro's TST equation includes only one predictor variable..Metro's own price, as shown below.

TST Share = f(Metro Price)

While it is understandable that the specification does not include factors such as travel time, convenience, etc., it seems highly problematic that the independent variable is not expressed as a relative price. For example, the price of Metro versus the price of the Hillsboro landfill, expressed as a ratio.

As we discussed earlier in the context of the regional delivery model, the omission of important variables from an equation used to forecast can lead to non-sensical results. The direction and magnitude of the bias is dependent on the estimation period.

This equation, like the Step One Regional Delivery equation was estimated over a four year period between FY89/90 and FY92/93. During this period , Metro's prices were rising while the TST share was falling. Thus the equation dictates that whenever Metro increases its price in the future, the TST share will fall regardless of what prices the competition charges.

Year end evaluation of actual TST shares suggests that TST shares will increase in 1993 relative to 1992, not decrease. Future TST shares will depend on the relationship of Metro's prices to its competitors. For example, if Metro's prices fall relative to Hillsboro, the TST share will rise. Conversely, sharp relative increases in Metro's prices relative to recycling and disposal alternatives will cause the TST share to fall..

Willamette Resources, Inc.

2215 N. Front Street
Woodburn, Oregon 97071
(503) 981-1278
Fax: 982-7930

December 30, 1993

Ms. Rena Cusma
Executive Officer
Metro
600 N.E. Grand Avenue
Portland, Oregon 97232

Dear Ms. Cusma:

This is in response to your letter of October 19, 1993 pertaining to Willamette Resource, Inc.'s (WRI) credit enhancement for the Eastern Washington County Transfer Station.

As you know, West One Bank of Idaho issued a commitment letter on July 15, 1993 to provide credit enhancement for this project. West One Bank's offer expired on September 15th. Because the Metro Council had not made a final decision, the Bank extended the expiration date to October 15th. We requested an additional extension, however, West One Bank declined. While the Bank stated their continued interest in this project and their desire to participate, they felt that the delay may cause the financial forecast originally submitted by WRI to change and they needed an opportunity to review any changes. In addition, the Bank's policy is not to have outstanding commitment letters for an extended period of time since it commits funds and impacts their financial position.

I am pleased to say that WRI has received today another commitment letter to provide credit enhancement for the Eastern Washington County Transfer Station. U.S. National Bank of Oregon will issue an irrevocable direct-pay letter of credit in the amount of $10,500,000.00 for this project. Of special note, the annual fee charged by U.S. National Bank is 1%.

It is envisioned in the franchise agreement that the detail document between WRI and the credit enhancement provider will be negotiated subsequent to the franchise approval by Metro Council and subject to approval by Metro. In fact, Section 4 of the franchise agreement states that the credit enhancement document is a condition precedent of Metro issue of the bonds. I believe the U.S. National Bank's commitment addresses the major issues outlined in your letter of October 19th. Once the franchise is approved by Metro Council, we will be able to develop the detail legal document for credit enhancement.

Attached, please find a copy of the commitment letter from U.S. National Bank of Oregon dated December 30, 1993.

If you have any questions, please feel free to contact either Mr. Gary Barton, Controller, Waste Control Systems, Inc. at (503) 757-0011 or myself.

Sincerely,

Merle Irvine
Vice President

Attachment

cc: Todd Sadlo, Senior Assistant Counsel, Metro
Bob Martin, Director Solid Waste, Metro
Jennifer Sims, Director Finance, Metro
John Houser, Council Analysis, Metro
Gary Barton, Controller, Waste Control Systems, Inc.

Mid-Willamette Business
Banking Center
302 State Street
Post Office Box 14430
Salem, OR 97309-5000

December 30, 1993

Richard Brentano, President
Willamette Resources, Inc.
2215 N. Front Street
Woodburn, Or. 97071

Subject: Metropolitan Service District Revenue Bonds
(Eastern Washington County Transfer and Material Recovery Facility Project)

Dear Mr. Brentano:

We are pleased to extend to Willamette Resources, Inc. ("WRI"), the commitment of the United States National Bank of Oregon, a national banking association (the "Bank"), to issue an irrevocable direct-pay letter of credit (the "Letter of Credit") in the maximum stated amount of $10,500,000.00. The obligation of the Bank for payment of principal, interest, and premium, if any, on the Bonds shall not exceed $10,500,000.00. The Letter of Credit will support an issue of bonds (the "Bonds") to be issued by the Metropolitan Service District (the "Issuer"). The proceeds of the bonds are to be loaned to WRI for the purchase of land, construction of the facility, and purchase of fixtures and equipment sufficient to operate the facility. The obligation of WRI to pay debt service on the bonds shall be backed by the full faith and credit of WRI, Waste Control Systems, Inc. (WCS), and the WCS majority shareholders. The terms of this commitment are:

1. The Bonds. The Bonds shall be issued on a date prior to the expiration of this commitment and shall be payable in accordance with a maturity or redemption schedule providing for substantially equal annual payments of principal and interest for a period of 20 years. The Bonds shall bear interest payable semi-annually, at a fixed or variable rate, calculated on a 360 day basis. There shall be two separate bond issues; one issue taxable under current federal income tax law to the bondholder financing the purchase of the land, and one issue exempt from taxation under federal income tax law to the bondholder, whose funds will be utilized for the purchase of equipment, fixtures, and the construction of improvements of the Facility.

