

WASHINGTON STATE
DEPARTMENT OF
E C O L O G Y

A Study of Recycling Survey Methodologies for States in EPA Region X

Lex Vinsel

Publication # 94-135

Washington State Department of Ecology
Olympia, Washington 98504-7600

September, 1994



printed on recycled paper

A Study of Recycling Survey Methodologies for States in EPA Region X

September 1994

Second printing, January 1995

Washington Department of Ecology
Solid Waste Services Program
Program Development Section
Mail Stop 47600
Olympia, WA 98504-7600

Project Supervisor: Joy St. Germain
Author: Lex Vinsel
Editor: J.C. Armbruster

This study was funded by an EPA grant, Grant Number X1000803-01-1.

Document summary: This study found that the census-based recycling surveys of Oregon state and Washington state were sound. Each survey provided accurate information on what recyclable materials are collected, and their end dispositions. The study also found four areas of survey support needing improvement: education/outreach, technical assistance, compliance, and administration. The study makes six specific recommendations for improving these items.

The Department of Ecology is an Equal Opportunity and Affirmative Action employer. The department shall not discriminate on the basis of race, creed, color, national origin, sex, marital status, sexual orientation, age, religion, or disability as defined by applicable state and/or federal regulations or statutes.

This document is available in large text format or computer file format upon request.

If you have special accommodation needs regarding this document, please call (206) 407-6123 (voice) or (206) 407-6006 (TDD).

A Study of Recycling Survey Methodologies for States in EPA Region X

Scope		1
Executive Summary		1
1. Introduction and Overview		2
A. Oregon's State Recycling		2
B. Washington State's Recycling		4
2. Recycling Measurement Methodologies for EPA Region X States		6
A. Distinctions Between Census-Based and Conventional Survey Methods		7
B. Alternative Survey Methods and Their Values		7
3. Improving the Effectiveness of Recycling Surveys in Washington and Oregon		8
A. Current Impediments to the Survey		8
B. Providing State-Wide Education and Outreach To Improve Survey Effectiveness		9
i. Informing the Recycling Community		9
a. Ensuring Data Confidentiality		9
ii. A Recycling Survey Handbook for Recyclers		10
iii. Training the Recycling Community on Survey Recordkeeping Methods		10
C. Using Technical Assistance To Ensure the Accuracy and Timeliness of Survey Responses		10
D. Supporting Recycling Education and Technical Assistance at the Local Government Level		11
E. Ensuring Adequate and Appropriate Survey Response through Mandatory Enforceable Reporting		12
4. Comparing Contractor Versus Washington State Administration of Recycling Surveys		14
5. Comparing and Contrasting Recyclable Material Categories In Oregon and Washington		15
A. Definitions of Recyclable Materials		16
Table 1—Paper Categories		17
Table 2—Metal Categories		18
Table 3—Glass Categories		18
Table 4—Plastic Categories		19
Table 5—Other Recyclable Materials		20
i. An Option for Comparing Recyclable Quantities		20
6. Summary of Recommendations		21

Appendix A.	Oregon's Demographics and Recycling Activities-An Overview	23
Appendix B.	Washington's Demographics and Recycling Activities-An Overview . .	24
Appendix C.	Alaska's Demographics and Recycling Activities-An Overview	26
Appendix D.	Idaho's Demographics and Recycling Activities—An Overview	27
Appendix E.	Oregon's Law on The Annual Material Recovery Survey and Related Regulations	27
Appendix F.	Washington's Law on The Annual Recycling Survey and Related Regulations	29
Appendix G.	Oregon's and Washington's Definitions of Recycling	31
Appendix H.	Oregon's State Recycling Survey Form	34
Appendix I.	Washington's State Recycling Survey Form	36

Scope

This project studies how statewide recycling¹ rate data is collected for the four states within EPA Region X (Alaska, Idaho, Oregon, Washington). The project focuses on the methodologies used by Oregon and Washington to measure the quantities of recyclable materials collected annually in each state. It recommends improvements to the recycling survey process. These improvements, in education/outreach, technical assistance, compliance, and administration, target increases in survey accuracy and response levels.

Executive Summary

This study found that Oregon's and Washington's census-based recycling survey methodologies are sound. When proper levels of accuracy and response are met, the survey methodologies provide accurate information on what recyclable materials are collected, their sources, and their end dispositions.

While the survey methodologies are sound, this study found a number of survey support items in need of improvement. These items include education/outreach, technical assistance, compliance, and administration. Six specific recommendations come from these items of improvement.

To ensure that the recycling survey achieves acceptable levels of accuracy and response, the state's education/outreach and technical assistance should:

- 1) Provide information to recyclers on the survey's value to the state, and the survey's long-term presence as part of conducting a recycling business;
- 2) Provide recyclers with a recycling survey handbook that includes a method for recording recycling data, and related logsheets; and
- 3) Provide training to recyclers on properly gathering recycling data.

To better support the survey in its compliance and administration, the state should:

- 1) Develop mandatory, enforceable reporting with monetary penalties;
- 2) Provide recyclers with technical assistance on completing the recycling survey; and
- 3) Maintain state-based administration of the survey.

The study also compared of Oregon's and Washington's recyclable commodity types, and suggests how state and local governments can cooperate in improving the measurement of recycling activities. The study found that recycling data gathered on a county-by-county basis a troublesome data collection method, and suggests alternative methods to measure the success of local government goals.

¹For the purposes of this paper, the term "recycling" will include the Oregon definition of "resource recovery," unless otherwise noted.

1. Introduction and Overview

In 1986 Washington State began conducting annual recycling surveys. The Washington Department of Ecology (Ecology) has administered annual recycling surveys since 1989. Ecology and DEQs' survey efforts have yielded valuable lessons, including the amount of resources needed to conduct the effort, and the limits of current survey methods.

The key purpose of the recycling surveys is to measure progress toward recycling goals that were set by each state's respective legislature.

Since Oregon's and Washington's surveys have been developed and tested in use, the dominant question now becomes "How do you achieve compliance?" *Compliance* means more than receiving responses from the recycling community. It means that all of the large, end-use recyclers respond, and that their responses consist of accurate and timely data on their recycling activities.

Many states have set recycling rate goals, but lack a common methodology for comparing recyclable materials between states and regions. This study analyzed methodologies used by Washington and Oregon to identify common data that could be combined or compared. Washington and Oregon are the focus of this study, since both Alaska and Idaho currently do not conduct recycling surveys.

A. Oregon's State Recycling History

In 1983, Oregon passed the Recycling Opportunity Act. The Act's provisions allow people in both rural and urban areas of the state to voluntarily recycle. In rural communities, recycling drop-off boxes were located at all public landfills and other sites convenient to residents. In cities with over 4,000 residents, curbside programs collected glass, newspaper, cardboard, tin cans, aluminum, and motor oil. By 1990, 106 cities had curbside collection programs, including 68 of the 90 cities with populations of 4,000 or more. Curbside collection is now available in areas where 75% of all Oregonians live.

The 1991 Recycling Act is Oregon's newest major recycling legislation. It expands the 1983 Recycling Opportunity Act beyond collection, to include minimum content standards for newspapers, telephone directories, glass, and plastic containers. The 1991 Recycling Act expanded on state and local government requirements for purchasing recycled products. The legislation sets a statewide goal of 50% materials recovery by the year 2000, and sets interim goals for each county for the calendar year 1995.

To measure progress toward the 50% material recovery goal for the year 2000, the 1991 Recycling Act requires a statewide Material Recovery Survey. Oregon's administrative rules require that these surveys be returned by February 28 of the following year. Oregon law includes monetary penalties of up to \$10,000 per day for non-reporting on the recycling survey.

The entire Oregon recycling community² is surveyed. An estimated 1-1/2 staff positions, or Full Time Equivalent (FTE) positions, work on the survey throughout the year. These staff mail survey forms and instructions to businesses involved in materials recovery, enter the data, conduct follow-up phone calls, analyze the data, and complete the final report. Reminder cards are sent two weeks after surveys are mailed. Businesses may phone the Oregon Department of Environmental Quality (ODEQ) for assistance. During this time, ODEQ staff can assist respondents in filling out surveys.

