

Tillamook County Comprehensive Materials and Solid Waste Management Plan

Opportunities for a Greener Future



December 2012



by Green Solutions

Comprehensive Materials and Solid Waste Management Plan

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Prepared for Tillamook County

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EXECUTIVE SUMMARY

INTRODUCTION

This *Tillamook County Comprehensive Materials and Solid Waste Management Plan* (the “Plan”) examines the solid waste system in Tillamook County and explores options for improvements and refinements to that system. This Plan was developed with the assistance of the Solid Waste Advisory Committee (SWAC), which is a diverse group of representatives of the collection companies, private industry and citizens of Tillamook County.

This Plan addresses solid waste, which is defined to exclude most types of agricultural wastes (especially the large volumes of animal manures and crop residues that are produced by local farms and ranches). Household trash and similar types of wastes from farms is included in the definition of solid waste and hence is addressed by this Plan. In addition, there is some overlap in programs and activities, so agricultural wastes are discussed to some degree in this Plan.

BACKGROUND

Previous solid waste plans for Tillamook County were adopted in 1988 and 1996. There have been significant changes in solid waste and recycling since the 1996 plan was adopted, and there were also a number of specific current issues that needed to be addressed, hence the development of this new Plan. This Plan also addresses emerging technologies and new approaches (such as conversion technologies and materials management), although it is still too soon to say how much Tillamook County might benefit from these in the future. This Plan is expected to help guide policies and programs for solid waste and recycling in Tillamook County for at least the next five to ten years, possibly longer with amendments.

EXISTING SYSTEM

The current system for collecting and disposing of solid waste (garbage) in Tillamook County is working fairly well, at least from the standpoint of avoiding the public health and nuisance issues that are potentially associated with garbage. There are, however, opportunities to do better or to do more with the waste from Tillamook County. Some of the more significant opportunities and service gaps for the existing system include:

- The curbside recycling program in the City of Tillamook needs improvement.

- Other haulers in Tillamook County are interested in providing curbside recycling services and at least one (Nestucca Valley Sanitary Service) has plans to begin providing this service in 2013.
- Yard debris (grass clippings and leaves) are largely being handled adequately through informal means (such as neighbors taking in yard debris for their gardens), but too much of this material is also being dumped in forests and waterways.
- Several programs have been implemented recently in the Pacific Northwest to collect and compost food waste, but this is generally being done by including it in yard debris collection programs (which aren't currently available in Tillamook County). Food waste could, however, be collected from commercial sources in Tillamook County and possibly included in the mix going into existing or future anaerobic digesters.
- Some effort is necessary to review and revise contracts and franchise agreements for the three transfer stations and for the waste collection franchises. It would also be helpful to include performance standards in the franchise agreements and develop a standardized rate request form.
- In the long run, should Tillamook County be successful with waste prevention, recycling and composting, the amount of waste disposed at the transfer stations will decrease significantly. This will lead to a decrease in the tipping fees paid at the transfer stations and the funding mechanism for the Solid Waste Department will need to be changed as a result.

This Plan examines options for these and other opportunities and service gaps, and then evaluates those options according to several criteria (consistency with the solid waste hierarchy, potential for waste prevention or for diverting materials to recycling, cost-effectiveness, and SWAC support). The recommendations shown in this plan are derived from rating the options according to these criteria. Recommendations are prioritized (by high, medium and low priority), and also assigned a target timeline (0 to 3 years, 3 to 7 years and 7 to 10 years). Most of this work was accomplished in a day-long workshop that was held with the SWAC on August 14, 2012. All of the SWAC members participated in that workshop. The workshop was open to the public and publicized, and one additional person participated in the meeting.

RECOMMENDED CHANGES

All of the recommendations are shown below. More details for the recommendations can be found in one of three chapters of the Plan. Recommendations H1 through H9, M1 through M7, L1 and L2 are discussed in Section Three; Recommendations H10, H11, M8 and M9 are discussed in Section Four; and Recommendation H12 is discussed in Section Five of the Plan.

High-Priority Recommendations

- H1) Education activities should be continued or expanded, with a special focus on the following activities:
- Outreach and education should be conducted to businesses to promote green business practices consistent with solid waste hierarchy.
 - Promotion of reuse options should be increased.
 - Continue promoting home composting for yard debris and food waste should be continued.
 - Education and promotion for proper handling of household hazardous waste (HHW) should be expanded.
 - Tillamook County should move to a materials management system as an educational strategy.
- H2) Salvage and deconstruction activities for buildings and infrastructure should be promoted.
- H3) City Sanitary Service and the City of Tillamook should work together to improve the recycling program in Tillamook and to meet DEQ requirements.
- H4) Curbside recycling in other areas, if desired, should be implemented. This will need to be accompanied by the implementation of re-loading capabilities at one or more of the transfer stations.
- H5) Consider lowering the minimum weight at TTS and PCTS to promote recycling, and review these fees annually.
- H6) Research potential solutions for separate yard debris collection and processing, including code enforcement for mismanaged materials.
- H7) Explore the potential for anaerobic digesters (primarily the Hooley Digester) to accept yard debris.
- H8) Explore the possibility of processing food waste at the Hooley Digester and other anaerobic digesters.
- H9) Conduct a survey of CEGs to determine if additional collection events would be a beneficial approach.
- H10) Establish standards and a review process for collection and disposal franchises and contracts, including
- Institute performance standards for the waste collection franchises.
 - Conduct a periodic review of the waste collection performance and programs.
 - Prepare a standardized rate request form for use by the franchise haulers.
 - Conduct an annual rate review for transfer stations.
 - Review, revise, renew, and standardize the contracts and franchises for the transfer stations.

- H11) When a successful curbside recycling program is implemented, consider closing PCTS.
- H12) Change the funding methods for the Solid Waste Department.

Medium-Priority Recommendations

- M1) Examine the possibility of a reuse shelf or shed at the HHW facility.
- M2) Find local recycling applications for glass.
- M3) Encourage transfer stations to recycle tires.
- M4) Implement a reduced rate for clean and separated loads of wood.
- M5) Food waste should be collected from commercial sources.
- M6) A new anaerobic digester should be developed to handle food waste and animal mortalities.
- M7) Tillamook County should help CARTM develop a system to recycle latex paint.
- M8) Evaluate the benefits of mandatory collection (along with curbside recycling).
- M9) Develop the capability to accept large loads at MTS.

Low-Priority Recommendations

- L1) Close the recycle shacks, either on the basis of problems occurring or in the future if usage drops due to the implementation of curbside recycling.
- L2) Expand the collection of woody debris and green waste.

The next step for Tillamook County (and the cities, private companies and others, depending on the activity) is to implement the high-priority recommendations of this Plan. Medium and low-priority recommendations may also be implemented as appropriate, time and budget permitting, but the emphasis for the next five to ten years will be on the high-priority recommendations.

Table E-1 shows the projected costs and proposed schedule for the high-priority recommendations. The recommendations are shown in an abbreviated form due to space constraints in the table. The costs shown in Table E-1 are only the additional or new costs for implementing the recommendations, and in some cases may only be for the public expenditures associated with the recommendation. Table E-1 also shows the organization or company that is primarily responsible for implementing each recommendation. The implementation details for the medium-priority and low-priority

Table E-1: Ten-Year Implementation Schedule and Budget for High-Priority Recommendations

High-Priority Recommendations	Lead Agency	Cost and Funding Source	Year of Implementation									
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
H1) Education activities should be continued or expanded	County	0.25 FTE, County Fund 410	Ongoing									
H2) Salvage and deconstruction activities should be promoted	County	Existing							X	X	X	X
H3) CSS and Tillamook to work together to improve recycling program	CSS and City of Tillamook	Up to \$5/household, paid by user fees	X									
H4) Implement curbside recycling in other areas, and implement re-loading capabilities at transfer station(s)	Haulers	\$5 to \$6 per household, paid by user fees	X									
H5) Consider lowering the minimum weight at TTS and PCTS to promote recycling, and review annually	County	NA (although costs will shift)	X	Review annually								
H6) Research potential for separate yard debris collection	County	Existing (plus user fees if implemented)			X							
H7) Explore potential for anaerobic digesters to accept yard debris	County	Existing			X							
H8) Explore possibility of processing food waste at digesters	County	Existing			X							
H9) Conduct a survey of CEGs	County	Existing	X									
H10) Establish standards and review process for franchises, contracts	County	Existing	X	Review annually								
H11) When curbside recycling is implemented, consider closing PCTS	County	Possible cost savings		X	X							
H12) Change the funding methods for the Solid Waste Department	County	NA		X	X	X						

Notes: For Cost and Funding Source, “existing” refers to the use of existing funds and staffing to conduct the activity; “user fees” means that program participants will cover the cost of the program; and “NA” means that the activity is revenue-neutral, although costs may shift.

recommendations are shown in Tables 28 and 29 of the Plan, respectively (see Section Six).

TWENTY-YEAR IMPLEMENTATION PROGRAM

The solid waste management system in Tillamook County will continue to evolve based on changes in population, demographics, the economy, regulations, and advancements in waste handling and recycling. It must be recognized that some amount of flexibility will be needed to see Tillamook County and their partners through the next few years and into the next twenty years.

The SWAC and Tillamook County solid waste staff should review this Plan annually to determine if the goals and recommendations of this Plan are being met. If the goals and recommendations are not being met, it should be determined if this is due to changes in conditions or priorities, in which case this Plan's goals could be modified, or if the County's annual work plans need to be modified to better achieve the Plan's goals and recommendations. If conditions or priorities have changed to the extent that this Plan needs to be amended or modified to reflect that, then that should be done, although it is anticipated that this would not be necessary for at least five years. The recommended procedures for amending this Plan are outlined in Section Six of the Plan.

SECTION ONE INTRODUCTION

PURPOSE OF PLAN

The purpose of the *Tillamook County Comprehensive Materials and Solid Waste Management Plan* (the “Plan”) is to examine the solid waste system in Tillamook County and to explore options for improvements and refinements to that system. This Plan was developed with the assistance of the Solid Waste Advisory Committee (SWAC), which is a diverse group of representatives of the collection companies, private industry and citizens of Tillamook County.

Parts of this section of the Plan were initially shown in the first Technical Memo developed for the planning process (see Attachment A for the complete copy of that technical memo).

PLANNING PROCESS

The development of this Plan began in July 2011. Over the course of the next year, several specific documents were produced for review by Tillamook County staff and the SWAC. Once reviewed and revised, these documents were combined to create this Plan. The options that were developed during the planning process were reviewed by the SWAC in a facilitated workshop on August 14, 2012, with a few options being added or deleted at that time. Through a consensus process, SWAC members agreed to the rating for each option and also agreed to the priority level and time frame for the recommendations of this Plan. A complete draft of this Plan was reviewed by the SWAC on September 11 and October 9, and revisions were made based on their comments. This revised draft was distributed for public review beginning on October 16, 2012. Tillamook County staff also made presentations to every city council and several other groups in October and November. By the deadline for comments (December 1), no comments had been received on the Plan. The SWAC conducted a final review of the Plan on December 6 and approved it for adoption.

GOALS AND OBJECTIVES FOR THIS PLAN

The goals identified for this Plan are to:

- Develop a range of public and private options for solid waste management that creates a long-term sustainable materials management infrastructure.

- Maintain a balance between reasonable costs and best possible service levels.
- Establish performance standards.
- Meet governmental, financial, environmental and public health obligations.
- Assure consistency with the Tillamook County Comprehensive Land Use Plan, the Tillamook County 2020 Strategic Vision, and other plans.
- Address system needs for projected population change.
- Review current solid waste regulations and policies; giving particular attention to reducing the amount of materials generated, and to reuse, recycling and future disposal needs.
- Identify trends in the solid waste industry locally, regionally and globally.
- Incorporate flexibility to accommodate future needs.
- Conduct an administrative review, including addressing the need for inter-governmental agreements, performing a risk assessment for solid waste facilities, standardizing the rate review process, refining the franchise agreements, and refining the public-private balance.
- Consider safety issues and steps to reduce risks and liabilities.
- Identify and encourage educational opportunities to support the goals and objectives of this Plan.

Options and recommendations developed for this Plan should be weighed against these goals, although each option and recommendation may not be able to satisfy, or perhaps even be consistent with, every goal shown above.

TRENDS

Local Trends. Locally there is increasing use of anaerobic digestion and composting to address agricultural wastes. In both cases, these technologies are converting wastes that can be problematic into useful products (energy, compost, etc.).

Statewide and Regional Trends. There are several trends affecting solid waste management on a statewide or regional basis:

Commingled Systems Workgroup: The increasing use of commingled and single-stream recycling in the region and throughout the nation has led to questions about the ability of processing systems to adequately sort materials. There is a growing concern that both systems lead to cross-contamination because materials are not fully separated at the processing facility. In Oregon,

until quite recently, the primary concern has been loss of recoverable materials due to a commingled system (which has been in place throughout Oregon for many years now) that requires more attention to sorting at material recovery facilities (MRFs). More recently, local governments in Oregon, particularly in the Portland Metro region, have expressed concern about potential movement towards a single stream collection system which could result in the loss of glass (as glass once mixed with other recyclables can be difficult to sort out at MRFs, and once broken to a certain size it is useless for glass to glass or fiberglass recovery). Broken glass can also damage equipment at MRFs and paper mills.

In Oregon, recycling stakeholders explored the concerns related to commingled recycling through the Commingled Systems Workgroup. The purpose of this group, which had a series of meetings in 2010 and 2011, was to identify opportunities to improve Oregon's commingled recycling system at all levels, from collection and consumer education to processing and end-markets.

Washington State conducted a similar process that has recently resulted in a best management practices (BMP) guidance document on what to include in a commingled curbside program. A recent report by DEQ¹ concluded that 92-94% of commingled recyclables entering MRFs were properly sorted by the facility and sent to the correct markets. For some of the lower tonnage materials, however, the loss for those commodities was quite high (for instance, 16% of plastic containers and 33% of aluminum cans, both materials with high embodied energy, were not recovered by the MRFs).

Mixed Organics Collection Programs: Implementation of residential mixed organics systems (food scraps with yard waste) and source-separated commercial food waste collections has increased substantially in recent years in Oregon and Washington. After one and a half years of a pilot program, the City of Portland expanded their residential mixed organics program citywide on October 3, 2011. With the launch of food scraps collected in yard waste carts, Portland has also gone to every-other-week collection of garbage. These steps have led to a 44% reduction in the amount of garbage being disposed by single-family homes in the city.²

Product Stewardship: There is increasing interest in product stewardship on both a regional and national level. The Department of Environmental Quality (DEQ) completed a stakeholder process and released a report in December, 2010 with recommendations on the future direction of product stewardship in

¹ From "Composition of Commingled Recyclables Before and After Processing," Oregon DEQ, March 2011.

² From the Portland Curbsider, Summer 2012.

Oregon. Likewise, the Association of Oregon Counties and the Oregon Refuse and Recycling Association recently adopted principals relating to product stewardship in Oregon.

Product stewardship efforts aim to encourage manufacturers and retailers to take increasing responsibility to reduce the lifecycle impacts of a product and its packaging in product design and in the end-of-life management of the products they produce. Lifecycle impacts include energy and materials consumption, air and water emissions, the amount of toxics in the product, worker safety, and waste disposal.

Conversion Technologies: DEQ also recently formed an advisory committee to provide input for rules that will be formulated to address conversion technologies. Conversion technologies are defined by DEQ as “a variety of biological, chemical and thermal (excluding incineration) processes that convert solid waste into chemicals, fuels and other products.” Examples of conversion technologies include anaerobic digestion, gasification, hydrolysis, and pyrolysis. While these technologies are well-proven for specific wastes and other materials (such as the use of anaerobic digestion for animal manures), the application of these processes to solid wastes is a relatively new endeavor. These technologies have significant potential but generally require substantial capital investment and large waste flows (although a few of the technologies may be amenable to smaller amounts of waste).

National/Global Trends. Several global trends may have an impact on the programs discussed in this Plan. Three such trends include:

Climate Change: The magnitude and causes of climate change are still being debated, but a growing body of evidence indicates that the world is undergoing some type of climate change. This change may lead to more variable weather patterns and an increase in severe storms of all types. An increase in average global temperatures could actually make some areas colder or wetter by changing existing weather patterns. Increased global temperatures may also provide more energy and thus stronger storms, which on a local level could mean that a single storm might deliver much more rain or snow than previously experienced.

Recycling provides a huge amount of offsetting reductions in greenhouse gas emissions by reducing the need to process more raw materials (such as ore and paper fibers) and through other benefits. The processing of various raw materials is often a large contributor to greenhouse gas emissions due to the amount of energy consumed in the process (and hence the large amount of carbon dioxide created). For instance, it has long been recognized that producing

aluminum cans from old aluminum cans requires only 5% of the energy required to produce such cans from bauxite ore (and hence creates only 5% of the greenhouse gas emissions associated with producing aluminum cans). The materials management approach attempts to recognize and account for these types of benefits.

Increasing Oil Prices: In the long term, the price of petroleum products will increase as the supply of oil shrinks, unless demand shrinks as well. In other words, it is not the point at which the world runs out of oil that is important, but the point at which supply can no longer keep up with demand. It is difficult to predict when this point will be reached due to uncertain predictions about supply and demand. The increase in oil prices is one of those trends that could have both positive and negative impacts on Tillamook County's economy and on solid waste programs. The net impact to solid waste programs could include:

- there could be more or less solid waste generated if tourism or seasonal population patterns are affected,
- higher fuel costs will lead to higher prices for collection and other transportation-based programs, thus making waste export less cost-effective and efficient transfer systems more important,
- recycling could become more or less cost-effective, depending on the competing impacts of transportation costs versus the value of recyclable materials,
- the costs of consumer goods reliant on petroleum inputs (such as fertilizers for food and asphalt shingles) and the cost of long-distance transportation for goods could increase significantly, and
- local composting systems could become more important because local growers will be able to use that compost at a lower cost than compost shipped into Tillamook County from other areas. As shipping costs increase, growing and eating locally-produced food will become more important to an area's economy and sustainability.

International shifts in manufacturing and demand for raw materials: A large amount of manufacturing capacity has already shifted to China and other countries, but there is increasing recognition in China of the environmental costs of these activities. This and other factors, such as rising fuel costs, make it uncertain whether worldwide shipping practices will continue to be as competitive in the future. Since the United States also ships a large amount of goods and materials to other countries, rising fuel costs will have a mixed impact on international shipping and the demand for raw (recycled) materials.

It is impossible to predict the exact nature and degree of local impacts that may result from these trends because the magnitude and timing of these trends is highly uncertain. Furthermore, the actual local impacts of these trends could be both positive and negative, and some aspects could even cancel each other out to a degree (at least on a local level).

Materials Management Approach. There is increasing interest both nationally and regionally in the concept of “materials management.” This concept is seen as a next step beyond the solid waste management approach used to date. Materials management is a broader view that, by taking a life-cycle approach, avoids limitations imposed by traditional solid waste management methods (including recycling). Disposal, recycling and other current solid waste management programs tend to focus on materials only after those materials are discarded, thus overlooking the significant impacts associated with resource extraction, manufacturing processes and the transportation of goods. These “upstream” activities have significant impacts to the environment (due to mining and other resource extraction activities) and create the demand for large amounts of energy consumption (which create more environmental and social impacts). According to DEQ³, the upstream environmental impacts are 10 to 100 times greater than the impacts associated with recycling or disposal of the material or product. A materials management approach attempts to recognize these additional impacts by accounting for the “life cycle” of a material or product, rather than by only addressing a waste through recycling or disposal when it has reached the end of its useful life.

The Oregon DEQ is currently conducting a process to further define materials management for the state through a diverse stakeholder process. As part of that process, they have recently released a draft plan for materials management in Oregon, the *2050 Vision and Framework for Action*. The mission statement for that plan states:

“Oregonians in 2050 live well, responsibly producing and using materials, conserving resources and restoring the environment.”

The information that accompanies this vision notes that achieving it will require “attention to materials throughout their lifestyle and to the economic system at large.” The explanation of the draft vision also states that an action plan for the vision should focus on four elements: 1) upstream/production, 2) consumption, 3) end-of-life management, and 4) social and economic systems.

DEQ’s draft *2050 Vision and Framework for Action* proposes that additional work be conducted to assess various impacts and opportunities associated with current consumption patterns, as well as conducting research to identify the highest and best

³ From “What is Materials Management” by David Allaway, DEQ, October 12, 2011.

use for end-of-life management of discarded materials. Other recommendations are made for a variety of policy, regulatory actions and partnerships that could be implemented in the future. Some of the recommendations that are proposed in the draft *2050 Vision and Framework for Action* include:

- Prioritize products and materials for product stewardship programs based on DEQ's product stewardship principles and support legislation consistent with these principles.
- Develop a strategy to limit the amount of food scraps, yard debris and metal that are landfilled.
- Evaluate the potential for disposal bans for other materials.
- Increase recycling opportunities through a review and update of the Opportunity to Recycle Act.
 - Evaluate existing food waste prevention programs (such as “Love Food Hate Waste”) for application in Oregon. Partner with others to implement efforts in Oregon including efficient food redistribution systems.
 - Support opportunities for consumers to opt out of receiving unwanted mail.
 - Develop information that can be used to help consumers understand relative impacts of actions and choices, and partner with others to disseminate the information.
 - Embed sustainable consumption concepts into existing public education programs, such as outreach under the Opportunity to Recycle Act. Revise “Rethinking Recycling” curriculum and supporting materials; expand the curriculum to include grades 6 to 12 and a broader materials management perspective.
 - Develop consistent statewide messaging on the benefits of reuse, repair, composting, recycling, and disposal, taking into account differences in programs throughout the state.
 - Work with partners such as grocery and retail stores and libraries to deliver messages related to sustainable end-of-life materials management.

Application of the materials management approach locally is an interesting challenge, since many of the potential solutions are state, national, or global in scale. Activities that can be supported locally might include educational programs related to waste prevention, and infrastructure and promotional support for the reuse industry, since activities that prevent the generation of waste in the first place or reuse products are effective materials management approaches. Another way that a materials management approach can be applied locally is through the use of “best current management practices” that clarify the preferred method for reducing or diverting

materials from the waste stream. These practices could take into account the life cycle impacts of specific materials and products.

Future Recycling Trends. Several trends are expected to have an impact on future recycling programs⁴, including:

- The Internet has changed how people purchase products. With more online shopping, there are more cardboard boxes in the residential recycling mix.
- The Internet has also changed how people get news and information. Newsprint, which for years has been the cornerstone of recycling programs, is being generated in decreasing amounts. Fewer people currently subscribe to newspapers and this trend is expected to continue. As the amount of newsprint in the paper fiber stream decreases it becomes harder to clean it up to a quality that newsprint mills find acceptable.
- Fewer phone directories are being produced (and hence recycled). The daily use of paper telephone directories has decreased as more people look up telephone numbers online or via internet directories.
- There are more home offices and printers, and so the amount of higher-grade paper in residential curbside programs is increasing.
- The population is aging, due to a combination of a large group of people approaching their senior years and because people are living longer. This means that there will be more demand for various home services and for products such as convenience food and packaging that is easy to open. This could also lead to more syringes and other medical wastes being placed in the residential garbage unless convenient disposal alternatives are available.
- Family life is changing. Many families do not sit down to a traditional family dinner every night, hence more take-out food and prepared meals are being purchased.

Tsunami Debris Field. The earthquake and tsunami that struck Japan in March 2011 resulted in millions of tons of debris being swept into the ocean. This debris is being carried by ocean currents to the west coast of the U.S., primarily to Oregon and Washington beaches. The actual amount of debris that washes ashore on the west coast will likely be substantially less than initial projections, due to some of the material being diverted into the Pacific Ocean “Garbage Patch” and other material sinking over time.⁵ The bulk of the debris is expected to wash ashore in 2013 to 2014, although wind-blown pieces started to arrive in June 2012.

⁴ From an article, “What’s Going to be in the Bin?,” by Maria Kelleher, Resource Recycling Magazine, September 2011.

⁵ From an article, “Researchers Plot Path, Timing of Japan Tsunami Debris Mass Headed for Oregon, Washington, Hawaii,” in The Columbia Basin Bulletin, October 28, 2011.

The arrival of the Japanese tsunami debris will require a plan for dealing with that material. Disaster debris planning is a function of Tillamook County Solid Waste and is incorporated into the County's Emergency Operations Plan. A Disaster Debris Plan is currently being developed by Tillamook County. This plan would provide an effective approach for dealing with this type of disaster debris as well as debris from local catastrophes (floods, fires, extreme weather events, tsunamis, large accidents, and other events).



*Dock that washed ashore on Agate Beach, photo taken June 19, 2012.
Photo courtesy of Oregon Parks and Recreation Department.*

SECTION TWO BACKGROUND INFORMATION FOR TILLAMOOK COUNTY

INTRODUCTION

This section provides background data that is largely specific to Tillamook County, including demographic information, the results of a survey that was conducted in the fall of 2011, an analysis of the County's waste stream, and a comparison of Tillamook County to four other counties in Oregon.

Parts of this section were initially shown in the first Technical Memo developed for the planning process (see Attachment A for the complete copy of that technical memo) and in a memo addressing the survey results (see Attachment C).

DEMOGRAPHIC FACTORS FOR TILLAMOOK COUNTY

Population figures for Tillamook County from the past two census counts are shown in Table 1. As can be seen in the table, only one of the cities in Tillamook County exceeds 4,000 people, and all of the other cities have less than 1,500 residents. Almost two-thirds (62%) of the people live in unincorporated areas.

Table 1: Population of Tillamook County

City or Area	2000	2010	Percent Increase
Incorporated Areas	8,825	9,595	8.7%
Bay City	1,149	1,286	11.9%
Garibaldi	899	779	-13.3%
Manzanita	564	598	6.0%
Nehalem	203	271	33.5%
Rockaway Beach	1,267	1,312	3.6%
Tillamook	4,352	4,935	13.4%
Wheeler	391	414	5.9%
Unincorporated Area	15,437	15,655	1.4%
Totals	24,262	25,250	4.1%

Notes: All data is from the 2000 and 2010 Census.

The increase in Tillamook County’s population over the past decade was 4.1% (or 0.40% annually). If the County’s population continues to increase at this same rate, the population will grow to 27,349 by 2030 (see Table 2).

Table 2: Population Projections for Tillamook County

Year	Number of People
Census Counts	
2000	24,262
2010	25,250
Projected Figures	
2011	25,351
2012	25,452
2013	25,554
2014	25,656
2015	25,759
2020	26,278
2025	26,808
2030	27,349

Note: The projected figures assume the same population growth as for the period 2000 to 2010 (0.40% annually).

An important point about the above tables is that the population figures shown do not include the substantial number of seasonal residents and tourists that live temporarily in Tillamook County, primarily in the summer months. It has been estimated that 60% or more of the houses in Tillamook County are seasonal homes or rental properties. In Manzanita, for instance, 73% of the homes are second homes. In addition, there are also large numbers of people that camp at state and county parks in Tillamook County in the summer.

SURVEY RESULTS

The following tables show a summary of the responses received from a survey that was conducted in November and December, 2011. The survey asked a number of questions about current waste disposal and recycling habits, and about the level of interest in new programs or options for these. A total of 1,000 surveys were mailed on November 7, 2011. Participants were randomly selected from two sources: a list of registered voters and a list of absentee property owners. Absentee property owners were defined as owners of residential property in Tillamook County that have a mailing address outside

the county. The list of registered voters (consisting of a total of 9,084 names) was obtained from the Tillamook County Clerk’s Office and the list of absentee property owners (a total of 7,524 people) was obtained from the Tillamook County Assessor’s Office. Out of the 1,000 surveys mailed out, 750 surveys were mailed to a random sampling of registered Tillamook County voters and another 250 surveys were sent to a random sampling of absentee property owners. An online survey was also prepared to allow the randomly-selected participants and other interested people to respond electronically.

A total of 166 surveys were completed and returned, including 151 mail surveys and 15 online surveys. This resulted in a 16.6% response rate. The reliability of the overall

Table 3: Demographic Factors for Survey Respondents

Survey Question	Percent Response	
Do you live in Tillamook County full time?	Yes	88%
	No	10%
	No answer	2%
Do you live inside city limits?	Yes	28%
	No	54%
	No answer	18%
Which city do you live in?	Bay City	4%
	Garibaldi	4%
	Manzanita	5%
	Nehalem	4%
	Rockaway Beach	6%
	Tillamook	11%
	Wheeler	4%
Gender	Female	57%
	Male	39%
	No answer	4%
Including yourself, how many people live in your household?	1 person	26%
	2 people	50%
	3 people	8%
	4 people	6%
	5 or more	5%
	No answer	5%
Which of the following categories best describes your age?	18 – 24	1%
	24 – 34	4%
	35 – 54	26%
	55 – 64	30%
	65 and over	36%
	No answer	3%
Which of the following categories best describes your annual income?	Less than \$40,000	33%
	\$40,000 - \$80,000	37%
	More than \$80,000	15%
	No answer	15%

results is +/- 7.6% at the 95% confidence level. This means that in 95 out of 100 repetitions of the survey, the results will not vary more than +/- 7.6%. It is important to recognize that because of the topic content and length of the survey, reliability is also affected by self-selection bias. Self-selection bias is expected to a certain degree when participants are likely to choose to participate based on their interest in the topic area, or not to participate because of a lack of interest. While the sampling for this survey was random, some level of self-selection likely impacts the results, meaning that the results are biased to some degree in favor of those in Tillamook County who hold at least some level of interest in the topic of garbage and recycling (whether a positive or negative interest).

As can be seen in Table 3, the respondents contained relatively more permanent residents than the pool of people that were sent surveys. Although 25% of the surveys were sent to absentee property owners, only 10% of the respondents indicated that they were in this group. The number of respondents who live in a city versus outside city limits compares fairly well to the county average (see Table 2), with about twice as many people in rural areas responding as people who live within city limits. The respondents are weighted heavily toward older residents, with only 5% of the respondents reporting their age in the two youngest categories (18 to 24 and 25 to 34 years old), versus recent census data showing 24% of the county's adult population falling into these groups. Middle-aged respondents (35 to 54 years old) are relatively well-represented, with 26% of the respondents in this category versus 30% in the county population. Older respondents (55 to 64 and 65 years and older) made up 66% of the survey respondents, whereas these groups make up 36% of the county population.

Table 4 shows the survey results for the frequency of using garbage and recycling services. 83% of the respondents had been to one or more of the transfer stations in the past year. One-quarter of them frequented the transfer stations on a monthly basis. A large portion of them (40%) bring both garbage and recycling. The survey respondents reported that they are generally satisfied with the value they get from the use of the transfer stations and from garbage collection services. There were a large number of people that did not respond to the questions about the satisfaction with the transfer station and garbage collection services because they did not use the stations or subscribe to garbage collection. Almost half of the respondents had been to a hazardous waste collection event, demonstrating that the HHWF (the permanent facility recently constructed) can serve as a driver for awareness of recycling and proper disposal methods.

Table 5 provides the results for questions about what people do with their recyclables as well their reasons for recycling. Multiple answers were allowed to these questions, so the totals may add up to more than 100%. A large number of respondents stated that they bring recyclables to a transfer station or a recycle shack and many also compost materials. When asked why they don't recycle more or recycle more materials, several people said that some materials are not recycled locally or they are inconvenient to

Table 4: Survey Responses for Disposal Habits

Survey Questions	Percent Response	
Have you been to one of Tillamook County's transfer stations in the past year?	Yes	83%
	No	13%
	No answer	4%
Which transfer station have you been to in the past year?	Tillamook	49%
	Manzanita	32%
	Pacific City	16%
On average, how many times per year do you go to the transfer station?	Weekly	11%
	Monthly	25%
	2-6 times	39%
	Once per year	9%
	Don't know	4%
	No answer	12%
Do you typically go to the transfer station to dispose of garbage only, garbage and recycling, or recycling only?	Garbage and recycling	40%
	Recycling only	36%
	Garbage only	10%
	No answer	14%
Do you consider the transfer station to be a good value?	Yes	73%
	No	8%
	Don't know	6%
	No answer	13%
Do you subscribe to regular garbage service at your home in Tillamook County?	Yes	53%
	No	45%
	No answer	2%
If you subscribe, on average, how often do you set out garbage for collection?	Weekly	68%
	Every other week	18%
	Monthly	11%
	On call/as needed	4%
If you subscribe, on average how much garbage do you put out for pickup?	1 can	89%
	2 cans	7%
	3 cans	2%
	More than 3 cans	2%
How satisfied are you with the current service provided by your garbage hauler?	Very Satisfied	45%
	Somewhat Satisfied	7%
	Somewhat Dissatisfied	2%
	Very Dissatisfied	1%
	No answer	45%
Do you consider garbage service to be a good value?	Yes	49%
	No	11%
	No answer	39%
Have you ever participated in one of Tillamook County's hazardous waste collection events?	Yes	47%
	No	45%
	Don't know	1%
	No answer	13%

Table 5: Survey Responses for Recycling and Composting

Survey Questions	Percent Response	
What do you typically do with the recyclables from your home in Tillamook County?	Take them to a recycling center or transfer station	68%
	Compost in my backyard	42%
	Take them to a recycle shack	40%
	Garbage hauler picks them up	6%
	Nothing, I do not recycle	4%
	Other	17%
Why don't you recycle or why don't you recycle more materials?	Some materials are not recycled locally	26%
	Inconvenient, no service available	11%
	Takes too much time/effort	4%
	Don't know what can be recycled	2%
	Don't know where to recycle	2%
	Don't know how to prepare items for recycling	1%
Other	17%	
If you recycle, why do you recycle?	Reduce the amount of waste going to the landfill	91%
	It's good for the environment	81%
	It's the right thing to do	75%
	Saves natural resources (water, energy, trees)	74%
	Saves money on my garbage bill	34%
	To get the five cent deposit back	31%
	My friends or other people I know do it	17%
	Other	11%

recycle. In response to why they recycle, respondents strongly support a whole list reasons, with the top two reasons being “reducing the amount of waste going to the landfill” and “it’s good for the environment.” It should be noted that this series of questions in the survey included questions about what materials people recycle at home and at work, with a long list of materials shown in the question. This information is not shown here due to space constraints but can be found in the full report on the survey.

A greater number of respondents would like curbside service than are willing to pay for it. In Table 6, nearly half of the respondents (48%) said they would like their hauler to provide curbside collection on materials, yet only 38% agreed to pay an additional processing or handling fee for recycling. A slightly lower percentage (34%) were willing to pay more for garbage service if it including recycling.

In Table 7, respondents rated attitudes about the environment and recycling very highly. More than 81% of the respondents strongly agreed on all counts that recycling and protecting the environment is important, that recycling is good for the environment, and that everyone should recycle.

Table 6: Survey Responses for Recycling Options

Survey Questions	Percent Response	
What recycling options, if any, would you like to see available in Tillamook County through your local garbage hauler?	Curbside collection of recyclables	48%
	Nothing new, I prefer to keep recycling the way I'm doing it now	28%
	Nothing new, I don't recycle	1%
	Other	16%
	Don't know or does not apply	10%
I am willing to pay a processing or handling fee for recycling services.	Strongly Agree	13%
	Somewhat Agree	25%
	Somewhat Disagree	18%
	Strongly Disagree	28%
	Don't know or does not apply	11%
I am willing to pay more for garbage service if it includes collecting recyclables.	Strongly Agree	14%
	Somewhat Agree	20%
	Somewhat Disagree	10%
	Strongly Disagree	27%
	Don't know or does not apply	19%

Table 7: Survey Responses for Attitudes about the Environment and Recycling

Survey Questions	Strongly Agree	Some-what Agree	Some-what Disagree	Strongly Disagree	Don't Know
Recycling is important.	87%	10%	0%	1%	1%
Protecting the environment is important	84%	10%	1%	0%	0%
Recycling is good for the environment	85%	9%	2%	1%	0%
Everyone should recycle	81%	12%	1%	2%	1%

Note: responses do not add up to 100% because not all respondents answered this question.