2. Term of the Letter of Credit. The Letter of Credit will be issued for a five year term, subject to three renewals of five years each, at the sole discretion of the Bank. The Bank will provide written notice to WRI of its decision not to renew the Letter of Credit within 30 days after the Bank receives a request for renewal, together with WRI's annual financial statements and management reports for the fiscal year immediately preceding the year in which the termination date occurs.

3. Reimbursement Agreement. WRI shall be obligated to reimburse the Bank for draws on the Letter of Credit in accordance with the terms of a reimbursement agreement. The agreement, as yet undrawn, and subject to negotiation of terms between WRI and the Bank that are satisfactory to both parties.

The agreement shall also provide for the payment of fees to the Bank, and shall include covenants of WRI as required by the Bank. Any amounts not paid when due under the reimbursement agreement shall bear interest at the Bank's prime rate plus 2%.

4. Collateral. As security for WRI's obligations under the reimbursement agreement, WRI shall (i) grant to the Bank a first deed of trust on the real property and improvements owned by WRI (approximately 10 acres), (ii) assign to the Bank for security purposes the interests of WRI under a Franchise Agreement with the Metropolitan Service District, and (iii) the unlimited guarantees of Waste Control Systems, Inc. and its majority shareholders. The deed of trust and assignment shall be in form satisfactory to the Bank and its counsel. The Franchise Agreement assignment shall include provisions requiring that notice of default and the right to cure be given to the Bank. WRI shall provide to the Bank an environmental audit covering the entire property and shall resolve all environmental issues relating to such property to the satisfaction of the Bank prior to the issuance of the Bonds. WRI shall pay for and provide to the Bank an ALTA extended coverage mortgagee's title insurance policy covering the entirety of the property and improvements in the stated amount of the Letter of Credit, subject only to those exceptions approved by the Bank.

5. Fees and Expenses. WRI shall pay to the Bank an issuance fee of 1% of the stated amount of the Letter of Credit. In addition, WRI shall pay to the Bank an annual letter of credit fee of at least 1% of the stated amount of the letter of credit. The annual letter of credit fee is subject to increase if a higher rate is required of Bank, caused by changes in government regulation requiring Bank to maintain a higher level of capital than is currently required under applicable law. The annual fees for the first calendar year shall be paid at the time of issuance; thereafter, the annual fees shall be paid quarterly, in advance. WRI shall pay the Bank's usual and customary transaction fees for draws on the Letter of Credit. WRI shall pay the Bank's legal expenses in connection with the review of documents relating to the bond transaction and the preparation of the Letter of Credit, the loan agreement, the reimbursement agreement, security documents, legal opinions, and any related documents. In addition, WRI shall pay the Bank's reasonable current and ongoing out-of-pocket expenses (including legal fees) incurred in connection with the Letter of Credit and the administration of the reimbursement agreement and the fees of U.S. Bancorp Real Estate Services.

6. Documentation. All documentation respecting the issuance of the Bonds shall be prepared or reviewed by bond counsel acceptable to the Bank, and such documentation shall be in form acceptable to the Bank and its counsel. At the closing of the bond issue, there shall be delivered to the Bank, together with certified copies of the transcript of proceedings for the Bank and its counsel, an executed counterpart of the opinion of bond counsel satisfactory to the Bank in form and substance, which opinion shall provide, among other things, that the Bonds have been duly authorized, executed, and delivered, and that the interest on the issue funding the costs of improvements and equipment is excluded from gross income of the bondholder under federal income tax laws. The opinion shall be addressed to the Bank or the Bank shall receive a letter authorizing the Bank to rely on the opinion. The documentation shall conform to the terms of this commitment letter. The documents shall provide that so long as the Letter of Credit is in force, the documents shall not be amended without the consent of the Bank and all remedies on default shall be exercised on instructions of the Bank.