When the surveys are returned to ODEQ, the survey coordinator reviews them for completeness. The survey data entry and calculation is done using a computer-aided software engineering (CASE) program specifically designed for this purpose. If the data appears incomplete or incorrect, ODEQ staff call the recycler to get the information needed. The survey coordinator also makes quality checks to the initial survey data. After the data is entered, numerous quality checks are performed to highlight discrepancies and problem data. For example, the material tonnage reported by a recycler may not agree with a receiving broker's report. Additional phone calls are required to eliminate such discrepancies. During the 1992 survey, the survey coordinator made multiple calls back to respondents at this point in the process.

The state recovery rate is based on material generated in Oregon, regardless of the state in which it is ultimately recycled. The state recovery rate is calculated in three steps:

1. Obtaining the amount of Municipal Solid Waste (MSW) disposed;
2. Adding this number to the total tons recovered to get the total tons generated, as shown in the following equation:

$$\text{Amount Disposed} + \text{Amount Recovered} = \text{Amount Generated}$$

3. Dividing the total tons recovered by the total tons generated to get the state recovery rate. This is shown in the equation below:

$$\frac{\text{Amount Recovered}}{\text{Amount Generated}} = \% \text{ Recovered}$$

Oregon uses its CASE program to calculate their state and county recovery rates. The CASE program calculates each county's "wasteshed" recovery rate. The program then uses these county wasteshed profiles to calculate the statewide recovery rate profile. (See Appendix E for relevant sections of Oregon's 1991 Recycling Act and related regulations. For further information on Oregon's recycling definitions, see Appendix G, "Definitions of Recycling.")

²Recycling community members include recyclable material brokers and end-users; recycling firms using buy-back centers, or drop-off boxes; and commercial and residential curbside recycling services. Each state differs slightly in their respective definition of recycling community members.

B. Washington State's Recycling History

Washington state's solid waste legislation is the Solid Waste Management—Reduction and Recycling Act.³ This act established solid waste management priorities, detailed the roles of both state and local government, mandated community recycling programs, required state government recycling programs, and set a state recycling goal of 50% by 1995.

The type and quantity of recyclable materials are reported to Ecology, as part of the agency's annual data-gathering on the amount of waste generated, recycled, incinerated, and landfilled. Each year since 1986, Ecology has conducted a recycling survey. The survey obtains information from local governments, haulers, and recyclers to determine the amount of materials from the recyclable portion of the waste stream that are collected for recycling.⁴ Since 1987, the statewide recycling rate has increased from 23% to 35.5% in 1992.

Ecology also conducts statewide waste characterization studies. The last waste characterization study was done in 1988, and a 1992 study has just been completed. Washington's Solid Waste Management—Reduction and Recycling Act requires Ecology to monitor the disposed waste streams, and monitor changes in the amounts of waste generated.

Washington's Annual Recycling Survey is sent to the entire statewide recycling community. During the survey period, Ecology offers respondents assistance by phone in filling out the surveys. When Ecology receives the completed surveys, the data is entered into a relational database using Paradox software. If the survey data appears incomplete or incorrect, Ecology staff call the recycler to get the information needed. After the data is entered, the survey coordinator conducts quality checks to highlight discrepancies between related recycler records and broker records. A large amount of time and resources go into additional phone calls and inquiries to complete some surveys and eliminate reporting discrepancies.

³Solid Waste Management—Reduction and Recycling Act, chapter 70.95 RCW.

⁴The recycling survey does not include sludge, asbestos, or petroleum contaminated soils in the amount generated or disposed.

The state recycling rate is calculated by:

1. Obtaining the total tons of Municipal Solid Waste (MSW) disposed;
2. Adding this number to the total tons recycled to get the total tons generated, as shown by the following equation:

$$\text{Amount Disposed} + \text{Amount Recycled} = \text{Amount Generated}$$

3. Dividing the total tons recycled by the total tons generated to get the state recycling rate, as shown in the equation:

$$\frac{\text{Amount Recycled}}{\text{Amount Generated}} = \% \text{ Recycled}$$

After the state rate is established, the county rates are analyzed and calculated.⁵ Obtaining accurate county and city numbers continue to be a challenge; many recyclers don't know or don't report where their recycled materials come from. Since there is no penalty for not returning the information, some firms choose not to respond at all.

(See Appendix F for relevant sections of Washington's Solid Waste Management—Reduction and Recycling Act and related regulations. For further information on Washington's recycling definitions, see Appendix G, "Definitions of Recycling," section ii.)

⁵Although Washington's law does not set recycling goals for local governments, Ecology has agreed to collect the data at the county level for local governments' use.

2. Recycling Measurement Methodologies for EPA Region X States

The four states in EPA's Region X use either a *survey method* or an *estimation method* to measure recycling or resource recovery⁶ rates. Surveys are performed in Oregon and Washington, since both states must by law monitor their waste streams.

Alaska and Idaho estimate their recycling rates. Each state uses a different estimation method. States usually estimate recycling rates when surveys and actual quantities of recyclable materials are not available or easily obtained.

With Oregon's and Washington's recycling survey methods, each member of the recycling community receives a survey form to complete and return by mail. The survey asks each recycler what quantities of recyclable materials it collected that year. The survey form asks where the material is collected from, and where the material was sold. This information is used to avoid double counting of material quantities as they pass from one recycler to another.

The survey responses provide raw recycling *data*. The data is checked for accuracy or omissions, and used to calculate the statewide local jurisdictions' recycling rates. The initial survey data remains proprietary and confidential.

When the raw data is consolidated, all confidential components are removed, creating a new and separate set of recycling *information*. This information is distinct from the original data, and cannot be used to identify specific recycler's figures.

The survey totals the tonnage of each type of recyclable material collected. The tonnages of these recyclable materials are then combined. The recycling rate is determined by dividing the total quantity of recyclable materials by the combined total of municipal solid waste⁷ disposed, plus recyclable materials. Although this is a gross number, it provides a good estimate of how much recycling is occurring in the state.

⁶Oregon's definition of "recovered materials" is similar but not identical to Washington State's definition of "recycled" materials. Oregon Revised Statute (ORS) 459.005(d) defines "material recovery" more fully, and appears in Appendix G, section i.

⁷Municipal solid wastes include residential, commercial, and institutional non-hazardous solid wastes. (This definition differs slightly from state to state.)

A. Distinctions Between Census-Based and Conventional Survey Methods

The Oregon and Washington surveys both use *census methods* to measure recycling rates. Census methods require a high response rate from the large end-users of recyclable materials. In order to calculate a statewide recycling rate, it is important that the recyclers who handle the majority of the recyclables respond to the survey. For instance, if there is an 80% response rate that did not include any of the major brokers, end-users, and buyers of the recyclable materials, the survey results would not provide an accurate picture of the amount of recyclable materials collected. When using a census method approach, from whom the information is obtained is more important than how many recyclers responded to the survey. *Survey methods*, on the other hand, only measure a "sample" of data (for example, tons of aluminum collected by a few aluminum recyclers) which is part of a larger "population" (total tons aluminum collected by all aluminum recyclers in the state). The surveyor then applies statistical methods to the data sample to estimate what the larger population's figure is.

B. Alternative Survey Methods and Their Values

An alternative recycling survey method is the *mailed state-wide end-user survey*. End users are businesses which use recyclable materials to make new products. For example, an end-user could use plastic from two-liter pop bottles to make another plastic-based product, like plastic park benches.

While an end-user survey is less expensive than a state-wide census survey, one could not determine where recyclable materials come from, or calculate county-wide recycling rates. End-user surveys could only determine the total material collected for recycling statewide.

3. Improving the Effectiveness of Recycling Surveys in Washington and Oregon

A. Current Impediments to the Survey

For the recycling survey to successfully capture recycling data in a timely manner, three criteria must be met:

- 1) **Survey data must have high levels of accuracy for every data category;**
- 2) **Survey responses must come from a particular segment of the recycling community.**
- 3) **Surveys must be submitted within the survey period.**

Several factors currently impede meeting these criteria.

A number of recyclers have not kept recycling data in a format that is easily transferable to the recycling surveys. This has resulted in poor accuracy in the data reported and increased staff time to conduct follow-up phone calls.

In addition, in Washington, the recycling survey has had low response rates. In general, a higher response rate is needed to get accurate state and local government rates. Of those required to respond in 1992, only 64% of Washington's recyclers responded. Oregon's survey, on the other hand, currently yields a 96% response rate. In Oregon, the population was considered to have "responded" when they provided the requested information, or when DEQ staff determined that their responses were not needed to calculate watershed or statewide data, because the information had been captured elsewhere in the survey process.