As shown in Table 8, outreach and education is reaching the respondents adequately for 78% of the people for recycling, followed by toxic waste education at 71% and reuse outreach at 69%. It is interesting to note that waste prevention outreach reaches the respondents at a lower rate of 52%. Respondents get their outreach mainly from a recycling center or transfer station and the newspaper. Slightly more than half of the survey respondents say they receive just the right amount of information.

Table 8: Survey Responses for Attitudes about Outreach and Education

Survey Questions	Percent Response		
		<u>Yes</u>	<u>No</u>
Do you recall seeing or hearing advertising related to the following?	Recycling	78%	17%
	Waste prevention	52%	34%
	Reuse (donating goods, buying used or refurbishing/fixing)	69%	23%
	Toxic/hazardous waste reduction/prevention	71%	20%
Where do you go for information about garbage and recycling in Tillamook County?	Recycling center or transfer station	49%	
	Newspaper	40%	
	Waste Wise newsletter	27%	
	Tillamook County Solid Waste	17%	
	Garbage hauler	13%	
	Internet	11%	
Considering the amount of information you receive regarding garbage and recycling, would you say your receive:	Other	11%	
	Just the right amount	54%	
	Not enough	28%	
	Too much	1%	

Table 9 explores the purchasing habits of respondents. It was found that the most (at 39%) important consideration out of the five listed is considering whether the product contains a toxic or hazardous material. The other factors to consider (but not the most important factors) included whether they are buying something used or refurbished, how much waste the product and its packaging will produce later, and whether the product was made recycled materials.

Table 9: Survey Responses for Attitudes about Purchasing Habits

When choosing an item to buy, how important to you are the following:	This is the most important factor to me	It's not the most important factor, but I do consider it	I do not ever consider this
a. Do you consider how much waste the product and its packaging will produce later?	13%	58%	22%
b. Do you consider buying something used or refurbished?	23%	61%	8%
c. Do you consider whether the product was made from recycled materials?	17%	58%	17%
d. Do you consider whether the product and its packaging will be recyclable later?	19%	53%	19%
e. Do you consider whether the product contains toxic or hazardous materials?	39%	38%	14%

WASTE QUANTITIES AND COMPOSITION

A. Waste Quantities

All of Tillamook County's municipal solid waste⁶ (MSW) is transferred through the Tillamook Transfer Station (TTS), which makes accurate measurements of the county's waste stream a relatively straightforward process. There is also a substantial amount of other wastes generated in the county, such as cow manure and other agricultural wastes, which are not considered part of MSW and so are not directly addressed by this Plan. The non-MSW materials are addressed to some extent, however, where programs and facilities are currently or potentially dealing with both types of waste.

The amounts of waste disposed from the Tillamook Transfer Station are shown in Table 10 and in Figure 1. These graphics show the amount of waste disposed (transferred to the Coffin Buttes Landfill), which is different (lower) from the amount of incoming waste due to the recovery of some materials (metals and cardboard) from the tipping floor of the transfer station.

Table 10 and Figure 1 clearly demonstrate the increased waste tonnages that result from seasonal visitors to Tillamook County. The influx of tourists and temporary residents in the summer months impacts the waste tonnages in July and August, and possibly also to a lesser extent in June and September. What is less obvious in the tonnage information, however, is the tourism that occurs in other months. The large number of second homes and temporary residents in the non-summer months also contributes to waste quantities in Tillamook County and artificially inflates the per capita disposal rate (since the per capita rate is calculated based on the number of permanent residents).

As can be seen in Table 10, the amount of waste disposed from Tillamook County was higher in 2008 than in the past two years. The 2010 rate (1,591 pounds per person per year) is 16% lower than the 2008 rate (1,900 pounds per person per year). This is similar to the trend seen in most areas of the United States and is widely assumed to be the result of lower consumption due to the economic problems of the past few years. The seasonal trend remains similar, however, with the largest amounts of waste disposed in the summer months due to the influx of visitors and tourists.

B. Waste Composition

Local data on the composition of waste disposed from Tillamook County is not available, but data from a statewide study provides an indication of what materials can

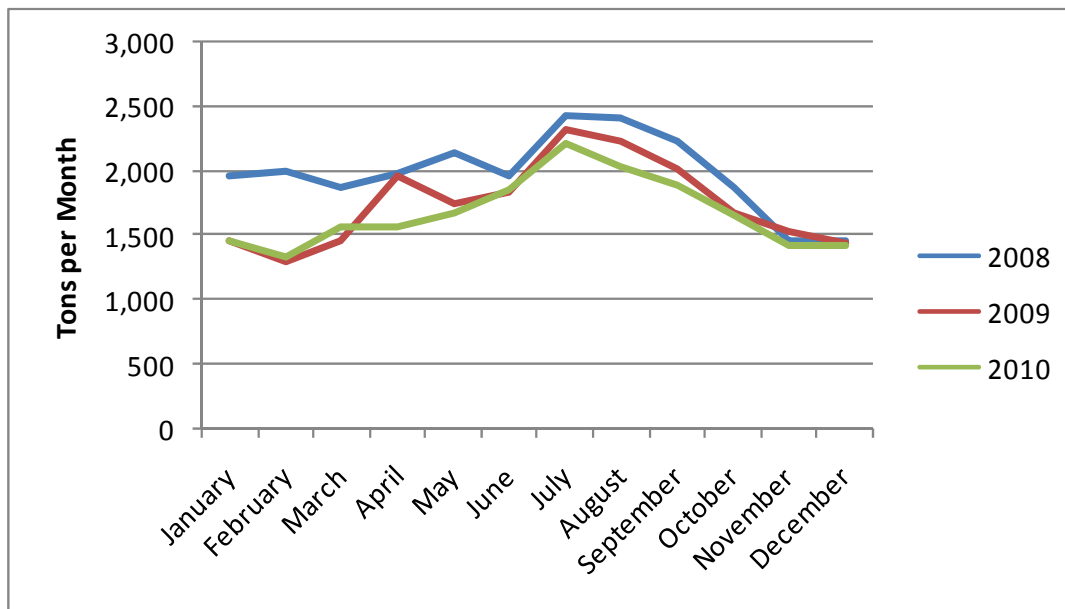
⁶ "Municipal solid waste" is used here to mean the same types of wastes as what DEQ calls "municipal post-consumer waste," which includes residential and commercial wastes and some types of waste generated by industries, but excludes agricultural wastes and other wastes defined as "industrial materials."

Table 10: Amount of Solid Waste Disposed from Tillamook County, tons

Month	2008	2009	2010
January	1,966	1,455	1,466
February	1,999	1,297	1,334
March	1,872	1,450	1,565
April	1,977	1,960	1,565
May	2,142	1,747	1,675
June	1,964	1,828	1,848
July	2,429	2,314	2,207
August	2,409	2,221	2,031
September	2,231	2,007	1,892
October	1,880	1,670	1,658
November	1,465	1,522	1,420
December	1,457	1,442	1,422
Annual Total	23,791	20,913	20,083¹
Population ²	25,045	25,147	25,250
Per Capita Waste Disposal Rate³	1,900	1,663	1,591

- Notes: Figures show the amount of waste (in tons) shipped out of the Tillamook Transfer Station.
1. The total waste amount for 2010 shown here differs from the figures shown in other tables (22,373 tons) due to diversion of wastes at TTS (in other words, this is the outgoing waste amount and other tables show the incoming waste tonnages).
 2. The population figure for 2010 is based on the U.S. Census, and for 2008 and 2009 the population is interpolated from 2000 and 2010 census figures (see Table 2).
 3. The waste disposal rate is expressed as pounds per person per year.

Figure 1: Amount of Solid Waste Disposed from Tillamook County



be found in the County's solid waste stream. The *2009/2010 Waste Composition Study*, prepared by DEQ, provides data for several distinct areas of the state (such as the Portland Metro region, Marion County, and Lane County), but separate data is not provided for most areas of the state and instead the rest of the state is simply combined into a category called "rest of Oregon." This is because the cost for taking a sufficient number of samples needed to provide an accurate breakdown for other counties was prohibitively expensive. Thus, the best available data for Tillamook County is the data that was collected and reported in aggregate for Tillamook County and 30 other counties. Those composition figures are shown in Table 11, and that breakdown is applied to Tillamook County's annual waste tonnage for 2010 to provide an estimate of the number of tons of each material that are disposed in the County's waste stream.

The composition data shown in Table 11 can be combined with the recycling data collected by DEQ to provide an estimate of recovery level for each material. That information is shown in Table 12.

C. Waste Projections

Projecting future amounts of solid waste is a necessary part of planning for proper solid waste management. Projections for the future amounts of solid waste are an important starting point for ensuring that there will be adequate collection, transfer and disposal capacity for that waste, and projections also provide the basis for designing recycling and other waste diversion programs. This is, however, an interesting time for attempting to predict future quantities of waste. The sudden decrease in waste amounts associated with the economic downturn has shown previous projections to be nearly worthless. In Tillamook County, for instance, the amount of waste disposed in 2010 is 16% less than the amount in 2008 (see Table 10). The question at this point is whether, and to what extent, people will return to previous consumption and garbage generation levels.

Table 13 compares future disposal and recycling amounts, which together add up to the total amount of waste generated, at the 2008 and 2010 waste generation rates. This table uses the projected population figures (see Table 2) and the recycling rates for 2008 and 2010. This comparison only addresses MSW (i.e., does not include agricultural or other non-MSW solid wastes).

The projected figures are provided for planning purposes only, and actual figures in the future will be strongly influenced by consumption levels, recycling rates and other factors.

Table 11: Waste Composition for Tillamook County

Material	Disposed	
	Percent ¹	Tons per Year ²
PAPER	12.85%	2,874
Cardboard	2.89%	647
Newspaper	0.65%	146
Magazines	0.69%	154
Other Recyclable Paper	3.96%	886
Compostable Paper	2.53%	565
Other Paper	2.13%	477
PLASTIC	8.49%	1,899
Rigid Plastic Containers	1.39%	310
Plastic Bags, Film	1.62%	362
Other Plastics	5.48%	1,226
METALS	7.23%	1,618
Aluminum (cans and other)	0.23%	51.7
Tin Cans	0.71%	159
Other Metals	6.29%	1,407
GLASS	2.41%	538
Recyclable Glass	1.36%	307
Other Glass	1.04%	232
ORGANICS	35.92%	8,036
Food Waste	15.90%	3,558
Yard Debris	7.34%	1,642
Wood Waste	12.68%	2,838
HAZARDOUS MATERIALS	0.53%	119
Lead-Acid Batteries	0.02%	3.6
Dry-Cell Batteries	0.05%	10.6
Motor Oil	0.06%	13.0
All Other Hazardous Materials	0.40%	89
OTHER	32.57%	7,287
Disposable Diapers	2.31%	516
Textiles	3.11%	695
Carpet	3.1%	693
Furniture and Mattresses	2.25%	504
Gypsum Wallboard	2.69%	602
Animal Excrement	3.0%	672
Other Materials	16.11%	3,604
TOTAL	100.0%	22,373

- Notes: 1. Percentage figures for the amount of materials in the waste stream are from DEQ's 2009/2010 Waste Composition Study (for the "rest of Oregon," excluding Metro, Marion and Lane Counties).
2. Figures for tons per year are based on the annual amount of waste (22,373 tons in 2010) and the percentages shown in the previous column.

Table 12: Material Recovery Levels for Tillamook County

Material	Disposed Tons ¹	Amount Recycled ²	Percent Recovery
Aluminum (cans and other)	51.7	283	84.5%
Animal Waste/Grease	NA	109	NA
Antifreeze	NA	6.8	NA
Cardboard/Kraft	647	2,593	80.0%
Electronics	242	88.4	26.8%
Fluorescent Lamps	1.5	0.9	37.6%
Food Waste	3,558	66.5	1.8%
Glass Containers	307	635	67.4%
Glass Other	232	0.7	0.3%
Gypsum Wallboard	602	44.4	6.9%
Household Hazardous Waste	NA	28.7	NA
Lead Acid Batteries	3.6	77.7	95.6%
Mixed Batteries	10.6	0.5	4.2%
Paint	31.5	13.3	29.7%
Paper Fiber	1,186	636	34.9%
Plastic Film	362	14.1	3.8%
Plastic Other	1,226	22.2	1.8%
Rigid Plastic Containers	301	105	25.9%
Roofing - Asphalt	655	35.5	5.1%
Scrap Metal - Other	1,433	3,584	71.4%
Solvents	NA	0.6	NA
Tin Cans	159	24.1	13.2%
Tires	3.6	129	97.3%
Used Motor Oil	13.0	185	93.4%
Wood Waste	2,838	1,266	30.8%
Yard Debris	1,642	198	10.8%
Other Wastes/Materials	6,892	NA	NA
Totals	22,373	10,147	

- Notes:
1. Disposed tons are based on figures for the amount of materials in the waste stream from DEQ's 2009/2010 Waste Composition Study (for the "rest of Oregon," excluding Metro, Marion and Lane Counties) and Tillamook County's annual (2010) amount of waste (see Table 2).
 2. Figures for the amounts recycled are from DEQ's 2010 Oregon Material Recovery Survey.

Table 13: Waste Generation Rates

	At 2008 Rate	At 2010 Rate
Disposal Rate, lb/person/yr¹	1,900	1,591
Waste Disposed, tons;		
2008	23,791	
2010		20,083
2015	24,480	20,499
2020	24,982	20,919
2025	25,495	21,349
2030	26,019	21,787
Recycling Rate, %²	33.5%	33.6%
Recycled Amounts, tons;		
2015	12,332	10,326
2020	12,585	10,538
2025	12,843	10,755
2030	13,107	10,975
Waste Generated, tons;³		
2008	35,785	
2010		30,230
2015	36,812	30,825
2020	37,568	31,458
2025	38,339	32,104
2030	39,126	32,763

- Notes: 1. See Table 10.
 2. The recycling rate for 2010 does not include waste prevention credits.
 3. The figures shown for the amount of waste generated are the sum of the amount of waste disposed and the amount recycled.
 All figures are in tons unless indicated otherwise.

WASTESHED COMPARISON

Comparing counties with similar characteristics can be effective for determining how different programs and policies have an impact on recycling rates and other parameters for solid waste management. Table 14 compares the basic conditions and results for Tillamook and four other counties (Clatsop, Columbia, Coos and Lincoln Counties).

A few trends can be observed based on the data in Table 14:

- The disposal rates shown for Tillamook County are significantly impacted by the seasonal influx of vacationers and temporary residents. These visitors contribute to the annual waste amounts but are not counted in the population figures (see also Table 10 and Figure 1 in the previous section, “Waste Quantities and Composition”).

Table 14: Comparison of Tillamook County to Other Counties

Data by County	Tillamook	Clatsop	Coos	Lincoln	Columbia
Demographic Factors					
2010 Population	25,250	37,070	63,035	46,135	49,430
# Cities over 4,000	1	3	3	2	2
Land Area, square miles	1,103	829	1,596	980	657
Population Density, people per sq. mile	22.9	44.7	39.5	47.1	75.2
Current Disposal and Recycling Amounts					
2010 Waste Disposed, tons	20,083	31,036	34,574	38,932	24,616
Disposal Rate; - lbs/person/year - lbs/person/day	1,591 4.4	1,674 4.6	1,097 3.0	1,688 4.6	996 2.7
Disposal rate average = 1,409 pounds per person per year and 3.9 lb. per person per day					
2010 Total Recovery Rate	39.6%	36.0%	39.5%	34.6%	37.8%
Recovery Credits: Prevention Reuse Composting	2% 2% 2%			2%	2%
Recovery Rate without Credits	33.6%	36.0%	39.5%	32.6%	35.8%
Recovery rate average (w/o credits) = 35.5%					
Top 5 Materials Recycled in 2010 (and percent of total amount diverted)	Metal 36%, Cardboard 26%, Wood 12%, Paper 6%, Glass 6%	Yard Debris 27%, Cardboard 20%, Wood 17%, Paper 10%, Glass 6%	Wood 26%, Metal 19%, Cardboard 18%, Paper 10%, Yard Debris 9%	Wood 33%, Cardboard 20%, Metal 13%, Paper 12%, Glass 7%	Cardboard 26%, Yard Debris 26%, Paper 14%, Metal 10%, Wood 8%
Recycling Programs					
Drop-Off Sites	4 staffed recycling depots	2 staffed recycling depots 1 not staffed	8 staffed recycling drop offs	5 staffed drop-offs (1 public, 4 private) and 2 non-staffed	3 staffed recycling drop-offs, 1 non-staffed
Residential Curbside Collection of Recycling	Residential curbside by subscription is offered by one hauler to City of Tillamook residents.	Residential curbside in Astoria, Seaside, Gearhart, and Cannon Beach through bundled rates, and for an additional charge in Warrenton.	Residential curbside in a bundled rate in North Bend, Coquille and Coos Bay. Bandon recycling fees are additional.	Residential curbside in a bundled rate in Newport, Lincoln City, Toledo, Waldport and Yachats.	Residential curbside in rural Columbia County including St. Helens and Vernonia mandatory and bundled rate.

Table 14, Comparison of Tillamook County to Other Counties, continued

	Tillamook	Clatsop	Coos	Lincoln	Columbia
Recycling Programs, continued					
Commercial Recycling	2 haulers provide commercial recycling	1 hauler provides commercial recycling	3 haulers provide commercial recycling	3 haulers provides commercial recycling	2 haulers provide commercial recycling
Yard Debris Collection Sites	2 sites: Manzanita and Tillamook Transfer Stations	3 sites: Astoria Seaside Cannon Beach	1 site: Beaver Hill Disposal, between Coos Bay and Bandon	3 sites: Dahl Disposal, Toledo; North Lincoln Sanitary, Lincoln City; and Thompson Sanitary, Newport	1 site: Beaver Bark Compost Facility in Scappoose
Solid Waste Programs					
Garbage Collection	5 haulers service Tillamook County and its incorporated cities	1 hauler serves Gearhart, Cannon Beach, and all of unincorporated Clatsop County, and the cities of Astoria and Seaside. Warrenton has municipal service	4 haulers service Coquille, North Bend, Bandon and Coos Bay	4 haulers service Lincoln City, Newport, Depoe Bay, Yachats, Waldport, Siletz and unincorporated County	2 haulers service Columbia County and its incorporated cities
Transfer Stations	3 sites: Tillamook Manzanita Pacific City	1 site: Clatsop Transfer and Disposal in Astoria	1 site: Beaver Hill in Coos Bay ¹	1 site: Public Transfer Station	2 sites: County Transfer Station and Vernonia
Disposal Cost per Ton	\$74.75	\$93.45	\$87.27 ¹	\$89.25	\$114.00
Disposal Facilities (and one-way distance from main transfer station)	Coffin Butte in Corvallis, OR, 82 miles	Riverbend Landfill in McMinnville, OR, 112 miles	Beaver Hill Incinerator in Coos Bay, OR, 0 miles ¹	Coffin Butte in Corvallis, OR, 63 miles	Riverbend Landfill in McMinnville, OR, 68 miles
	Average distance to disposal site = 72 miles (90 miles without Coos County)				
HHW Facility	Yes	No	No	No	Yes

Sources include the Oregon Department of Environmental Quality; phone conversations and websites for counties, cities, and haulers; and the U.S. Census Bureau (for population and land area).

Note: 1. The Beaver Hill Incinerator has closed since this data was collected, and so the disposal site and costs, and possibly other factors such as recycling tonnages, will change for the latter half of 2012 and future years for Coos County.

- The two counties with the highest total population, Coos and Columbia Counties, also have the highest actual recycling rate (not counting waste prevention credits) and along with that these counties also have the lowest per capita disposal rate.
- The top five most recycled materials are similar for the five counties except that three of the counties have yard debris in their top five, indicating that Tillamook County could possibly benefit from more programs for yard debris. For Tillamook County, yard debris represents only 2% of the total amount of materials diverted in 2010, compared to 9%, 26%, and 27% for three of the other counties. Tillamook County recycled significantly more metal than the other counties, which may be due to special circumstances in 2010 and if this should change in the future then Tillamook County's recycling rate could drop.
- The curbside recycling cost is bundled with garbage service in several cities of the neighboring counties. On the contrary, the only city in Tillamook County that offers curbside recycling is available by subscription in the City of Tillamook (and the subscription rate is very low, at 1 to 2% of the eligible customers).
- Recycling and yard waste drop-off stations are commonly available throughout all the counties.
- The Tillamook Transfer Station offers the lowest per ton cost for garbage at \$74.75 per ton. Other counties range from \$87.27 to \$114.00 per ton.
- The average distance travelled to the disposal site is 72 miles (or an average of 90 miles if the 0 miles for Coos County is ignored). The distance for Tillamook County waste to travel to the Coffin Butte Landfill in Corvallis is 82 miles.
- Columbia County's hazardous waste facility is also open monthly, but Tillamook County is the only county on the coast that hosts a household hazardous waste facility.
- Commercial recycling services are provided by most of the solid waste collection companies. Service is available throughout most of the counties, although primarily in the franchised cities.

SECTION THREE WASTE DIVERSION PROGRAMS

INTRODUCTION

This section of the *Tillamook County Comprehensive Materials and Solid Waste Management Plan* (the “Plan”) discusses existing programs for a variety of activities that can be categorized as “waste diversion” (diverting waste from the disposal system). These activities include waste prevention, reuse, recycling, composting, resource recovery, and proper disposal of small-quantity hazardous waste. Much of this section was initially shown in the *Evaluation of Waste Diversion Activities in Tillamook County* (see Attachment D for the complete copy of that document) and in the *Market Analysis for Recyclable Materials in Tillamook County* (see Attachment E).

BACKGROUND

Waste diversion activities are given a high priority by laws and policies in Oregon. A perceived shortage of landfill space, in part, led to passage of Oregon’s first Opportunity to Recycle Act in 1983. This Act also established solid waste management policies that recognized the environmental benefits of waste prevention, reuse and recycling, stating that in order to conserve energy and natural resources, solid waste management should follow a hierarchy:

- Reduce the amount of waste generated;
- Reuse materials for their original intended use;
- Recycle what can’t be reused;
- Compost what can’t be reused or recycled;
- Recover energy from what cannot be reused, recycled or composted, and finally;
- Dispose of residuals safely.

The 1983 Act also required wastesheds to have recycling depots. A "wasteshed" is defined in Oregon law as being an area of the state that shares a common solid waste disposal system, or an appropriate area in which to develop a common recycling system. Wasteshed boundaries are typically the same as counties (except for the City of Milton-Freewater and Metro). The 1991 Oregon Recycling Act (SB 66) strengthened and broadened recycling requirements and set a statewide recovery goal of 50% by 2000 and established interim recovery goals for individual wastesheds by 1995.

In 2001, DEQ confirmed to legislators that the original watershed goals would not produce a statewide recovery goal of 50%. Some watersheds, particularly large ones, would have to do more to enable the state to meet its goal. This reality was reflected in legislation unanimously passed in 2001 (HB 3744). HB 3744 set a statewide recovery goal of 45% for 2005 and 50% for 2009. In order to help meet the statewide recovery goals, all of the watersheds set new voluntary recovery goals for 2005 and 2009 and submitted plans to DEQ for how they planned to meet their new goals. For watersheds that did not achieve their 2005 or 2009 waste recovery goal, HB 3744 required the watershed to conduct a technical review of existing policies or programs and determine revisions to be implemented to meet the recovery goal.

Tillamook County's goal is 30%, and this goal was not met for 2009 (although at 29.1%, the County did not fall very short). This situation has already been resolved and in 2010 Tillamook County achieved 39.6% recovery (although 6% of the recovery rate is the result of credits being given for waste prevention, reuse and composting programs).

CURRENT ACTIVITIES

A. Waste Prevention

Activities and practices that reduce the amount of wastes that are created are classified as "waste prevention." Waste prevention differs from other waste diversion activities such as recycling and composting because these other methods deal with materials at the end of their useful life.

Waste prevention is the highest priority for solid waste management according to Oregon law. Waste prevention is preferred over recycling and composting because the environmental benefits for waste prevention are typically much greater. All three methods avoid the environmental and economic costs of disposing of the diverted materials as garbage, but waste prevention reaps the added environmental benefits from addressing materials further upstream and avoids the additional expenses for collecting and processing the materials through recycling or composting.

Waste prevention is sometimes associated with reuse because they both reduce waste generation. In this Plan, however, waste prevention and reuse are treated as separate topics. Waste prevention refers to "activities that prevent the generation of solid waste in an environmentally beneficial manner. Waste prevention encompasses using fewer materials (sometimes called "pure" waste prevention), reuse, and on-site management of organic wastes. Recycling, centralized composting, and energy recovery do not prevent waste generation (as defined in Oregon)."⁷

⁷ Oregon Department of Environmental Quality, Waste Prevention Strategy (Dec. 2007).

Oregon Department of Environmental Quality’s December 2007 Waste Prevention Strategy identifies four focus areas for waste prevention: design, construction, remodeling and demolition of buildings; business practices; consumer education; and foundation research and analysis.

In the area of consumer education, the Tillamook County Solid Waste Department provides a substantial amount of education materials to residents about waste prevention, reuse, recycling, composting, and hazardous waste. These include:

- “Waste Wise” newsletter direct mailed to residents
- Website information
- Radio announcements
- Local television network spots
- Local newspaper articles
- Community events
- Primary and secondary school events



Tillamook County receives a 2% credit towards their watershed recovery goals for waste prevention, reuse, and composting activities (6% altogether). For waste prevention, Tillamook County receives credit for education and outreach activities, working with schools to identify opportunities to reduce the amount of waste they are generating, and encouraging the reduction of household hazardous materials being consumed and entering the waste stream.

B. Reuse

Reuse is the second highest priority for solid waste and material management. Like waste prevention, reuse activities avoid the need for processing and transforming materials into new products, thus avoiding the additional energy and other requirements associated with recycling and composting. Reuse also delays and, in some cases, prevents impacts from the resource extraction and manufacturing steps required to produce new products.

There are many reuse activities occurring in Tillamook County. Several of these activities are promoted by the County but are primarily conducted by private and non-profit organizations. These activities include:

- Reuse activities occur at second-hand and thrift shops, charitable organizations that collect clothing and household goods, garage sales, used bookstores, and

through similar activities. One example of this activity is the Wild Flower Boutique in Tillamook, which is operated by the Tillamook County Women's Resource Center. They accept donated items, which are repaired and then offered to customers at prices well below retail. Donations are often picked up. Some larger items, such as appliances, are also refurbished. Other examples include the Hope Chest in Nehalem, Hope Chest Too in Rockaway Beach, Kit & Caboodle in Tillamook, Teen Challenge in Tillamook, New 2 Used in Tillamook, and the Thrift Shop Library in Pacific City.

- The non-profit Re-Store in Bay City (operated by Habitat for Humanity) provides a mechanism for reuse of building materials. A recent 4,000 square foot warehouse addition is now open for use, and allows the Re-Store to take significantly more donated housing and construction material. They also take donations of metal, including scrap metal, copper tubing, aluminum gutters, metal wire, and automobiles.

- CARTM Recycling invests a significant effort into reuse and actively encouraging customers of the Manzanita Transfer Station to divert reusable and recyclable materials. They also accept donations of clean, reusable items in working condition for sale in their store. Staff and volunteers sort, test, price and display donated items. They collect and sell books, building materials, electronics, sporting goods, toys and many other items.



Building material reuse area at Manzanita Transfer Station, photo taken September 12, 2011.

- Private efforts to reuse materials are extensive but can be difficult to document. One example of a private reuse effort is the Tillamook County Creamery Association (TCCA), which directs their used 5-gallon buckets and other items to reuse outlets.

Tillamook County receives a 2% credit towards their wasteshed recovery goals for waste prevention, reuse, and composting activities (6% altogether). For reuse, Tillamook County receives credit for promoting reuse options within the county, encouraging citizens to donate reusable and/or repairable items, and diverting reusable materials at transfer stations.

C. Recycling

“Recycling” refers to the act of collecting and processing materials to return them to a similar use. Recycling does not include materials burned for energy recovery or destroyed through pyrolysis and other high-temperature processes. The State’s definition of recycling is “any process by which solid waste materials are transformed into new products in a manner that the original products may lose their identity” (ORS 459.005).

A network of private-sector recyclers currently serves residents and businesses in Tillamook County. The predominant collection method in the county is drop-off sites, with curbside and commercial services offered in some areas.

Drop-Off Recycling. There are eight drop-off sites located throughout the county. These sites include:

- All three transfer stations, located in Tillamook (TTS), Pacific City (PCTS), and Manzanita (MTS).
- City Sanitary Service, located in Tillamook.
- Four recycling depots (“Recycle Shacks”), located in Rockaway, Garibaldi, Bay City, and Tillamook.

Materials collected at the Recycle Shacks include tin cans, newspaper, magazines, and container glass. City Sanitary and the three transfer stations also take aluminum cans, corrugated cardboard and plastic bottles. In addition, the Manzanita Transfer Station and the Tillamook Transfer Station take yard debris (excluding grass clippings). More details about these sites are provided below, and the materials collected at each are shown in the following table.

Transfer stations: The Tillamook Transfer Station (TTS) is operated by Don G. Averill Recycling. This site accepts a wide variety of self-haul recyclable materials. All recyclables, except woody debris, are accepted free of charge. Averill Recycling accepts yard debris (excluding grass cuttings) and wood waste at the transfer station for a fee. These materials are chipped and used as hog fuel.

The Pacific City Transfer Station (PCTS) is operated by Nestucca Valley Sanitary Service. This site also accepts a variety of recyclable materials at no charge to the customer. Materials collected here are transferred to the Tillamook Transfer Station for transportation to markets.

The Manzanita Transfer Station (MTS) is operated by CARTM Recycling, and they divert as much waste as possible from the incoming stream. CARTM

**Table 15
Materials Collected by Drop-Off Sites in Tillamook County**

	Transfer Stations			City Sanitary	Recycle Shacks			
	Tillamook	Manzanita	Pacific City		Rock-away	Gari-baldi	Bay City	Tillamook
Newspaper	X	X	X	X	X	X	X	X
Glass	X	X	X	X	X	X	X	X
Tin Cans	X	X	X	X	X	X	X	X
Cardboard	X	X	X	X				
Magazines	X	X	X	X	X	X	X	X
Aluminum	X	X	X	X				X
Scrap Metal	X	X	X	X				
Mixed Paper	X	X	X					
Refrigerators	X	X						
Washers/Dryers	X	X	X	X				
Dishwashers	X	X	X	X				
Tires	X	X	X	X				
Motor Oil	X	X	X					
Plastic Bottles	X	X	X	X				
Other Plastics		X						
Batteries	X	X	X	X				
Wood	X	X						
Propane Tanks	X	X						
Medical Sharps				X				
Yard Debris	X	X						

accepts over 30 different materials for recycling, including aseptic containers, berry boxes, books, brown bags, egg cartons, ice cream containers, pet food bags, to-go containers, tofu cartons, bags, bubble wrap, buckets, caps, CD cases, plastic containers 1-7, lawn chairs, milk and juice jugs, plant containers, shrink wrap, toys, water and beer bottles, clear glass jars and bottles, aluminum cans, aluminum foil and baking pans, appliances, copper, ferrous metals, motors, non-ferrous metals, scrap metal, stainless steel, tin cans, cables, cords, electronics, remotes, batteries, corks, ink cartridges, light bulbs, motor oil, rubble, shoes, and vegetable oil. CARTM also accepts yard debris (excluding grass cuttings) and wood waste at the Manzanita Transfer Station for a fee.

City Sanitary Service (CSS): located in the City of Tillamook, CSS provides a recycling center that is open Monday through Saturday. They also provide residential and commercial recycling services (which are discussed in other parts of this document).

Recycle Shacks: There are four recycling depots (drop-off sites) located in the county, including sites in Bay City, Garibaldi, Rockaway, and the City of Tillamook. These sites collect a variety of materials (see Table 15). Collection franchisees are required to maintain and provide service to the Recycle Shacks in their service area.

Although the Recycle Shacks are convenient, these sites also pose some challenges. An ongoing difficulty in the development and maintenance of these and other drop off sites is in the placement of the sites. Recycling drop-off sites can be subject to illegal dumping and may present an eyesore due to litter and related problems. Hence, neighbors and private landowners may object to their presence. New sites can be difficult to locate due to these problems. In recent years, two Recycle Shacks have been closed in Tillamook County because of such problems.



Garibaldi Recycle Shack, photo taken July 14, 2011.

While residents in the southern part of Tillamook County can recycle at the Pacific City Transfer Station, many also use a drop-off center in Lincoln County (the Highway 101 Recycling Center). That site is owned and operated by North Lincoln Sanitary Service. The site accepts many materials for free (primarily materials that they want to keep out of the curbside bins), including glass bottles, scrap metal, non-refrigerated appliances, athletic shoes, cell phones, used cooking oil, compact discs, paint, batteries, e-waste, plastic bags and other film plastics. The site also accepts fluorescent bulbs and tires for a small fee. Appliances containing Freon are accepted for a charge at the Schooner Creek Transfer Station (the fee covers the cost of removing and handling the Freon). Woody debris, tires and construction waste are also accepted for a fee at the Schooner Creek Transfer Station, and reusable construction materials are accepted for free there.

Residential Recycling. Curbside recycling collection services are only available within the City of Tillamook on a subscription basis. Very few Tillamook residents take advantage of this service. The hauler in Tillamook, City Sanitary Service, picks up recyclables that are placed next to a customer's garbage can upon request. Materials collected include glass, newspaper, cardboard, aluminum and tin cans. Glass set out for recycling is sorted by color.

The current design and participation level for the curbside recycling program in Tillamook does not meet the Opportunity to Recycle requirements. The Opportunity to Recycle, as set forth in ORS 459, includes the requirement that every city with a population of 4,000 or more provide on-route collection service for source separated recyclable materials. Oregon Administrative Rule 340-090-0040 further defines the required service levels and provides options for complying. Alternate approaches are allowed in some cases. The City of Tillamook operated under an alternate plan authorized by Oregon DEQ for over a decade in lieu of providing a residential curbside recycling program. In 2011, DEQ determined that the city was neither meeting the requirements of its alternate plan nor providing an adequate residential curbside recycling program. Therefore, DEQ was not able to provide full approval to the watershed's (Tillamook County's) 2011 Opportunity to Recycle Report.

Multi-Family Recycling. The Opportunity to Recycle rules also apply to multi-family (apartment) residents that live in dwellings with five or more units. Each of the eight locations for drop-off recycling is open and available to multi-family residents. City Sanitary Service also provides recycling collection services to many of the apartment complexes in their service area.

Commercial Recycling. Commercial-sector recycling is handled by the franchise haulers, although the County does offer technical assistance services to businesses on request. City Sanitary Service offers recycling services to City of Tillamook businesses and serves an estimated 80% of the businesses in their area. Businesses are also able to recycle their materials at the eight drop-off sites located throughout the County.

The larger businesses in the county recycle a significant amount of materials through their own efforts that are conducted separately from the county system or the services offered by the franchise haulers. Stores such as Safeway and Fred Meyer, for instance, bale their cardboard and "back-haul" it (send it back on the same trucks that deliver retail products to the stores) to their distribution centers to be marketed from there. TCCA similarly recycles cardboard and motor oil.

Construction and Demolition (C&D) Recovery. A significant amount of construction and demolition wood is being collected at TTS, MTS, and through reuse efforts (see previous section on reuse activities). Wood collected at MTS is sent to Trails End Recovery in Warrenton, while the wood from TTS is chipped and sold as hog fuel to a nearby paper mill.

Other Recycling Services. Household batteries, fluorescent light bulbs and motor oil are accepted at the County's Household Hazardous Waste Facility the first Saturday of each month (and other hazardous wastes, see Section F for more details). Electronic waste is collected as part of the Oregon E-Cycles program. Oregon E-Cycle collection sites provide free recycling of computers, monitors and televisions to anyone bringing

seven or fewer items for recycling at one time. Oregon E-Cycles collection sites located in Tillamook County are provided by Don G. Averill Recycling and CARTM Recycling. Oregon residents and businesses can no longer put computers, monitors and TVs in the garbage, or take them to a transfer station or landfill to be thrown away.