7. General Covenants. WRI shall not sell, transfer, assign, or otherwise encumber any of its real or personal property or make any capital expenditures during the term of the Letter of Credit without the prior written consent of the Bank. It is anticipated that i) WRI may desire to purchase and install material recovery equipment during the term of the Letter of Credit which is acknowledged by the Bank and whose purchase is subject to the prior written consent of the Bank and, ii) the Bank will approve a certain level of capital expenditures upon the request of WRI in compliance with the Willamette Resources, Inc. Washington County Transfer and Material Recovery Facility forecasted Statement of Cash Flows, 20 Year Summary, attached as Exhibit I, that allows for the sale and replacement of worn or obsolete equipment. Borrower will establish an Equipment Replacement Fund with the Bank funded monthly. All such capital item replacements shall be funded by the balance in the Equipment Replacement Fund. WRI shall not purchase for cash nor incur additional indebtedness or incur liability under conditional sales contracts and lease agreements for any capital items purchased during the term of the Letter of Credit except as provided for in this paragraph. WRI shall name the Bank as co-payee on all of its policies of insurance, including but not limited to, course of construction, comprehensive, liability, environmental protection, fire and other casualty, and business interruption insurance.

8. Financial Covenants.

a. WRI will maintain a Debt Service Coverage Ratio of not less than 1.20:1. Debt Service Coverage Ratio is calculated by dividing the sum of net profit and non-cash expenses by the sum of any dividends/withdrawals of capital, current portion of long term debt, and equipment replacement fund contributions.

b. A debt/worth ratio shall not exceed the following for the fiscal year end financial statement for the fiscal year then ending:

6-30-95	6.30:1
6-30-96	5.50:1
6-30-97	4.75:1
6-30-98	4.00:1
6-30-99	3.30:1

c. WRI shall provide the Bank copies of all necessary regulatory approvals and permits for the construction and operation of the proposed solid waste transfer facility prior to issuance of the Letter of Credit.

d. WRI shall provide to the Bank a signed copy of the Loan Agreement between WRI and Metropolitan Service District whose contents will govern the lending of bond proceeds to WRI. The Bank shall have the right to approve this agreement, currently undrawn, before being obligated to issue the Letter of Credit.

e. The Bank's Commercial Real Estate Department shall monitor and approve in writing all construction advances and change orders before the bond trustee shall disburse any requested funds during the course of construction.

f. Payment and Performance bonds are required of all contractors selected for the construction of all on and off site facility improvements.

g. A project real estate appraisal shall be ordered. obtained, and reviewed by the Bank before issuance of the Letter of Credit.

h. Unless expressly defined otherwise, all terms used in this Section 8 shall be interpreted in accordance with generally accepted accounting principals.

9. Reporting Requirements.

WRI shall provide the Bank:

a. Annual audit report received by the Bank within 120 days after the end of each fiscal year.

b. Quarterly internally prepared financial statements received within 45 days of the end of each fiscal quarter.

Waste Control Systems, Inc. shall provide the Bank:

a. Annual audit report received by the Bank within 120 days after the end of each fiscal year.

b. Quarterly internally prepared consolidated financial statements received within 45 days after the end of each fiscal quarter.

The majority shareholder of WCS shall provide:

a. Internally prepared fiscal year end financial statements within 120 days after the close of the fiscal year end. Exhibits shall include a full copy of the IRS return as well as financial statements/IRS returns on related entities as required by the Bank.

10. Change in Management. WRI shall notify the Bank of a change in WRI's senior management. Senior management shall include all corporate officers and the general manager, if not a corporate officer.

11. Closing. The sale of the Bonds shall take place on a closing date mutually agreed upon, during the term of this commitment. The closing shall occur at the office of bond counsel in Portland, Oregon.

12. Term of Commitment. The commitment made herein shall expire July 1, 1994 unless extended by written agreement between the parties. Thereafter, neither WRI nor the Bank shall have any further obligation to the other; provided, however, that WRI shall pay the Bank's expenses as provided in Section 5 above, unless failure to issue the letter of credit results from any action or inaction attributable to the Bank.

13. Statutory Statement. In compliance with Oregon law, the Bank makes the following statement regarding this commitment:

> **UNDER OREGON LAW, MOST AGREEMENTS, PROMISES, AND COMMITMENTS MADE BY US AFTER OCTOBER 3, 1989, CONCERNING LOANS AND OTHER CREDIT EXTENSIONS WHICH ARE NOT FOR PERSONAL, FAMILY, OR HOUSEHOLD PURPOSES OR SECURED SOLELY BY THE BORROWER'S RESIDENCE MUST BE IN WRITING, EXPRESS CONSIDERATION, AND BE SIGNED BY US TO BE ENFORCEABLE.**

To be effective, this commitment must be accepted by written acknowledgement of the terms and conditions hereof on the enclosed copy, with the same returned to us not more than 15 days from the date hereof.

Sincerely,

UNITED STATES NATIONAL BANK OF OREGON

By: _____

Title: Vice President

Accepted:

WILLAMETTE RESOURCES, INC.

By: _____

Title: _____

Date: _____

WASTE CONTROL SYSTEMS, INC.

By:_____

Title:_____

GUARANTORS

By:_____

Title:_____

By:_____

Title:_____