Since the methodologies of Washington's and Oregon's surveys are largely the same, it could be inferred that Oregon's higher response rate is due primarily to the state's mandatory, enforceable reporting requirements for Oregon recyclers, as well as the state-wide requirements for curbside programs. The latter leads to a **targetted number** of regulated collections programs that are more likely to respond than the unregulated private recyclers.

The following four sections recommend solutions to these impediments.

B. Providing State-Wide Education and Outreach To Improve Survey Effectiveness

The following education and outreach recommendations can improve recycling survey response and data quality:

1. **Inform the recycling community** on the survey's value to the state and its necessity as a long-term responsibility of doing business as a recycler. The concerns of recyclers regarding the confidentiality of data must be addressed. Current laws, policies, and procedures that are in place need to be effectively explained.
2. **Provide the recycling community with a recycling survey handbook** which includes a method for recording recycling data, and sample recycling data logsheets. At a future date, the survey forms should be evaluated to see if the forms can be made more compatible with usual business practices, while obtaining the needed information.
3. **Support and/or provide training to the recycling community on recycling survey recordkeeping methods and logsheet use.** Recyclers need to utilize the existing staff services available to them by calling for assistance on completing the survey forms. Training workshops could be beneficial if desired by the recycling community.

i. Informing the Recycling Community

Why is the recycling community's role so critical in the collecting of recyclable materials information? They are the only ones who know the source or origin of the material by region. End-user data on the amounts of recyclable materials they handle cannot be used to accurately calculate county rates. If accurate county rates are required, then the cooperation of the entire recycling community is required.

The survey must be accepted as part of the recyclers' responsibility of doing business, just as they must submit data to the state to obtain a business license, or report unemployment insurance data.

a. Ensuring Data Confidentiality

Explaining and emphasizing the confidentiality of reporting data is an essential part of collecting information from the recycling community. They must understand that their recycling survey data will only be used to calculate state and local recycling rates.

The government and the business community need to increase their trust regarding the use of the proprietary information in the survey. The state keeps all survey data confidential. To make confidentiality more tangible, states should have guidelines defining current laws and methods for maintaining data confidentiality, and the conditions for releasing information. These guidelines should be part of the recycler's handbook, and all education and assistance efforts. Informing recyclers on the strengths of state

confidentiality laws and practices could increase cooperation on the survey, and make it more successful.

ii. A Recycling Survey Handbook for Recyclers

A recycler may report up to twenty commodities in completing an annual recycling survey. To help with this complex task, the handbook would show recyclers how to effectively gather these multiple data sets year-round.

The handbook would provide a clear method for the recording of recycling data. It could include sample daily log sheets for recording the recycling data. The handbook would have common recycling definitions and measurement conversions used by the survey. It would explain how, as recyclers, survey recipients are required by state law to report their recycling activities. It would also stress the confidentiality of the reported data.

These handbook elements could make it easier for recyclers to accurately and fully record data required by the state in the annual survey. It would help maintain direct, accurate communication between recyclers, city, county, and state governments.

iii. Training the Recycling Community on Survey Recordkeeping Methods

A properly designed recycling handbook would minimize the need for more individualized training. When state-based training is needed, it could be provided by:

- Assistance by phone;

- Training videotapes;

- Direct training held in regions throughout the state. Training would only be useful if recyclers truly desired the assistance, or if it was seen as critical to their business operations.

C. Using Technical Assistance To Ensure the Accuracy and Timeliness of Survey Responses

Many of the 1992 recycling survey responses lacked accurate, complete, and timely accounting of the survey period's recycling data. This created two major impediments to the survey. A large amount of phone contact was required to correct or obtain accurate data not found on the survey form. In addition, since the data was not submitted in a timely manner, the survey's results lost some of its usefulness for local government decision-making.

After education and training have helped recyclers properly respond to the survey, those problems remaining should be resolved with appropriate technical assistance. Technical assistance is provided at the state level by Oregon's DEQ staff, and Washington's Ecology staff. Recyclers can call appropriate survey staff to ask questions on filling out the survey.

Current technical assistance is available and appropriate, and needs to continue, as part of the recycling survey program. Such technical assistance should be coupled with local education and oversight.

To obtain county-specific rates, and to avoid double-counting the materials, every recycler must respond to the survey. However, even if this occurs, information regarding recycling collected at the county/city level may not exist.

Many recyclers often do not know from which county or city the materials came. Business practices do not easily allow recyclers to capture this information. A major challenge in conducting state recycling surveys is finding more efficient ways to obtain information on what materials are coming from each local jurisdiction.

D. Supporting Recycling Education and Technical Assistance at the Local Government Level

It is important that state and local governments work together to obtain the information needed on recycling programs. There are many ways that local governments monitor and measure the success of programs that they plan and implement. However, local governments also rely on state recycling surveys to obtain information on what and how much is being collected from the county/city. In order to increase efficiency and obtain solid data, a variety of actions are recommended, including:

1. **Local government assistance with the state recycling survey.** Local governments could assist the state by sharing with the state the information they collect from their local recycling programs. State and local governments need to standardize the information they obtain from recyclers to maximize efficiency and eliminate duplication. Local governments could assist by notifying the state of new firms and companies that have gone out of business, so that the state database can be kept up to date. Local governments could also contact the nonrespondents to the state recycling survey, ask them to participate, and relay to them the importance of doing so to the local community as well as the state.
2. **Educational workshops on monitoring and measuring recycling programs for state and local governments.** There is a need for state and local governments to discuss and understand the purpose for collecting certain information and what methods are best suited for each need. Measuring the success of recycling is important for both evaluating existing programs and for future program development. Data collection efforts are costly and need to be done efficiently. Alternative ways for state and local governments to measure program effectiveness need to be explored.

E. Ensuring Adequate and Appropriate Survey Response through Mandatory Enforceable Reporting

Washington's 1991 recycling survey response rate was 64%. Oregon's 1992 response rate was 96% of those required to respond. A major reason for Oregon's high response rate may have been the \$10,000 a day maximum fine that could be levied for non-reporting.

There are numerous advantages to mandatory enforceable reporting⁸:

- * It ensures that non-reporters will not have a competitive advantage over reporters.
- * It increases available statewide recycling data.
- * It improves the accuracy of long-term recycling data.
- * It makes the information more timely.
- * It reduces time and resources spent collecting or correcting data.

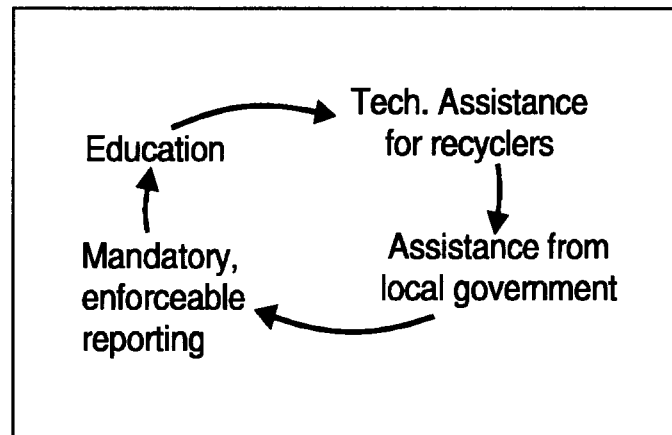
Many recyclers do not report all the data the survey requests. If this is not reported, the other information provided may not be useable. For example, to eliminate double counting, data regarding to whom the materials were sold is required.

In short, the recycling community cannot record specific numbers if their recordkeeping systems are not currently designed to do so. Mandatory enforceable reporting will help ensure that state and local government recycling data will be reported, and that efforts to recyclers to do so will be made. Such state-mandated reporting must include penalties for not keeping appropriate records, and for delaying or failing to return reports. If penalties are imposed, the funds might be used to provide incentives to all recyclers who do report annually (such as money, sweepstakes, or reduced subscription costs).

Mandatory enforceable reporting is recommended for statewide recycling surveys in the EPA Region X area. Mandatory enforceable reporting will ensure that information is obtained in a timely fashion when using the survey/census methodology. Equally important, mandatory enforceable reporting will eliminate the unequal business advantage obtained by non-reporting recyclers. Without mandatory enforceable reporting, some people will resist giving survey data or will simply not provide it, while others diligently take the time and effort to complete the forms. Through education and technical assistance, reporting issues can be discussed and resolved among recyclers and state and local governments.

⁸"Mandatory enforceable reporting" includes monetary penalties for not submitting reports.