Appliances and tires are accepted at the County transfer stations and at a few private locations. The tires that are collected at the Tillamook Transfer Station are sent to Coffin Butte Landfill as a waste material and are not recycled.

A significant amount of recycling occurs through the bottle bill system. Under the current Oregon law, people pay a 5-cent container deposit when they buy beer, soft drinks, water and flavored water in metal, glass and plastic bottles and cans three liters or less in size. They can return the empty containers to stores and receive the 5-cent refund value for each container.

Leftover paint can be returned to stores and other locations to be recycled through a relatively new program in Oregon. The Paint Product Stewardship program rollout did not include Tillamook County, however, and collection convenience and outreach remain a challenge locally. Tillamook County's hazardous waste facility has recently become a PaintCare collection site, although the facility is only open once a month and does not provide the convenience intended by the State legislation (House Bill 3037). The Paint Product Stewardship program has also set up paint return locations near Tillamook County, in Lincoln City, Gearhart, McMinnville, and Portland. The distances to these locations range from 34 to 77 miles for Tillamook County residents to recycle paint. In 2010, the County collected 28,700 pounds of covered paint⁸ and paint related items at the Household Hazardous Waste Collection Events. After opening the hazardous waste facility in October, 2011, Tillamook County collected 34,850 pounds of covered paint and paint related items in the first seven months.

Processing and Marketing of Recyclable Materials. As noted in the *Market Analysis for Recyclable Materials in Tillamook County* (see Attachment E), 77% of the recovered materials collected and handled by the garbage collection franchisees in 2010 were processed, stored, and marketed by Don G. Averill Recycling from the Tillamook Transfer Station (TTS). In other words, TTS is the "de facto" materials recovery facility (MRF) for Tillamook County.

CARTM is the only franchisee that does not utilize TTS for recovery but instead processes and directly markets the materials brought to the Manzanita Transfer Station. This strategy allows CARTM to collect and market a wider variety of materials and to receive payment for those materials.

⁸ Paint that is covered by the Paint Product Stewardship Law includes interior and exterior grades of oil-based and latex paints sold in containers of five gallons and less.

Recycling Outreach and Education. The County provides a website which details transfer station and collection services, as well as other recycling, hazardous waste and medical waste services. The Tillamook County Solid Waste Department also prepares and distributes the “Waste Wise” newsletter semi-annually. Waste Wise brings residents regular news about waste prevention, recycling, composting, and household hazardous waste issues.

Information distributed by the franchise haulers to their customers includes information about recycling. City Sanitary Service, for instance, provides information about recycling to their customers annually and to new customers when they sign up.

Oregon Green Schools is a nonprofit organization that was formed in 1997. There are over 25 regional coordinators throughout the state and nearly 200 participating schools. Tillamook County’s regional coordinator helps schools conduct waste audits, provide guidance and training for new programs and recommend curriculum resources and grant opportunities. Oregon Green Schools is dedicated to helping Oregon Schools set up and maintain effective, permanent waste reduction and resource efficiency programs that improve school environments and communities. There are currently two Tillamook County schools that have received Oregon Green Schools certification (Nestucca High School and Tillamook Junior High School).

D. Composting

Yard debris and food waste are estimated to be almost one-quarter (23.2%, see Table 11) of Tillamook County’s waste stream. There are currently no central composting sites for yard debris in Tillamook County or food waste collection programs available to commercial generators or the general public. There is some local usage of compostable plates and other serviceware, but these materials are simply being landfilled because there is no local composting facility.

Composting activities that are being currently conducted in Tillamook County are discussed below.

Backyard Composting. Backyard composting is promoted on the County’s website and through distribution of brochures. The City of Tillamook also distributes information on backyard composting. Composting bins (“Earth Machines”) are sold by the County at cost and are also available at CARTM Recycling.

Other Waste Prevention Activities for Organics. Edible food can be donated to food banks or distributed through informal channels. Food that is not fit for human consumption can be used as animal feed, which is what one local manufacturer is doing (in that case, the food is being provided to a mink farm).

Yard Debris. Yard debris and wood waste is collected at two transfer stations, the Tillamook Transfer Station (TTS) and the Manzanita Transfer Station (MTS). These materials are chipped and sold as hog fuel.

Other On-Site Composting. Tillamook Junior High School students have taken responsibility for composting through “Food Roots,” an organization that promotes local food production and food security. Students learn the benefits of composting by maintaining a composting unit adjacent to the greenhouse at the Tillamook Junior High School. Students use this for the vegetative wastes from the greenhouse and for food scraps and leftover salad makings from the school cafeteria. Students are responsible for collecting the food waste daily and placing it on the compost pile. They also compost yard waste such as leaves, weeds, and grass clippings.

Food Roots is a not-for-profit (501c3) organization. They rely on donations and volunteer assistance to conduct programs such as:

- Community and school gardens
- Education and community outreach
- Community development and economic
- Micro-enterprise development

Composting demonstration sites are provided at several locations by the Master Gardeners, in some cases in concert with community gardens maintained by Food Roots. Compost demonstration sites are located at the Manzanita Transfer Station, Tillamook Junior High School, Camp Magruder, Alder Creek Farm, the Tillamook County Fairgrounds, and at Sacred Heart Community Garden.

Tillamook County receives a 2% credit towards their wasteshed recovery goal for composting activities. Tillamook County receives this credit for promoting the environmental benefits of composting, making composters available to the public, and encouraging composting in local schools and community gardens.

E. Resource Recovery

The term “resource recovery” has had many different meanings over the years. In the past, the term has been used by many people to refer to waste-to-energy systems, in part because these systems have often had a recycling element (such as metals recovery). More recently, the term “conversion technologies” has become more widespread and is being used to distinguish between processes that recover products and fuels from waste, versus waste-to-energy systems that primarily incinerate wastes to produce heat and electricity. Conversion technologies are of significant interest due

to their potential to create a wider array of products, including liquid fuels, electricity, heat, chemicals and other products. In this Plan, the term “resource recovery” is being used as a broad term that encompasses both waste-to-energy and conversion technologies.

Current resource recovery activities in Tillamook County include the diversion of wood waste to a local paper mill (Hampton Lumber Company) for hog fuel. The diversion of wood waste is occurring from the Tillamook Transfer Station, although the paper mill also purchases hog fuel from other sources. Another local activity is the anaerobic digestion of animal manure by the Hooley Digester, located at the Port of Tillamook Bay. Although animal manure is defined as an agricultural waste and is exempt from solid waste regulations, there is some interest in expanding this plant or constructing another facility to include food scraps and other organic wastes.

There are few resource recovery facilities located in Oregon. The only waste-to-energy facility operating for solid waste is in Marion County, although there are also a number of smaller incinerators being operated for various special waste streams. There was a solid waste incinerator operating in Coos County (the Beaver Hill Incinerator), but without energy recovery (and hence it was not classified as a “resource recovery” facility). In early 2012, the Beaver Hill Incinerator was shut down by a mechanical systems failure, and it might not be reopened due to the expense of the repairs. For those types of facilities defined as conversion technology, there are currently 21 facilities that are being operated, constructed or that are in the planning stages in Oregon (as of October 2011⁹).

Tillamook County BioEnergy Feasibility Study. A workgroup was established to obtain funding for the purpose of investigating issues related to the disposal of animal mortalities in Tillamook County. A 2007 Oregon Solutions project studied the economic and public health impacts of closure of the state’s last two rendering plants, establishing a useful piece as background for this study. The Tillamook County Bioenergy Feasibility Study expanded on prior research and developed strategies related to alternatives to the disposal of animal mortalities through anaerobic digestion (AD). The Feasibility Study also examined alternatives to the disposal of other municipal solid waste streams (MSW), including institutional food waste.

The results of the Bioenergy Feasibility Study were economically and environmentally favorable. The study concluded that sufficient feedstock is available, mortalities can be successfully addressed and managed, AD and composting are proven technologies, and saleable products would be generated. The project would create jobs, reduce carbon and odors, offer a net environmental benefit, as well as mitigating the risk associated with

⁹ From “Waste Trends and Recovery Potential” by Peter Spendelow and Bob Barrows, DEQ, November 10, 2011.

taking no action. The study offers three scenarios, including combined heat and power systems (CHP) and compressed natural gas (CNG) options; two of which are cash flow positive. Tetra Tech, Inc., the consultants that conducted the study, recommended proceeding with a CNG project based upon favorable returns.

F. Hazardous Wastes

Businesses and organizations using products that are corrosive, ignitable, reactive or toxic often generate hazardous waste. Entities that frequently generate hazardous waste include:

- construction and painting contractors
- printers
- equipment repair shops
- laboratories
- dry cleaners
- metal manufacturing operations
- vehicle maintenance and auto body shops

Hazardous waste generator status, as determined by the federal Resource Conservation and Recovery Act (RCRA), includes the following possibilities:

- Conditionally Exempt Generators (CEGs), which generate 220 pounds or less of hazardous wastes per month or 2.2 pounds or less of acute hazardous waste per month;
- Small Quantity Generators (SQGs), which generate between 220 and 2,200 pounds per month of hazardous wastes; and
- Large Quantity Generators (LQGs), which generate hazardous wastes in greater amounts.

A number of private companies provide hazardous waste management services to SQGs and LQGs. DEQ publishes a list of these companies on their website. DEQ regulates the handling of SQG and LQG hazardous waste management, reporting, and transporting.

The household hazardous waste collection facility at the Tillamook Transfer Station accepts materials from businesses (CEGs) and households. Household hazardous waste collection events are held monthly and CEG collections are held semi-annually by appointment only.

G. Waste Pharmaceuticals and Sharps Disposal

Pharmaceuticals are collected in coordination with the Tillamook County Sheriff's Office. The County previously held annual collection events in cooperation with the Drug Enforcement Administration (DEA). In 2012, a permanent collection box was placed at the Tillamook County Sheriff's Office for residents to safely and properly dispose of unused and expired prescription and over-the-counter medications. Several police departments within the County are also participating in the collection. It has been shown that prescription drug abuse is increasing. Unused and expired prescription and over the counter medications pose a significant threat to human health, public safety and the environment.

City Sanitary Service (CSS) accepts syringes for a fee at their office in Tillamook. These syringes must be in a proper container, which can be obtained from the local drugstore. CSS also sells boxes for syringes, and the fee for the box includes disposal charges. WOW collects sharps once per month in their service area, through a service that includes the container with the disposal cost. Customers can also purchase and then return sharps containers at the Fred Meyer pharmacy in Tillamook.

SERVICE GAPS AND OPPORTUNITIES

A. Waste Prevention

In reviewing the DEQ's Waste Prevention Strategy mentioned earlier (see Current Activities, Waste Prevention), Tillamook County could potentially increase their efforts in two areas: remodeling/deconstruction of buildings and business practices. In the other focus areas for waste prevention, Tillamook County could continue to rely on the State to take the lead for design and construction of buildings, large-scale business practices, and foundation research and analysis. In the final focus area, consumer education, Tillamook County is already conducting a wide variety of activities.

B. Reuse

CARTM would like to do a route for reusable materials, but may have to charge for that service. It was previously thought that this would not be allowed by current franchise ordinances, but a review of this idea as part of this solid waste plan concluded that they can do it without violating franchise rules since the reusables are not defined as waste.

Other opportunities for reuse could include encouraging more diversion of reusable building materials, increasing promotion of the reuse and repair network in Tillamook County, and creating a reuse shelf at the HHW facility for reusable items.

C. Recycling

The distance to recycling markets is a concern for Tillamook County. In addition, there are challenges with the low value of glass and the significant distance to markets for this material especially. DEQ has supported “highest and best use” for recyclable materials, but has sometimes allowed more distant collectors to use glass in landfill applications. A local application for crushed glass or glass bottles might provide a more cost-effective market. A local MRF or re-load facility could help make recycling more cost-effective, although there is some feeling locally that a MRF could also limit the variety of materials that could be recycled since it would need to be designed to handle specific materials.

Curbside recycling is offered in the City of Tillamook but participation is very low. Residents must subscribe and then set out materials in paper bags. Providing recycling carts or other containers would help by making the program more convenient and attractive. Garbage collection is not mandatory in the City of Tillamook and recycling service is only available to garbage customers (only about 60% of the residents subscribe to garbage collection in the City). Upgrading the curbside services in the City of Tillamook may lead to demand for this service in other areas of Tillamook County. Western Oregon Waste recently received approval to begin curbside recycling in the rural areas of Yamhill County.

Instituting curbside recycling services in Tillamook County (or expanding the participation rate in the case of the City of Tillamook) could lead to significant additional costs for the franchise haulers to purchase new trucks and possibly recycling containers. If this is pursued, approaches that allow them to use existing equipment or to share equipment would help make curbside service more cost-effective.

The franchise system, and related state laws and county ordinances, is a significant barrier to recycling in Tillamook County. The current county ordinance requires that recycling services be offered for free or provide a payment to the generator (state law only requires that recycling services charge less than garbage collection). This creates a requirement that the franchise haulers must handle the less-profitable materials and blocks other recycling services that would need to charge to collect those materials. It is especially a problem for materials such as C&D wastes, which can be recycled but require processing and other expenses such that these materials generally do not “pay for themselves.”

Tires from TTS could be recycled. This material is currently landfilled. In 2010, this would have meant an additional 61.5 tons of materials recycled.

The Recycle Shacks are valuable for providing a local opportunity to recycle, but are problematic and expensive to maintain. For instance, OSS has calculated that they

could provide curbside service for what it would cost to maintain a Recycle Shack in their area.

CARTM feels that a commercial cardboard route is needed in Manzanita and Nehalem (at least on Tuesdays and Wednesdays, when their site is closed).

Hours at MTS/CARTM are a problem for some, especially for seasonal visitors that may not be aware of the hours or may not have flexible schedules (i.e., they can't come back when site is open if they are leaving that day).

The minimum fee for waste loads at TTS (for up to 400 pounds) and the similar fee at PCTS (based on volume) is a disincentive for recycling. The lower minimum fee at the Manzanita Transfer Station (implemented in June 2012) provides greater incentive for the customers to reduce the amount of waste disposed as much as possible. CARTM encourages people in their area to self-haul their waste to the Manzanita Transfer Station because this provides an opportunity for them to recycle. With the current rate structure at TTS and PCTS, however, self-hauling may have the opposite result.

The product stewardship program for paint is not working well for Tillamook County due to the lack of a local business interested in handling it. CARTM is interested, but some problems are preventing them from handling paint. CARTM would like to re-mix and sell paint.

D. Composting

The lack of local processing options for yard debris, especially grass clippings, could be a service gap. There are currently only two drop-off points (Tillamook and Manzanita transfer stations) for woody yard debris. There does not appear to be much yard debris in the waste stream for Tillamook County, and much of this material is handled through backyard composting or through other informal methods (such as neighbors that garden taking it from other neighbors). The franchise haulers do sometimes receive large amounts of brush or similar materials from homes that are doing extensive landscaping, and may charge more for large amounts. There are also reports that not all of the yard debris is being handled properly. There are reports of yard debris being dumped in forests, waterways, and other inappropriate locations.

Separate collection of food waste would address this material, which is the largest remaining material in waste stream, but Tillamook County would need a local facility to process this material. Food waste collection from residential customers would be expensive and pose other problems, but food waste collections from large commercial generators (such as restaurants and grocery stores) could be done much more cost-effectively.

A local site for composting yard debris and food could provide important capabilities. Currently, the closest composting facility that can handle food scraps is in Corvallis.

Local farms and nurseries could use more of the compost generated by the Hooley digester, but the digester is receiving a better price for this material from a large nursery operation in the Willamette Valley. The Hooley Digester does sell to local users, but demand is limited by the market price of \$16 per cubic yard. Some compost is also being produced and sold locally by others, as part of “3-way” mix and other products.

Rates at MTS and TTS could be lower for clean wood, this would provide a greater incentive for customers to keep it separate and thus divert more of this material.

There is a large amount of logyard waste at the Port, approximately 1.2 million cubic yards of it. Although classified as an industrial waste and not as a solid waste, this material could present an opportunity for a composting system for food scraps or for combined management of other waste streams. There is some interest locally in mining this deposit for the organics and also to separate and market the rocks.

E. Resource Recovery

Expansion of the Hooley Digester or a new anaerobic digester to handle animal mortalities could also provide an option for food scraps.

There is some local interest in using plastics-to-fuel technology to handle large volumes of hard-to-recycle waste plastics, but the net value of this approach has been questioned by DEQ.

F. Hazardous Wastes

Additional promotion and public education on reducing hazardous waste quantities could decrease the cost of operating the HHW facility, and also lead to a healthier environment, less human exposure to toxic materials, and other benefits.

OPTIONS

The following options have been identified through the process of evaluating the solid waste system in Tillamook County. These options address existing service gaps or potential improvements in the county’s solid waste system. It should be noted, however, that not every option shown below is feasible or cost-effective. Options are listed below if they appear to have some potential, but the next steps of the planning

process will evaluate these further to determine if the options merit additional consideration. In other words, the mere presence of an option in the list below should not be taken as an indication that Tillamook County believes that it is an option worth pursuing.

The following options are organized according to the service gap or potential system improvement that is addressed.

A. Waste Prevention

For the two areas where Tillamook County could potentially increase their waste prevention efforts, the following programs could be considered.

1. Promote Salvage and Reuse of Building Materials: Remodeling and deconstruction activities (dismantling buildings to salvage reusable materials and products) can be conducted to avoid creating wastes. Construction activities in Tillamook County have decreased in the past few years with the downturn in the economy. Hence, there is less activity going on currently in demolition and construction, but that might mean that this is also an opportune time to develop a new approach or revise existing programs and policies. In the area of construction and demolition, Tillamook County and the cities could promote deconstruction activities as opposed to demolition, and possibly create an incentivized permit fee structure. The possible benefits of this approach could be significant in terms of fewer tons of waste generated. The costs of this approach could be limited to staff time (to meet and discuss possible approaches and then implement those), plus a small amount of costs for outreach materials.

2. Business Outreach and Education: More could be done in Tillamook County to encourage businesses to generate less waste. Additional outreach and/or technical assistance to the business community for waste prevention could encourage activities such as paper waste reduction (e.g. double-sided printing, electronic filing), providing reusable coffee cups for employees and customers, green purchasing specifications and green service contracts, education to food-waste generating businesses on reducing the wasting of food, and many other practices. The benefits of this approach would be realized in small increments (in other words, any one activity would provide only a small amount of benefit), but all prevention activities generally have a broad range of economic and environmental benefits. The cost for this option would be staff time and some expense for outreach materials and other supplies. This approach may require a significant investment to be effective, possibly up to one-quarter of an employee's time (0.25 FTE).

B. Reuse

Options that address the service gaps for reuse are described below.

1. Increased Promotion of Reuse: One option that could be considered for reuse is conducting more promotion and public education to encourage residents and businesses to make use of existing reuse options in Tillamook County (such as outlets for used clothing, charities, etc.), including options for building material reuse (such as Habitat for Humanity). This option would only require a small amount of staff time and some expense for outreach materials, although it should be kept in mind that adding to the current workload for county staff might mean the cancellation of one or more of the existing activities.

2. Reuse Shelf or Shed at HHW Facility: Many of the HHW facilities in Oregon and Washington have a mechanism where potentially-usable products that are dropped off by one customer can be taken and used by another customer. A separate area (either shelves or a stand-alone shed) would need to be constructed for this, at a cost of anywhere from \$500 to \$5,000 (or higher for the installed price of a simple shed). Policies would need to be established for the use of this area, such as avoiding materials that are highly toxic or of suspect quality, and possibly limiting the amount that any one person can take (to prevent hoarding and stockpiling issues). Liability concerns would also need to be addressed, although other facilities have not had significant problems with this (participants who take materials can be asked to sign waivers, while donors can be asked to sign a form attesting to the identity of the material). The cost of this option could potentially be offset in a few years through lower disposal fees.

C. Recycling

The recycling options can be grouped by type of activity: drop-off, curbside collection, processing, and market issues.

1. Recycling Drop-Off Options: Recycling drop-off sites can be convenient locations for residents and businesses to use for recycling, but drop-off sites also have significant limitations. Unstaffed sites are subject to illegal dumping of unrecyclable materials and a host of related problems. TSS, PCTS, CSS and CARTM provide staffed drop-off sites, but the Recycle Shacks are not staffed. Drop-off sites can also be limited in the amount and types of materials than can be collected. CARTM is an exception in this case, as they collect a wider variety of materials than are collected through other methods, although CARTM's approach also requires a significant amount of labor supported in part by volunteers, plus the facilities and equipment to support their activities, and this approach may be difficult to duplicate to other locations.

Possible options to improve or otherwise change the system of Recycle Shacks used in Tillamook County include (shown in no particular order):

- a. The Recycle Shacks could be closed altogether and curbside recycling service implemented instead. One of the franchised haulers in Tillamook County (OSS) calculated that they could provide curbside service for what it costs to maintain a Recycle Shack in their area. It should be noted that even with curbside service, drop-off sites provide a valuable option for people that miss their collections or for other reasons (although the three transfer stations can provide that option).
- b. The County could require regular hours at the Manzanita Transfer Station (MTS). MTS is not open on Tuesdays and Wednesdays, whereas the Tillamook Transfer Station is open seven days per week. The Pacific City Transfer Station (PCTS) is only open two days per week, but this has not been identified as a problem like it has for MTS. The hours at MTS have been identified as a problem for some, especially for seasonal visitors that may not be aware of the hours or may not have flexible schedules (i.e., they can't come back when the site is open if they are leaving that day).
- c. The County could change minimum fees for waste loads at transfer stations to encourage recycling. The minimum fee for waste loads at TTS, for up to 400 pounds, and PCTS (\$17.00) could be acting as a disincentive for recycling for some customers. If the minimum fee was set for a lower amount of waste (200 pounds or less at TTS, and the equivalent volume at PCTS), people would have greater incentive to reduce the amount of waste they are disposing.

2. Recycling Collection Options: A limited amount of curbside recycling service is provided in Tillamook County, but interest has been increasing recently in providing curbside recycling in additional areas. Possible options for curbside recycling in Tillamook County include:

- a. The recycling program in the City of Tillamook could be improved in several ways, which would lead to a better participation rate. The City and City Sanitary Service (CSS) could work cooperatively to promote recycling and meet DEQ requirements. CSS or the City of Tillamook could provide recycling carts or other containers for curbside collection in Tillamook, which would make the program more convenient and attractive. This might lead to the need to charge for this service, at a level of about \$5.00 per household (see the cost analysis in Table 16). Subscribers could be informed that they can possibly reduce their garbage service level if they recycle, thus offsetting this additional cost. If the use of carts led to a commingled program, then CSS would also need access to a re-load or processing facility that could accept that material. Residents could also be allowed to subscribe to recycling only.

Table 16: Curbside Recycling Costs

Cost Factor	Cost for 300 Customers	Cost for 1,400 Customers
Labor Expense	\$10,630	\$39,684
Truck and Operations Expense	\$6,689	\$24,970
Recycling	\$3,967	\$11,914
Overhead and Allocated Expenses	\$2,457	\$9,173
Total	\$23,743	\$85,742
Cost per Customer per Month	\$6.60	\$5.10

- b. Additional haulers and cities in Tillamook County could institute curbside recycling services in areas where it is desired. This would lead to additional costs for the franchised haulers to operate a separate route, purchase recycling containers, and for other expenses. If the recycling program is commingled, then existing trucks could be used and the cost of purchasing new trucks could be avoided.

A cost analysis for curbside recycling is summarized in Table 16. Most of the costs for the recycling program are variable (i.e., the costs depend on the number of customers and the amount of recyclables collected) but some of the costs are fixed, so the cost analysis shows the costs for programs serving 300 customers and 1,400 customers. The costs shown in Table 16 assume the use of existing (waste collection) trucks for the collection of commingled recyclables. The costs assume that carts would be provided to all customers, and that the costs of these carts would be amortized over five years at an 8% interest rate. The cost analysis also assumes that the collection company would transport the recyclables to a market in the Portland area. The costs shown for “Recycling” are the cost for the carts and for transporting materials to the Portland area, minus the savings in disposal fees. All of the costs shown in Table 16, except the per customer figures, are annual costs.

- c. The County could modify Solid Waste Ordinance #4 to encourage recycling. The franchise system is a significant barrier to recycling in Tillamook County. The current county ordinance requires that recycling services be offered for free or provide a payment to the generator (state law only requires that recycling services charge less than garbage collection). This creates a requirement that the franchised haulers must handle the less-profitable materials and blocks other recycling services that would need to charge to collect those materials. This is

especially a problem for recycling C&D materials, which generally do not “pay for themselves” due to high processing costs.

- d. Other service-providers could be allowed to conduct recycling collections, whether through contract with the County, contract with the franchised haulers, or other approaches. For instance, CARTM feels that a commercial cardboard route is needed in Manzanita and Nehalem (at least on Tuesdays and Wednesdays, when MTS is closed).

3. Recycling Processing Options: Recyclables collected in Tillamook County are currently transferred to processors and markets without being processed to a great extent (some materials are baled or compacted); raising the question that local processing may improve the marketability or market value of the recyclable materials. Possible options for recycling processing in Tillamook County include:

- a. The franchised haulers or the County could develop a local Material Recovery Facility (MRF) or a re-load facility that could help make recycling more cost-effective. Members of CARTM have expressed concern that a MRF could also limit the variety of materials that could be recycled.
- b. The franchised haulers could consider building a re-load facility located at the Port or elsewhere to transfer recyclables collected by new curbside services. If a re-load facility was developed at a new site, instead of at an existing transfer station, there would be significant expense for site development, equipment, permitting, and other costs.
- c. One or more of the existing transfer stations could be modified to add re-load capabilities. The expenses associated with this approach could include additional equipment and site development costs, but this approach could be implemented at a much lower cost than constructing a re-load facility at a new site.

4. Recycling Market Options: The distance to recycling markets is a serious issue for Tillamook County. In addition, there is a widespread belief that DEQ requires “highest and best use” for recyclable materials, which leads to local collectors feeling that they are forced to haul materials to specific markets (such as glass going to Owens Brockway in Portland) despite the fact that this is not cost-effective. Possible options for recycling markets in Tillamook County include:

- a. Tillamook County could encourage local applications for glass which may provide a more cost-effective market. A few areas have responded to poor glass markets by landfilling the glass, although obviously this is not a preferred approach and is generally not allowed by DEQ. Local market opportunities

could include using crushed glass (cullet) for park pathways, other landscaping applications, and backfilling and marking utility trenches.

- b. The County could encourage recycling of tires from the transfer stations. If tires from TTS were recycled, this would have meant an additional 61.5 tons of materials recycled in 2010.

D. Organics

There are two primary organic materials of interest to this Plan: yard debris and food waste. Options are separately described for each of these materials below, although in some cases these materials could be handled through the same or similar systems.

1. Yard Debris: There does not appear to be much yard debris in the waste stream for Tillamook County, but there are significant amounts being burned and being dumped in forests and waterways. Yard debris is also handled through backyard composting or through other informal methods (such as neighbors that have gardens taking it from other neighbors). Possible options for yard debris in Tillamook County include:

- a. The County could increase drop-off points for yard debris. Yard debris collection is currently only provided at two drop-off points (the Tillamook and Manzanita transfer stations). In addition, CARTM may be interested in processing yard debris at MTS, but for now it is being taken off-site by Trails End.
- b. The County or the franchised haulers could collect more woody debris by expanding collection sites. This could be part of a campaign to encourage people not to dispose of this material through backyard burning.
- c. Tillamook County could research the need for separate yard debris collection. The franchised haulers do sometimes see a load of brush or similar materials, and in some cases charge more for large amounts, and there are reported incidents of yard debris being dumped in forests and waterways. The extent to which this is occurring could be investigated more, including the areas and time periods that this occurs, to determine if an alternative collection method is necessary.
- d. The County could explore the potential for anaerobic digestion (AD) facilities to accept yard debris.
- e. The County could encourage local distribution of compost to farms and nurseries. Local farm and nurseries could use more of the compost generated by

the Hooley digester, but the digester is receiving a better price for this material from a large nursery operation in the Willamette Valley. The Hooley Digester does sell to local users, but demand is limited by the market price of \$16 per cubic yard. Some compost is also being produced and sold locally by others, as part of “3-way” mix.

- f. The transfer stations could charge less for different types of wood. Rates at MTS and TTS could be lower for clean wood, and this would provide a greater incentive for customers to keep it separate and thus divert more of this material.

2. Food Waste: Food waste represents a significant amount of material in the waste stream, amounting to an estimated 15.9% or 3,558 tons (based on 2010 waste tonnages). This is also a material that could be processed and used locally, although significant challenges exist in the collection and handling of it. On the other hand, handling food waste separately may make the remaining garbage easier to handle and less prone to vector and odor issues. Possible options for food waste in Tillamook County include:

- a. The County could set up a residential curbside food waste collection program. Food waste collection from residential customers could be expensive and may pose other problems.
- b. The franchised haulers could institute food waste collection from commercial generators. Food waste collections from large commercial generators (such as food processors, institutions, restaurants and grocery stores) could be done relatively cost-effectively (i.e., relative to collection from residential sources).
- c. The County could consider development of a food waste composting facility. Currently, the closest composting facilities that can handle food scraps are in the Portland area.
- d. The County and/or franchised haulers could encourage diversion of food waste to existing and future anaerobic digestion systems.
- e. The County and others could continue to encourage home composting.

E. Resource Recovery

Currently, resource recovery activities in Tillamook County are being used only for agricultural waste (cow manure). Waste-to-energy systems for solid waste are not widely used, with only one such facility operating in Oregon at this time (the Marion County incinerator). These facilities generally require larger volumes of waste (larger than Tillamook County’s waste stream) to be cost-effective. There is increasing interest

in a variety of “waste conversion” technologies that could hold substantial promise for smaller, local facilities that would generate energy and/or various products from solid waste, but most of these are still in the experimental stage.

Resource recovery options for Tillamook County are shown below.

1. New Anaerobic Digester: The County or a private company could develop a new anaerobic digester to handle food scraps, animal mortalities and possibly other materials.

2. Plastics-to-Fuel: The County could assist or encourage local businesses to explore the possibility of plastics to fuel. There is some local interest in plastics-to-fuel, although the net value of this approach has been questioned by DEQ.

F. Hazardous Wastes

The recent opening of the HHW Facility has significantly improved the system for collecting and properly disposing of hazardous wastes in Tillamook County. A few refinements are still possible, however, as described below.

1. Increase Education and Promotion for Proper Disposal of HHW: Increasing the amount and frequency of promotion and public education would help divert more household hazardous wastes (HHW) from the waste stream and to the HHW Facility. There is, however, likely a point of diminishing returns for the amount of HHW that can be diverted, regardless of how much publicity is conducted.

2. Survey CEG Customers about Increased Collections: The HHW Facility at the Tillamook Transfer Station takes materials from businesses (conditionally exempt small quantity generators), but currently the CEG collections are conducted semi-annually by appointment only. Increasing the frequency of these collections could potentially lead to better disposal of hazardous wastes from businesses. Methods could be explored to make this service more convenient, but the first step should be a survey of the existing CEG customers to assess their needs and interests.

3. CARTM to Implement Paint Recycling: CARTM is interested in collecting latex paint and then re-mixing and selling the usable paint, as well as recycling the paint cans, but some issues have prevented them from implementing this. The primary issue is the lack of a sewer line at this facility, which prevents them from being able to wash and recycle the paint cans. The County could work with CARTM to help address this and other issues.

G. Other

Other options for the solid waste system in Tillamook County could include:

1. Moving to a Materials Management System as an Educational Strategy: The County could consider researching the application of the materials management approach by reviewing how other counties are addressing it. It is somewhat challenging to apply this approach on a local level because many of the potential solutions are state, national, or global in scale. Activities that can be done locally include greater emphasis and more education on waste prevention and reuse, since activities that reuse products or that reduce demand for new products are effective materials management approaches. Another way that a materials management approach can be applied locally is through the use of “best management practices” that clarify the preferred method for reducing or diverting materials from the waste stream. These practices could take into account the life cycle impacts of specific materials and products. The best approach on a local level could be to use the principles of materials management to educate residents and businesses on the impacts of consumption habits.

Evaluation of Options

The above options can be evaluated according to the following criteria:

- **Consistency with the solid waste hierarchy:** The hierarchy is discussed in other parts of this Plan, but for reference the solid waste hierarchy is: reduce the amount of waste generated; reuse materials for their original intended use; recycle what can't be reused; compost what can't be reused or recycled; recover energy from what cannot be reused, recycled or composted; and dispose of residuals safely. The food waste hierarchy is somewhat different: source reduction, feeding hungry people, feeding animals, industrial uses (provide fats for rendering or fuel and food discards for animal feed production), composting, and landfill/incineration.

A high rating (H) for this criteria means that the option supports the higher goals of the hierarchy, a medium rating (M) means that the option is relatively neutral to achieving the goals of the hierarchy, and a low rating (L) means that the option is contrary to achieving the goals of the hierarchy.

- **Diversion potential:** This factor is an attempt to measure not only the amount of material that could be prevented or recycled by a specific option, but other factors such as participation rate as well. For hazardous waste options, this criteria is intended to address how well the specific option leads to the proper disposal of the waste.

A high rating (H) for this criteria means that there is a high potential for increased recovery or for proper handling of wastes, a low rating (L) means that there is low potential for these, and a medium rating (M) means that the option falls somewhere between the high and low levels or that the option is neutral with respect to this criteria.

- **Cost-effectiveness:** This is a measure of the total cost for a specific option compared to the amount of material that the option addresses, generally compared to the cost for the current handling/ disposal system.

A high rating (H) for this criteria means that the option is projected to be cost-effective, a low rating (L) means that the option is not expected to be cost-effective, and a medium rating (M) means that the option is medium in terms of cost-effectiveness or that this factor does not apply very well to the option.

- **SWAC support:** This criteria shows the degree to which the SWAC members agreed to support a specific option. These ratings were determined through a consensus process at a special meeting of the SWAC on August 14, 2012.
- **Overall rating:** The overall rating is based on the ratings for the four other criteria. A high (H), and in some cases a medium (M), rating means that the option may merit further consideration as a recommendation, whereas a low (L) rating generally means that the option does not merit further consideration (although in some cases a low-rated option could be improved through modifications or could be applied in limited circumstances).

Table 17: Evaluation of the Waste Diversion Options

Option	Consistency with SW Hierarchy	Diversion Potential	Cost Effectiveness	SWAC Support	Overall Rating
A. Waste Prevention					
1. Promote salvage and reuse of building materials	H	H	H	H	H
2. Business outreach and education	H	L	M	M	M
B. Reuse					
1. Increased promotion for reuse	H	M	M	H	H
2. Examine feasibility of reuse shelf or shed at HHW Facility	H	L	H	M	M

H – High

M – Medium

L – Low

Table 17, Evaluation of the Waste Diversion Options, continued

Option	Consistency with SW Hierarchy	Diversion Potential	Cost Effectiveness	SWAC Support	Overall Rating
C. Recycling					
Recycling Drop-Off Options					
1a. Close the Recycle Shacks	L	L	M		L
1b. Expand hours at MTS	M	M	L	L	M
1c. Change minimum fees at TTS, PCTS	M	H	H	H	H
Recycling Collection Options					
2a. CSS and City of Tillamook to work cooperatively to meet DEQ requirements	H	H	M	H	H
2b. Begin curbside recycling in other areas	H	H	M	H	H
2c. Modify County ordinance to allow non-franchisees to charge for recycling services	M	M	M	L	L*
2d. Contracts for non-franchisees to collect recyclables	M	H	L	L	L*
Recycling Processing Options					
3a. Haulers to develop local MRF	M	M	L	L	L*
3b. Haulers to develop a new facility for re-loading recyclables	M	M	L	L	L
3c. Implement re-loading at transfer station(s)	M	M	H	H	H
Recycling Market Options					
4a. Find local applications for glass	M	M	H	M	M
4b. Encourage recycling of tires from transfer stations	H	H	M	M	M
D. Organics					
Yard Debris Options					
1a. More drop-off sites	H	M	M	M	M
1b. Expanded collection of woody debris	H	M	M	M	M

H – High

M – Medium

L – Low

* Option is not currently feasible.