The graphic below illustrates how the four major recommendations discussed above reinforce the survey process:



These four activities will help ensure that the recycling community makes preparing and completing the recycling survey a part of doing business. Until then, good recycling data recordkeeping will be the exception. With appropriate education, technical assistance, local oversight, and mandatory, enforceable reporting, state recycling survey tools can be improved.

4. Comparing Contractor Versus Washington State Administration of Recycling Surveys

For three years Washington State used an outside contractor to administer the recycling survey. During that time, contractor costs ran \$200,000+ per year. Current Washington State costs for directly conducting the survey run about \$140,000+ per year. This includes the cost of 2.1 staff positions, or Full Time Equivalents (FTEs).

A higher cost per year is the chief monetary disadvantage of private contractor survey administration. Added to that higher cost are contract administration costs, which would still be borne directly by the state. If reporting is enforced, there would be additional coordination costs—for tracking and reconciliation of contractor records kept on survey compliance, and state records kept on survey non-compliance and enforcement.

There are a number of non-monetary disadvantages as well. First, since the task needs to go through the bidding process annually, there is no guarantee that a specific contractor will conduct the survey from year to year. This reduces the experience and efficiency of the respective contractors' work. Second, after the contract period ends, there is no additional technical support to the recycling community. Third, the state will not have the knowledge base needed to develop and maintain the survey system, and conduct further analysis of the data.

The two chief advantages of using a private contractor are that the survey results can be quickly delivered, and the state incurs no direct capital costs.

There are a number of advantages to having the state administer the survey. First, the state has a lower cost to administer the survey. Second, if mandatory enforceable reporting is enacted, the state can provide its own enforcement. This would eliminate double-tracking, as mentioned above. Third, the state can provide continuing support throughout the year to recyclers. Fourth, the state also gives the survey continuity from year to year, since virtually the same group of staff can continue to work on the survey. Lastly, the data collected can be better understood and further analyzed by Ecology if the survey is state-administered from start to finish.

The chart below compares the pros and cons of the state administering a recycling survey, versus a private contractor:

State

Pros

Lower cost
Direct enforcement
Additional support throughout the year
Continuity from year to year

Cons

Software/hardware required
Data entry staff required

Private Contractor

Pros

Quick deliverable
No capital equipment cost

Cons

Higher cost
Contract administration costs
Double tracking/reconciliation costs between administration and enforcement
No additional support throughout the year
No continuity from year to year

5. Comparing and Contrasting Recyclable Material Categories In Oregon and Washington

This section compares and contrasts recyclable material categories used in state recycling surveys in EPA's Region X. Alaska and Idaho do not currently perform state recycling surveys.

This section identifies which recyclable materials and measurements are comparable, and which are not, due to differing methods or conditions. It concludes with recommendations for future collaborative recycling between states in EPA Region X.

A. Definitions of Recyclable Materials

Oregon defines recyclable materials as *materials that are both recyclable and have an available market.*

Washington defines recyclable materials in RCW 70.95.030(14). This statute states that "Recyclable materials" means those solid wastes that are separated for recycling or reuse, such as papers, metals, and glass, that are identified as recyclable material pursuant to a local comprehensive solid waste plan.

Definitions of recyclable materials should be clearly defined so as to build a common understanding between the recycling community, their buyers, and government entities gathering recycling information.

Each state's definitions must be clearly defined if comparisons or regional analyses are to be made between states' recycling programs.

The Washington survey requests the following data from the recycler:

Total Tonnage Collected (in tons)

Tonnage Sold (in tons)

Receiving Company (or exported, if located outside of Washington, Oregon, Idaho, California, or British Columbia)

Buyer's Address (City, State and ZIP Code)

Identified Materials originating from a specified company

County Totals (tons)

Collection Sources (tons or percentages): Residential; commercial/industrial.

Materials Originating from a Specified City (Everett, Seattle)

City Totals (Tons)

The following tables compare recyclable materials included in Oregon's recovery survey and Washington's recycling survey. They are compared on a definition-by-definition basis. (Note: The Oregon or Washington legal definitions of these recyclable materials are not necessarily the same as the following recycling survey descriptions.)

This table describes recyclable paper categories. The table finds that the paper definitions between Oregon and Washington are close enough to compare quantities. (In the case of Oregon's magazines and mixed papers, these two categories can be added together and compared to Washington mixed paper category.)

Table 1—Paper Categories

Material	Oregon	Washington
Newspaper	Printed ground-wood newsprint (minimally bleached fiber) and newspaper inserts referred to as #1 news. Excludes overruns, printer waste, and trim.	Newspaper
Corrugated cardboard	Container-board cartons of corrugated paper (waxed or unwaxed); <i>includes</i> kraft linerboard and kraft paper bags. <i>Excludes</i> Converting plant waste paper (i.e., DLK (double-lined kraft) clippings and grocery bag waste).	Corrugated cardboard
High grade paper	High-grade paper includes computer printout, ledger-grade printing and writing paper and other bleached papers that can be de-inked and that are relatively free of groundwood and coatings. Does not include magazines or other coated papers.	All office paper, including white, colored, computer and ledger papers.
Magazines	Glossy, clay-coated bleached paper; no newspaper inserts; tabloids or paperback books; may include magazine-type catalogs.	
Mixed paper	<i>Includes:</i> various recyclable papers such as unsorted junk mail, and low-valued grades of paper not separately listed above, such as chipboard and other folding boxboard, telephone directories, molded paper containers, envelopes with plastic windows or pressure-sensitive labels, and paper with thin plastic coatings.	<i>Includes:</i> magazines, phone books, scrap papers, etc.

The comparison of metal categories in Oregon and Washington found that recyclable metal quantities could not be compared at this time. One reason is that Oregon scrap metal dealers are not required to report.

Table 2—Metal Categories

Material	Oregon	Washington
Aluminum cans	Aluminum beverage cans	Aluminum beverage cans
Aluminum		Included in nonferrous metals
Tin cans	Tin food cans	Tin cans
Ferrous metals*	Ferrous metals	Ferrous scrap <i>Includes:</i> white goods, iron, steel
Non-ferrous metals*	Nonferrous metals <i>Excludes:</i> beverage cans	Nonferrous scrap <i>Excludes:</i> beverage cans
White goods	White goods	White goods

*Excludes industrial and most commercial metals for both Washington and Oregon.

Table 3—Glass Categories

Material	Oregon	Washington
		Refillable beer bottles
Container glass	Glass bottles and jars; includes refillable beer bottles	All other container glass or cullet glass
Other Glass	Window glass, fiberglass, etc.	

The quantities of plastic reported by Oregon and Washington can be compared because they collect relatively similar materials.

Table 4—Plastic Categories

Material	Oregon	Washington
#1 PET Beverage	Bottles made from polyethylene terephthalate (PET or PETE) commonly used for soft drink and liquor bottles.	PET bottles
#1 PET Other	Other non-beverage products and packages made from polyethylene terephthalate (PET or PETE)	Included in #1 PET beverage
#2 HDPE Milk Jugs	Uncolored "natural" jugs made from high-density polyethylene used for milk, water, juice and some other beverages.	HDPE containers
#2 HDPE Other	Other products and packaging made from high-density polyethylene.	Included in #2 HDPE milk jugs
#3 PVC	Polyvinyl chloride, commonly used for food packaging film and forms, closures, blister-pack, tape bottles for shampoo, and other household items.	Other recyclable plastics
#4 LDPE	Low-density polyethylene, commonly used as a clear film wrap to package many products. Many plastic bags, container lids and some bottles are also made with LDPE.	LDPE plastics
#5 PP	Polypropylene, commonly used for containers, tubs and bottles for yogurt, cream cheese, margarine, medicine, snack foods, confections and condiments; screw-on or snap-on caps; and bags, sacks, film and wrap.	Other recyclable plastics
#6 PS and EPS	Polystyrene and expanded polystyrene, commonly used in an expanded form for egg cartons, meat trays, coffee cups, fast-food containers and foam blister/"peanuts", and in solid form for containers and plastic "silverware".	Other recyclable plastics
Mixed Plastic	Plastics which are marketed without being sorted by resin type.	Other recyclable plastics

Other Recyclable Materials

These materials can also be compared on a per-capita basis, because their definitions are similar.

Table 5—Other Recyclable Materials

Material	Oregon	Washington
Tires	"Waste tire" means a tire that is no longer suitable for its original intended purpose because of wear, damage, or defect.	Used tires
Vehicle Batteries	No definition	Vehicle batteries
Used Motor Oil	Oil which has been (a) refined from crude oil, (b) used, and (c) as a result of such use, contaminated by physical or chemical impurities.	Used oil
Yard Debris	Pruning, bulky wood yard waste, and leaves and grass clippings.	Yard waste
Batteries		Household batteries Food waste
Wood waste	Construction lumber and packaging lumber used in pallets and crates. Excludes branches, logs, etc. from major land clearing, logging operations, sawmill operations.	Wood waste Construction/demolition/land clearing (CDL) debris (not included in recycling rate) Textiles: rags, clothing, etc.
Other waste (specify)	Other waste (specify)	Other wastes (specify)

i. An Option for Comparing Recyclable Quantities

To compare and analyze the collection of recyclables between Oregon and Washington, first, the categories of paper, plastic, glass, and other material categories (as described in the preceding tables) need to be chosen. Since recycling survey methodologies are similar in Washington and Oregon, fairly good regional analysis of recyclables collected can be done.

6. Summary of Recommendations

This study found that the methodologies of Oregon's and Washington's census-based recycling surveys are sound. The survey results could be improved if additional support were provided in four areas: education/outreach, technical assistance, compliance and administration.

To ensure that the data the recycling community provides reaches acceptable levels of accuracy and response, state survey education and outreach should:

- 1) **Provide information to recyclers on the survey's value to the state, its long-term presence as part of conducting a recycling business, and the confidentiality of data.**
- 2) **Evaluate the usefulness of providing recyclers with a recycling survey handbook. The handbook might include 1) a proposed method for recording recycling data, 2) related logsheets, 3) a summary of the requirements for responding, and 4) an explanation of how data is kept confidential.**

The goal of such a handbook is to make it easier for companies to annually collect data and collate data for reporting. The recycling community's role is critical in the success of gathering recyclable materials data. Since a number of recyclers provide faulty, incomplete, or no data, a handbook and additional technical assistance could help them gather recycling data throughout the year.

The handbook would have a clear method for daily recording of recycling data. It would help recyclers accurately and fully record data required in the annual state survey. The handbook would explain how the recyclers are required by state law to report their recycling activities, and stress the confidentiality of the reported data.

- 3) **Support or provide recyclers with training on properly gathering recycling data.**
- 4) **Provide recyclers with technical assistance on completing the recycling survey**

Currently, technical assistance is available, and needs to continue, as part of the recycling survey program.

- 5) **Develop mandatory, enforceable reporting of the state recycling surveys, with monetary penalties. Consider reward for reporting the data, possibly funded by penalties.**

Mandatory enforceable reporting:

- * Ensures that non-reporters will not have a competitive advantage over reporters.
- * Increases available statewide recycling data.
- * Improves the accuracy of long-term recycling data.
- * Makes the information more timely.
- * Reduces time spent collecting or correcting data.

Mandatory reporting will help ensure accurate state and local government recycling data. Such state-mandated reporting must include penalties for not keeping records, and for

delaying or failing to return survey forms. Some reward for reporting the data should be considered.

6) Support Recycling Education and Technical Assistance at the Local Government Level

In order to increase efficiency and obtain solid recycling data, state and local governments should work together to obtain the information needed on recycling programs. A variety of actions are recommended, including:

1. **Increased local government involvement in the state recycling survey.** This arrangement might decrease the duplication of data that is collected from the business annually and increase the accuracy of the data collected.
2. **Educational workshops on monitoring and measuring recycling programs for state and local governments.** Measuring the success of recycling is important for both evaluating existing programs and for future program development. Alternative ways for state and local governments to measure program effectiveness need to be explored.

7) Maintain state-based administration of the survey.

Current survey cost histories indicate that state-administered surveys cost less than contractor-based administration. State administration also better maintains the continuity and confidentiality of the state recycling survey. State-based administration of the survey will ensure that comprehensive and unique analyses can be conducted with the recycling data.

Appendix A. Oregon's Demographics and Recycling Activities-An Overview

Oregon has a population of 2,842,321, placing it 29th in U.S. state populations. It encompasses 96,184 square miles. Through legislation, Oregonians have demonstrated keen awareness of the relationship between good solid waste management and a healthy environment. This includes a strong commitment to recycling. It is the mission of the Waste Reduction Section of Oregon's Department of Environmental Quality (ODEQ) "to be a leader in resource conservation and ensure a sustainable future."

In 1971 Oregon created the nation's first bottle deposit bill. Within one year of passage, a survey showed that 95% of all carbonated beverage containers were returned. That figure remains high today.

In 1983, Oregon passed the Recycling Opportunity Act. The Act contains provisions which allow people in both rural and urban areas of the state to voluntarily recycle. In rural communities, drop-off boxes were located at all public landfills and other sites convenient to residents. In cities with over 4,000 residents, curbside recycling programs were established to collect glass, newspaper, cardboard, tin, aluminum, and motor oil. By 1990, 106 cities had curbside collection programs; 69 of those cities had populations of 4,000 or more. Curbside collection is now available to close to 75% of all Oregonians.

The 1991 Recycling Act is Oregon's newest recycling legislation. It expands the 1983 Recycling Opportunity Act beyond collection, to include re-manufacturing and purchasing. The legislation sets a statewide goal of 50% materials recovery by the year 2000, and sets 1995 interim goals for each county.

To help ensure that Oregon reaches its 50% material recovery goal for the year 2000, the 1991 Recycling Act requires a statewide Material Recovery Survey. Oregon law requires that all surveys be returned by February 28 of the following year. Oregon law has monetary penalties for non-reporting.

The entire Oregon recycling community is surveyed. Survey forms and instructions are mailed to businesses involved in materials recovery. Reminder cards are sent two weeks after surveys are mailed. Businesses may phone ODEQ for assistance. ODEQ currently has 1-1/2 staff administering the survey, and providing survey assistance.

When the surveys are returned to ODEQ, the survey coordinator reviews them for completeness. If the data appears incomplete or incorrect, ODEQ staff call the recycler to get the information needed. The survey coordinator also makes quality checks to the initial survey data, using the survey's Computer Aided Software Engineering (CASE) program. For example, the material tonnage reported by a recycler may not agree with a receiving broker's report. Additional phone calls are required to eliminate discrepancies. During the 1992 survey, the survey coordinator made multiple calls back to respondents at this point in the process.

The materials used in calculating a state recovery rate must originate in Oregon. The Oregon survey also attempts to track materials that originate in Oregon and are sold out-of-state.

The state recovery rate is calculated by:

1. Obtaining the amount of Municipal Solid Waste (MSW) disposed.
2. Adding this number to the total tons recovered to get the total tons generated, as shown in the equation:

$$\text{Amount Disposed} + \text{Amount Recovered} = \text{Amount Generated}^{\text{Oregon}}$$

3. Dividing the total tons recovered by the total tons generated to get the state recovery rate. This is calculated using the equation:

$$\frac{\text{Amount Recovered}}{\text{Amount Generated}^{\text{Oregon}}} = \% \text{ Recovered}$$

Oregon uses a CASE program to calculate all of their state and county recovery rates. The CASE program calculates each county's watershed recovery rate. The program then uses these county watershed profiles to calculate the statewide recovery rate profile.

See Appendix E for a copy of Oregon's recycling law and recycling survey forms.

Appendix B. Washington's Demographics and Recycling Activities-An Overview

Washington has a population of 4,866,692 people⁹ (ranking 18th in U.S. state populations), and 66,511 square miles of land. It has more people per square mile (73.1) than other states in EPA's Region X. Each person generates, on average, 6.4 pounds of garbage per day. The state generates an average of 5,669,069 tons per year. Given the amount of garbage generated, waste reduction plays an important part in the lives of its citizens.

Washington has 39 counties and 268 cities and towns. County and city governments assume primary responsibility for solid waste management and for the development and implementation of aggressive and effective waste reduction and source separation strategies. Each county in the state is required to prepare a coordinated, comprehensive solid waste management plan.

The state has achieved one of the highest recycling rates in the country. This demonstrates the public's willingness to participate in new recycling collection programs. Washington has led the region in studying and understanding recycling materials, while helping to develop the infrastructure needed for successful recycling in the region. At the same time, markets for recycling materials can be greatly improved.

⁹1990 U.S. Census figures.