Table 17, Evaluation of the Waste Diversion Options, continued

Option	Consistency with SW Hierarchy	Diversion Potential	Cost Effectiveness	SWAC Support	Overall Rating
Yard Debris Options, continued					
1c. Research potential solution for separate yard debris collection	H	M	M	H	H
1d. Explore potential for AD facility to accept yard debris	M	M	H	H	H
1e. Encourage local distribution of compost	M	M	M	M	M
1f. Reduce rates for wood	M	H	H	M	M
Food Waste Options					
2a. Residential curbside collection for food waste	M	H	L	L	L
2b. Collect food waste from commercial sources	M	H	L	M	M
2c. Develop a local composting facility for food waste	M	M	L	M	M
2d. Use anaerobic digesters for food waste	M	H	M	H	H
2e. Continue to promote home composting	H	M	H	H	H
E. Resource Recovery					
1. Develop a new anaerobic digester	M	H	M	M	M
2. Explore plastics-to-fuel options	M	M	L	L	L
F. Hazardous Waste					
1. Increased promotion for proper handling of HHW	H	H	M	M	H
2. Survey CEG customers about increased collections	H	H	L	M	H
3. CARTM to recycle paint	H	H	M	M	M
G. Other Options					
1. Move to a materials management system as an educational strategy	H	M	M	H	H

H – High

M – Medium

L – Low

RECOMMENDATIONS

The following recommendations are being made by this Plan for waste diversion activities. Recommendations for waste collection, transfer and disposal are shown at the end of Section Four, and administrative recommendations are shown at the end of Section Five. The timeline and other important details for all of the recommendations are shown in Section Six of this Plan. The recommendations are numbered to make it easier to refer to them, with an abbreviation for the level of priority (H, M or L), and this numbering system is continued in Sections Four and Five. The recommendations were ranked in priority by the SWAC at the August 14 workshop, and are shown below in the same order as the discussions in previous parts of this Plan (with education shown first, followed by waste prevention, reuse, recycling, organics, resource recovery, hazardous wastes, and other). Most of the options that were rated “low” in the above table are not being moved forward as a recommendation.

High-Priority Recommendations

- H1) Education activities should be continued or expanded, with a special focus on the following activities:
- Outreach and education should be conducted to businesses to promote green business practices consistent with solid waste hierarchy.
 - Promotion of reuse options should be increased.
 - Promotion of home composting for yard debris and food waste should be continued.
 - Education and promotion for proper handling of household hazardous waste (HHW) should be expanded.
 - Tillamook County should move to a materials management system as an educational strategy.
- H2) Salvage and deconstruction activities for buildings and infrastructure should be promoted.
- H3) City Sanitary Service and the City of Tillamook should work together to improve the recycling program in Tillamook and to meet DEQ requirements.
- H4) Curbside recycling in other areas, if desired, should be implemented. This will need to be accompanied by the implementation of re-loading capabilities at one or more of the transfer stations.

- H5) Consider lowering the minimum weight at TTS and PCTS to promote recycling, and review these fees annually.
- H6) Research potential solutions for separate yard debris collection and processing, including code enforcement for mismanaged materials.
- H7) Explore the potential for anaerobic digesters (primarily the Hooley Digester) to accept yard debris.
- H8) Explore the possibility of processing food waste at the Hooley Digester and other anaerobic digesters.
- H9) Conduct a survey of CEGs to determine if additional collection events would be a beneficial approach.

Medium-Priority Recommendations

- M1) Examine the possibility of a reuse shelf or shed at the HHW facility.
- M2) Find local recycling applications for glass.
- M3) Encourage transfer stations to recycle tires.
- M4) Implement a reduced rate for clean and separated loads of wood.
- M5) Food waste should be collected from commercial sources.
- M6) A new anaerobic digester should be developed to handle food waste and animal mortalities.
- M7) Tillamook County should help CARTM develop a system to recycle latex paint.

Low-Priority Recommendations

- L1) Close the recycle shacks, either on the basis of problems occurring or in the future if usage drops due to the implementation of curbside recycling.
- L2) Expand the collection of woody debris and green waste.

SECTION FOUR COLLECTION, TRANSFER AND DISPOSAL

INTRODUCTION

This section discusses existing programs for waste collection, transfer and disposal. Much of this section was initially shown in the *Collection and Disposal System Review* (see Attachment F for the complete copy of that document).

BACKGROUND

Waste collection in Tillamook County is provided by privately-owned waste collection companies with regulatory oversight by the County through the Solid Waste Service District. The terms and conditions of the exclusive franchise areas are stipulated in the agreements signed between each company and the County in June 2005. The County regulates the waste collection franchises for the unincorporated areas and the cities control the franchise agreements within their boundaries. For the contracts with the County, all five of the franchise agreements have ten-year terms with a rolling expiration date and are set to expire on the same date, which is currently June 30, 2015.

The District owns the property and the fixed assets of all three of the disposal and recycling facilities, but subcontracts the operations to entities outside of the District. With its central location near Tillamook, the Tillamook Transfer Station is the primary disposal site in the County and two smaller facilities are strategically located to the north and south. All waste is funneled through the Tillamook Transfer Station for final disposal at Coffin Butte Landfill.

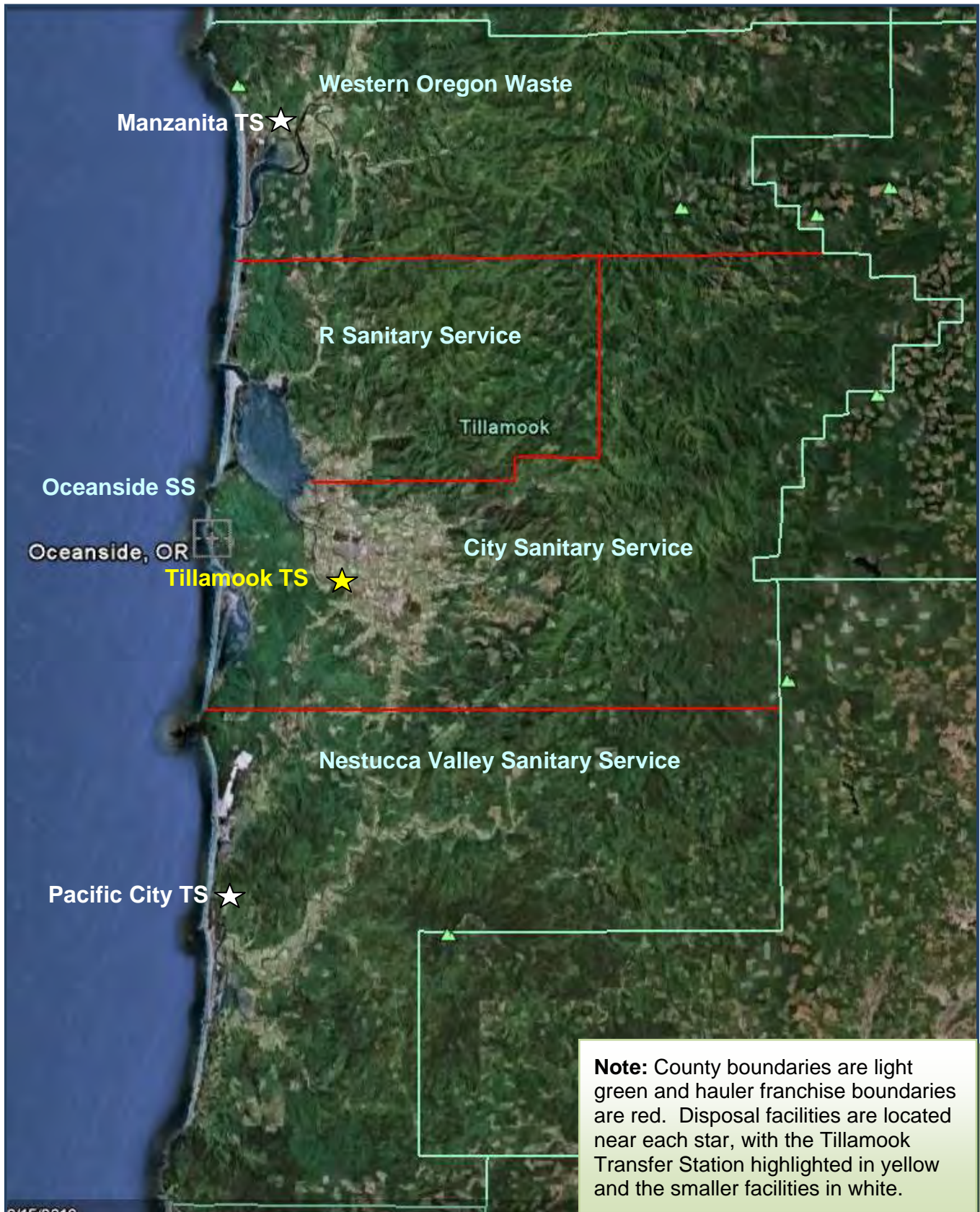
CURRENT ACTIVITIES

A. Waste Collection

Waste collection in the unincorporated areas of the County is by subscription and is provided to residents by one of five private companies. Figure 2 shows a map of Tillamook County and the franchise areas, with the county boundaries shown in green and the franchise boundaries in red. The five haulers that currently collect waste and recyclables in Tillamook County are described below.

Western Oregon Waste (WOW): Western Oregon Waste's service area is the northernmost portion of the county, including the cities of Manzanita, Nehalem,

Figure 2: Tillamook County Solid Waste Franchise Areas



Wheeler, and parts of Rockaway Beach. WOW was recently bought by Recology, a regional waste company with operations in Oregon, California, Washington, and Nevada. WOW utilizes a semi-automated cart collection system for residential and small business customers. Large commercial generators are served with front load containers ranging in size from one cubic yard to eight cubic yards. WOW is the only hauler in Tillamook County to utilize a front-load collection system.



R Sanitary Service (RSS): R Sanitary Service is a family-owned business located in Garibaldi servicing customers from Bay City to Rockaway Beach. R Sanitary has approximately 600 residential customers in the Rockaway Beach/Twin Rocks area with an additional 1,400 customers in Garibaldi and Bay City area. RSS services three recycle shacks that are north of Tillamook. The shacks are checked daily due to use by commercial customers. Commercial customers can receive cardboard collection at no charge. RSS utilizes a manual rear load collection system for both residential and commercial customers.



City Sanitary Service (CSS): City Sanitary Service is the hauler for the City of Tillamook and surrounding unincorporated areas. Service is not mandatory in Tillamook; however, CSS has a 60 to 65% subscription rate for garbage collection services in their franchised areas. Residential waste is collected using a semi-automated loader and commercial service is provided using a rear load system with containers varying in size from one yard up to two yards. Recyclables are collected from business and residential customers in Tillamook. Approximately 80% of the business customers receive recycling services for high-grade paper and cardboard. Most of their recycling collections are done using 55-gallon barrels which are loaded onto a pick-up truck with a lift-gate. Residential customers who sign up are provided curbside recycling service. At one time, CSS had as many as 90 residential customers signed up for recycling, but that figure has dropped to only ten. A drop-off depot for recyclable materials is available at the CSS office.

Oceanside Sanitary Service (OSS): Oceanside Sanitary Service is operated by a trucking firm that is involved in a variety of other activities. Collection service is provided to approximately 315 residential and 10 commercial customers within the city limits of Oceanside. Collection is conducted once per week for most of the year and up to two times per week during the summer. OSS utilizes a manual rear load collection system for both residential and commercial customers.

Nestucca Valley Sanitary Service (NVSS): Nestucca Valley Sanitary Service collects in the southern part of Tillamook County. Their franchise area is the largest in the County at approximately 350 square miles and is comprised primarily of farms and forest. Approximately 30% of their customers are part-time or seasonal residents. There are no incorporated cities in their service area and few commercial businesses. Roads are a problem in their area, due to lack of maintenance and other issues. NVSS conducts semi-automated collections and also has a lift-truck to handle roll-off containers. Service for the larger carts (65 and 95 gallons) are charged on a per-disposal basis. Unlike most hauling companies, NVSS does not lease the garbage carts used for residential collections to their customers but instead sells the carts. This is largely due to the part-time and seasonal customers, which would require repeated deliveries and returns of the carts if they were being leased.

The following tables compare the service levels and the current collection fees for the five franchised haulers at the various container sizes

Table 18: Comparison of Collection Systems in Tillamook County (2010 data)

Service Levels	WOW	RSS	CSS	OSS	NVSS
Residential Collection	Semi-Auto	Manual	Semi-Auto	Manual	Semi-Auto
Commercial Collection	Front Load	Rear Load	Rear Load	Rear Load	Rear Load
Drop Box Service	Yes	No	Yes	No	Yes
Collection of Recycling	No	No	Yes	No	No
Customers	1,576	2,009	2,581	306	1,206
Weekly Routes	6	5	16	1	6
Collected Waste Tons	1,846	1,948	6,995	169	2,371

Table 19: Monthly Collection Fees for Weekly Service in Tillamook County (2012)

Weekly Curbside	WOW	RSS	CSS	OSS	NVSS
32 gallon can	\$25.48	\$22.25	\$20.90	\$26.70	\$29.75
32 gallon cart	\$24.13	n/a	n/a	n/a	\$29.75
64 gallon cart	n/a	n/a	\$38.70	n/a	\$14.10/disposal
96 gallon cart	\$40.25	n/a	\$56.50	n/a	\$18.80/disposal
32 gal EOW	\$15.69	n/a	\$16.00	n/a	\$21.00
32 gal monthly	\$8.44	\$11.25	\$8.00	n/a	\$7.45
Weekly Commercial					
1 yard container	\$130.98	\$85.90	\$101.65	\$113.50	\$117.00
2 yard container	\$199.45	\$162.25	\$172.00	\$202.60	\$225.33
3 yard container	\$266.07	n/a	n/a	n/a	\$316.33

Note: The above table shows the rates effective as of June 1, 2012.

B. Transfer and Disposal

Waste collected in Tillamook County by the franchised haulers and waste that is hauled by the generators (“self-haul”) is brought to one of three transfer stations. Two of these transfer stations (Manzanita and Pacific City Transfer Stations) bring the waste to the Tillamook Transfer Station. From there, it is taken to a landfill about 82 miles away. More details about this system are provided below.

Manzanita Transfer Station (MTS): CARTM operates the Manzanita Transfer Station and operates a recycling center and resale shop at that location. CARTM serves the residents and businesses in North Tillamook County, including the cities of Manzanita, Nehalem, and Wheeler. The primary mission of CARTM is to divert materials and usable items from the landfill to either the recycling facility or their



Table 20: CARTM Waste and Recovery Tons

Year	2008		2009		2010	
Disposed SW Tons	546.76		291.74		298.36	
Recyclable Materials	Tons	%	Tons	%	Tons	%
ONP / Magazines	129.86	13.7%	144.90	3.2%	110.73	7.9%
Mixed Paper	40.16	4.2%	51.93	1.2%	41.28	3.0%
OCC	133.60	14.1%	115.65	2.6%	102.25	7.3%
Film	5.18	0.5%	5.58	0.1%	4.60	0.3%
Rigid Plastic Container	17.73	1.9%	27.35	0.6%	25.64	1.8%
Other Plastic	10.42	1.1%	16.56	0.4%	20.17	1.4%
Glass	109.97	11.6%	169.77	3.8%	168.54	12.1%
Aluminum	15.49	1.6%	9.50	0.2%	12.63	0.9%
Tin Cans	9.95	1.1%	83.97	1.9%	9.52	0.7%
Scrap Metal	136.30	14.4%	471.90	10.5%	126.43	9.1%
Lead Acid Batteries	117.00	12.4%	110.00	2.4%	73.00	5.2%
Tires	124.00	13.1%	55.00	1.2%	59.00	4.2%
Used Motor Oil	3.33	0.4%	1.35	0.0%	3.67	0.3%
Electronics	3.34	0.4%	14.86	0.3%	18.13	1.3%
Roofing	18.61	2.0%	293.35	6.5%	35.50	2.5%
Wood / Lumber			1,833.47	40.7%	304.55	21.9%
Yard Debris	44.50	4.7%	550.04	12.2%	198.21	14.2%
Other C&D	27.18	2.9%	550.03	12.2%	75.44	5.4%
Other Waste Oil			3.61	0.1%	4.44	0.3%
Total Recyclable Tons	946.62		4,508.82		1,393.72	

resale shop. Yard debris and construction/demolition (C&D) waste is collected separately on-site. All solid waste from CARTM is delivered to the Tillamook Transfer Station in 40-yard drop boxes and diverted materials are delivered to various outlets, primarily in the Portland area. Although the infrastructure at CARTM is owned by the County, its operations are overseen by the non-profit corporation and operated by staff and volunteers. Table 20 details the reported materials disposed and diverted at CARTM and Trails End over the last three years.

Pacific City Transfer Station (PCTS): South Tillamook County has a small transfer station and recycling depot in Pacific City. The facility is open two days a week for local self-haulers and drop-off of recyclable materials. Nestucca Valley Sanitary Service has the franchise with Tillamook County for operating PCTS. All recyclables collected at PCTS are transported via drop box to Tillamook Transfer Station. Self-haul waste is compacted in a roll-off compactor and also delivered to the Tillamook Transfer Station. An open-top 40-yard roll-off container is used at the site for over-sized wastes that do not fit into the compactor. The following table details the reported materials handled at PCTS for the previous three years.



Table 21: PCTS Waste and Recovery Tons

Year	2008		2009		2010	
Disposed SW Tons	116.40		95.06		97.40	
Recyclable Materials	Tons	%	Tons	%	Tons	%
ONP / Magazines	6.09	6.0%	18.43	18.6%	5.91	9.4%
OCC	16.87	16.6%	21.45	21.6%	20.90	33.3%
Rigid Plastic Container	0.86	0.8%	2.16	2.2%	2.24	3.6%
Glass	31.56	31.0%	21.1	21.3%	7.43	11.8%
Scrap Metal	46.46	45.6%	36.06	36.4%	26.26	41.9%
Total Recyclables	101.84		99.20		62.74	

Tillamook Transfer Station (TTS): All waste collected within the County by the franchised haulers or at the Manzanita and Pacific City Transfer Stations is delivered to the Tillamook Transfer Station. The Tillamook Transfer Station is set up with two segregated tipping floor areas; one for self-haulers and the other for commercial

haulers. The area is large enough for a simple floor sort. Large materials such as clean wood, cardboard, and metal are pulled from the loads dumped on the tipping floor. Waste is pushed from the tipping floors to a 48-foot trailer that sits between the two areas in a below grade load-out tunnel.



At TTS, recyclable materials and scrap metal are consolidated and baled for delivery to Portland area markets. Clean wood waste is ground up and used locally by Hampton Lumber Company as hog fuel. Over the last three years, the amount of waste handled at the Tillamook Transfer Station has diminished in conjunction with the slow economy

Table 22: Tillamook Transfer Station Waste and Recovery Tons

Year	2008		2009		2010	
	Tons	%	Tons	%	Tons	%
Solid Waste by Source						
Franchised Haulers, Compacted	10,199.80	41.3%	9,914.03	47.0%	10,138.12	49.1%
Franchised Haulers, Drop Boxes	4,496.86	18.2%	3,119.0	14.8%	3,208.24	15.5%
Self-Haul	9,320.06	37.8%	7,657.97	36.3%	6,916.97	33.5%
Transferred from MTS, PCTS	663.16	2.7%	386.8	1.8%	395.76	1.9%
Total Incoming Waste	24,679.88		21,077.80		20,659.09	
Recovered from Floor Sort	889.22		165.08		576.11	
Disposed Solid Waste Tons	23,790.66		20,912.72		20,082.98	
Recyclable Material	Tons	%	Tons	%	Tons	%
ONP / Magazines	188.55	3.8%	221.19	4.8%	159.08	3.1%
OCC	591.62	11.9%	743.23	16.0%	655.40	12.8%
Rigid Plastic Containers	59.74	1.2%	39.18	0.8%	29.52	0.6%
Glass	86.39	1.7%	82.82	1.8%	62.8	1.2%
Aluminum	40.1	0.8%	86.69	1.9%	81.63	1.6%
Tin Cans	16.35	0.3%	16.5	0.4%	14.67	
Scrap Metal	2,954.73	59.5%	2,308.17	49.7%	3,045.63	59.7%
Lead Acid Batteries	3.59	0.1%	11.70	0.3%	12.57	
Tires	90.80	1.8%	39.35	0.8%	53.50	1.0%
Used Motor Oil	12.10	0.2%	7.58	0.2%	12.41	
Electronics	2.55	0.1%	61.33	1.3%	66.75	1.3%
Wood / Lumber	921.55	18.5%	1,022.24	22.0%	907.04	17.8%
Total Recyclable Tons	4,968.07		4,639.98		5,101.00	

and efforts to encourage waste prevention and recycling. The Tillamook Transfer Station is owned by the County and operated under contract with Don G. Averill Recycling. All equipment and personnel necessary to process, transfer and transport waste from Tillamook County is provided by Don G. Averill Recycling. Currently, waste is transported via long-haul tractor and trailer to Coffin Butte Landfill near Corvallis. Table 22 details the reported materials handled at the Tillamook Transfer Station over the last three years. The amounts of recyclable materials reported include the materials transferred to the Tillamook Transfer Station from PCTS, City Sanitary Service, Oceanside Sanitary Service, and R Sanitary.

SERVICE GAPS AND OPPORTUNITIES

The County covers 1,125 square miles with the Pacific Ocean as its western boundary. One of the primary issues for the franchised haulers must contend with is the sparse population in the rural areas. Collection costs in the County's rural areas are considerably higher when compared to urban areas due to the distance between stops. Full utilization of equipment and expanding the customer base can keep hauler profits at a level necessary to provide the service; however, offering additional services such as curbside recycling present logistical and financial difficulties.

Another issue for the haulers is the large seasonal increase in population and waste generation. The coastal areas are a vacation destination during the summer months, and these areas have a large number of vacation rentals and second homes. There are also a large number of campers that fill the parks and campgrounds in Tillamook County in the summer. The coastal areas and campgrounds generate more garbage in the summer due to the increase in population from short-term renters and vacationers, plus these temporary residents rely more on disposable items than do long-term residents. A majority of the disposable items consumed by the transient population are recyclable, thereby presenting an opportunity to recycle. The service areas for all five franchised haulers are impacted by this issue.

OPTIONS

The following options have been identified through the process of evaluating the solid waste system in Tillamook County. These options address existing service gaps or potential improvements in the County's solid waste system. It should be noted, however, that not every option shown below is feasible or cost-effective. Options are listed below if they appear to have some potential, but the next steps of the planning process will evaluate these further to determine if the options merit additional consideration. In other words, simply listing an option below should not be taken as an indication that Tillamook County believes that it is an option worth pursuing.

The following options are organized according to the service gap or potential system improvement that is addressed.

A. Waste Collection

The waste collection system in Tillamook County is currently effective, but it is still worthwhile to considering possible changes in the system as part of this Plan. Those options are considered below and are grouped by actual changes to the collection system and changes that could be implemented in the administration and monitoring of the collection system.

1. Waste Collection: Possible options for changes to the waste collection system in Tillamook County include:

- a. The Cities and/or the County could evaluate the benefits of universal (mandatory) garbage collection, with or without mandatory recycling. This approach would have several benefits, including spreading collection costs over the entire population (thus leading to lower service rates), enabling the haulers to provide more services or provide those services more cost-effectively, and helping to ensure proper disposal and hence cleaner properties in Tillamook County. On the other hand, forcing people to subscribe to garbage collection services could be very difficult politically and could be perceived as an increase in costs for many.
- b. The franchised haulers could offer every-other-week (EOW) garbage service, as some already do, with or without alternating with recycling. This approach would help keep rates lower, and could potentially offset the additional cost of curbside recycling. There is some interest locally in this approach, but this approach would need to consider vacation and short-term rental properties and it runs counter to city/county ordinances that currently require weekly removal of garbage for rental properties.

2. Waste Collection System Review: The waste collection system in Tillamook County is working well, but could be improved through minimum standards and periodic reviews. Possible options for the waste collection system in Tillamook County include:

- a. Performance standards could be established for the franchised haulers and transfer stations. These standards could address waste collection and recycling, and could include a report on tonnages collected, customer counts, finances, complaints, injuries or other factors.
- b. Periodic review of performance and programs could be conducted to determine if services need to be modified or new services added. This could be annually or

every two years, and could be conducted by the SWAC or by Tillamook County staff.

- c. A standardized rate request form could be developed, which would provide for easier review and possibly more consistent treatment of rate change requests.

B. Transfer and Disposal

The disposal system in Tillamook County is working well, and large changes do not appear to be necessary. Options to enhance or refine the transfer and disposal system in Tillamook County are described below.

1. Large Loads and Bulky Wastes at MTS: MTS could consider how to handle larger loads and construction/demolition (C&D) wastes, including bulky and hard-to-handle materials. Larger loads of wastes, especially C&D wastes, cannot be handled at MTS due to the lack of truck scale and equipment to handle it. One option for this would be to install an open-top trailer at MTS, similar to what is used by PCTS for bulky wastes, but the cost to implement this at MTS would likely exceed \$100,000 (assuming the need for grading, a retaining wall, guardrail, the container itself, and related expenses). In the long run, however, it would be prudent if this site had the capability to accept large loads in emergency situations or on a short-term basis if the normal transportation routes were interrupted.

2. Close PCTS: The low volume of waste collected at the Pacific City Transfer Station (PCTS) leads to the question as to whether this site should be closed. The current operations are being subsidized by the operator (NVSS), although they are supportive of the site and in fact would like to make improvements to enhance the services it can provide. Another option would be to close the site to the general public, while continuing to use it for larger loads and to transfer recyclables to TTS.

3. Conduct Annual Review of Transfer Station Contracts/Franchises: An annual review of the contracts or franchises for the operation of the transfer stations would allow specific needs and issues to be addressed in a more timely fashion.

4. Review, Revise and Standardize Contracts for Transfer Stations: A thorough review of the existing contracts and franchises for the operation of the transfer stations could be conducted. The goal of this task would be update the contracts and also to standardize the language in the contracts. Contracts could also be revised to include performance standards.

Evaluation of Options

The above options can be evaluated according to the following criteria:

- **Consistency with the solid waste hierarchy:** The hierarchy is discussed in other parts of this Plan, but for reference the solid waste hierarchy is: reduce the amount of waste generated; reuse materials for their original intended use; recycle what can't be reused; compost what can't be reused or recycled; recover energy from what cannot be reused, recycled or composted; and dispose of residuals safely.

A high rating (H) for this criteria means that the option supports the higher goals of the hierarchy, a medium rating (M) means that the option is relatively neutral to achieving the goals of the hierarchy, and a low rating (L) means that the option is contrary to achieving the goals of the hierarchy.

- **Diversion potential:** This factor is an assessment of the amount of waste diversion that can be achieved by an option, or the degree to which an option leads to the proper disposal of the materials in question.

A high rating (H) for this criteria means that there is a high potential for increased recovery or for proper handling of wastes, a low rating (L) means that there is a low potential for these results, and a medium rating (M) means that the option falls somewhere between the high and low levels or that the option is neutral with respect to this criteria.

- **Cost-effectiveness:** This is a measure of the total cost for a specific option compared to the amount of material that the option addresses, generally compared to the cost for the current handling/disposal system.

A high rating (H) for this criteria means that the option is projected to be cost-effective, a low rating (L) means that the option is not expected to be cost-effective, and a medium rating (M) means that the option is medium in terms of cost-effectiveness or that this factor does not apply very well to the option.

- **SWAC support:** This criteria shows the degree to which the SWAC members agreed to support a specific option. These ratings were determined through a consensus process at a special meeting of the SWAC on August 14, 2012.
- **Overall rating:** The overall rating is based on the ratings for the four other criteria. A high (H), and in some cases a medium (M), rating means that the option may merit further consideration as a recommendation, whereas a low (L) rating generally means that the option does not merit further consideration.

Table 23: Evaluation of the Collection, Transfer and Disposal Options

Option	Consistency with SW Hierarchy	Diversion Potential	Cost Effectiveness	SWAC Support	Overall Rating
A. Collection					
Waste Collection Options					
1a. Evaluate mandatory collection	M	M	H	M	M
1b. EOW collection	M	L	H	L	L
Waste Collection System Review Options					
2a. Institute performance standards	M	M	M	M	M
2b. Periodic review	M	M	M	M	M
2c. Create a standardized rate request form	M	M	H	H	H
B. Transfer and Disposal					
1. Develop capability for large loads at MTS	M	L	L	M	L-M
2. Close PCTS	L	L	L	L	L
3. Annual review of transfer station contracts/franchises	M	M	H	H	H
4. Review and revise contracts	M	M	H	H	H

H – High

M – Medium

L – Low

RECOMMENDATIONS

The following recommendations are being made by this Plan for waste collection, transfer and disposal. Recommendations for waste diversion activities are shown at the end of Section Three, and administrative recommendations are shown at the end of Section Five. The timeline and other important details for all of the recommendations are shown in Section Six of this Plan. The recommendations are numbered to make it easier to refer to them, with an abbreviation for the level of priority (H, M or L), and this numbering system is continued from Section Three. The recommendations were ranked in priority by the SWAC at the August 14 workshop. Options that were rated “low” in the above table are not being moved forward as a recommendation.

High-Priority Recommendations

H10) Establish standards and a review process for collection and disposal franchises and contracts, including

- Institute performance standards for the waste collection franchises.
- Conduct a periodic review of the waste collection performance and programs.
- Prepare a standardized rate request form for use by the franchise haulers.
- Conduct an annual rate review for transfer stations.
- Review, revise, renew, and standardize the contracts and franchises for the transfer stations.

H11) When a successful curbside recycling program is implemented, consider closing PCTS.

Medium-Priority Recommendations

M8) Evaluate the benefits of mandatory collection (along with curbside recycling).

M9) Develop the capability to accept large loads at MTS.

There are no low-priority recommendations being made in this Plan for waste collection, transfer and disposal activities.

SECTION FIVE ADMINISTRATION

INTRODUCTION

The solid waste system in Tillamook County is currently managed in large part by the Public Works Department, although several private companies manage key pieces of the system and a variety of activities are handled through public-private partnerships. This section of the Plan describes the current activities in administering the solid waste system, with the primary focus being on the activities conducted by the Public Works Department. Parts of this section have been drawn from the *Asset Identification and Replacement Plan* (see Attachment G) and an analysis of the County solid waste funds (see *System Costs and Financing* in Attachment H).

MISSION STATEMENT FOR TILLAMOOK COUNTY

As part of the discussions for this Plan, the Solid Waste Advisory Committee (SWAC) developed a new mission statement for the Tillamook County Solid Waste Department:

Tillamook County regulates solid waste management, providing a coordinated and fiscally responsible solid waste program to protect the health, safety and welfare of the people, and the natural and scenic resources of Tillamook County.

Tillamook County seeks to minimize the impacts of materials throughout their lifecycle, implementing outreach and education strategies that encourage thoughtful consumption, the reduction of toxics, and the recovery of our material resources.

RELEVANT RULES AND REGULATIONS

Local Regulations. The primary local regulations affecting solid waste and recycling are the County's Ordinance No. 4 and several city codes. Tillamook County Solid Waste Ordinance No. 4 defines the regulation of solid waste management and was last amended in 2009. The solid waste ordinance covers the particulars of nuisances, enforcement, penalties, abatements, and appeals. It also outlines the purpose, roles and duties of the Solid Waste Advisory Committee. Much of the ordinance addresses the specifics of solid waste collection and disposal franchises, including the responsibilities of the franchisees, terms and renewals, and franchise fees.

The cities have also adopted various codes addressing waste disposal and related issues, including:

Bay City: City Ordinances #555 and #618 address the solid waste franchise, Resolution #09-13 sets the franchise rates, and Ordinance #649 addresses nuisances and abandoned vehicles.

Garibaldi: City Code #8.05 addresses solid waste collection and transportation, including franchises and rates, and Code #8.15 is the nuisance ordinance.

Manzanita: City Ordinance #10-05 is a solid waste franchise ordinance and #79-6 is a nuisance ordinance.

Nehalem: Ordinance #2010-3, with amendment #2010-07, addresses solid waste franchise rates and insurance requirements, and Ordinance #203 has a nuisance section.

Rockaway Beach: Title V, Chapter #51 addresses garbage handling and collection.

Tillamook: City Ordinance #1155 is a solid waste franchise ordinance and Ordinance #1253 is a nuisance, junk and debris ordinance.

Wheeler: Chapter #8 has sections addressing the garbage collection franchise and Chapter #6 focuses on nuisances.

State Regulations. The two primary pieces of legislation affecting solid waste and recycling in Oregon are Oregon Revised Statutes (ORS) 459 (Solid Waste Management) and 459a (Reuse and Recycling). These two statutes address many different aspects of solid waste management and recycling, but the key elements are outlined below.

ORS 459, Solid Waste Management: Originally adopted in 1967 and amended many times since then (most recently in 2012), this State law began with the regulation of landfills and defining State versus local responsibilities. It currently addresses:

- the responsibilities and authority of the Oregon Department of Environmental Quality (DEQ).
- the division of authority between the state and local governments.
- regulation of landfills and other disposal sites.
- enforcement authority.
- infectious waste disposal.
- household and small quantity generator hazardous waste collection.
- disposal rules for batteries, tires and thermostats.

ORS 459a, Reuse and Recycling: This State law contains many provisions that impact recycling and other solid waste programs, and the key elements of this law are reviewed below according to the original legislation or by topic area (for e-waste, paint, and the Bottle Bill).

1983 Opportunity to Recycle Act: The Opportunity to Recycle Act, passed by the Oregon legislature in 1983, was ground-breaking legislation that required:

- residential on-route (curbside) recycling collection in cities of 4,000 or more people.
- recycling at solid waste disposal sites.
- education and promotion programs designed to make all Oregonians aware of opportunities to recycle and the reasons for recycling.

Although Oregon already had an extensive recycling infrastructure, both private and public, before the passage of the act, the system was enhanced through this legislation.

1991 Oregon Recycling Act: In 1991, the Oregon Legislature took recycling legislation a step further and passed the Oregon Recycling Act. Among other things, the Oregon Recycling Act established a recovery level goal of 50% by the year 2000. The Oregon Recycling Act mandated the development of a statewide solid waste plan by 1994 and the performance of waste composition studies. The act also specified purchasing preferences by government agencies for materials with high percentages of recycled content and high degrees of reusability and recyclability. Finally, the act established minimum recycled-content requirements for newsprint, telephone directories, glass containers and rigid plastic containers sold in Oregon.

1997 Two Percent Credits for Waste Prevention: This law enabled local governments to obtain credit for more than just their recycling programs by allowing 2% credits for wastesheds that establish and maintain programs in waste prevention, reuse and backyard composting. DEQ has established guidelines and evaluation criteria for wastesheds that allow them to earn up to 6% total credits toward recovery goals for qualifying programs.

2001 State and Wasteshed Goals: In 2001, although most of the wastesheds in the state were meeting their individual required recovery goals, the DEQ confirmed to the legislature that these accomplishments were not going to produce a statewide recovery rate of 50%. The legislature responded with HB 3744 (amending ORS 459.010) that set a statewide recovery goal of 45% for 2005

and 50% for 2009 and adjusted individual wasteshed goals. The bill set out review procedures regarding the goals:

“If a wasteshed does not achieve its 2005 or 2009 waste recovery goal, the wasteshed shall conduct a technical review of existing policies or programs and determine revisions to meet the recovery goal. The department shall, upon the request of the wasteshed, assist in the technical review. The wasteshed may request, and may assist the department in conducting, a technical review to determine whether the wasteshed goal is valid” (ORS 450.010(6)(e)).