Through legislation, Washington encourages the purchasing of recycled products. The state's recent solid waste reduction and recycling legislation¹⁰ not only mandated community recycling programs, it required state government recycling programs, and set a state recycling goal of 50% by 1995.

Ecology is responsible for monitoring municipal solid waste in Washington state. It annually gathers data on the amount of waste generated, recycled, incinerated, and landfilled. The type and quantity of materials collected for recycling and disposal are reported to Ecology. Statistics on Washington recycling programs have been compiled and collected since 1987.

The Department of Ecology is responsible for collection of recycling data; the Department of Trade and Economic Development's Clean Washington Center is responsible for performing recycling market research. Several marketing research studies were performed on recycling markets in Washington state. Washington is the only state in the region to have performed research studies on recycling markets.

Waste Generation, Recycling, Incineration and Disposal

Washington recycles 34% of its garbage. It currently incinerates eight percent of its garbage. It sends a little over 58% of its solid waste to landfills.

Ecology conducts an annual recycling survey, which is mailed to all the recyclers in the state. Ecology also conducts statewide waste characterization studies. The last waste characterization study was done in 1988, and a new 1992 study is currently being completed.

Washington's Annual Recycling Survey is sent to the entire statewide recycling community. During the survey period, Ecology offers respondents assistance by phone in filling out the surveys. When Ecology receives the completed surveys, the data is entered into a relational database. If the survey data appears incomplete or incorrect, Ecology staff call the recycler to get the information needed. After the data is entered, the survey coordinator conducts quality checks to highlight discrepancies between related recycler records and broker records. A large amount of time and resources go into additional phone calls and inquiries to complete surveys and eliminate reporting discrepancies.

The state recycling rate is calculated by:

1. Obtaining the amount of Municipal Solid Waste (MSW) disposed (The thirty-nine counties, Seattle, and Everett report figures on total tons disposed);
2. Adding this number to the total tons recycled to get the total tons generated, as shown in the equation:

$$\textit{Amount Disposed} + \textit{Amount Recycled} = \textit{Amount Generated}$$

¹⁰Solid Waste Management—Reduction and Recycling Act, Chapter 70.95 RCW.

3. Dividing the total tons recycled by the total tons generated to get the state recycling rate, as shown by the equation:

$$\frac{\text{Amount Recycled}}{\text{Amount Generated}} = \% \text{ Recycled}$$

After the state rates are established, the county rates are analyzed and calculated. Obtaining accurate county and city numbers continue to be a challenge; many recyclers don't know or don't report where their recycled materials come from.

Appendix C. Alaska's Demographics and Recycling Activities-An Overview

Alaska has a population¹¹ of nearly 550,043, with 570,833 square miles of islands, mountains and plains. While the resident population is low, the transient population can more than double the size of some communities during peak tourist and fishing seasons. It has an abundance of wildlife and has been labeled one of the "last frontiers".

Anchorage and Fairbanks make up 54% of the state's population. There are only two communities with populations over 10,000, and four communities with populations from five to ten thousand year-round residents. As a result, municipal waste streams are correspondingly small.

Nonetheless, Alaska, like other states, has its solid waste concerns. Although many Alaskan cities and towns are small compared to other cities in the Northwest, they lack the infrastructure needed to collect and transport recyclables.

Traditionally, Alaska has landfilled most of its solid waste. Newer, more stringent EPA landfill regulations are increasing the pressure on Alaskan communities to improve their solid waste management methods. Many landfills are reaching capacity or are out of compliance with new federal regulations. Organic soils and high water tables cause problems in siting new landfills that can meet EPA's stringent regulations.

Alaska, because of its location, is a considerable distance from most recycling markets. Its distance from the "lower 48" states and limited transportation system make the cost of shipping recyclable materials a primary consideration for recyclers in the state. Most Alaskan recyclable materials are either transported by air or sea.

Alaska does not perform a recycling rate survey. Instead, Alaska estimates recycling rates.

Alaska's Recycling Estimates

Alaska assumes that each person in the state generates five pounds of waste per day, for a total of 456,000 tons per year; this figure includes automobiles, and construction, demolition, and land clearing (CDL) debris. Officials arrive at their 10% recycling estimate

¹¹Figures from the 1990 U.S. Census.

by taking the average of a 15% recycling rate for Anchorage, where half the population lives, and a 5% rate for the rest of the state.

Information Available on Waste Generation Rates

the future viability of Alaskan recycling programs depends on accurate estimates of waste quantities and composition. Numerous studies have been completed for individual Alaskan communities and regions. To date, however, no studies have estimated and summarized waste generation for the entire state.

Appendix D. Idaho's Demographics and Recycling Activities—An Overview

A brief discussion of Idaho's human and natural resources will illustrate why recycling estimation is used.

Idaho has 1,006,749 residents, and encompasses 82,412 square miles. Ada County is the largest county, making up 20% of the state's population. Canyon, Bonneville, Kootenai, and Bannock Counties each contain approximately 7-9 percent of the population. The remaining 39 counties have 5 percent or less.

Idaho does not perform a recycling rate survey. The state estimates the rate of recycling.

Idaho State's health district report estimates that 886,030 tons of Municipal Solid Waste (MSW) are generated per year. Ninety-eight percent of Idaho's municipal solid waste is landfilled. Idaho currently spends over \$8 million dollars per year on solid waste management. Future waste disposal costs are expected to more than double in the next two years. The report also estimates that Idaho recycles about 5% of its MSW. However, the state could not specify what materials make up that figure.

Waste Generation

Idahoans throw away nearly 4.9 pounds of trash per person per day, more garbage per capita than the national average of 4.0. Every day nearly 2,462 tons of garbage are landfilled, 50 tons incinerated, and about 25 tons recycled.

The landfill in Ada County (the largest county in the state, population 205,775) receives 535 tons per day. The county's average generation rate is approximately 5.2 pounds of garbage per person per day. The rural areas of Idaho produce approximately 4.7 pounds per person per day.

Appendix E. Oregon's Law on The Annual Material Recovery Survey and Related Regulations

The following excerpts from Oregon regulations describe the initial mandate for reporting recycling data, and the related level and range of possible enforcement penalties.

Reuse and Recycling Act, Annual Recycling Reports, 459A.050(6): At least annually, the department shall survey privately operated recycling and material recovery facilities,

including but not limited to buy-back centers, drop-off centers, recycling depots other than those at permitted land disposal facilities, manufacturers and distributors. The department shall collect the following information:

- (a) By type of material for each wasteshed, the weight of in-state material collected from other than on-route collection programs, both residential and commercial.
- (b) Any other information necessary to prevent double counting of material recovered or to determine if a material is recyclable.
- (7) Information collected under subsection (6) of this section, as it relates specifically to the entity's customer lists or specific amounts and types of materials collected or marketed, shall be maintained as confidential by the department and exempt from disclosure under ORS 192.410 to 192.505. The department may use and disclose such information in aggregated form.
- (8) The information in subsections (1) to (4) and (6) of this section shall be collected and reported annually on a form provided by the department beginning in 1992 for calendar year 1991.
- (9) As a part of the report required under section 91, chapter 385, Oregon Laws 1991, the Department shall report:
 - (a) The annual weight of material disposed of per capita, by wasteshed and statewide.
 - (b) The annual recovery rate achieved by each wasteshed and statewide.
 - (c) The amount of each type of material recovered annually statewide and, based on available information, the amount of each type of material recycled annually statewide.
 - (d) The status of implementation of the provisions of ORS 459A.005 to 459A.665.
 - (e) Participation rates for commercial and residential on-route collection by wasteshed and statewide.
 - (f) Recommendations for improvements in the recycling, reuse and waste reduction programs.
- (10) Unless extended by the commission upon application under ORS 459A.055 after the affected persons show good cause for an extension, the affected persons within the wasteshed shall implement the opportunity to recycle and submit the recycling report to the department. [Formerly 459.180)

Solid Waste Management Classification of Violations, Oregon Administrative Rule 340-12-065:

Violations pertaining to the management, recovery, and disposal of solid waste shall be classified as follows:....

(2) Class Two:

PER E, NOP (d): Failure to report weight and type of material recovered or processed from the solid waste stream in accordance with the laws and rules of the Department;

Oregon Administrative Rule 340-12-042(1)

(1) \$10,000 Matrix:

Class of Violation	Magnitude of Violation		
	Major	Moderate	Minor
Class II	\$2,000	\$1,000	\$500

(a) No civil penalty issued by the Director pursuant to this matrix shall be less than fifty dollars (\$50) or more than ten thousand dollars (\$10,000) for each day of each violation....

Appendix F. Washington's Law on The Annual Recycling Survey and Related Regulations

From chapter 70.95, Revised Code of Washington (RCW), Solid Waste Management—Reduction and Recycling:

RCW 70.95.280 Determination of best solid waste management practices -- Department to develop method to monitor waste stream -- Collectors to report quantity and quality of waste -- Confidentiality of proprietary information.

The department of ecology shall determine the best management practices for categories of solid waste in accordance with the priority solid waste management methods established in RCW 70.95.010. In order to make this determination, the department shall conduct a comprehensive solid waste stream analysis and evaluation. Following establishment of baseline data resulting from an initial in-depth analysis of the waste stream, the department shall develop a less intensive method of monitoring the disposed waste stream including, but not limited to, changes in the amount of waste generated and waste type. The department shall monitor curbside collection programs and other waste segregation and disposal technologies to determine, to the extent possible, the effectiveness of these programs in terms of cost and participation, their applicability to other locations, and their implications regarding rules adopted under this chapter. Persons who collect solid waste shall annually report to the department the types and quantities of solid waste that are collected and where it is delivered. The department shall adopt guidelines for reporting and for keeping proprietary information confidential.

History: [1989 c 431 Sec. 13; 1988 c 184 Sec. 1.]

RCW 70.95.285 Solid waste stream analysis.

The comprehensive, state-wide solid waste stream analysis under RCW 70.95.280 shall be based on representative solid waste generation areas and solid waste generation sources within the state. The following information and evaluations shall be included:

- (1) Solid waste generation rates for each category;
- (2) The rate of recycling being achieved within the state for each category of solid waste;
- (3) The current and potential rates of solid waste reduction within the state;
- (4) A technological assessment of current solid waste reduction and recycling methods and systems, including cost/benefit analyses;
- (5) An assessment of the feasibility of segregating solid waste at: (a) The original source, (b) transfer stations, and (c) the point of final disposal;

(6) A review of methods that will increase the rate of solid waste reduction; and (7) (7)

(7) An assessment of new and existing technologies that are available for solid waste management including an analysis of the associated environmental risks and costs.

The data required by the analysis under this section shall be kept current and shall be available to local governments and the waste management industry.

History: [1988 c 184 Sec. 2.]

RCW 70.95.290 Solid waste stream evaluation.

(1) The evaluation of the solid waste stream required in RCW 70.95.280 shall include the following elements:

(a) The department shall determine which management method for each category of solid waste will have the least environmental impact; and

(b) The department shall evaluate the costs of various management options for each category of solid waste, including a review of market availability, and shall take into consideration the economic impact on affected parties;

(c) Based on the results of (a) and (b) of this subsection, the department shall determine the best management for each category of solid waste. Different management methods for the same categories of waste may be developed for different parts of the state.

(2) The department shall give priority to evaluating categories of solid waste that, in relation to other categories of solid waste, comprise a large volume of the solid waste stream or present a high potential of harm to human health. At a minimum the following categories of waste shall be evaluated:

(a) By January 1, 1989, yard waste and other biodegradable materials, paper products, disposable diapers, and batteries; and

(b) By January 1, 1990, metals, glass, plastics, styrofoam or rigid lightweight cellular polystyrene, and tires.

History: [1988 c 184 Sec. 3.]

Confidentiality

The primary proprietary data collected for the recycling survey is confidential information. Confidential information includes any data that relates specifically to the transactions between individual firms, (i.e., recyclers, brokers, processors/end users), as well as any information which could be used to identify an individual employer.

Several existing laws, policies, and rules emphasize the responsibility of each state employee to prevent the misuse and compromise of protected information held by the Department of Ecology. Foremost among these laws, policies and rules are chapter 42.17 RCW,

RCW 43.21A.160, and Ecology Administrative Policy 10-30. The disclosure of survey data that could result in private gain and/or private loss is strictly forbidden. No individual survey forms will be disclosed.

Appendix G. Oregon's and Washington's Definitions of Recycling

Oregon and Washington each perform an annual survey that measures recycling¹² for their respective states. Both surveys are required by law. This section examines the similarities and differences of methodologies and materials used to calculate recycling rates.

i. Oregon

Oregon measures a state Material Recovery Rate¹³. Material Recovery includes recycling; in cases where no viable market exists for recycling, energy recovery and composting count towards recovery. Oregon also has a bottle deposit system which collects glass, plastic and aluminum cans.

Definitions from Oregon Revised Statue (ORS) 459.005:

- (a) "Recyclable material" means any material of group of materials that can be collected and sold for recycling at a net cost equal to or less than the cost of collection and disposal of the same material.
- (b) "Energy recovery," which means recovery in which all or a part of the solid waste materials are processed to utilize the heat content, of other forms of energy, of or from the material.
- (c) "Material recovery," which means any process of obtaining from solid waste, by pre-segregation or otherwise, materials which still have useful physical or chemical properties and can be reused or recycled for some purpose.
- (d) "Recycling," which means any process by which solid waste materials are transformed into new products in such a manner that the original products may lose their identity.
- (e) "Reuse," which means the return of a commodity into the economic stream for use in the same kind of application as before without change in its identity.
- (f) Oregon's waste management hierarchy language:
After consideration of technical and economic feasibility, establish priority in methods of managing solid waste in Oregon as follow:
 - (1) First, to reduce the amount of solid waste generated;
 - (2) Second, to reuse material for the purpose for which it was originally intended;
 - (3) Third, to recycle material that cannot be reused;
 - (4) Fourth, to compost material that cannot be reused or recycled;
 - (5) Fifth, to recover energy from solid waste that cannot be reused, recycled or composted so long as the energy recovery facility preserves the quality of the air, water and land resources; and

¹²Oregon calculates a materials recovery rate, not a recycling rate. See Appendix E, part 459A.050(6) for a more detailed explanation of the term.

¹³The recyclable materials used in calculating the recovery rate are only post-consumer material—they exclude post-industrial material. State law also exempts scrap metal, except when collected at a disposal site or on-route by haulers, from resource recovery considerations.

- (6) Sixth, to dispose of solid waste that cannot be reused, recycled, composted or from which energy cannot be recovered by landfilling or other method approved by the department.
- (g) It is the goal of the State of Oregon that by January 1, 2000, the amount of recovery from the general solid waste stream shall be at least 50 percent.
 - (1) Clackamas, Multnomah and Washington counties, in aggregate, shall achieve a recovery rate of 40 percent for the calendar year 1995.
 - (2) The following wastesheds shall achieve a recovery rate of 30 percent for the calendar year 1995:
 - (A) Benton County;
 - (B) Lane County;
 - (C) Linn County;
 - (D) Polk County; and
 - (E) Yamhill County.
 - (c) the following wastesheds shall achieve a recovery rate of 25 percent for the calendar year 1995:
 - (A) Clatsop County;
 - (B) Columbia County;
 - (C) Deschutes County;
 - (D) Douglas County;
 - (E) Hood River County;
 - (F) Marion County;
 - (G) Jackson County;
 - (H) Josephine County; and
 - (I) Wasco County.
 - (d) The following wastesheds shall achieve a recovery rate of 15 percent for the calendar year 1995:
 - (A) Baker County;
 - (B) Coos County;
 - (C) Crook County;
 - (D) Curry County;
 - (E) Klamath County;
 - (F) Lincoln County;
 - (G) Malheur County;
 - (H) Tillamook County;
 - (I) Umatilla County;
 - (J) Union County; and
 - (K) The City of Milton-Freewater.
 - (E) The following wastesheds shall achieve a recovery rate of seven percent for the calendar year 1995:
 - (A) Gilliam County;
 - (B) Grant County;
 - (C) Harney County;
 - (D) Jefferson County;
 - (E) Lake County;
 - (F) Morrow County;
 - (G) Sherman County;
 - (H) Wallowa County; and
 - (I) Wheeler County.

ii. Washington

Washington measures a state recycling rate. Although the recycling rate does not count energy recovery, Washington does record the amount of material used for energy recovery.