In addition, HB 3744 established the following statewide waste generation goals:

- by 2005, there will be no annual increase in per capita municipal solid waste generation; and
- by 2009, there will be no annual increase in total municipal solid waste generation.

E-waste: The Oregon State Legislature passed Oregon’s Electronics Recycling Law (ORS 495A.300-.365) in 2007, creating and financing a statewide collection, transportation and recycling system for desktop computers, portable computers, monitors and televisions (referred to as covered electronic devices, or CEDs). The system provides free, convenient and environmentally sound recycling options for households, small businesses and nonprofits with ten or fewer employees, and anyone giving seven or fewer CEDs to a collector at any one time.

Under the system, manufacturers of CEDs sold or offered for sale in Oregon must register with DEQ and pay an annual registration fee to fund DEQ’s administrative costs for the program. Manufacturers then choose to manage their own statewide collection programs or participate in a state contractor program that DEQ has established. Manufacturers cover their own manufacturer-run program costs or pay a recycling fee to participate in the state contractor program. Programs began operating January 1, 2009, and the disposal of CEDs was prohibited in Oregon as of January 1, 2010. As of January 1, 2009, only registered brands are eligible for sale in Oregon.

Enacted in 2011, Senate Bill 82 expanded Oregon’s three-year-old electronics waste recycling program by adding computer peripherals (keyboards and mice) and printers to the Oregon E-Cycles program effective January 1, 2015. Printers include devices making reproductions and other functions (copying, scanning, faxing, etc.).

Paint: In 2009, Oregon became the first state in the nation to enact a law requiring paint manufacturers to manage leftover latex and oil-based paint. House Bill 3037 established a pilot program which began in July 2010 and is currently due to “sunset” in June 2014. Oregon’s paint product stewardship law serves as a demonstration for similar future programs in other states. PaintCare, a non-profit organization created by the American Coatings Association (a trade group for paint manufacturers), administers the Oregon program. PaintCare developed and implemented a system consisting of a series of depots statewide to collect unused paint. Consumers fund the program by paying a surcharge on paint and stain containers at the point of sale. Fees range from \$0.35 to \$1.60 per can, depending on paint container size. Manufacturers and retailers may be prohibited from selling paint unless they participate in an approved program. Retailers are also required to provide consumers information on their options to recycle or safely dispose of leftover paint.

Tillamook County’s new Household Hazardous Waste Facility is serving as a local collection point for paint.

The Oregon Bottle Bill: The Oregon legislature passed the Oregon Bottle Bill in 1971 and it took effect on October 1, 1972. This bottle bill was the first of its kind in the nation. Its purpose was to reduce litter and divert all beer and carbonated beverage containers from the waste stream so that they could be reused or recycled. The bill requires that a refund be paid to any person who returns empty soft drink or beer bottles or cans to a retail store.

The Bottle Bill was amended in 2007 to include:

- 1) Water and flavored water were added to the bottle bill, effective Jan.1, 2009.
- 2) Stores occupying 5,000 square feet or more must begin accepting empty containers of any brand or size, if they sell the same type of beverage, effective January 1, 2009. For example, a store that sells soft drinks must accept and pay a refund on any brand of soft drink container.
- 3) Stores occupying less than 5,000 square feet can limit the number of containers they redeem to 50 per person per day.
- 4) The law set up the Bottle Bill Task Force, charged with submitting a report to the governor by November 1, 2008 on recommendations on how to further expand or modify the bottle bill’s recycling system.

The Bottle Bill was further amended in 2011 and new additions to the law include:

- 1) Containers eligible for a refund will be expanded to include juices, teas, coffees and sports drinks. These containers become eligible for deposit refunds one year after the Oregon Liquor Control Commission (OLCC) determines that at least 60% of beverage containers are returned to redemption centers or on January 1, 2018, whichever comes first.
- 2) Increases the 5 cent deposit to 10 cents after OLCC determines that, in each of two previous years, the number of containers returned was less than 80% of the total number of beer, soft drink and water containers sold. OLCC cannot make this determination prior to January 1, 2016.
- 3) Encourages the development of additional “redemption centers” to provide convenient places for people to return containers besides participating grocery stores. OLCC will authorize a pilot project for a container redemption center operated by a distributor cooperative and serving a majority of retail dealers in an Oregon city less than 300,000 in population.

With the deposit on additional bottles, more bottles will be handled at redemption centers and fewer at MRFs, and fewer bottles will end up in the landfill.

Federal Laws. At the federal level, the Resource Conservation and Recovery Act of 1976 (RCRA), as amended by the Solid Waste Disposal Act Amendments of 1980 (42 U.S.C. 6901-6987), is the primary body of legislation dealing with solid waste. Subtitle D of RCRA addresses non-hazardous solid waste disposal and required states to develop comprehensive solid waste management programs that outline the authorities of local, state and regional agencies. Subtitle D required the state programs to prohibit “open dumps” and provide that all solid waste is disposed in an environmentally-sound manner.

CURRENT ACTIVITIES

Solid waste activities for Tillamook County are administered primarily by the Solid Waste Coordinator in the Solid Waste Office, a division within the Tillamook County Public Works Department, with assistance provided by an Outreach Coordinator, a Code Enforcement Officer, the Public Works Director, the County Counsel, and others on an as-needed basis, with oversight provided by the Board of County Commissioners. The Tillamook County solid waste office conducts a number of important activities, many of which are required by Oregon State law (primarily provisions shown in ORS

459 and 459a). The solid waste program in Tillamook County is set up as a service district, which allows the implementation of a charge on property tax statements to help support solid waste activities.

Some of the more important services and activities provided or managed by the Tillamook County Public Works Department include:

- Responsibility for proper disposal of solid waste, through either County-owned facilities or through contracts with private industry providers.
- Responsibility for adequate residential solid waste collections, which is accomplished by issuing and maintaining collection franchises.
- Providing opportunities for citizens to recycle (at transfer facilities and through the Recycle Shacks).
- Solid waste planning.
- Coordinating meetings and activities of the Solid Waste Advisory Committee.
- Sending annual post-closure reports for the Tillamook County Landfill to DEQ.
- Sending annual financial assurance compliance reports for Tillamook County's closed landfill to DEQ and maintaining environmental compliance for that landfill.
- Providing hazardous waste and special waste management.
- Sending annual recycling and solid waste reports to DEQ.
- Conducting or assisting with solid waste code enforcement.

Tillamook County owns and maintains several facilities and other infrastructure to accomplish the above responsibilities. A listing of these facilities, along with information about repair and replacement schedules, is shown in the *Asset Identification and Replacement Plan* (see Attachment G).

The above activities are funded by service fees (such the "tipping" fees paid by customers at the three transfer stations), a fee on property tax statements (for the solid waste district), and occasional state and federal grants. As part of the development of this Plan, the three accounts that make up the solid waste budget for Tillamook County were evaluated (see Attachment H). The following tables show the recent history for the two main accounts; Fund 410 and Fund 420. Fund 410 is used for the solid waste program, while Fund 420 is used as the asset repair and replacement fund.

The principal funding source for solid waste activities is the tipping fee charged at the Tillamook Transfer Station for the disposal of solid waste. The tipping fee accounts for approximately 80% of the incoming revenue. Fees vary by customer, and at the time

Table 24: Fund 410 Financial Summary

Description	FY 08-09 Actual	FY 09-10 Actual	FY 10-11 Actual	FY 11-12 Estimated
Beginning 410 Balance	813,006	760,245	631,827	540,418
Revenue	1,738,482	1,648,852	1,791,205	1,778,767
Less 41001 Administration	(128,426)	(199,915)	(228,063)	(225,458)
Less 41002 Transfer Station	(1,269,976)	(1,240,592)	(1,286,267)	(1,306,645)
Less 41003 Landfill	(51,769)	(100,125)	(101,632)	(101,357)
Less 41004 RHC	(121,072)	(36,638)	(66,652)	(121,216)
Less Transfer to Fund 420	(220,000)	(200,000)	(200,000)	(116,667)
Less Transfer to Fund 430	0	0	0	(291,667)
Net of Revenue and Expense	(52,761)	(128,418)	(91,409)	(384,243)
Ending 410 Balance	760,245	631,827	540,418	156,175

Table 25: Fund 420 Financial Summary

Description	FY 08-09 Actual	FY 09-10 Actual	FY 10-11 Actual	FY 11-12 Estimated
Beginning Balance	1,239,966	841,666	974,989	959,755
Revenue (Transfers & Interest Income)	244,820	207,831	204,543	119,790
Less Expenses	(643,120)	(74,508)	(219,776)	(418,134)
Net of Revenue and Expense	(398,300)	133,323	(15,234)	(298,344)
Ending 420 Fund Balance	841,666	974,989	959,755	661,411

the information for Tables 24 and 25 was gathered, the franchised haulers paid \$68.25 per ton and self-haulers paid \$74.75 per ton. These rates increased on July 1, 2012 to \$71.50 for franchised haulers and \$84.50 for self-haulers. The property tax assessment generates approximately \$220,000 a year or 12% of the total revenue. Grants add to total revenue and are awarded on a project basis, varying from year to year.

The County's largest expense is for the operation and disposal cost for the Tillamook Transfer Station. Over the last four years, approximately \$0.70 of each incoming revenue dollar¹⁰ was paid to Don G. Averill Recycling (Averill) for the operation of the Tillamook Transfer Station. The contract between the County and Averill covers the

¹⁰ This includes all revenue sources: tipping fees, tax assessments, grant revenues, and miscellaneous revenues.

operation and maintenance of the Tillamook Transfer Station, operation and maintenance of the closed landfill, transport of waste and recycling, and waste disposal at Coffin Butte Landfill in Corvallis, Oregon.

Saving for long-term capital projects is the objective of Solid Waste Sinking Fund. A portion of the annual revenues from the operational fund (Fund 410) is allocated to the Sinking Fund to ensure adequate capital for future infrastructure, safety updates, fixed asset replacement, as well as unscheduled expenses. Over the last three years, \$0.12 of every incoming revenue dollar has been allocated to Fund 420.

SERVICE GAPS AND OPPORTUNITIES

Possible issues or problems that may occur with funding and administration include long-term funding and unanticipated expenses. Long-term funding could become problematic because revenues from waste disposal will decrease as the amount of recycling increases. Although this Plan and plans being made by others will lead to increased recycling, the projected increase in recycling is not large enough to indicate any financial problems in the near term.

Large, unanticipated expenses, such as the need to address a serious issue with one of the facilities or additional work needed for remediation of the old landfill, could create significant budget problems.

Potential opportunities to improve administration and funding aspects of the solid waste system could include the availability of grant funds or potential teaming arrangements to help accomplish the recommendations shown in this Plan or other activities.

OPTIONS

The following option has been identified through the process of evaluating the solid waste system in Tillamook County.

1. Examine Long-Term Funding Options for County Solid Waste Programs: The County will need to evaluate alternative options for funding the solid waste department and their programs if the waste stream in Tillamook County is reduced. A reduced waste stream will lead to lower revenues, at the same time that an increasing number of programs will need to be funded. Other possible funding sources include recycling revenue profit/loss sharing agreements, reformatting franchise fees (which could be tied to customer counts rather than a flat fee), an increase in the solid waste district fee, and possibly other methods.

Evaluation of Options

The above option can be evaluated according to the following criteria:

- **Consistency with the solid waste hierarchy:** The hierarchy is discussed in other parts of this Plan. A high rating (H) for this criteria means that the option supports the higher goals of the hierarchy, a medium rating (M) means that the option is relatively neutral to achieving the goals of the hierarchy, and a low rating (L) means that the option is contrary to achieving the goals of the hierarchy.
- **Diversion potential:** This factor is an attempt to measure not only the amount of material that could be prevented or recycled by a specific option, but other factors such as participation rate as well. A high rating (H) for this criteria means that there is a high potential for increased recovery or for proper handling of wastes, a low rating (L) means that there is a low potential for these results, and a medium rating (M) means that the option falls somewhere between the high and low levels or that the option is neutral with respect to this criteria.
- **Cost-effectiveness:** This is a measure of the total cost for a specific option compared to the amount of material that the option addresses, generally compared to the cost for the current handling/disposal system.

A high rating (H) for this criteria means that the option is projected to be cost-effective, a low rating (L) means that the option is not expected to be cost-effective, and a medium rating (M) means that the option is medium in terms of cost-effectiveness or that this factor does not apply very well to that option.

- **SWAC support:** This criteria shows the degree to which the SWAC members agreed to support a specific option. These ratings were determined through a consensus process at a special meeting of the SWAC on August 14, 2012.
- **Overall rating:** The overall rating is based on the ratings for the four other criteria. A high (H), and in some cases a medium (M), rating means that the option may merit further consideration as a recommendation, whereas a low (L) rating generally means that the option does not merit further consideration (although in some cases a low-rated option could be improved through modifications or could be applied in limited circumstances).

Table 26: Evaluation of the Administration Options

Option	Consistency with SW Hierarchy	Diversion Potential	Cost Effectiveness	SWAC Support	Overall Rating
1. Examine the long-term funding for the Solid Waste Dept.	M	M	H	H	H

H – High

M – Medium

L – Low

RECOMMENDATIONS

The following recommendation is being made by this Plan for administrative activities. Recommendations for waste diversion activities are shown at the end of Section Three, and recommendations for waste collection, transfer and disposal are shown at the end of Section Four. The timeline and other important details for all of the recommendations are shown in Section Six of this Plan. The recommendations are numbered to make it easier to refer to them, with an abbreviation for the level of priority (H, M or L), and this numbering system is continued from Sections Three and Four. The recommendations were ranked in priority by the SWAC at the August 14 workshop.

High-Priority Recommendations

H12) Change the funding methods for the Solid Waste Department.

There are no medium- or low-priority recommendations being made in this Plan for administrative activities.

SECTION SIX IMPLEMENTATION PLAN

INTRODUCTION

This section of the *Tillamook County Comprehensive Materials and Solid Waste Management Plan* (the “Plan”) provides implementation details (schedule and costs) for each of the recommendations of this Plan. Since the recommendations need to be abbreviated in the following tables (due to space constraints), this section begins with a complete listing of all of the recommendations.

SUMMARY OF RECOMMENDATIONS

More details about the following recommendations can be found in one of the preceding three chapters. Recommendations H1 through H9, M1 through M7, L1 and L2 are discussed in Section Three of this Plan; Recommendations H10, H11, M8 and M9 are discussed in Section Four; and Recommendation H12 is discussed in Section Five.

High-Priority Recommendations

- H1) Education activities should be continued or expanded, with a special focus on the following activities:
- Outreach and education should be conducted to businesses to promote green business practices consistent with solid waste hierarchy.
 - Promotion of reuse options should be increased.
 - Promotion of home composting for yard debris and food waste should be continued.
 - Education and promotion for proper handling of household hazardous waste (HHW) should be expanded.
 - Tillamook County should move to a materials management system as an educational strategy.
- H2) Salvage and deconstruction activities for buildings and infrastructure should be promoted.
- H3) City Sanitary Service and the City of Tillamook should work together to improve the recycling program in Tillamook and to meet DEQ requirements.

- H4) Curbside recycling in other areas, if desired, should be implemented. This will need to be accompanied by the implementation of re-loading capabilities at one or more of the transfer stations.
- H5) Consider lowering the minimum weight at TTS and PCTS to promote recycling, and review these fees annually.
- H6) Research potential solutions for separate yard debris collection and processing, including code enforcement for mismanaged materials.
- H7) Explore the potential for anaerobic digesters (primarily the Hooley Digester) to accept yard debris.
- H8) Explore the possibility of processing food waste at the Hooley Digester and other anaerobic digesters.
- H9) Conduct a survey of CEGs to determine if additional collection events would be a beneficial approach.
- H10) Establish standards and a review process for collection and disposal franchises and contracts, including
- Institute performance standards for the waste collection franchises.
 - Conduct a periodic review of the waste collection performance and programs.
 - Prepare a standardized rate request form for use by the franchise haulers.
 - Conduct an annual rate review for transfer stations.
 - Review, revise, renew, and standardize the contracts and franchises for the transfer stations.
- H11) When a successful curbside recycling program is implemented, consider closing PCTS.
- H12) Change the funding methods for the Solid Waste Department.

Medium-Priority Recommendations

- M1) Examine the possibility of a reuse shelf or shed at the HHW facility.
- M2) Find local recycling applications for glass.

- M3) Encourage transfer stations to recycle tires.
- M4) Implement a reduced rate for clean and separated loads of wood.
- M5) Food waste should be collected from commercial sources.
- M6) A new anaerobic digester should be developed to handle food waste and animal mortalities.
- M7) Tillamook County should help CARTM develop a system to recycle latex paint.
- M8) Evaluate the benefits of mandatory collection (along with curbside recycling).
- M9) Develop the capability to accept large loads at MTS.

Low-Priority Recommendations

- L1) Close the recycle shacks, either on the basis of problems occurring or in the future if usage drops due to the implementation of curbside recycling.
- L2) Expand the collection of woody debris and green waste.

IMPLEMENTATION PLAN

The next step for Tillamook County (and the cities, private companies and others, depending on the activity) is to implement the high-priority recommendations of this Plan. Medium and low-priority recommendations may also be implemented as appropriate, time and budget permitting, but the emphasis for the next five to ten years will be on the high-priority recommendations.

Table 27 shows the projected costs and proposed schedule for the high-priority recommendations. The recommendations are shown in an abbreviated form due to space constraints in the table. The costs shown in Table 27 are only the additional or new costs for implementing the recommendations, and in some cases may only be for the public expenditures associated with the recommendation. Table 27 also shows the organization or company that is primarily responsible for implementing each recommendation. Tables 28 and 29 show the implementation details for the medium-priority and low-priority recommendations, respectively.

Table 27: Ten-Year Implementation Schedule and Budget for High-Priority Recommendations

High-Priority Recommendations	Lead Agency	Cost and Funding Source	Year of Implementation									
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
H1) Education activities should be continued or expanded	County	0.25 FTE, County Fund 410	Ongoing									
H2) Salvage and deconstruction activities should be promoted	County	Existing							X	X	X	X
H3) CSS and Tillamook to work together to improve recycling program	CSS and City of Tillamook	Up to \$5/household, paid by user fees	X									
H4) Implement curbside recycling in other areas, and implement re-loading capabilities at transfer station(s)	Haulers	\$5 to \$6 per household, paid by user fees	X									
H5) Consider lowering the minimum weight at TTS and PCTS to promote recycling, and review annually	County	NA (although costs will shift)	X	Review annually								
H6) Research potential for separate yard debris collection	County	Existing (plus user fees if implemented)			X							
H7) Explore potential for anaerobic digesters to accept yard debris	County	Existing			X							
H8) Explore possibility of processing food waste at digesters	County	Existing			X							
H9) Conduct a survey of CEGs	County	Existing	X									
H10) Establish standards and review process for franchises, contracts	County	Existing	X	Review annually								
H11) When curbside recycling is implemented, consider closing PCTS	County	Possible cost savings		X	X							
H12) Change the funding methods for the Solid Waste Department	County	NA		X	X	X						

Notes: For Cost and Funding Source, “existing” refers to the use of existing funds and staffing to conduct the activity; “user fees” means that program participants will cover the cost of the program; and “NA” means that the activity is revenue-neutral, although costs may shift.

Table 28: Ten-Year Implementation Schedule and Budget for Medium-Priority Recommendations

Medium-Priority Recommendations	Lead Agency	Cost and Funding Source	Year of Implementation									
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
M1) Examine the possibility of a reuse shelf or shed at the HHW facility	County	Up to \$5,000, County Fund 420			X	X	X					
M2) Find local recycling applications for glass	County, Haulers	Existing			X	X	X					
M3) Encourage transfer stations to recycle tires	County	Existing							X	X	X	X
M4) Implement a reduced rate for clean loads of wood	County	NA	X	X								
M5) Collect food waste from commercial sources	Haulers	Possible disposal savings, or user fees			X	X	X	X				
M6) Develop a new anaerobic digester	Private sector	\$7-14 million, private funds							X	X	X	X
M7) Tillamook County to help CARTM recycle latex paint	County, CARTM	Cost of sewer line, County Fund 420			X	X	X	X				
M8) Evaluate benefits of mandatory collection	County, cities, haulers	Existing			X	X	X					
M9) Develop the capability to accept large loads at MTS	County, CARTM	Over \$100,000, County Fund 420			X	X	X	X				

Notes: For Cost and Funding Source, “existing” refers to the use of existing funds and staffing to conduct the activity; “user fees” means that program participants will cover the cost of the program; and “NA” means that the activity is revenue-neutral, although costs may shift.

Table 29: Ten-Year Implementation Schedule and Budget for Low-Priority Recommendations

Low-Priority Recommendations	Lead Agency	Cost and Funding Source	Year of Implementation									
			2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
L1) Close the recycle sheds	County	NA							X	X	X	X
L2) Expand the collection of woody debris and green waste	County	Existing, plus user fees if implemented			X	X	X	X				

Notes: For Cost and Funding Source, “existing” refers to the use of existing funds and staffing to conduct the activity; “user fees” means that program participants will cover the cost of the program; and “NA” means that the activity is revenue-neutral, although costs may shift.

TWENTY-YEAR IMPLEMENTATION PROGRAM

The solid waste management system in Tillamook County will continue to evolve based on changes in population and demographics; the local, state, and national economy; regulations; and advancements in waste handling and recycling. Because this Plan is being developed during an economic downturn and the timing and extent of a recovery are uncertain, it is particularly difficult to project waste generation and the resultant need for additional facilities and programs. It must be recognized that some amount of flexibility will be needed to see Tillamook County and their partners through the next few years and into the next twenty years.

The SWAC and Tillamook County solid waste staff should review this Plan annually to determine if the goals and recommendations of this Plan are being met. If the goals and recommendations are not being met, it should be determined if this is due to changes in conditions or priorities, in which case this Plan's goals could be modified, or if the County's annual work plans need to be modified to better achieve the Plan's goals and recommendations. If conditions or priorities have changed to the extent that this Plan needs to be amended or modified to reflect that, then that should be done, although it is anticipated that this would not be necessary for at least five years.

PROCEDURES FOR AMENDING THE PLAN

There is no requirement to maintain this Plan in a current condition, but if it should be deemed necessary or desirable to update this Plan at some point in the future, then amendments or a complete revision could be conducted. A complete revision would involve developing a new plan, whereas an amendment would be a simpler process involving updating one or more sections of the Plan. In either case, changes in the Plan could be initiated by Tillamook County, working with the Solid Waste Advisory Committee (SWAC) to develop and review proposed revisions. This process could be prompted by a request from a city or by an outside party, in which case the individual or organization wishing to propose plan amendments must petition the County Public Works Director in writing. The petition should describe the proposed amendment or revision and explain why such action is needed.

The Public Works Director will investigate the basis for the petition and provide a response within 60 days as to whether the petition has merit. If the Public Works Director decides that the petition warrants further consideration, the petition will be referred to the SWAC for review and recommendation. The Public Works Director will draft the proposed amendment together with the SWAC. The Public Works Director may develop reasonable rules for submitting and processing proposed plan amendments, and may establish reasonable fees to investigate and process petitions.

All administrative rulings of the Director may be appealed to the Tillamook County Board of County Commissioners.

Minor changes may occur in the solid waste management system, whether due to internal decisions or external factors. These changes can be adopted without going through a formal amendment process. If there is uncertainty about whether or not a change is “minor,” it should be discussed by the SWAC and a decision made based on the consensus of that committee.

Implicit in the development and adoption of this Plan is the understanding that in the future, the County may need to take emergency action for various reasons, and that these actions can be undertaken without the need to amend this Plan beforehand. In this case, Tillamook County staff will endeavor to inform the SWAC and other key stakeholders as soon as feasibly possible, but not necessarily before new actions are implemented.

GLOSSARY

ACRONYMS

The following acronyms are used in the *Tillamook County Comprehensive Materials and Solid Waste Management Plan*.

- BOCC: Board of County Commissioners
- C&D: construction and demolition (waste)
- CEG: conditionally exempt generator
- CHP: combined heat and power
- CNG: compressed natural gas
- CSS: City Sanitary Service
- DEQ: Oregon Department of Environmental Quality
- EOW: every other week
- EPA: United States Environmental Protection Agency
- EPR: extended producer responsibility
- FTE: full-time equivalent
- HHW: household hazardous waste
- HHWF: household hazardous waste facility
- MRF: materials recovery facility
- MSW: municipal solid waste
- MTS: Manzanita Transfer Station
- NVSS: Nestucca Valley Sanitary Service
- ORS: Oregon Revised Statutes
- OSS: Oceanside Sanitary Service
- PCTS: Pacific City Transfer Station
- RCRA: Resource Conservation and Recovery Act
- RSS: R Sanitary Service
- SWAC: Solid Waste Advisory Committee
- TTS: Tillamook Transfer Station
- WOW: Western Oregon Waste

DEFINITIONS

The following definitions are provided for various terms used in the *Tillamook County Comprehensive Materials and Solid Waste Management Plan*.

Anaerobic digester: a facility that processes livestock manure, biosolids, and/or other organics, using microorganisms in a decomposition process within a closed, oxygen-free vessel to produce methane and residual solids.

Biodiesel: a type of diesel fuel derived from vegetable oils or animal fats rather than petroleum, used in vehicles and other compression-ignition engines.

Commingled: recyclable materials that have been collected separately from garbage by the generator, but the recyclable materials have been mixed together in the same container (see also single stream and source-separation).

Composting: the controlled microbial degradation of organic waste, yielding a soil amendment product.

Conditionally-exempt generator, or CEG: a business that generates small amounts of hazardous waste (more than 220 but less than 2,200 pounds) is classified as a conditionally exempt generator (CEG).

Conversion technologies: chemical or thermal processes used to convert solid waste into fuels or other useful products, including pyrolysis, gasification, biodiesel production, hydrolysis, and distillation. Anaerobic digestion and fermentation for ethanol production, which are both biological processes, are also often considered to be forms of conversion technology.

Curbside recycling: the act of collecting recyclable materials directly from residential generators, usually after the recyclable materials have been placed at the curb (or at the side of the street if no curb exists in the area) by the residents.

End-of-life: the point at which a product or material is no longer useful to the person possessing it and is either discarded or abandoned.

EPA: the United States Environmental Protection Agency; the federal agency responsible for promulgation and enforcement of federal environmental regulations.

E-Waste: electronics, including TVs, computers and monitors.

Hazardous waste: wastes that are classified as hazardous are flammable, toxic, corrosive, reactive or have other characteristics that make the wastes dangerous or that require special handling and disposal.

Hog fuel: wood waste that is reduced in size to facilitate burning.

Household hazardous waste (HHW): wastes that would be classified as hazardous due to their characteristics, except that the amount is too small to be regulated. HHW includes solvents, some paints, cleaners, pesticides, herbicides, oil, car batteries and other materials.

Material recovery facility, or MRF: a facility that processes recyclable materials to separate the materials and prepare them for companies that can then use them as a raw material in their manufacturing process. Additional processing that may occur at a MRF could include crushing, shredding, baling (compacting into rectangular bales) and other steps to increase the marketability of the materials or render them easier and/or less expensive to transport.

Materials management: an approach to reduce environmental impacts by managing materials through all stages of their life. Materials management identifies impacts and actions across the full cycle of materials and products as they move through the economy – from raw material extraction to product design and manufacture, transport, consumption, use, reuse, recycling, and disposal.

Product stewardship: also known as “producer responsibility” or “extended producer responsibility” (EPR), product stewardship is a strategy designed to address the environmental impacts of products through their entire lifecycle, including end-of-life management (prevention, reuse, recycling and disposal).

Public education: a broad effort to present and distribute public information materials.

Recycling: the transformation or remanufacturing of recyclable waste materials into usable or marketable materials for a use other than landfill disposal, alternative daily (landfill) cover, industrial waste stabilizer or incineration.

Re-load facility: a re-load facility is designed to allow recyclable materials to be transferred from collection vehicles to larger containers for shipment to a MRF for further processing. No processing would occur at a re-load facility, except perhaps for incidental amounts of contamination removal.

Reusable items: items that may be reused (or easily repaired), including things such as small electronic goods, household items such as dishes, and furniture.

Self-haul waste: waste that is brought to a landfill or transfer station by the person (residential self-haul) or company (non-residential or commercial self-haul) that created the waste.

Single stream: refers to the practice of placing all recyclable materials together in one container for curbside collection. This is similar to “commingled” except that glass bottles may or may not be included in a commingled mixture whereas glass bottles are definitely mixed with the other materials in single stream collection programs.

Solid waste: as stated in Tillamook County Solid Waste Ordinance No. 4: “All putrescible and nonputrescible wastes, including but not limited to garbage, rubbish, refuse, ashes, waste paper, cardboard, sewage sludge, septic tank and cesspool pumping or other sludge; commercial, industrial demolition and construction wastes; partially burned materials, discarded or abandoned vehicles or parts thereof; discarded home and industrial appliances; manure, vegetable or animal solid and semisolid wastes, dead animals, infectious waste as defined in ORS 459.386, and other wastes; but the term does not include:

A. Hazardous wastes as defined in ORS 466.005.

B. Materials used for fertilizer or for other productive purposes or which are salvageable as such materials used on land in agricultural operations and the growing or harvesting of crops and the raising of fowls or animals.”

Solid Waste Advisory Committee (SWAC): a group assisting Tillamook County with the development of this solid waste management plan and other issues, composed of representatives from the general public, private industry, and the cities that are appointed by the Tillamook County Board of County Commissioners (BOCC).

Source-separation: the segregation of recyclable materials from other solid waste for the purpose of recycling, conducted by or for the generator of the materials on the premises at which they were generated. Source separation does not require that different types of recyclable materials be separated from each other.

Special wastes: those solid wastes which require special handling either due to a potential health hazard, or due to their bulky or abrasive nature which could damage transfer equipment, and which are designated as “special wastes” by the authorized designee.

Sustainability: using, developing, and protecting resources in a manner that enables people to meet current needs and provides that future generations can also meet future needs.

Transfer station: a staffed collection/transportation/disposal facility, used by individuals or route collection vehicles to deposit solid wastes into the larger transfer vehicle for transport to a disposal site.

Upstream: those actions and impacts that occur before that point in the life cycle, at any point on a product's life cycle. For example, as viewed by a consumer, upstream impacts are those associated with extraction of raw materials, production, distribution, and sale of the product.

Waste diversion: activities and practices that divert solid waste from disposal, including waste prevention, reuse, recycling, composting, resource recovery, and proper disposal of small-quantity hazardous waste.

Waste prevention: activities and practices that reduce the amount of solid waste that is created.

Wood waste: a by-product resulting from the handling and processing of wood, including, but not limited to, hog fuel, sawdust, shavings, chips, bark, small pieces of wood, stumps, limbs, or other materials composed largely of wood.

Yard debris: includes leaves, grass clippings, brush and branches.

ATTACHMENT A

FIRST TECHNICAL MEMO FOR THE COMPREHENSIVE
MATERIALS AND SOLID WASTE MANAGEMENT PLAN

MEMORANDUM

DATE: February 9, 2012 (revised August 18, 2012)
TO: Jennifer Purcell
FROM: Rick and Sharon Hlavka
RE: Revised Technical Memo for the Solid Waste Plan

Attached is a technical memo for the Comprehensive Materials and Solid Waste Management Plan (the Plan), with revisions per the SWAC's comments received on January 17. This memo addresses basic facts about Tillamook County, including demographics, waste composition, the goals and objectives for the Plan, regulations, and trends. The next step will be to pull this information into the Plan, and any additional review and comments on this information should be conducted after that point.

TECHNICAL MEMO

BACKGROUND AND ADDITIONAL DATA FOR THE TILLAMOOK COUNTY COMPREHENSIVE MATERIALS AND SOLID WASTE MANAGEMENT PLAN

INTRODUCTION

This technical memo provides basic data for Tillamook County. This information will assist with and support other parts of the Tillamook County Comprehensive Materials and Solid Waste Management Plan (the Plan). The information discussed in this memo includes:

- the goals of the planning process,
- basic conditions in Tillamook County (such as population and regulations), and
- data to help assess the potential impact of new policies and programs (such as waste composition data, watershed comparison and future trends).

Unlike most of the other parts of the solid waste planning process, there are no specific conclusions or recommendations that are derived from this information, but instead this information will be used to help formulate recommendations in other parts of the Plan.

GOALS OF THE PLANNING PROCESS

The goals previously identified for this Plan are to:

- Develop a range of public and private options for solid waste management that creates a long-term sustainable materials management infrastructure.
- Maintain a balance between reasonable costs and best possible service levels.
- Establish performance standards.
- Meet governmental, financial, environmental and public health obligations.
- Assure consistency with the Tillamook County Comprehensive Land Use Plan, the Tillamook County 2020 Strategic Vision, and other plans.
- Address system needs for projected population change.
- Review current solid waste regulations and policies; giving particular attention to reducing the amount of materials generated, and to reuse, recycling and future disposal needs.
- Identify trends in the solid waste industry locally, regionally and globally.
- Incorporate flexibility to accommodate future needs.

- Conduct an administrative review, including addressing the need for inter-governmental agreements, performing a risk assessment for solid waste facilities, standardizing the rate review process, refining the franchise agreements, and refining the public-private balance.
- Consider safety issues and steps to reduce risks and liabilities.
- Identify and encourage educational opportunities to support the goals and objectives of this Plan.

Options and recommendations developed for this Plan should be weighed against these goals, although each option and recommendation may not be able to satisfy, or perhaps even be consistent with, every goal shown above.

SOLID WASTE REGULATIONS

Local Regulations. The primary local regulations affecting solid waste and recycling are the County's Ordinance No. 4 and several city codes.

The Tillamook County Solid Waste Ordinance No. 4 defines the regulation of solid waste management and was last amended in 2009. The solid waste ordinance covers the particulars of nuisances, enforcement, penalties, abatements, and appeals. It also outlines the purpose, roles and duties of the solid waste advisory committee. Much of the ordinance presents the specifics of franchising of solid waste collection and disposal, including the responsibilities of the franchisees, terms and renewals, and franchise fees.

Most of the cities have adopted various codes addressing waste disposal and related issues, including:

Bay City: City Ordinances #555 and #618 address the solid waste franchise, Resolution #09-13 sets the franchise rates, and Ordinance #649 addresses nuisances and abandoned vehicles.

Garibaldi: City Code #8.05 addresses solid waste collection and transportation, including franchises and rates, and Code #8.15 is the nuisance ordinance.

Manzanita: City Ordinance #10-05 is a solid waste franchise ordinance and #79-6 is a nuisance ordinance.

Nehalem: Ordinance #2010-3, with amendment #2010-07, addresses solid waste franchise rates and insurance requirements and Ordinance #203 has a nuisance section.

Rockaway Beach: Title V, Chapter #51 addresses garbage handling and collection.

Tillamook: City Ordinance #1155 is a solid waste franchise ordinance and Ordinance #1253 is a nuisance, junk and debris ordinance.

Wheeler: Chapter #8 has sections addressing the garbage collection franchise and Chapter #6 focuses on nuisances.

State Regulations. The two primary pieces of legislation affecting solid waste and recycling in Oregon are Oregon Revised Statutes (ORS) 459 (Solid Waste Management) and 459a (Reuse and Recycling). These two statutes address many different aspects of solid waste management and recycling, but the key elements are outlined below.

ORS 459, Solid Waste Management: Originally adopted in 1967 and amended many times since then (most recently in 2009), this State law began with the regulation of landfills and defining State versus local responsibilities. It currently addresses:

- the responsibilities and authority of the Oregon Department of Environmental Quality (DEQ).
- the division of authority between the state and local governments.
- regulation of landfills and other disposal sites.
- enforcement authority.
- infectious waste disposal.
- household and small quantity generator hazardous waste collection.
- disposal rules for batteries, tires and thermostats.

ORS 459a, Reuse and Recycling: This State law contains many provisions that impact recycling and other solid waste programs, and the key elements of this law are reviewed below according to the original legislation or by topic area (for e-waste, paint, and the Bottle Bill).