From Chapter 70.95 Revised Code of Washington (RCW)

RCW 70.95.030 Definitions

- (a) "Energy recovery" means a process operating under federal and state environmental laws and regulations for converting solid waste into usable energy and for reducing the volume of solid waste. (This is not considered recycling)
- (b) "Recyclable materials" means those solid wastes that are separated for recycling or reuse, such as papers, metals, and glass, that are identified as recyclable material pursuant to a local comprehensive solid waste plan. Prior to the adoption of the local comprehensive solid waste plan, adopted pursuant to RCW 70.95.110(2), local governments may identify recyclable materials by ordinance from July 23, 1989.
- (c) "Recycling" means transforming or remanufacturing waste materials into usable or marketable materials for use other than landfill disposal or incineration.
- (d) "Waste reduction" means reducing the amount or toxicity of waste generated or reusing materials.
- (e) Washington's waste management hierarchy language:
The following priorities for the collection, handling, and management of solid waste are necessary and should be followed in descending order as applicable:
 - (1) Waste reduction;
 - (2) Recycling, with source separation of recyclable materials as the preferred method;
 - (3) Energy recovery, incineration, or landfill of separated waste;
 - (4) Energy recovery, incineration, or landfill of mixed wastes.
- (f) It is the state's goal to achieve a fifty percent recycling rate by 1995.

Appendix H. Oregon's State Recycling Survey Form

1992 Oregon Material Recovery Survey

If you need assistance completing this form, call Jacque Moon at 1-800-432-4011, or mail to 209-5479

	Material	ID Code	Line #		
			1		
A Inventory Levels	Beginning Inventory, January 1, 1992		2		
	Ending Inventory, December 31, 1992		2a		
B Material Sold/Shipped/Transferred/Used:	<i>(Only in-region firms in Oregon, Washington, Idaho and California should be identified by name)</i>				
In-Region Markets	Markets' Location (City, State)	Material used for composting or energy recovery?	Tons		
		Yes <input type="checkbox"/> No <input type="checkbox"/>	3		
		Yes <input type="checkbox"/> No <input type="checkbox"/>	4		
		Yes <input type="checkbox"/> No <input type="checkbox"/>	5		
Total Tons from Additional In-Region Markets, page 2, line 30			6		
Total Tons, Out of Region Markets (includes exports)			7		
Subtotal <i>Add lines 3 through 7</i>			8		
Used On-Site	Material used for energy recovery or composted? Yes <input type="checkbox"/> No <input type="checkbox"/>		9		
Shrinkage			10		
Total <i>Add lines 8 through 10</i>			11		
Adjustment for change in inventory levels			12		
<i>If line 2 is larger than line 2a, subtract line 2a from line 2. Enter result on line 12. Proceed to line 13.</i>			12a		
<i>If line 2a is larger than line 2, subtract line 2 from line 2a. Enter result on line 12a. Proceed to line 13a.</i>			12a		
Adjusted Total <i>Subtract line 12 from line 11</i>			13		
<i>Add lines 11 and 12a</i>			13a		
C Sources of Material - Location and Collection Method					
Oregon County Name Are you estimating tonnage by county of origin? Yes <input type="checkbox"/> No <input type="checkbox"/>	If estimating the collection method, allocate by amount or percentage of the total.		Check here the method you used: <input type="checkbox"/> Percentage -or- <input type="checkbox"/> Amount	Total Tons	
	Haulers/Disposal Sites	Commercial Collection	Buy Back		Other Depots
					14
					15
Additional County Totals, page 2, line 41					16
Unknown Origin in Oregon					17
Subtotal, Add Lines 14-17					18
Total Tons collected, Out-of-State					19
Total Tons Generated On-Site					20
TOTAL 1992 Collected/Generated On-Site <i>Add lines 18 through 20.</i>					21

Appendix H. Oregon's State Recycling Survey Form

WORKSHEET TO LIST ADDITIONAL BUYERS AND COUNTIES OF ORIGIN

B. continued		Material Sold/Shipped/Transferred/Used:		Line #
In-Region Markets	Markets' Location (City, State)	Material sold for composting or energy recovery?		Tons
		Yes <input type="checkbox"/>	No <input type="checkbox"/>	22
		Yes <input type="checkbox"/>	No <input type="checkbox"/>	23
		Yes <input type="checkbox"/>	No <input type="checkbox"/>	24
		Yes <input type="checkbox"/>	No <input type="checkbox"/>	25
		Yes <input type="checkbox"/>	No <input type="checkbox"/>	26
		Yes <input type="checkbox"/>	No <input type="checkbox"/>	27
		Yes <input type="checkbox"/>	No <input type="checkbox"/>	28
		Yes <input type="checkbox"/>	No <input type="checkbox"/>	29
Add lines 22 - 29. Enter on page 1, line 6.				30

C. continued		Sources of Material - Location and Collection Methods					Line #
Oregon County Name	Haulers/ Disposal Sites	Commercial Collection	Buy Back	Other Depots	Other	Total Tons	
							31
							32
							33
							34
							35
							36
							37
							38
							39
							40
Add lines 31 through 40. Enter on page 1, line 16.							41

CONFIDENTIALITY OF INFORMATION
 ORS 459A.050 (7) states, "Information collected under subsection (6) of this section, as it relates specifically to the entity's customer lists or specific amounts and types of materials collected or marketed, shall be maintained as confidential by the department and exempt from disclosure under ORS 192.410 to 192.505. The department may use and disclose such information in aggregated form."



Date ?

Appendix I. Washington's State Recycling Survey Form

1992 Washington State Recycling Survey Form

Page 1

Material Handled: _____ ID Code: _____

-Please list each material on a separate form-

Part A. Tons Handled by Your Company in 1992.		Tons	Line #
Tons Collected, Purchased or Brokered in 1992	From Washington State sources		1
	From other states or countries		2
Estimate Your Change in Inventory	Beginning inventory, Jan. 1, 1992		3
	Ending inventory, Dec. 31, 1992		4
	If line 3 is larger than line 4, subtract (4) from (3)		5
	If line 4 is larger than line 3, subtract (3) from (4)		6
Determine Total Tons Handled in 1992	Add lines 1, 2 and 5.		7
	Subtract line 6 from line 7		8

Part B. Who Was the Material Sold To?

(Also indicate in the Buyer's name box material "utilized on-site", "disposed" of or ending up as "shrinkage" and list the tonnage.)

Buyer's Name (Check shaded box if used for energy recovery)	Buyer's Mailing Address (P.O. Box or Street Address, City, State, Zip Code) and Telephone No.	Tons	
<input type="checkbox"/>			9
<input type="checkbox"/>			10
<input type="checkbox"/>			11
<input type="checkbox"/>			12
Total from additional buyers listed on line 31, page 2.			13
Add lines 9 through 13. Total should equal line 8.			14

Part C. From Which Counties and Collection Sources did the Material Originate?

County Name	Residential	Commercial/Industrial	Total Tons
	+	=	15
	+	=	16
	+	=	17
	+	=	18
	+	=	19
	+	=	20
Unknown Origin-County(ies) not known	+	=	21
Totals from additional counties listed on line 50, page 2.		+	22
Add Lines 15 through 22. Total should equal line 1.		+	23

Part D. What Amounts Originated from the Cities of Everett and Seattle?

City	Residential	Commercial/Industrial	Total Tons
Everett	+	=	24
Seattle	+	=	25

Appendix I. Washington's State Recycling Survey Form

1992 Washington State Recycling Survey Form

Page 2

Material Handled: _____ ID Code: _____

-Please list each material on a separate form-

Part E. Additional Buyers

(Also indicate in the Buyer's name box material "utilized on-site", "disposed" of or ending up as "shrinkage" and list the tonnage.)

Buyer's Name (Check shaded box if used for energy recovery)	Buyer's Mailing Address (P.O. Box or Street Address, City, State, Zip Code) and Telephone No.	Tons	Line #
<input type="checkbox"/>			26
<input type="checkbox"/>			27
<input type="checkbox"/>			28
<input type="checkbox"/>			29
<input type="checkbox"/>			30
Add lines 26 through 30. Transfer tonnage to line 13 on page 1			31

Part F. Additional Counties

County Name	Residential	Commercial	Total Tons	
		+	=	32
		+	=	33
		+	=	34
		+	=	35
		+	=	36
		+	=	37
		+	=	38
		+	=	39
		+	=	40
		+	=	41
		+	=	42
		+	=	43
		+	=	44
		+	=	45
		+	=	46
		+	=	47
		+	=	48
		+	=	49
Add lines 32 through 49.				50
Transfer total tonnage from line 50 to line 22 on page 1				

Confidential Information. For Ecology internal use only.