1983 Opportunity to Recycle Act: The Opportunity to Recycle Act, passed by the Oregon legislature in 1983, was ground-breaking legislation that required:

- residential on-route (curbside) recycling collection in cities of 4,000 or more people.
- recycling at solid waste disposal sites.
- education and promotion programs designed to make all Oregonians aware of opportunities to recycle and the reasons for recycling.

Although Oregon already had an extensive recycling infrastructure, both private and public, before the passage of the act, the system was enhanced through this legislation. The recycling programs called for have been implemented throughout the state.

1991 Oregon Recycling Act: In 1991, the Oregon Legislature took recycling legislation a step further and passed the Oregon Recycling Act. Among other things, the Oregon Recycling Act established a recovery level goal of 50% by the year 2000. The Oregon Recycling Act also mandated the development of a statewide solid waste plan by 1994 and the performance of waste composition

studies. The act also specified purchasing preferences by government agencies for materials with high percentages of recycled content and high degrees of reusability/recyclability. Finally, the act established minimum recycled-content requirements for newsprint, telephone directories, glass containers and rigid plastic containers sold in Oregon.

1997 Two Percent Credits for Waste Prevention: This law enabled local governments to obtain credit for more than just their recycling programs by allowing 2% credits for wastesheds that establish and maintain programs in waste prevention, reuse and backyard composting. DEQ has established guidelines and evaluation criteria for wastesheds that allow them to earn up to 6% total credits toward recovery goals for qualifying programs.

2001 State and Wasteshed Goals: In 2001, although most of the wastesheds in the state were meeting their individual required recovery goals, the DEQ confirmed to the legislature that these accomplishments were nevertheless not going to produce a statewide recovery rate of 50%. The legislature responded with HB 3744 (amending ORS 459.010) that set a statewide recovery goal of 45% for 2005 and 50% for 2009 and adjusted individual wasteshed goals. The bill set out review procedures regarding the goals:

“If a wasteshed does not achieve its 2005 or 2009 waste recovery goal, the wasteshed shall conduct a technical review of existing policies or programs and determine revisions to meet the recovery goal. The department shall, upon the request of the wasteshed, assist in the technical review. The wasteshed may request, and may assist the department in conducting, a technical review to determine whether the wasteshed goal is valid” (ORS 450.010(6)(e)).

In addition, HB 3744 established the following statewide waste generation goals:

- by 2005, there will be no annual increase in per capita municipal solid waste generation; and
- by 2009, there will be no annual increase in total municipal solid waste generation.

E-waste: The Oregon State Legislature passed Oregon’s Electronics Recycling Law (ORS 495A.300-.365) in 2007, creating and financing a statewide collection, transportation and recycling system for desktop computers, portable computers, monitors and televisions (referred to as covered electronic devices, or CEDs). The system provides free, convenient and environmentally sound recycling options for households, small businesses and nonprofits with 10 or fewer employees, and anyone giving seven or fewer CEDs to a collector at any one time.

Under the system, manufacturers of CEDs sold or offered for sale in Oregon must register with DEQ and pay an annual registration fee to fund DEQ’s

administrative costs for the program. Manufacturers then choose to manage their own statewide collection programs or participate in a state contractor program that DEQ has established. Manufacturers cover their own manufacturer-run program costs or pay a recycling fee to participate in the state contractor program. Programs began operating January 1, 2009, and the disposal of CEDs was prohibited in Oregon as of January 1, 2010. As of January 1, 2009, only registered brands are eligible for sale in or into Oregon.

Enacted in 2011, Senate Bill 82 expanded Oregon's three-year-old electronics waste recycling program by adding computer peripherals (keyboards and mice) and printers to the Oregon E-Cycles program effective January 1, 2015. Printers include devices making reproductions or reproductions and some other function (copying, scanning, faxing, etc.).

Paint: In 2009, Oregon became the first state in the nation to enact a law requiring paint manufacturers to manage leftover latex and oil-based paint. House Bill 3037 established a pilot program which began in July 2010 and is currently due to "sunset" in June 2014. Oregon's paint product stewardship law serves as a demonstration for similar future programs in other states. PaintCare, a non-profit organization created by the American Coatings Association (a trade group for paint manufacturers), administers the Oregon program. PaintCare develops and implements a program plan providing a series of depots statewide to collect unused paint. Consumers pay for the program by paying a surcharge on paint and stain containers at the point of sale. Fees range from \$0.35 to \$1.60 per can, depending on paint container size. DEQ must review and approve PaintCare's program plan and the fee. Manufacturers and retailers may be prohibited from selling paint unless they participate in an approved program. Retailers are also required to provide consumers information on their options to recycle or safely dispose of leftover paint.

Tillamook County's new Household Hazardous Waste Facility is serving as a local collection point for paint.

The Oregon Bottle Bill: The Oregon legislature passed the Oregon Bottle Bill in 1971 and it took effect on October 1, 1972. This bottle bill was the first of its kind in the nation. Its purpose was to reduce litter and divert all beer and carbonated beverage containers from the waste stream so that they could be reused or recycled. The bill requires that a refund be paid to any person who returns empty soft drink or beer bottles or cans to a retail store.

The Bottle Bill was amended in 2007 to include:

- 1) Water and flavored water were added to the bottle bill, effective Jan.1, 2009.
- 2) Stores occupying 5,000 square feet or more must begin accepting empty containers of any brand or size, if they sell the same type of beverage, effective Jan. 1, 2009. For example, a store that sells soft drinks must accept and pay a refund on any brand of soft drink container.

- 3) Stores occupying less than 5,000 square feet can limit the number of containers they redeem to 50 per person per day.
- 4) The law set up the Bottle Bill Task Force, charged with submitting a report to the governor by Nov. 1, 2008 on recommendations on how to further expand or modify the bottle bill's recycling system.

The Bottle Bill was further amended in 2011 and new additions to the law include:

- 1) Containers eligible for a refund will be expanded to include juices, teas, coffees and sports drinks. These containers become deposit refund – eligible one year after the Oregon Liquor Control Commission (OLCC) determines that at least 60% of beverage containers are returned to redemption centers or on January 1, 2018, whichever comes first.
- 2) Increases the 5 cent deposit to 10 cents after OLCC determines that, in each of two previous years, the number of containers returned was less than 80% of the total number of beer, soft drink and water containers sold. OLCC cannot make this determination prior to January 1, 2016.
- 3) Encourages the development of additional “redemption centers” to provide convenient places for people to return containers besides participating grocery stores. OLCC will authorize a pilot project for a container redemption center operated by a distributor cooperative and serving a majority of retail dealers in an Oregon city less than 300,000 in population.

With the deposit on additional bottles, more bottles will be handled at redemption centers and fewer at MRFs, and fewer bottles will end up in the landfill.

Federal Laws. At the federal level, the Resource Conservation and Recovery Act of 1976 (RCRA), as amended by the Solid Waste Disposal Act Amendments of 1980 (42 U.S.C. 6901-6987), is the primary body of legislation dealing with solid waste. Subtitle D of RCRA addresses non-hazardous solid waste disposal and required states to develop comprehensive solid waste management programs that outline the authorities of local, state and regional agencies. Subtitle D required the state programs to prohibit “open dumps” and provide that all solid waste is disposed in an environmentally-sound manner.

WASTESHED COMPARISON

Comparing counties with similar characteristics can be effective for determining how different programs and policies have an impact on recycling rates and other parameters for solid waste management. Table 1 compares the basic conditions and results for Tillamook and four other counties (Clatsop, Columbia, Coos and Lincoln Counties).

**Table 1
Comparison of Tillamook County to Other Counties**

	Tillamook	Clatsop	Coos	Lincoln	Columbia
2010 Population	25,250	37,070	63,035	46,135	49,430
# Cities over 4,000	1	3	3	2	2
Land Area, square miles	1,103	829	1,596	980	657
Population Density, people per sq. mile	22.9	44.7	39.5	47.1	75.2
2010 Waste Disposed, tons	20,083	31,036	34,574	38,932	24,616
Disposal Rate; - lbs/person/year - lbs/person/day	1,591 4.4	1,674 4.6	1,097 3.0	1,688 4.6	996 2.7
Disposal rate average = 1,409 pounds per person per year and 3.9 lb. per person per day					
2010 Total Recovery Rate	39.6%	36.0%	39.5%	34.6%	37.8%
Recovery Credits: Prevention Reuse Composting	2% 2% 2%			2%	2%
Recovery Rate without Credits	33.6%	36.0%	39.5%	32.6%	35.8%
Recovery rate average (w/o credits) = 35.5%					
Top 5 Materials Recycled in 2010 (and percent of total amount diverted)	Metal 36%, Cardboard 26%, Wood 12%, Paper 6%, Glass 6%	Yard Debris 27%, Cardboard 20%, Wood 17%, Paper 10%, Glass 6%	Wood 26%, Metal 19%, Cardboard 18%, Paper 10%, Yard Debris 9%	Wood 33%, Cardboard 20%, Metal 13%, Paper 12%, Glass 7%	Cardboard 26%, Yard Debris 26%, Paper 14%, Metal 10%, Wood 8%
Recycling Programs					
Drop-Off Sites	4 staffed recycling depots	2 staffed recycling depots 1 not staffed	8 staffed recycling drop offs	5 staffed drop-offs (1 public, 4 private) and 2 non-staffed	3 staffed recycling drop-offs, 1 non-staffed
Residential Curbside Collection of Recycling	Residential curbside by subscription is offered by one hauler to City of Tillamook residents.	Residential curbside in Astoria, Seaside, Gearhart, and Cannon Beach through bundled rates, and for an additional charge in Warrenton.	Residential curbside in a bundled rate in North Bend, Coquille and Coos Bay. Bandon recycling fees are additional.	Residential curbside in a bundled rate in Newport, Lincoln City, Toledo, Waldport and Yachats.	Residential curbside in rural Columbia County including St. Helens and Vernonia mandatory and bundled rate.
Commercial Recycling	2 haulers provide commercial recycling	1 hauler provides commercial recycling	3 haulers provide commercial recycling	3 haulers provides commercial recycling	2 haulers provide commercial recycling

Table 1, Comparison of Tillamook County to Other Counties, continued

	Tillamook	Clatsop	Coos	Lincoln	Columbia
Recycling Programs, continued					
Yard Debris Collection Sites	2 sites: Manzanita and Tillamook Transfer Stations	3 sites: Astoria Seaside Cannon Beach	1 site: Beaver Hill Disposal, between Coos Bay and Bandon	3 sites: Dahl Disposal, Toledo; North Lincoln Sanitary, Lincoln City; and Thompson Sanitary, Newport	1 site: Beaver Bark Compost Facility in Scappoose
Solid Waste Programs					
Garbage Collection	5 haulers service Tillamook County and its incorporated cities	1 hauler serves Gearhart, Cannon Beach, and all of unincorporated Clatsop County, and the cities of Astoria and Seaside. Warrenton has municipal service	4 haulers service Coquille, North Bend, Bandon and Coos Bay	4 haulers service Lincoln City, Newport, Depoe Bay, Yachats, Waldport, Siletz and unincorporated County	2 haulers service Columbia County and its incorporated cities
Transfer Stations	3 sites: Tillamook Manzanita Pacific City	1 site: Clatsop Transfer and Disposal in Astoria	1 site: Beaver Hill in Coos Bay ¹	1 site: Public Transfer Station	2 sites: County Transfer Station and Vernonia
Disposal Cost per Ton	\$74.75	\$93.45	\$87.27 ¹	\$89.25	\$114.00
Disposal Facilities (and one-way distance from main transfer station)	Coffin Butte in Corvallis, OR, 82 miles	Riverbend Landfill in McMinnville, OR, 112 miles	Beaver Hill Incinerator in Coos Bay, OR, 0 miles ¹	Coffin Butte in Corvallis, OR, 63 miles	Riverbend Landfill in McMinnville, OR, 68 miles
Average distance to disposal site = 72 miles (90 miles without Coos County)					
HHW Facility	Yes	No	No	No	Yes

Sources include the Oregon Department of Environmental Quality; phone call conversations and websites for counties, cities, and haulers; and the U.S. Census Bureau (for population and land area).

Note: 1. Beaver Hill Incinerator closed since this data was collected, and so the disposal site and costs, and possibly other factors such as recycling tonnages, will change for the latter half of 2012 and future years.

A few trends can be observed based on the data in Table 1:

- The disposal rates shown for Tillamook County are significantly impacted by the seasonal influx of vacationers and temporary residents. These visitors contribute to

the annual waste amounts but are not counted in the population figures (see also Table 4 and Figure 1 in the later section, “Waste Quantities and Composition”).

- The two counties with the highest total population, Coos and Columbia Counties, also have the highest actual recycling rate (not counting waste prevention credits) and along with that these counties also have the lowest per capita disposal rate.
- The top five most recycled materials are similar for the five counties except that three of the counties have yard debris in their top five, indicating that Tillamook County could possibly benefit from more programs for yard debris. For Tillamook County, yard debris represents only 2% of the total amount of materials diverted, compared to 9%, 26%, and 27% for three of the other counties.
- The curbside recycling cost is bundled with garbage service in several cities of the neighboring counties. On the contrary, the only city in Tillamook County that offers curbside recycling is available by subscription in the City of Tillamook.
- Recycling and yard waste drop-off stations are commonly available throughout all the counties.
- The Tillamook County transfer station offers the lowest per ton cost for garbage at \$74.75 per ton. Other counties range from \$87.27 to \$114.00 per ton.
- The average distance travelled to the disposal site is 72 miles (or an average of 90 miles if the 0 miles for Coos County is ignored). The distance for Tillamook County waste to travel to the Coffin Butte Landfill in Corvallis is 82 miles.
- Columbia County’s hazardous waste facility is also open monthly, but Tillamook County is the only county on the coast that hosts a household hazardous waste facility.
- Commercial recycling services are provided by most of the solid waste collection companies. Service is available throughout most of the counties, although primarily in the franchised cities.

TRENDS IN SOLID WASTE MANAGEMENT

Local Trends. Locally there is increasing use of anaerobic digestion and composting to address agricultural wastes. In both cases, these technologies are converting wastes that can be problematic into useful products (energy, compost, etc.).

Statewide and Regional Trends. There are several trends affecting solid waste management on a statewide or regional basis:

Commingled Systems Workgroup: The increasing use of commingled and single-stream recycling in the region and throughout the nation has led to questions about the ability of processing systems to adequately sort materials. There is a growing concern that both systems lead to cross-contamination because materials are not fully separated at the processing facility. In Oregon, until quite recently, the primary concern has been loss of recoverable materials due to a commingled system (in place throughout Oregon for many years now)

that requires more attention to sorting at material recovery facilities. More recently, local governments in Oregon, particularly in the Portland Metro region have expressed concern about potential movement towards a single stream collection system which would result in the loss of glass (as glass once mixed with other recoverable can be difficult to sort out at Material Recovery Facilities (MRFs) and once broken to a certain size useless for glass to glass or fiberglass recovery). Broken glass can also damage equipment at MRFs and paper mills.

In Oregon, recycling stakeholders explored the concerns related to commingled recycling through the Commingled Systems Workgroup. The purpose of this group, which had a series of meetings in 2010 and 2011, was to identify opportunities to improve Oregon's commingled recycling system at all levels, from collection and consumer education to processing and end-markets.

Washington State conducted a similar process that has recently resulted in a best management practices (BMP) guidance document on what to include in a commingled curbside program. A recent report by DEQ¹ concluded that 92-94% of commingled recyclables entering material recovery facilities (MRFs) were properly sorted by the facility and sent to the correct markets. For some of the lower tonnage materials, the loss for those commodities was quite high: for instance 16% of plastic containers and 33% of aluminum cans, both materials with high embodied energy, were not recovered by the MRFs.

Mixed Organics Collection Programs: In Oregon and Washington, implementation of residential mixed organics systems (food scraps with yard waste) and source-separated commercial food waste collections has increased substantially in recent years. After one and a half years of a pilot program, the City of Portland expanded their residential mixed organics program citywide on October 3, 2011. With the launch of food scraps collected in yard waste carts, Portland has also gone to every other week collection of garbage.

Product Stewardship: There is increasing interest in product stewardship on both a regional and national level. The Department of Environmental Quality (DEQ) completed a stakeholder process and released a report in December, 2010 with recommendations on the future direction of product stewardship in Oregon. Likewise, the Association of Oregon Counties and the Oregon Refuse and Recycling Association recently adopted principals relating to product stewardship in Oregon.

Product stewardship efforts aim to encourage manufacturers and retailers to take increasing responsibility to reduce the lifecycle impacts of a product and its packaging in product design and in the end-of-life management of the products they produce. Lifecycle impacts include energy and materials consumption, air and water emissions, the amount of toxics in the product, worker safety, and waste disposal.

¹ From "Composition of Commingled Recyclables Before and After Processing," Oregon DEQ, March 2011.

Conversion Technologies: DEQ also recently formed an advisory committee to provide input for rules that will be formulated to address conversion technologies. Conversion technologies are defined by DEQ as “a variety of biological, chemical and thermal (excluding incineration) processes that convert solid waste into chemicals, fuels and other products.” Examples of conversion technologies include anaerobic digestion, gasification, hydrolysis, and pyrolysis. While these technologies are well-proven for specific wastes and other materials (such as the use of anaerobic digestion for animal manures), the application of these processes to solid wastes is a relatively new endeavor. These technologies have significant potential but generally require substantial capital investment and large waste flows (although a few of the technologies may be amenable to smaller amounts of waste).

National/Global Trends. Several global trends may have an impact on the programs discussed in this Plan. Three such trends include:

Climate Change: The magnitude and causes of climate change are still being debated, but a growing body of evidence indicates that the world is undergoing some type of climate change. This change may lead to more variable weather patterns and an increase in severe storms of all types. An increase in average global temperatures could actually make some areas colder or wetter by changing existing weather patterns. Increased global temperatures may also provide more energy and thus stronger storms, which on a local level could mean that a single storm could deliver much more rain or snow than previously experienced.

Recycling provides a huge amount of offsetting reductions in greenhouse gas emissions by reducing the need to process more raw materials such as ore and paper fibers and through other benefits. The processing of various raw materials is often a large contributor to greenhouse gas emissions due to the amount of energy consumed in the process (and hence the large amount of carbon dioxide created). For instance, it has long been recognized that producing aluminum cans from old aluminum cans requires only 5% of the energy required to produce such cans from bauxite ore (and hence creates only 5% of the greenhouse gas emissions associated with producing aluminum cans). The materials management approach attempts to recognize and account for these types of benefits.

Increasing Oil Prices: In the long term, the price of petroleum products will increase as the supply of oil shrinks, unless demand shrinks as well. In other words, it is not the point at which the world runs out of oil that is important, but the point at which supply can no longer keep up with demand. It is difficult to predict when this point will be reached due to uncertain predictions about supply and demand. The increase in oil prices is one of those trends that could have both positive and negative impacts on Tillamook County’s economy and on solid waste programs. The net impact to solid waste programs could include:

- there could be more or less solid waste generated if tourism or seasonal population patterns are affected,
- higher fuel costs will lead to higher prices for collection and other transportation-based programs, thus making waste export less cost-effective and efficient transfer systems more important,
- recycling could become more or less cost-effective, depending on the competing impacts of transportation costs versus the value of recyclable materials,
- the costs of consumer goods reliant on petroleum inputs (e.g. fertilizers for foods, asphalt shingles) and long haul transportation could increase significantly, and
- local composting systems could become more important because local growers will be able to use that compost at a lower cost than compost shipped into Tillamook County from other areas. As shipping costs increase, growing and eating locally-produced food will become more important to an area's economy and sustainability.

International shifts in manufacturing and demand for raw materials: A large amount of manufacturing capacity has already shifted to China and other countries, but there is increasing recognition in China of the environmental costs of these activities. This and other factors, such as rising fuel costs, make it uncertain whether worldwide shipping practices will continue to be as competitive in the future. Since the United States also ships a large amount of goods and materials to other countries, rising fuel costs will have a mixed impact on international shipping and the demand for raw (recycled) materials.

It is impossible to predict the exact nature and degree of local impacts that may result from these trends because the magnitude and timing of these trends is uncertain. In addition, the impacts of these trends could be both positive and negative, and some aspects could even cancel each other out to a degree (at least on a local level).

Materials Management Approach. Solid waste management may be experiencing a transition from end-of-life management of wastes to a materials management approach. The end-of-life management approach that has been used to date focuses primarily on options for handling a material once it is discarded (such as recycling, composting or proper disposal). This approach has long recognized the value of recycling in terms of reduced virgin resource extraction and other environmental impacts, but the materials management approach seeks to provide a more comprehensive analysis of the environmental impacts of managing materials throughout their life cycle. This involves a more thorough accounting of the energy demands, amount of pollution and other impacts associated with the extraction, production, use and end-of-life management for specific materials. As such, the materials management approach does a much better job of recognizing the climate change impacts for materials and products.

The materials management approach is gaining increasing attention on a national scale through the efforts of the EPA and numerous state and local governments. In Oregon, the DEQ is using this concept as the foundation for the update of the state's solid waste management plan. DEQ is convening a cross-section of stakeholders to inform the development of DEQ's statewide Vision and contribute to the development of an action plan to move forward.

Future Recycling Trends. Several trends are expected to have an impact on future recycling programs², including:

- The Internet has changed how people purchase products. With more online shopping, there are more cardboard boxes in the residential recycling mix.
- The Internet has also changed how people get news and information. Newsprint, which for years has been the cornerstone of recycling programs, is being generated in decreasing amounts. Fewer people currently subscribe to newspapers and this trend is expected to continue. As the amount of newsprint in the paper fiber stream decreases it becomes harder to clean it up to a quality that newsprint mills find acceptable.
- Fewer phone directories are being produced (and hence recycled). The daily use of paper telephone directories has decreased as most people look up telephone numbers online or via internet directories.
- There are more home offices and printers, and so the amount of higher-grade paper in residential curbside programs is increasing.
- The population is aging, due to a combination of a large group of people approaching their senior years and because people are living longer. This means that there will be more demand for various home services and for products such as convenience food and packaging that is easy to open. This could also lead to more syringes and other medical wastes being placed in the residential garbage unless convenient disposal alternatives are available.
- Family life is changing. Many families do not sit down to a traditional family dinner every night, hence more take-out food and prepared meals are being purchased.

Tsunami Debris Field. The strong earthquake and tsunami that struck Japan in March 2011 resulted in millions of tons of debris being swept into the ocean. This debris is being carried by ocean currents to the west coast of the U.S., primarily to Oregon and Washington beaches. The actual amount of debris that washes ashore on the west coast will likely be substantially less than initial projections, due to some of the material being diverted the Pacific Ocean "Garbage Patch" and other material sinking over time.³ The bulk of this debris is expected to wash ashore in 2013 to 2014, although wind-blown pieces will begin arriving before that.

² From "What's Going to Be in the Bin?," by Maria Kelleher, Resource Recycling Magazine, Sept., 2011.

³ From an article, "Researchers Plot Path, Timing of Japan Tsunami Debris Mass Headed for Oregon, Washington, Hawaii," in The Columbia Basin Bulletin, October 28, 2011.

The eventual arrival of the Japanese tsunami debris will require a plan for dealing with that material. Disaster debris planning is a function of Tillamook County Solid Waste and is incorporated into the County's Emergency Operations Plan. A Disaster Debris Plan is currently being developed by Tillamook County. This plan would provide an effective approach for dealing with this type of disaster debris as well as debris from local catastrophes (floods, fires, extreme weather events, tsunamis, large accidents, etc.).

DEMOGRAPHICS

Population figures for Tillamook County from the past two census counts are shown in Table 2. As can be seen in the table, only one of the cities in Tillamook County exceeds 4,000 people, and all of the other cities have less than 1,500 residents. Almost two-thirds (62%) of the people live in unincorporated areas.

**Table 2
Population of Tillamook County**

City or Area	2000	2010	Percent Increase
Incorporated Areas	8,825	9,595	8.7%
Bay City	1,149	1,286	11.9%
Garibaldi	899	779	-13.3%
Manzanita	564	598	6.0%
Nehalem	203	271	33.5%
Rockaway Beach	1,267	1,312	3.6%
Tillamook	4,352	4,935	13.4%
Wheeler	391	414	5.9%
Unincorporated Area	15,437	15,655	1.4%
Totals	24,262	25,250	4.1%

Notes: All data is from the 2000 and 2010 Census.

The increase in Tillamook County's population over the past decade was 4.1% (or 0.40% annually). If the County's population continues to increase at this same rate, the population will grow to 27,349 by 2030 (see Table 3).

An important point about the figures shown in the population tables is that these do not include the substantial number of seasonal residents and tourists that live temporarily in Tillamook County, primarily in the summer months. It has been estimated that 60% or more of the houses in Tillamook County are seasonal homes or rental properties. In Manzanita, for instance, 73% of the homes are second homes. In addition, there are also large numbers of people that camp at state and county parks in Tillamook County in the summer.

**Table 3
Population Projections for Tillamook County**

Year	Number of People¹
Census Counts	
2000	24,262
2010	25,250
Projected Figures	
2011	25,351
2012	25,452
2013	25,554
2014	25,656
2015	25,759
2020	26,278
2025	26,808
2030	27,349

Notes: Assumes the same population growth as for the period 2000 to 2010 (0.40% annually).

WASTE QUANTITIES AND COMPOSITION

Waste Quantities. All of Tillamook County’s municipal solid waste⁴ (MSW) is transferred through the Tillamook Transfer Station (TTS), which makes accurate measurements of the county’s waste stream a relatively straightforward process. There is also a substantial amount of other wastes generated in the county, such as cow manure and other agricultural wastes, which are not considered part of MSW and so are not directly addressed by this Plan. The non-MSW materials are addressed to some extent, however, where programs and facilities are currently or potentially dealing with both types of waste.

The amounts of waste disposed from the Tillamook Transfer Station are shown in Table 4 and in Figure 1. These graphics show the amount of waste disposed (transferred to the Coffin Buttes Landfill), which is different (lower) from the amount of incoming waste due to the recovery of some materials (metals and cardboard) from the tipping floor of the transfer station.

Table 4 and Figure 1 clearly demonstrate the increased waste tonnages that result from seasonal visitors to Tillamook County. The large influx of tourists and temporary residents in the summer months impacts the waste tonnages in July and August, and possibly also to a lesser extent in June and September. What is less obvious in the tonnage information, however, is the tourism that occurs in other months. The large

⁴ “Municipal solid waste” is used here to mean the same types of wastes as what DEQ calls “municipal post-consumer waste,” which includes residential and commercial wastes and some types of waste generated by industries, but excludes agricultural wastes and other wastes defined as “industrial materials.”

number of second homes and temporary residents in the non-summer months also contributes to waste quantities in Tillamook County and artificially inflates the per capita disposal rate (since the per capita rate is calculated based on the number of permanent residents).

As can be seen in Table 4, the amount of waste disposed from Tillamook County was higher in 2008 than in the past two years. The 2010 rate (1,591 pounds per person per year) is 16% lower than the 2008 rate (1,900 pounds per person per year). This is similar to the trend seen in most areas of the United States and is widely assumed to be the result of lower consumption due to the economic problems of the past few years. The seasonal trend remains similar, however, with the largest amounts of waste disposed in the summer months due to the influx of visitors and tourists.

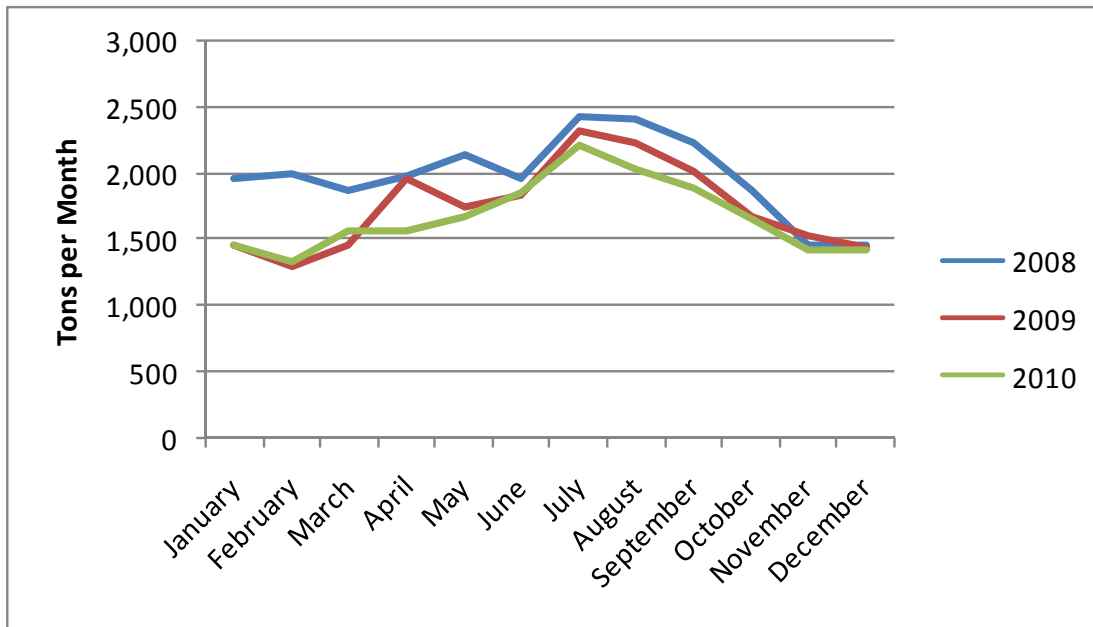
Table 4
Amount of Solid Waste Disposed from Tillamook County, tons

Month	2008	2009	2010
January	1,966	1,455	1,466
February	1,999	1,297	1,334
March	1,872	1,450	1,565
April	1,977	1,960	1,565
May	2,142	1,747	1,675
June	1,964	1,828	1,848
July	2,429	2,314	2,207
August	2,409	2,221	2,031
September	2,231	2,007	1,892
October	1,880	1,670	1,658
November	1,465	1,522	1,420
December	1,457	1,442	1,422
Annual Total	23,791	20,913	20,083
Population ¹	25,045	25,147	25,250
Per Capita Waste Disposal Rate²	1,900	1,663	1,591

- Notes: Figures show the amount of waste (in tons) shipped out of the Tillamook Transfer Station.
1. The population figure for 2010 is based on the U.S. Census, and for 2008 and 2009 the population is interpolated from 2000 and 2010 census figures (see Table 2).
 2. The waste disposal rate is expressed as pounds per person per year.

Waste Composition. Local data on the composition of waste disposed from Tillamook County is not available, but data from a statewide study provides an indication of what materials can be found in the County's solid waste stream. The *2009/2010 Waste Composition Study*, prepared by DEQ, provides data for several distinct areas of the state (such as the Portland Metro region, Marion County, and Lane County), but separate data is not provided for most areas of the state and instead the rest of the state is simply combined into a category called "rest of Oregon." This is because the cost for taking a sufficient number of samples needed to provide an accurate

Figure 1
Amount of Solid Waste Disposed from Tillamook County



breakdown for other counties was prohibitively expensive. Thus, the best available data for Tillamook County is the data that was collected and reported in aggregate for Tillamook County and 30 other counties. Those composition figures are shown in Table 5, and that breakdown is applied to Tillamook County's annual waste tonnage for 2010 to provide an estimate of the number of tons of each material that are disposed in the County's waste stream.

The composition data shown in Table 5 can be combined with the recycling data collected by DEQ to provide an estimate of recovery level for each material. That information is shown in Table 6.

Waste Projections. Projecting future amounts of solid waste is a necessary part of planning for proper solid waste management. Projections for the future amounts of solid waste are an important starting point for ensuring that there will be adequate collection, transfer and disposal capacity for that waste, and projections also provide the basis for designing recycling and other waste diversion programs. This is, however, an interesting time for attempting to predict future quantities of waste. The sudden decrease in waste amounts associated with the economic downturn has shown previous projections to be nearly worthless. In Tillamook County, for instance, the amount of waste disposed in 2010 is 16% less than the amount in 2008 (see Table 4). The question at this point is whether, and to what extent, people will return to previous consumption and garbage generation levels.

Table 5
Waste Composition for Tillamook County

Material	Disposed	
	Percent ¹	Tons per Year ²
PAPER	12.85%	2,874
Cardboard	2.89%	647
Newspaper	0.65%	146
Magazines	0.69%	154
Other Recyclable Paper	3.96%	886
Compostable Paper	2.53%	565
Other Paper	2.13%	477
PLASTIC	8.49%	1,899
Rigid Plastic Containers	1.39%	310
Plastic Bags, Film	1.62%	362
Other Plastics	5.48%	1,226
METALS	7.23%	1,618
Aluminum (cans and other)	0.23%	51.7
Tin Cans	0.71%	159
Other Metals	6.29%	1,407
GLASS	2.41%	538
Recyclable Glass	1.36%	307
Other Glass	1.04%	232
ORGANICS	35.92%	8,036
Food Waste	15.90%	3,558
Yard Debris	7.34%	1,642
Wood Waste	12.68%	2,838
HAZARDOUS MATERIALS	0.53%	119
Lead-Acid Batteries	0.02%	3.6
Dry-Cell Batteries	0.05%	10.6
Motor Oil	0.06%	13.0
All Other Hazardous Materials	0.40%	89
OTHER	32.57%	7,287
Disposable Diapers	2.31%	516
Textiles	3.11%	695
Carpet	3.1%	693
Furniture and Mattresses	2.25%	504
Gypsum Wallboard	2.69%	602
Animal Excrement	3.0%	672
Other Materials	16.11%	3,604
TOTAL	100.0%	22,373

- Notes: 1. Percentage figures for the amount of materials in the waste stream are from DEQ's 2009/2010 Waste Composition Study (for the "rest of Oregon," excluding Metro, Marion and Lane Counties).
2. Figures for tons per year are based on the annual amount of waste (22,373 tons in 2010) and the percentages shown in the previous column.

**Table 6
Material Recovery Levels for Tillamook County**

Material	Disposed Tons¹	Amount Recycled²	Percent Recovery
Aluminum (cans and other)	51.7	283	84.5%
Animal Waste/Grease	NA	109	NA
Antifreeze	NA	6.8	NA
Cardboard/Kraft	647	2,593	80.0%
Electronics	242	88.4	26.8%
Fluorescent Lamps	1.5	0.9	37.6%
Food Waste	3,558	66.5	1.8%
Glass Containers	307	635	67.4%
Glass Other	232	0.7	0.3%
Gypsum Wallboard	602	44.4	6.9%
Household Hazardous Waste	NA	28.7	NA
Lead Acid Batteries	3.6	77.7	95.6%
Mixed Batteries	10.6	0.5	4.2%
Paint	31.5	13.3	29.7%
Paper Fiber	1,186	636	34.9%
Plastic Film	362	14.1	3.8%
Plastic Other	1,226	22.2	1.8%
Rigid Plastic Containers	301	105	25.9%
Roofing - Asphalt	655	35.5	5.1%
Scrap Metal - Other	1,433	3,584	71.4%
Solvents	NA	0.6	NA
Tin Cans	159	24.1	13.2%
Tires	3.6	129	97.3%
Used Motor Oil	13.0	185	93.4%
Wood Waste	2,838	1,266	30.8%
Yard Debris	1,642	198	10.8%
Other Wastes/Materials	6,892	NA	NA
Totals	22,373	10,147	

- Notes: 1. Disposed tons are based on figures for the amount of materials in the waste stream from DEQ's 2009/2010 Waste Composition Study (for the "rest of Oregon," excluding Metro, Marion and Lane Counties) and Tillamook County's annual (2010) amount of waste (see Table 2).
2. Figures for the amounts recycled are from DEQ's 2010 Oregon Material Recovery Survey.

Table 7 compares future disposal and recycling amounts, which together add up to the total amount of waste generated, at the 2008 and 2010 waste generation rates. This table uses the projected population figures (see Table 3) and the actual recycling rates for each year. This comparison only addresses MSW (i.e., does not include agricultural or other non-MSW solid wastes).

The projected figures are provided for planning purposes only, and actual figures in the future will be strongly influenced by consumption levels, recycling rates and other factors.

**Table 7
MSW Waste Generation Rates**

	At 2008 Rate	At 2010 Rate
Disposal Rate, lb/person/yr¹	1,900	1,591
Waste Disposed, tons;		
2008	23,791	
2010		20,083
2015	24,480	20,499
2020	24,982	20,919
2025	25,495	21,349
2030	26,019	21,787
Recycling Rate, %²	33.5%	33.6%
Recycled Amounts, tons;		
2015	12,332	10,326
2020	12,585	10,538
2025	12,843	10,755
2030	13,107	10,975
Waste Generated, tons;³		
2008	35,785	
2010		30,230
2015	36,812	30,825
2020	37,568	31,458
2025	38,339	32,104
2030	39,126	32,763

- Notes: 1. See Table 2.
2. Recycling rate for 2010 ignores waste prevention credits.
3. The figures shown for the amount of waste generated are the sum of waste disposed and the amount recycled.
All figures are in tons unless indicated otherwise.

ATTACHMENT B
SWAC MEETING MINUTES
from workshop on August 14, 2012

**Tillamook County Public Works
Solid Waste Advisory Committee (SWAC)
Workshop Notes**

Date: August 14, 2012, 9 am – 3 pm

Location: Port conference room, 6825 Officers Row, Tillamook, Oregon

Facilitator: Jeanne Nyquist

Staff & Technical Support:

Liane Welch, Tillamook County Public Works Director
David McCall, Tillamook County Solid Waste Program Manager
Peggy Weitman, Tillamook County Public Works staff
Sue Owens, Tillamook County Public Works staff
Rick Hlavka, Green Solutions

SWAC Participants:

Sandy Carbaugh, Chair, Solid Waste Franchisee
Clyde Zeller, Vice Chair, Public at Large
Tom Jayred, Public at Large
Laura Leebrick, Solid Waste Franchisee
Shawn Reiersgaard, Dairy Industry
Jon Wehage, Timber Industry
David Baxter, Construction Industry
Robert Poppe, Recycling Industry
Linda Kozlowski, Incorporated Cities

Public Participant: Jan Hamilton

Workshop Objectives:

- Review and provide comments on background documents:
 - *Evaluation of Waste Diversion Activities in Tillamook County*, and
 - *Second Technical Memo for the Solid Waste Plan, May 17, 2012*
 - *Status of Documents and Next Steps, July 10, 2012*
- Review Evaluation of the Options (excerpted from *Second Technical Memo*) and prioritize options.
- Define next steps in development of the Solid Waste Management Plan (including discussion of DEQ comments, if time permits).

Discussion Ground Rules:

- Ask questions
- Work collaboratively for the collective interests of the County.
- Seek consensus where possible.
- Air differences respectfully.
- Pursue creative solutions.
- Silence cell phones.

Review of Document(s):

Rick Hlavka, Green Solutions, provided an overview of the draft document, *Evaluation of Waste Diversion Activities in Tillamook County*. SWAC members provided feedback and suggestions for revision as follows:

- Recycling in Tillamook City - Description of recycling services needs to be updated as follows:
 - Residential recycling –
 - Services are provided curbside.
 - Approximately 1% - 2% of residents participate.
 - Currently no recycling container is provided to residential customers.
 - An education program and a list of primary recyclables might increase participation.
 - Commercial recycling –
 - Offered by request.
 - 70% - 80% of businesses participate.
 - Cardboard is the primary recyclable.
- Plastic recycling -
 - A definitive answer is needed from DEQ about requirements for plastic recycling.
 - Plastics represent a small quantity by weight but large volume with big public impact.
 - A large volume of non-recyclable plastic is generated by the Creamery.
 - Plastic drums, buckets and jugs are cleaned and reused. This needs to be tracked and reported as 'reuse'.
- Waste stream needs to be quantified so we can determine items of biggest impact, low hanging fruit, etc.
 - Need to revisit the Plan in 3 – 5 years.
 - Need baseline data to allow us to benchmark and evaluate progress.
- Best Practice (page 13) – The report needs to better define best practice. Since best practice is continually developing, it was suggested that some examples (of public entities) be listed in the body of the report, supplemented by a listing of 'Current Best Practice' in the Appendix.
- Returnable bottles and cans (page 3) – Habitat for Humanity gets \$9,000 per year in revenue from returnable bottles and cans. CARTM also accepts returnables with a similar annual revenue.
- Other Service Gaps (page 17) – Remove reference to 'family wage jobs' – move this discussion to the 'Conclusion'
- Snapshot – Need to emphasize that this report is a snapshot in time. The best snapshot of data is the year-end report.

Evaluation of the Options:

The SWAC reviewed the list of options for managing solid waste (*Table 2 – excerpted from the Second Technical Memo*) using the following discussion process.

- Description - Rick Hlavka, Green Solutions, provided a description and background information on each option, as well as his initial rating of the option.
- Rating - The SWAC discussed each option and agreed on an overall rating of high, medium, or low based on the following criteria:

Criteria:

- Consistency with Solid Waste Hierarchy
 1. Reduce
 2. Reuse
 3. Recycle
 4. Compost
 5. Recover Energy
 6. Disposal
- Diversion Potential
- Cost Effectiveness
- SWAC support
- Prioritization – The SWAC prioritized the options using a three-step process:
 - 1st – Grouped complementary high-priority options.
 - 2nd – Assigned a ranking of importance.
 - 3rd – Reviewed the list of medium-priority options and selected key items that should be included in the draft recommendation.
- Timeline – The SWAC developed an initial draft timeline by assigning short-term, mid-term and long-term timeframes to the recommended options.

The results of the SWAC’s discussion of the options are listed on the following pages:

- Recommended Options – Prioritized Pages 5 - 6
- Recommended Options – Timeline Pages 7 - 8
- SWAC Rating of All Options Pages 9 - 12

(Table 2: Excerpted from Second Technical Memo)

Items for Further Discussion:

The SWAC identified the following items for further discussion:

- Vacation rental companies hauling trash – needs to be included in the short-term plan.
- Development of Disaster Debris Management Plan – needs to be included in the short-term plan.

Next Steps (in sequence):

1. Rick Hlavka, Green Solutions, will develop revised draft of report (*Evaluation of Waste Diversion Activities in Tillamook County*) to distribute to SWAC members 2 weeks prior to September SWAC meeting.
2. County staff will schedule meetings with cities to review report and SWAC recommendations.
3. Final report and recommendations will be presented to Tillamook County Board of Commissioners.

SWAC Recommended Options - Prioritized

Option	Reference (Table 2)	SWAC Rating	Priority # of Votes	Timing
Establish Standards and Review Process for Disposal and Collections, including: <ul style="list-style-type: none"> • Annual Rate Review • Review, revise, renew, standardize contracts and agreements • Waste Collection – Institute performance standards • Waste Collection periodic review • Waste Collection standardize rate request form 	G3 G4 E2a E2b E2c	High	16	Short-Term
Recycling, including <ul style="list-style-type: none"> • Begin curbside recycling in other areas • Implement processing or reload facility at TTS/MTS/PCTS 	C2b C3c	High	11	Short-Term
Education, including <ul style="list-style-type: none"> • Business practices – outreach and education to influence green business practices consistent with solid waste hierarchy • Increased promotion for reuse • Promote home composting • Expand education and promotion for proper handling of HHW (household hazardous waste) • Move to a materials management system as an educational strategy 	A2 B2 D2e H1 I1	High	10	Ongoing 0 – 10 years
Recycle Organics – <ul style="list-style-type: none"> • Research potential solutions for separate yard debris collection and processing (including code enforcement for illegal dumping) • Explore digester for composting and encourage local distribution of compost • Use anaerobic digester for food waste – process at Hooley digester 	D1c D1d *D2d and F1	High	8	Mid-Term

Option	Reference (Table 2)	SWAC Rating	Priority # of Votes	Timing
Recycling – Work with City of Tillamook to meet DEQ recycling requirements	C2a	High	7	Short-Term
Other Options - Change funding for Solid Waste Department- Consider different rate methodologies	I2	High	7	Short-Term
Waste Prevention/Diversion - Salvage/deconstruction of buildings and infrastructure	A1	High	7	Long-Term
Hazardous Waste – Increase CEG collections- conduct survey	H2	High	3	Short-Term
Recycling – Change the minimum fees at TTS, PCTS (review annually)	C1c	High	2	Short-Term (ongoing)
Transfer and Disposal - Close PCTS (when successful curbside recycling is in place)	G2	High	1	Short-Term
Reuse - Encourage franchised haulers to subcontract with third parties	B1c	High	0	Long-Term
Waste Collection – Evaluate mandatory collection (along with curbside recycling)	E1a	Medium	9	Mid-Term
Organics – Reduce rates for wood (include with system rate review)	D1f	Medium	3	Short-Term
Recycling Market Options – Find local applications for glass	C4a	Medium	3	Mid-Long Term
Recycling Market Options – Recycle tires from TTS/MTS/PCTS	C4b	Medium	3	Long-Term
Hazardous Waste – CARTM to recycle paint-dependent on infrastructure	H3	Medium	3	Mid-Term
Reuse – Reuse shelf or shed at HHW facility	B3	Medium	3	Mid-Term
Organics – Collect food waste from commercial sources	D2b	Medium	2	Mid-Term
Resource Recovery – Develop a new anaerobic digester	F2	Medium	1	Long-Term
Transfer and Disposal – Develop capability for large loads at MTS	G1	Medium	1	Mid-Term
Recycling – Close the recycle shacks	C1a	Low	2	Long-Term
Organics – Expanded collections of woody debris and green waste	D1b	Low	1	Short – Mid Term

Note: Option F1 (Resource Recovery – Process food waste at Hooley Digester) was combined into Option D2d (Recycle Organics – Use anaerobic digester for food waste) since these 2 options refer to the same action.

SWAC Recommended Options – Draft Timeline

Short Term (0 - 3 Years)	Mid Term (3 – 7 Years)	Long Term (7 – 10 years)
High Priority Options		
Establish Standards and Review Process for Disposal and Collections, including: <ul style="list-style-type: none"> • Annual rate review • Review, revise, renew, standardize contracts and agreements • Waste Collection – institute performance standards, periodic review, standardize rate request form 		Waste Prevention – Diversion: Salvage/deconstruction of buildings and infrastructure
Recycling – <ul style="list-style-type: none"> • Begin curbside recycling in other areas • Implement processing or reload facility at TTS/MTS/PCTS • Work with City of Tillamook to meet DEQ recycling requirements • Charge minimum fees at TTS, PCTS (review annually) 	Recycle Organics, including: <ul style="list-style-type: none"> • Research potential solution for separate yard debris collection and processing (including code enforcement for illegal dumping) • Explore digesters for composting and encourage local distribution of compost • Use anaerobic digester for food waste – process at Hooley Digester 	Reuse – Encourage franchised haulers to subcontract with third parties
Education – <ul style="list-style-type: none"> • Business practices – outreach and education to influence green business • Increase promotion for reuse • Promote home composting • Expand education and promotion for proper handling of HHW • Move to materials management system as educational strategy 	Education – ongoing	Education - ongoing
Change funding for Solid Waste Department – Consider different rate methodologies		
Increase CEG collections – conduct survey		
Close PCTS when curbside recycling is in place		

Short Term (0 - 3 Years)	Mid Term (3 – 7 Years)	Long Term (7 – 10 years)
Medium Priority Options		
Organics – Reduce rates for wood (include with system rate review)	Waste Collection – Evaluate mandatory collection (along with curbside recycling)	
	Recycling Market Options – Find local applications for glass	Recycling Market Options – Recycle tires from TTS/MTS/PCTS
	Reuse – Reuse shelf or shed at HHW facility	Resource Recovery – Develop a new anaerobic digester
	Hazardous Waste – CARTM to recycle paint – dependent on infrastructure	
	Organics – Collect food waste from commercial sources	
	Transfer and Disposal – Develop capability for large loads at MTS	
Low Priority Options		
	Recycle Organics – Expanded collection of woody debris and green waste	Recycling – Close the recycle sheds

Table 2 (excerpted from the Second Technical Memo)
SWAC Rating of the Options
August 14, 2012, SWAC Meeting

H – High

M – Medium

L – Low

Option	Consistency with SW Hierarchy	Diversion Potential	Cost Effectiveness	SWAC Support	SWAC Rating
A. Waste Prevention/Diversion					
1. Salvage/deconstruction of buildings and infrastructure <i>(Need to consider providing incentives for reuse/recycling)</i>	H	H	M	H	H
2. Business practices – outreach and education to influence green business practices consistent with solid waste hierarchy	H	M	M	H	H
B. Reuse					
1a. Allow non-franchisees to conduct reusables collection	H	M	H	L	L
1b. Revise ordinances to allow collection exemptions	H	M	H	L	L
1c. Encourage franchised haulers to subcontract with third parties	H	M	H	H	H
2. Increased promotion for reuse	H	M	M	H	H
3. Reuse shelf or shed at HHW Facility	H	H	H	M	M
C. Recycling					
Drop-Off Options					
1a. Close the Recycle Shacks	L	L	L	L	L
1b. Expand hours at MTS	M	M	M	L	L
1c. Change minimum fees at TTS, PCTS (review annually)	M	H	H	H	H
Collection Options					
2a. Work with City of Tillamook to meet DEQ recycling requirements	H	H	M	H	H
2b. Begin curbside recycling in other areas	H	H	M	H	H
2c. Modify County ordinance to	M	H	H	L	L

Option	Consistency with SW Hierarchy	Diversion Potential	Cost Effectiveness	SWAC Support	SWAC Rating
allow non-franchisees to charge for recycling services					
2d. Contracts for non-franchisees to collect recyclables	M	H	H	L	not currently feasible
Processing Options					
3a. Haulers to develop local MRF	M	M	L	M	not currently feasible
3b. Haulers to develop re-load facility	M	M	M	L	L
3c. Implement processing or re-load facility at TTS/MTS/PCTS	M	M	H	H	H
Market Options					
4a. Find local applications for glass	M	H	H	M	M
4b. Recycle tires from TTS/MTS/PCTS	H	H	M	M	M
D. Organics					
Yard Debris Options					
1a. More drop-off sites	H	H	M	L	L
1b. Expanded collection of woody debris and green waste	H	H	M	L	L
1c. Research potential solution for separate yard debris collection and processing (including code enforcement for illegal dumping)	M	M	M	H	H
1d. Explore digesters for composting and encourage local distribution of compost	M	M	L	H	H
1f. Reduce rates for wood (include with system rate review)	M	M	M	M	M
1g. Mine logyard waste at Port	H	H	M	M	out of our jurisdiction
Food Waste Options					
2a. Residential curbside collection for food waste	M	H	L	L	L
2b. Collect food waste from commercial sources	M	H	L	M	M

Option	Consistency with SW Hierarchy	Diversion Potential	Cost Effectiveness	SWAC Support	SWAC Rating
2c. Develop a local composting facility for food waste	M	M	L	L	L
2d. Use anaerobic digesters for food waste	M	M	M	H	H
2e. Promote home composting	H	H	H	H	H
E. Collection					
Waste Collection Options					
1a. Evaluate mandatory collection (along with curbside recycling)	M	M	H	M	M
1b. EOW collection	M	M	H	L	L
Waste Collection System Review Options					
2a. Institute performance standards	M	M	M	H	H
2b. Periodic review	M	M	M	H	H
2c. Standardized rate request form	M	M	M	H	H
F. Resource Recovery					
1. Develop a new anaerobic digester	M	N	N	M	M
2. Explore plastics-to-fuel options	M	H	M	L	L
G. Transfer and Disposal					
1. Develop capability for large loads at MTS	M	L	L	M	M
2. Close PCTS (when successful curbside recycling is in place)	L	L	L	H	H
3. Annual rate review				H	H
4. Review, revise, renew, standardize contracts and agreements				H	H
H. Hazardous Waste					
1. Expand education and promotion for proper handling and use of HHW	H	H	M	H	H
2. Increase CEG collections – conduct survey	H	H	M	H	H
3. CARTM to recycle paint (dependent on infrastructure)	H	H	M	M	M

Option	Consistency with SW Hierarchy	Diversion Potential	Cost Effectiveness	SWAC Support	SWAC Rating
I. Other Options					
1. Move to a materials management system as an educational strategy	H	M	M	H	H
2. Change funding for SW Dept. – consider different rate methodologies	M	M	M	H	H

ATTACHMENT C
SURVEY RESULTS



Tillamook County
PUBLIC WORKS DEPARTMENT
Office of Solid Waste
Waste Prevention and Recycling

503 Marolf Loop Road
Tillamook, Oregon 97141
PH (503) 815-3975
FAX (503) 842-6473

Email: recycle@co.tillamook.or.us
www.co.tillamook.or.us/gov/solidwaste

Land of Cheese, Trees and Ocean Breeze

MEMORANDUM

DATE: January 3, 2012
TO: Tillamook County Solid Waste Advisory Committee
FROM: Jennifer Purcell, Solid Waste Coordinator
RE: Preliminary Public Survey Results

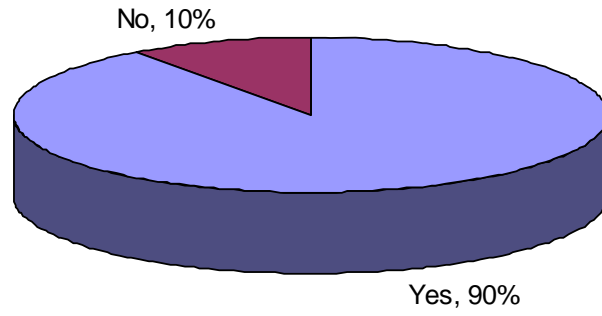
Following are the preliminary top-line results for the Garbage and Recycling Survey conducted November 8 through December 19, 2011. A total of 1,000 surveys were mailed on November 7, 2011. Participants were randomly selected from two sources. A list of registered voters (9,084) was obtained from the Tillamook County Clerk's Office and a list of absentee property owners (7,524) was obtained from the Tillamook County Assessor's Office.

250 surveys were sent to a random sampling of absentee property owners, defined as owners of residential property in Tillamook County that have a mailing address outside the county. 750 surveys were mailed to a random sampling of registered Tillamook County voters. A total of 166 surveys were completed and returned, including 151 mail surveys and 15 online surveys. This resulted in a 16.6% response rate. The reliability of the overall results is +/- 7.6% at the 95% confidence level. This means that in 95 out of 100 repetitions of the survey, the results will not vary more than +/- 7.6%.

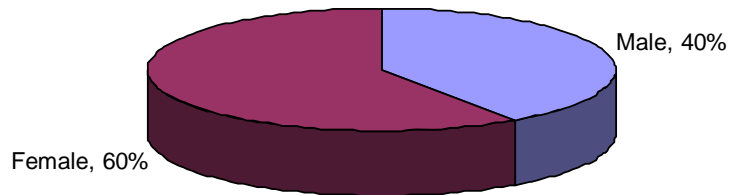
It is important to recognize that because of the topic content and length of the survey, reliability is also affected by self-selection bias. Self-selection bias is expected to a certain degree when participants are likely to choose to participate based on their interest in the topic area, or not to participate because of a lack of interest. While the sampling for this survey was random, we can expect that some level of unquantifiable self-selection impacts the data, reflecting opinions of those in Tillamook County who hold at least some level of interest in the topic of garbage and recycling.

DEMOGRAPHICS

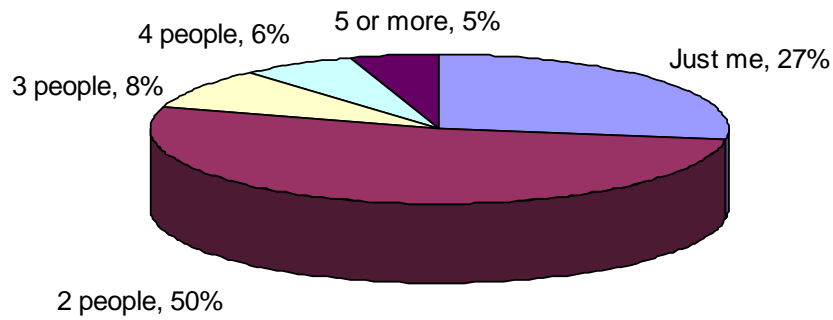
Do you live in Tillamook County full-time? (n=139)



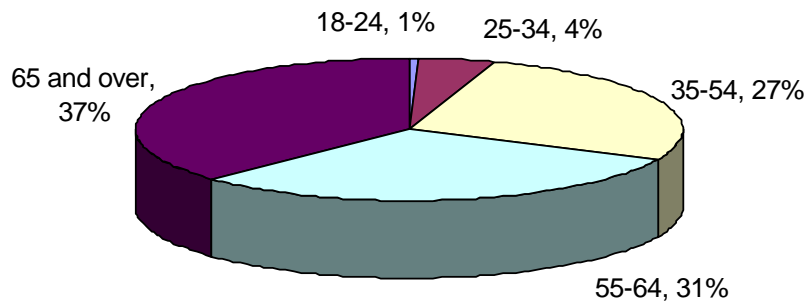
Gender (n=159)



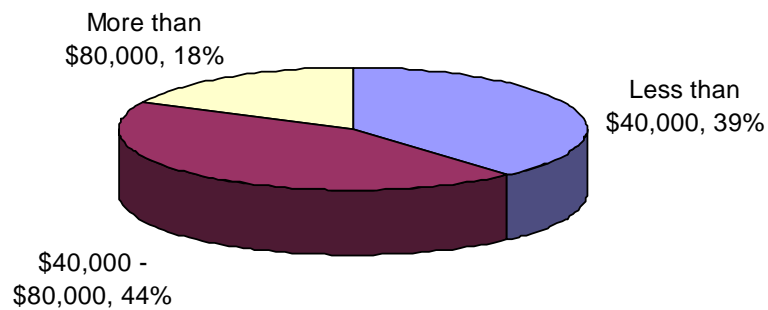
Including yourself, how many people live in your household? (n=158)



Which of the following categories best describes your age? (n=159)

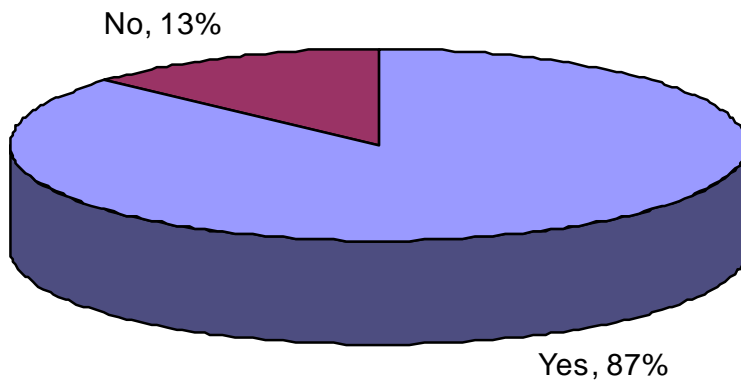


Which of the following categories best describes your annual household income? (n=140)

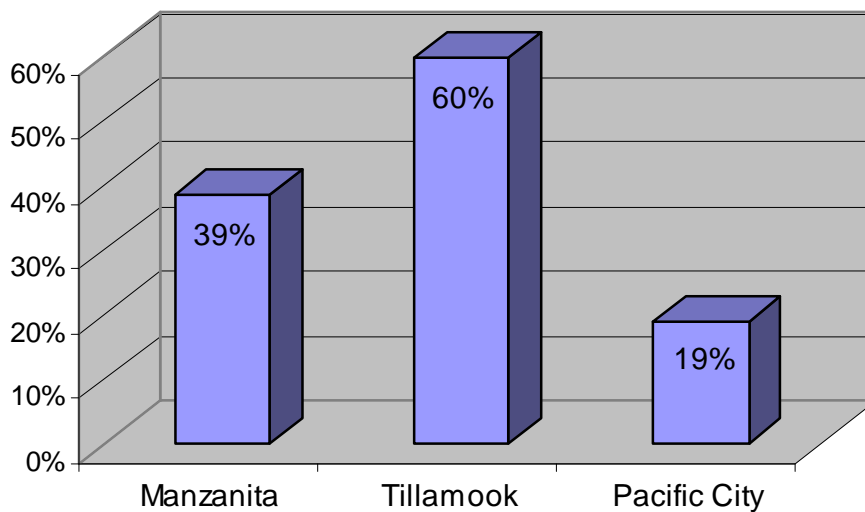


SURVEY RESULTS

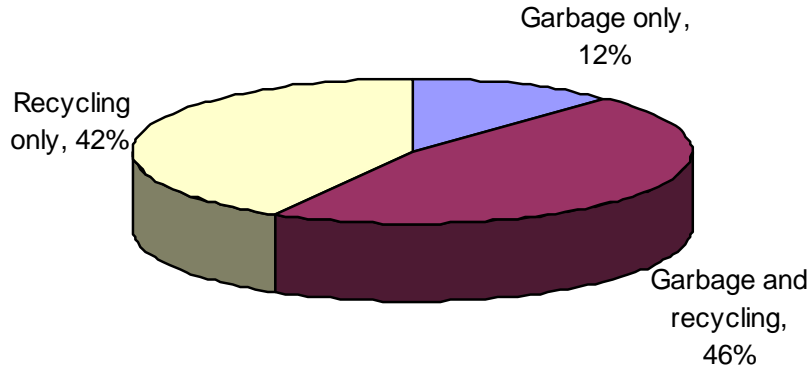
Have you been to one of Tillamook County's transfer stations in the past year? (n=158)



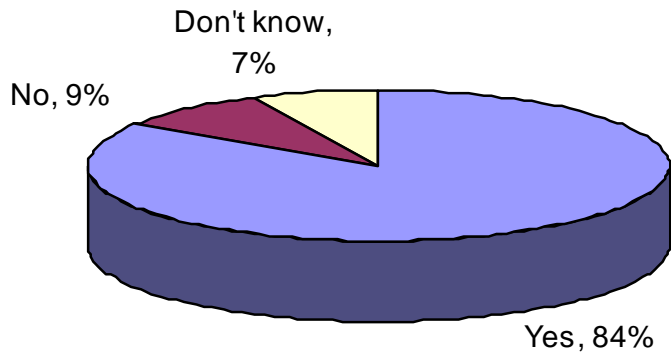
Which transfer station have you been to in the past year? (n=137)



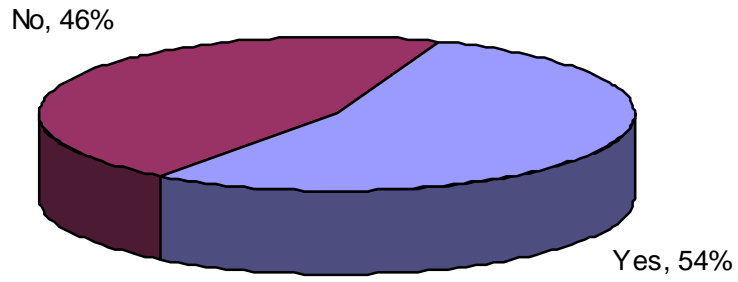
Do you typically go to the transfer station to dispose of garbage only, garbage and recycling, or recycling only? (n=143)



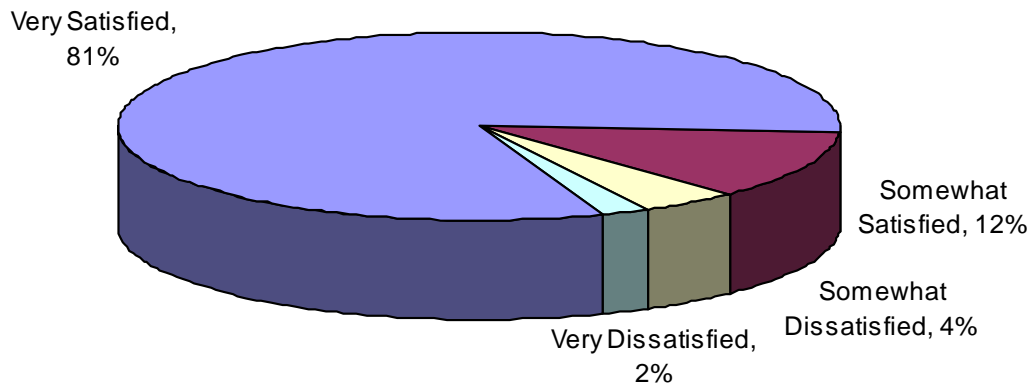
Do you consider the transfer station to be a good value? (n=145)

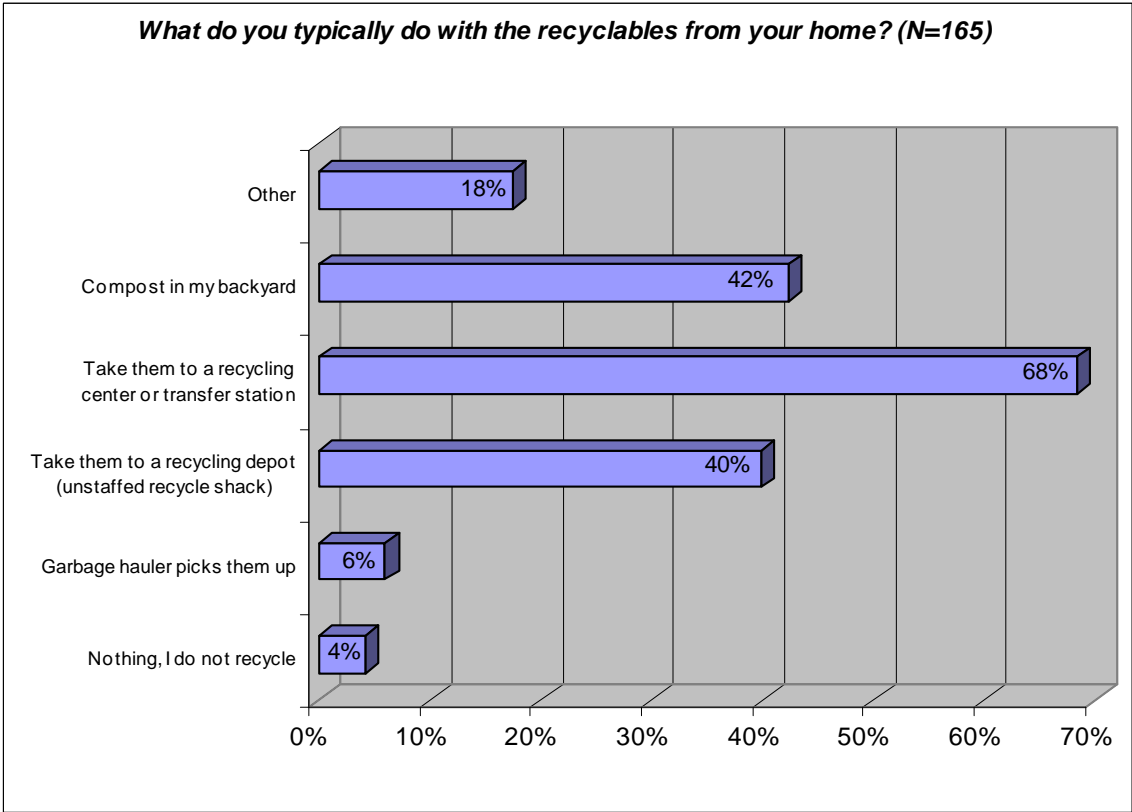
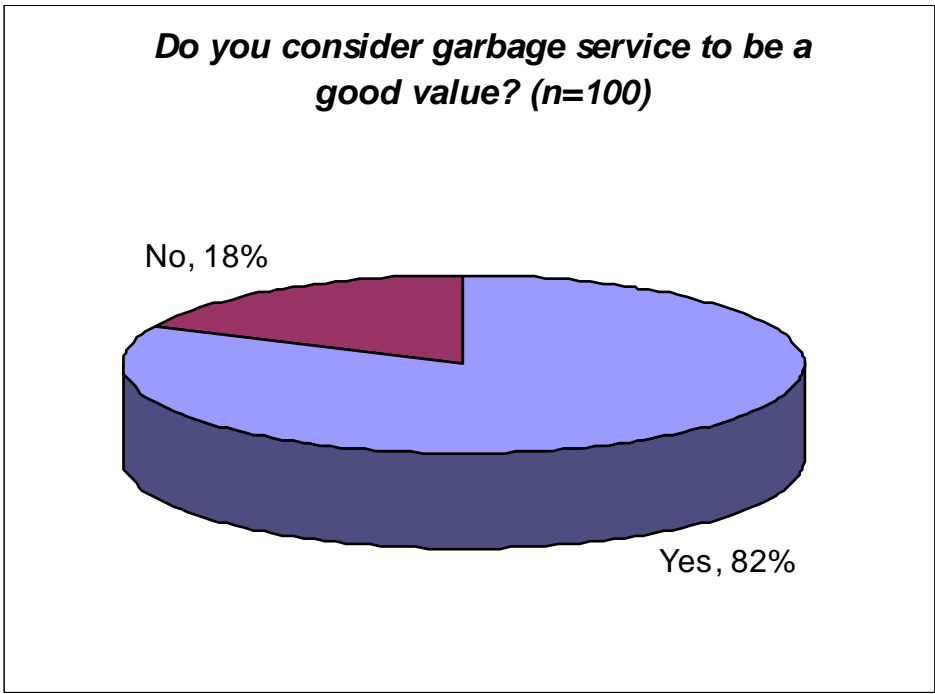


Do you subscribe to regular garbage service at your home? (n=162)

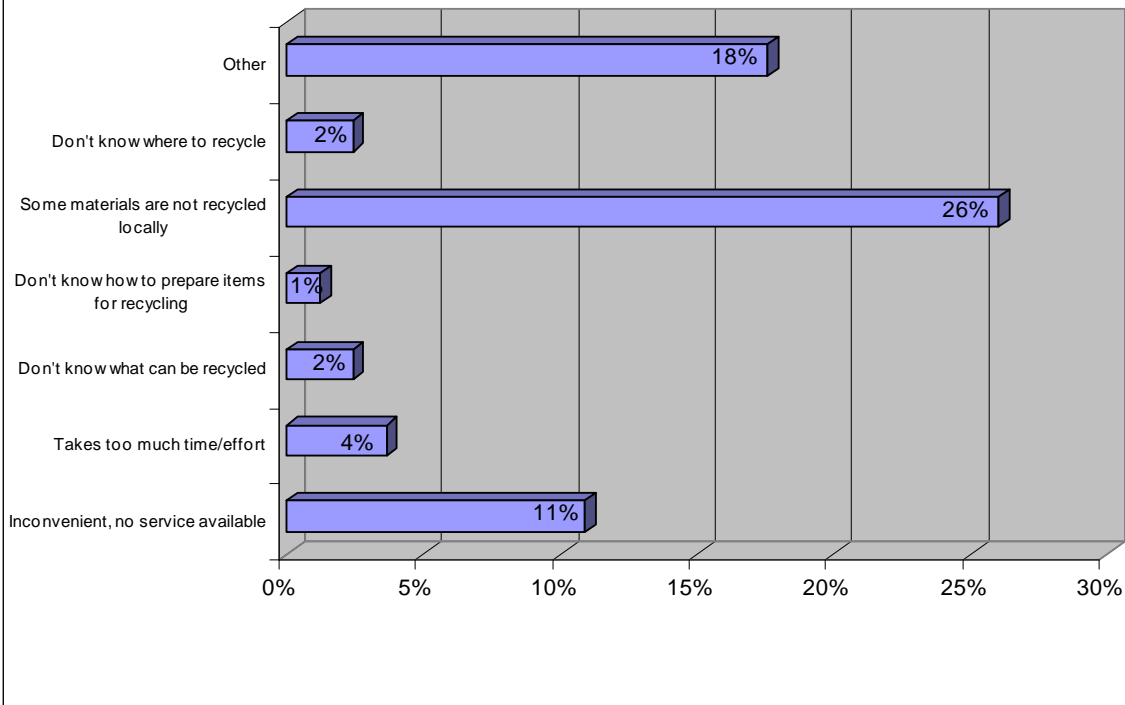


How satisfied are you with the current service provided by your garbage hauler? (n=91)

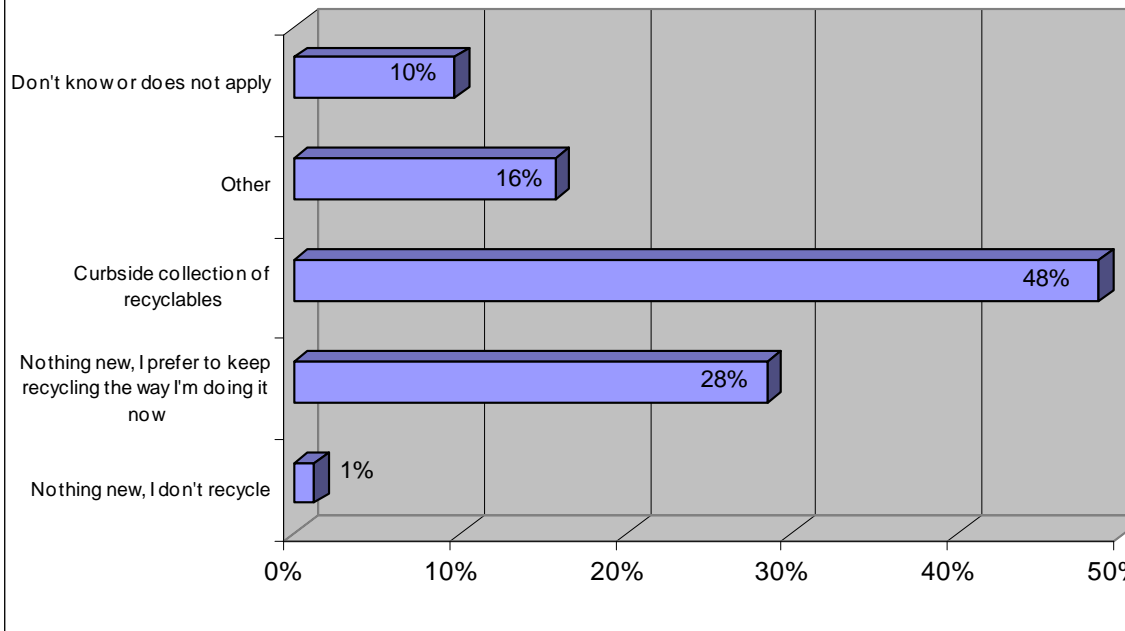




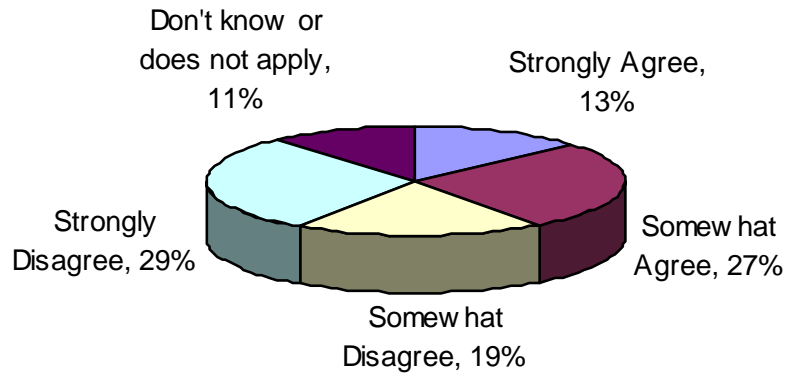
Why don't you recycle or why don't you recycle more? (N=165)



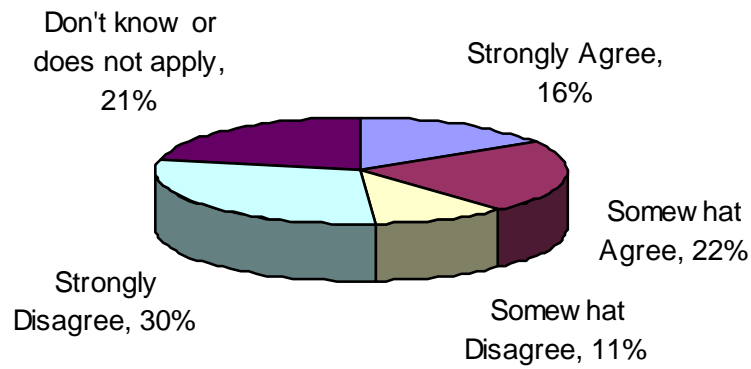
What recycling options would you like to see available in Tillamook County? (N=165)



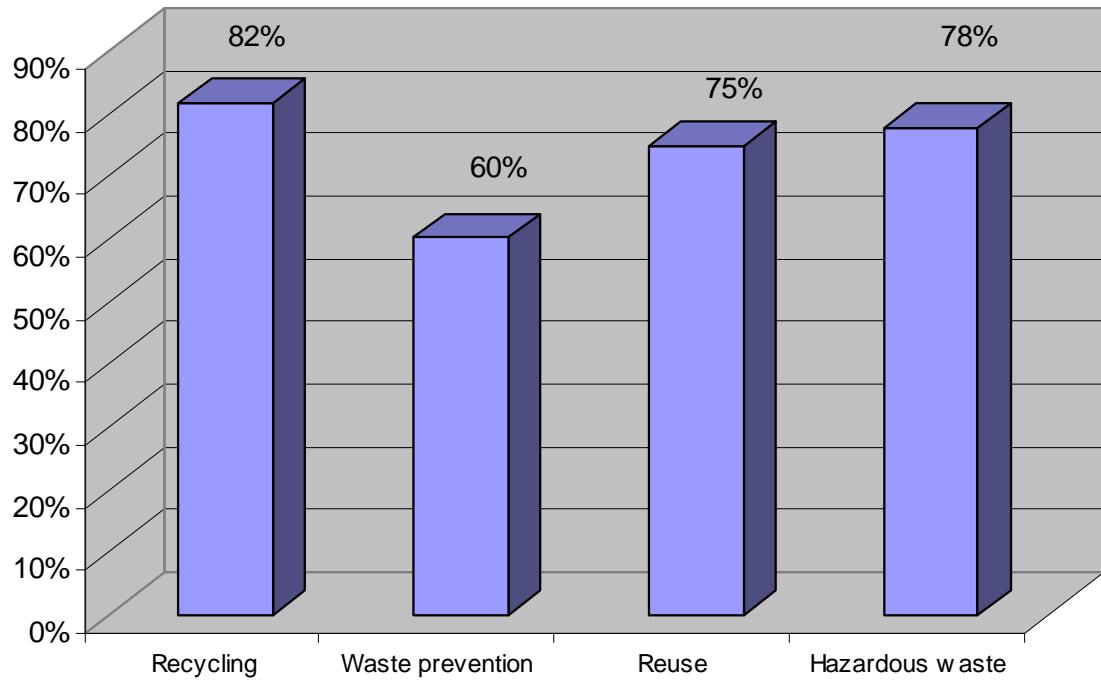
I am willing to pay a processing or handling fee for recycling services. (n=157)



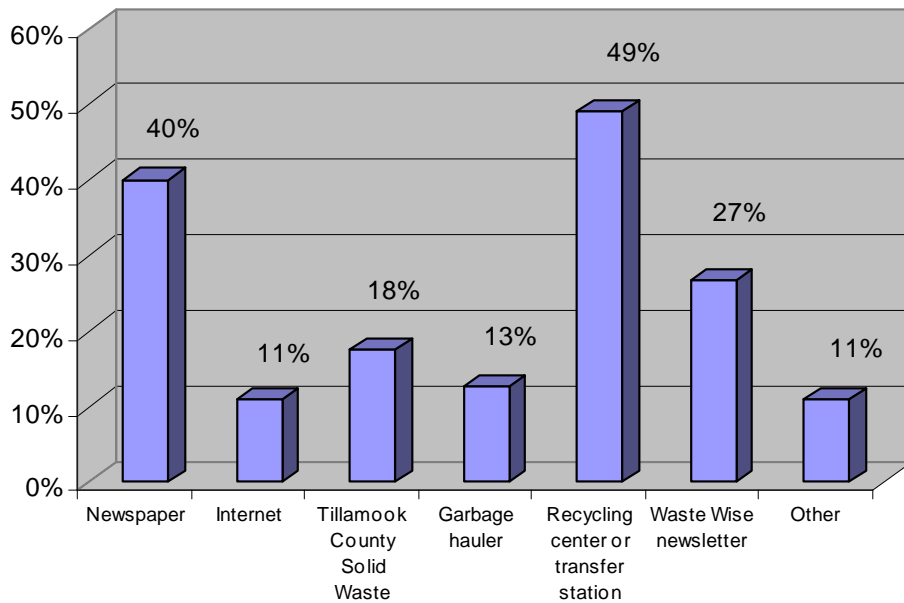
I am willing to pay a processing or handling fee for recycling services. (n=149)



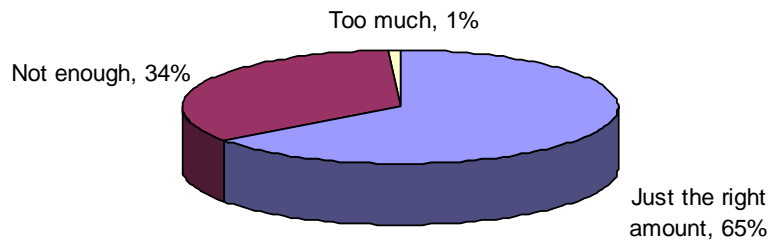
During the past year, do you recall seeing or hearing any advertising related to the following? (% Yes, n=varies)



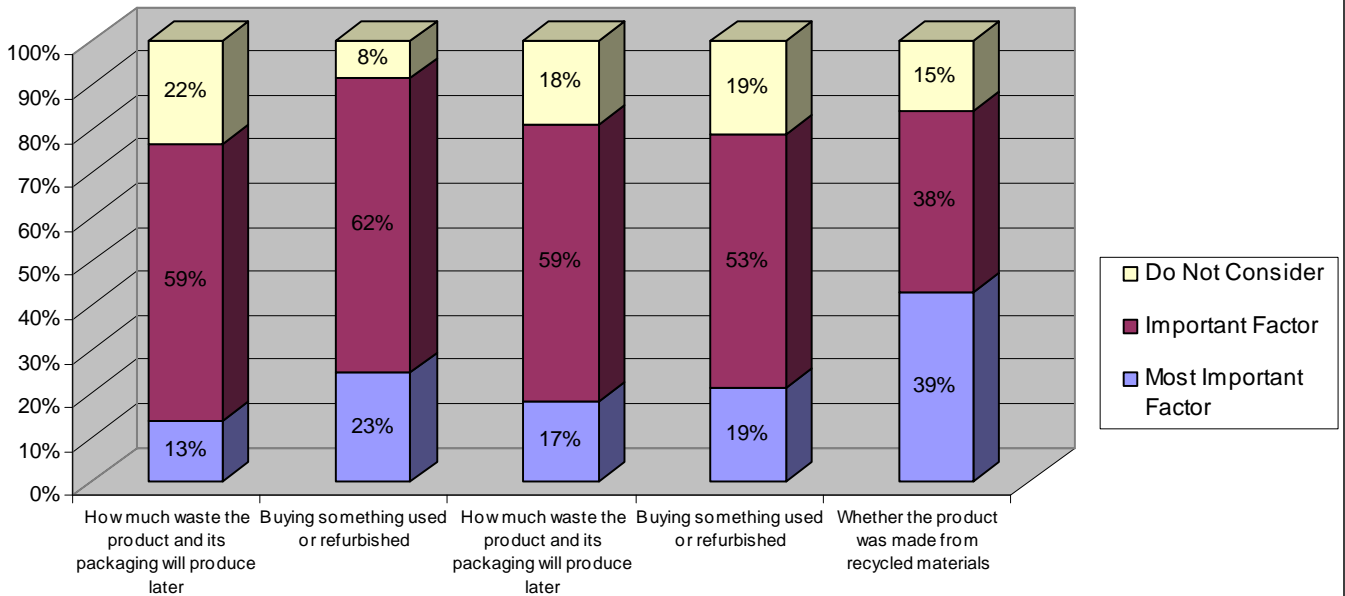
Where do you go for information about garbage and recycling in Tillamook County? (N=165)



Considering the amount of information you receive regarding garbage and recycling, would you say you receive...? (n=137)



When choosing an item to buy, do you consider ___?



ATTACHMENT D
EVALUATION OF WASTE DIVERSION ACTIVITIES IN
TILLAMOOK COUNTY

EVALUATION OF WASTE DIVERSION ACTIVITIES IN TILLAMOOK COUNTY

INTRODUCTION

This document discusses existing programs for a variety of activities that could be categorized as “waste diversion” (diverting waste from the solid waste disposal system). These activities include waste prevention, reuse, recycling, composting, resource recovery, and proper disposal of small-quantity hazardous waste. The intent of this document is to describe the existing waste diversion activities and programs in Tillamook County, and to identify possible service gaps and potential opportunities for expanded services in the future. This information will be incorporated into the *Tillamook County Comprehensive Materials and Solid Waste Management Plan* (“the Plan”), and at that time additional information on options and recommendations will be added to this discussion of waste diversion activities.

Waste diversion activities are given a high priority by laws and policies in Oregon. A perceived shortage of landfill space, in part, led to passage of Oregon’s first Opportunity to Recycle Act in 1983. This Act also established solid waste management policies that recognized the environmental benefits of waste prevention, reuse and recycling, stating that in order to conserve energy and natural resources, solid waste management should follow a hierarchy:

- Reduce the amount of waste generated;
- Reuse materials for their original intended use;
- Recycle what can’t be reused;
- Compost what can’t be reused or recycled;
- Recover energy from what cannot be reused, recycled or composted, and finally;
- Dispose of residuals safely.

The 1983 Act also required wastesheds to have recycling depots. A “wasteshed” is defined in Oregon law as being an area of the state that shares a common solid waste disposal system, or an appropriate area in which to develop a common recycling system. Wasteshed boundaries are typically the same as counties (except for the City of Milton-Freewater and Metro). The 1991 Oregon Recycling Act (SB 66) strengthened and broadened recycling requirements and set a statewide recovery goal of 50% by 2000 and established interim recovery goals for individual wastesheds by 1995.

In 2001, DEQ confirmed to legislators that the original wasteshed goals would not produce a statewide recovery goal of 50%. Some wastesheds, particularly large ones, would have to do more to enable the state to meet its goal. This reality was reflected in legislation unanimously passed in 2001 (HB 3744). HB 3744 set a statewide recovery

goal of 45% for 2005 and 50% for 2009. In order to help meet the statewide recovery goals, all of the watershed set new voluntary recovery goals for 2005 and 2009 and submitted plans to DEQ for how they planned to meet their new goals. For watershed that did not achieve their 2005 or 2009 waste recovery goal, HB 3744 required the watershed to conduct a technical review of existing policies or programs and determine revisions to be implemented to meet the recovery goal.

Tillamook County's goal is 30%, and this goal was not met for 2009 (although at 29.1%, the County did not fall very short). This situation has already been resolved and in 2010 Tillamook County achieved 39.6% recovery (although 6% of that was in the form of credits for waste prevention, reuse and diversion of organics).

CURRENT ACTIVITIES

a. Waste Prevention

Activities and practices that reduce the amount of wastes that are created are classified as "waste prevention." Waste prevention differs from other waste diversion activities such as recycling and composting because these other methods deal with materials at the end of their useful life.

Waste prevention is the highest priority for solid waste management according to Oregon law, and is preferred over recycling and composting because the environmental benefits of waste prevention are typically much greater. All three methods avoid the cost of disposing of the diverted materials as garbage, but recycling and composting frequently require significant additional expenses for collecting and processing the materials. Those additional expenses are avoided in the case of waste prevention, where the waste is not produced to begin with.

Waste prevention is sometimes associated with reuse because they both reduce waste generation. In this *Tillamook County Comprehensive Materials and Solid Waste Management Plan* (this "Plan"), however, waste prevention and reuse are treated as separate topics. Waste prevention refers to "activities that prevent the generation of solid waste in an environmentally beneficial manner. Waste prevention encompasses using fewer materials (sometimes called "pure" waste prevention), reuse, and on-site management of organic wastes. Recycling, centralized composting, and energy recovery do not prevent waste generation (as defined in Oregon)."¹

Oregon Department of Environmental Quality's Waste Prevention Strategy identifies four focus areas for waste prevention: design, construction, remodeling and demolition of buildings; business practices; consumer education; and foundation research and analysis.

¹ Oregon Department of Environmental Quality, Waste Prevention Strategy (Dec. 2007)

The Tillamook County Solid Waste Department provides a substantial amount of education materials to residents about waste prevention, recycling and reuse and hazardous waste. These include:

- “Waste Wise” newsletter direct mailed to residents
- Website information
- Radio announcements
- Local television network spots
- Local newspaper articles
- Community events
- Primary and secondary school events

Tillamook County receives 2% credits towards their watershed recovery goals for waste prevention, reuse, and composting activities (6% altogether). For waste prevention, Tillamook County receives credit for outreach activities, working with schools to identify opportunities to reduce the amount of waste they are generating, and encouraging the reduction of hazardous materials being consumed and entering the waste stream.

b. Reuse

Reuse is the second highest priority for waste and material management. Like waste prevention, reuse activities avoid the need for processing and transforming materials into new products, thus avoiding the additional energy and other requirements associated with recycling and composting.

There are many reuse activities occurring in Tillamook County. These activities are promoted by the County but are primarily conducted by private and non-profit organizations. These activities include:

- Reuse activities occur at second-hand and thrift shops, charitable organizations that collect clothing and household goods, garage sales, used bookstores, and through similar activities. An example is the Wild Flower Boutique in Tillamook, which is operated by the Tillamook County Women’s Resource Center. They accept or pick up donated items, which are repaired and then offered to customers at prices below retail. Some larger items, such as appliances, are also refurbished. Other examples include the Hope Chest in Nehalem, Hope Chest Too in Rockaway Beach, Kit & Caboodle in Tillamook, Teen Challenge in Tillamook, New 2 Used in Tillamook, and the Thrift Shop Library in Pacific City.
- The non-profit Re-Store in Bay City (operated by Habitat for Humanity) provides a mechanism for building material reuse. A recent 4,000 square foot warehouse addition is now open for use, and allows the Re-Store to take significantly more

donated housing and construction material. They take donations of metal, including scrap metal, copper tubing, aluminum gutters, metal wire, and automobiles. They also accept donations of deposit bottles, which amount to about \$9,000 annually.

- CARTM Recycling invests a significant effort into reuse and actively encouraging customers of the Manzanita Transfer Station to divert reusable and recyclable materials. They also accept donations of clean, reusable items in working condition for sale in their store. Staff and volunteers sort, test, price and display donated items. They collect and sell books, building materials, electronics, sporting goods, toys and many other items.
- Private efforts to reuse materials are extensive but can be difficult to document. One example of private reuse is the Tillamook County Creamery Association (TCCA), which directs their used 5-gallon buckets reuse outlets.

Tillamook County receives 2% credits towards their wasteshed recovery goals for waste prevention, reuse, and composting activities (6% altogether). For reuse, Tillamook County receives credit for promoting reuse options within the county, encouraging citizens to donate reusable and/or repairable items, and diverting reusable materials at transfer stations.

c. Recycling

“Recycling” refers to the act of collecting and processing materials to return them to a similar use. Recycling does not include materials burned for energy recovery or destroyed through pyrolysis and other high-temperature processes. The State’s definition of recycling is “any process by which solid waste materials are transformed into new products in a manner that the original products may lose their identity” (ORS 459.005).

A network of private-sector recyclers currently serves residents and businesses in Tillamook County. The predominant collection method in the county is drop-off sites, with curbside and commercial services offered in some areas.

Drop-Off Recycling. There are eight drop-off sites located throughout the county. These sites include:

- All three transfer stations, located in Tillamook (TTS), Pacific City (PCTS), and Manzanita (MTS).
- City Sanitary Service, located in Tillamook.
- Four recycling depots (“Recycle Shacks”), located in Rockaway, Garibaldi, Bay City, and Tillamook.

Materials collected at the Recycle Shacks include tin cans, newspaper, magazines, and container glass. City Sanitary and the three transfer stations also take aluminum cans, corrugated cardboard and plastic bottles. In addition, the Manzanita Transfer Station and the Tillamook Transfer Station take yard debris (excluding grass clippings). More details about these sites are provided below, and the materials collected at each are shown in the following table.

Table 1
Materials Collected by Drop-Off Sites in Tillamook County

	Transfer Stations			City Sanitary	Recycle Shacks			
	Tillamook	Manzanita	Pacific City		Rock-away	Gari-baldi	Bay City	Tillamook
Newspaper	X	X	X	X	X	X	X	X
Glass	X	X	X	X	X	X	X	X
Tin Cans	X	X	X	X	X	X	X	X
Cardboard	X	X	X	X				
Magazines	X	X	X	X	X	X	X	X
Aluminum	X	X	X	X				X
Scrap Metal	X	X	X	X				
Mixed Paper	X	X	X					
Refrigerator	X	X						
Washer/Dryer	X	X	X	X				
Dishwashers	X	X	X	X				
Tires	X	X	X	X				
Motor Oil	X	X	X					
Plastic Bottles	X	X	X	X				
Other Plastics		X						
Batteries	X	X	X	X				
Wood	X	X						
Propane Tanks	X	X						
Medical Sharps				X				
Yard Debris	X	X						

Transfer stations: The Tillamook Transfer Station is operated by Don G. Averill Recycling. This site accepts a wide variety of self-haul recyclable materials. All recyclables, except woody debris, are accepted free of charge. Averill Recycling accepts yard debris (excluding grass cuttings) and wood waste at the transfer station for a fee. These materials are chipped and recycled as hog fuel.

The Pacific City Transfer Station is operated by Nestucca Valley Sanitary Service. This site also accepts a variety of recyclable materials at no charge to

the customer. Materials collected here are transferred to the Tillamook Transfer Station for transportation to markets.

The Manzanita Transfer Station is operated by CARTM Recycling, and they divert as much waste as possible from the incoming stream. CARTM accepts over 30 different materials for recycling, including aseptic containers, berry boxes, books, brown bags, egg cartons, ice cream containers, pet food bags, to-go containers, tofu cartons, bags, bubble wrap, buckets, caps, CD cases, plastic containers 1-7, lawn chairs, milk and juice jugs, plant containers, shrink wrap, toys, water and beer bottles, clear glass jars and bottles, aluminum cans, aluminum foil and baking pans, appliances, copper, ferrous metals, motors, non-ferrous metals, scrap metal, stainless steel, tin cans, cables, cords, electronics, remotes, batteries, corks, ink cartridges, light bulbs, motor oil, rubble, shoes, and vegetable oil. CARTM also accepts yard debris (excluding grass cuttings) and wood waste at the Manzanita Transfer Station for a fee.

City Sanitary Service, located in the City of Tillamook, provides a recycling center that is open Monday through Saturday. They also provide residential and commercial recycling services (which are discussed in other parts of this document).

Recycle Shacks: There are four recycling depots (drop-off sites) located in the county, including sites in Bay City, Garibaldi, Rockaway, and the City of Tillamook. These sites collect a variety of materials (see Table 1). Collection franchisees are required to maintain the Recycle Shacks in their service area.

Although the Recycle Shacks are convenient, these sites also pose some challenges. An ongoing difficulty in the development and maintenance of these and other drop off sites is in the placement of the sites. Recycling drop-off sites can be subject to illegal dumping and may present an eyesore due to litter and related problems. Hence, neighbors and private landowners may object to their presence. New sites can be difficult to locate due to these problems. In recent years, two Recycle Shacks have been closed in Tillamook County because of such problems.

Residents in the southern part of Tillamook County can recycle at the Pacific City Transfer Station, but many also use a drop-off center in Lincoln County (the Highway 101 Recycling Center). That site is owned and operated by North Lincoln Sanitary Service. The site accepts many materials for free (primarily materials that they want to keep out of the curbside bins), including glass bottles, scrap metal, non-refrigerated appliances, athletic shoes, cell phones, used cooking oil, compact discs, paint, batteries, e-waste, plastic bags and other film plastics. The site also accepts fluorescent bulbs and tires for a small fee. Appliances containing Freon are accepted for a charge at the Schooner Creek Transfer Station (the fee covers the cost of removing and handling the Freon). Woody debris, tires and construction waste are also

accepted for a fee at the Schooner Creek Transfer Station, and reusable construction materials are accepted for free there.

Residential Recycling. Curbside recycling collection services are only available within the City of Tillamook, but only about 1-2% of the Tillamook residents take advantage of this service. The hauler in Tillamook, City Sanitary Service, picks up recyclables that are placed next to a customer's garbage can upon request. Materials collected include glass, newspaper, cardboard, aluminum and tin cans. Glass set out for recycling is sorted by color.

The current design and participation level for the curbside recycling program in Tillamook does not meet the Opportunity to Recycle requirements. The Opportunity to Recycle, as set forth in ORS 459, includes the requirement that every city with a population of 4,000 or more provide on-route collection service for source separated recyclable materials. Oregon Administrative Rule 340-090-0040 further defines the required service levels and provides options for complying. Alternate approaches are allowed in some cases. The City of Tillamook operated under an alternate plan authorized by Oregon DEQ for over a decade in lieu of providing a residential curbside recycling program. In 2011, DEQ determined that the city was neither meeting the requirements of its alternate plan nor providing an adequate residential curbside recycling program. Therefore, DEQ was not able to provide full approval to the watershed's (Tillamook County's) 2011 Opportunity to Recycle Report.

Multi-Family Recycling. The Opportunity to Recycle rules also apply to multi-family (apartment) residents that live in dwellings with five or more units. Each of the eight locations for drop off recycling is open and available to multi-family residents. City Sanitary Service also provides recycling collection services to many of the apartment complexes in their service area.

Commercial Recycling. Commercial-sector recycling is handled by the franchise haulers, although the County does offer technical assistance services to businesses on request. City Sanitary Service offers recycling services to City of Tillamook businesses and serves an estimated 80% of the businesses in their area. Businesses are also able to recycle their materials at the eight drop-off sites located throughout the County.

The larger businesses in the county recycle a significant amount of materials through their own efforts that are conducted separately from the county system or the services offered by the franchise haulers. Stores such as Safeway and Fred Meyer, for instance, bale their cardboard and "back-haul" it (send it back on the same trucks that deliver retail products to the stores) to their distribution centers to be marketed from there. TCCA similarly recycles cardboard and motor oil.

Construction and Demolition (C&D) Recovery. A significant amount of construction wood is being collected at TTS, MTS, and through reuse efforts (see Reuse section, above). Wood at MTS is sent to Trails End Recovery in Warrenton, while the wood at TTS is chipped and sold as hog fuel to a nearby paper mill.

Other Recycling Services. Household batteries, fluorescent light bulbs and motor oil are all accepted at the County's Household Hazardous Waste Facility the first Saturday of each month. Electronic waste is collected as part of the Oregon E-Cycles program. Oregon E-Cycles collection sites provide free recycling of computers, monitors and televisions to anyone bringing seven or fewer items for recycling at one time. Oregon E-Cycles collection sites located in Tillamook County include Don G. Averill Recycling and CARTM Recycling. Oregon residents and businesses can no longer put computers, monitors and TVs in the garbage, or take them to a transfer station or landfill to be thrown away.

Appliances and tires are accepted at the County transfer stations and at a few private locations. The tires that are collected at the Tillamook Transfer Station are sent to Coffin Butte Landfill as a waste material and are not recycled.

A significant amount of recycling occurs through the bottle bill system. Under the current Oregon law, people pay a 5-cent container deposit when they buy beer, soft drinks, water and flavored water in metal, glass and plastic bottles and cans three liters or less in size. They can return the empty containers to stores and receive the 5-cent refund value for each container.

Leftover paint can be returned to stores and other locations to be recycled through a relatively new program. The Paint Product Stewardship program rollout did not include Tillamook County, however, and collection convenience and outreach remain a challenge. Tillamook County's hazardous waste facility has recently become a PaintCare collection site, although the facility is only open once a month and does not provide the convenience intended by the State legislation (House Bill 3037). The Paint Product Stewardship program has also set up paint return locations near the County, in Lincoln City, Gearhart, McMinnville, and Portland. The distances to these locations range from 34 to 77 miles for Tillamook County residents to recycle paint. In 2010 the County collected paint at the Household Hazardous Waste Collection Event, and collected 28,700 pounds of covered paint² and paint related items. After opening the hazardous waste facility in October, 2011, Tillamook County collected 34,850 pounds of covered paint and paint related items in the first seven months.

Processing and Marketing of Recyclable Materials. As noted in the Market Analysis, 77% of the recovered materials collected and handled by the garbage collection franchisees in 2010 were processed, stored, and marketed by Don G. Averill Recycling from the Tillamook Transfer Station (TTS). In other words, TTS is the "de facto" materials recovery facility (MRF) for Tillamook County.

CARTM does not utilize TTS for recovery but instead processes and directly markets the materials brought to the Manzanita Transfer Station. This strategy allows CARTM

² Paint that is covered by the Paint Product Stewardship Law includes interior and exterior grades of oil-based and latex paints sold in containers of five gallons and less.

to collect and market a wider variety of materials and to receive payment for those materials.

Recycling Outreach and Education. The County provides a website which details transfer station and collection services, as well as recycling, hazardous waste and medical waste handled by the County. The Tillamook County Solid Waste Department also prepares and distributes the “Waste Wise” newsletter semi-annually. Waste Wise brings residents regular news about recycling and waste prevention issues.

Information distributed by the franchise haulers to their customers includes information about recycling. City Sanitary Service, for instance, provides information about recycling to their customers annually and to new customers when they sign up.

Oregon Green Schools is a nonprofit organization that was formed in 1997. There are over 25 regional coordinators throughout the state and nearly 200 participating schools. Tillamook County’s regional coordinator helps schools conduct waste audits, provide guidance and training for new programs and recommend curriculum resources and grant opportunities. Oregon Green Schools is dedicated to helping Oregon Schools set up and maintain effective, permanent waste reduction and resource efficiency programs that improve school environments and communities. There are currently two Tillamook County schools which have received Oregon Green Schools certification (Nestucca High School and Tillamook Junior High School).

d. Composting

Yard debris and food waste are estimated to be almost one-quarter (23.2%, see Table 5 in the First Technical Memo) of Tillamook County’s waste stream. There are currently no central composting sites for yard debris in Tillamook County or food waste collection programs available to commercial generators or the general public. There is some local usage of compostable plates and other serviceware, but these materials are simply being landfilled because there is no local composting facility.

Activities that are being currently conducted in Tillamook County are discussed below.

Backyard Composting. Backyard composting is promoted on the County’s website and through distribution of brochures. The City of Tillamook also distributes information on backyard composting. Composting bins (“Earth Machines”) are sold by the County at cost and are also available at CARTM Recycling.

Other Waste Prevention Activities for Organics. Edible food can be donated to food banks or distributed through informal channels. Food that is not fit for human consumption can be used as animal feed, which is what one local manufacturer is doing (in that case, the food is being provided to a local mink farm).

Yard Debris. Yard debris and wood waste is collected at two transfer stations, the Tillamook Transfer Station (TTS) and the Manzanita Transfer Station (MTS). These materials are chipped and sold as hog fuel.

Other On-Site Composting. Tillamook Junior High School students have taken responsibility for composting through “Food Roots,” an organization that promotes local food production and food security. Students learn the benefits of composting by maintaining a composting unit adjacent to the greenhouse at the Tillamook Junior High School. Students use this for the vegetative wastes from the greenhouse and for food scraps and leftover salad makings from the school cafeteria. Students are responsible for collecting the food waste once a day and placing it on the compost pile. They also apply yard waste such as leaves, weeds, and grass clippings.

Food Roots is a not-for-profit (501c3) organization. They rely on donations and volunteer assistance to conduct programs such as:

- Community and school gardens
- Education and community outreach
- Community development and economic
- Micro-enterprise development

Composting demonstration sites are provided at several locations by the Master Gardeners, in some cases in concert with community gardens maintained by Food Roots. Compost demonstration sites are located at the Manzanita Transfer Station, Tillamook Junior High School, Camp Magruder, Alder Creek Farm, the Tillamook County Fairgrounds, and at Sacred Heart Community Garden.

Tillamook County receives a 2% credit towards their watershed recovery goal for composting activities. Tillamook County receives credit for promoting the environmental benefits of composting, making composters available to public, and encouraging composting in local schools and community gardens.

e. Resource Recovery

The term “resource recovery” has had many different meanings over the years. In the past, the term has been used by many people to refer to waste-to-energy systems, in part because these systems have often had a recycling element (such as metals recovery). More recently, the term “conversion technologies” has become more widespread and is being used to distinguish between processes that recover products and fuels from waste, versus waste-to-energy systems that primarily incinerate wastes to produce heat and electricity. Conversion technologies are of significant interest due to their potential to create a wider array of products, including liquid fuels, electricity, heat, chemicals and other products. In this Plan, the term “resource recovery” is being

used as a broad term that encompasses both waste-to-energy and conversion technologies.

Current resource recovery activities in Tillamook County include the diversion of wood waste to a local paper mill for hog fuel. The diversion of wood waste is occurring from the Tillamook Transfer Station, although the paper mill also purchases hog fuel from other sources. Another local activity is the anaerobic digestion of animal manure by the Hooley Digester, located at the Port of Tillamook Bay. Although animal manure is defined as an agricultural waste and is exempt from solid waste regulations, there is some interest in expanding this plant or constructing another facility to include food scraps and other organic wastes.

There are few resource recovery facilities located in the state of Oregon, however this sector is growing. The only waste-to-energy facility operating for solid waste is in Marion County, although there are also a number of smaller incinerators being operated for various special waste streams. There was also an incinerator operating in Coos County (the Beaver Hill Incinerator), but without energy recovery (and hence it was not classified as a “resource recovery” facility). In early 2012, the Beaver Hill Incinerator was shut down by a mechanical systems failure, and it might not be reopened due to the expense of the repairs. For those types of facilities defined as conversion technology, there are currently 21 facilities that are being operated, constructed or that are in the planning stages in Oregon (as of October 2011³).

Tillamook County BioEnergy Feasibility Study. A workgroup was established to obtain funding for the purpose of investigating issues related to the disposal of animal mortalities in Tillamook County. A 2007 Oregon Solutions project studied the economic and public health impacts of closure of the state’s last two rendering plants, establishing a useful piece as background for this study. The Tillamook County Bioenergy Feasibility Study expanded on prior research and developed strategies related to alternatives to the disposal of animal mortalities through anaerobic digestion (AD). The Feasibility Study also examined alternatives to the disposal of other municipal solid waste streams (MSW), including institutional food waste.

The results of the Study were economically and environmentally favorable. Sufficient feedstock is available, mortalities can be successfully addressed and managed, AD and composting are proven technologies, and saleable products would be generated. The project would create jobs, reduce carbon and odors, offer a net environmental benefit, as well as mitigating the "no action" risk. The Study offers three scenarios, including CHP and CNG biogas options; two of which are cash flow positive. Tetra Tech, Inc., the consultants that conducted the study, recommended proceeding with a CNG project based upon favorable returns. With a projected payback of less than 8 years and a favorable Net Present Value, the workgroup is pursuing additional grant funding to continue technical development in this direction.

³ From “Waste Trends and Recovery Potential” by Peter Spendelow and Bob Barrows, DEQ, November 10, 2011.

f. Hazardous Wastes

Organizations using products that are corrosive, ignitable, reactive or toxic probably generate hazardous waste. These could include:

- construction and painting contractors
- printers
- equipment repair shops
- laboratories
- dry cleaners
- metal manufacturing operations
- vehicle maintenance and auto body shops

Some businesses generate small amounts of hazardous waste (more than 220 but less than 2,200 pounds) and could be considered a conditionally exempt generator (CEGs), as determined by the Department of Environmental Quality (DEQ). A number of private companies provide hazardous waste management services to small (SQG) and large quantity (LQG) generators. DEQ publishes a list of these companies on their website. DEQ regulates the handling of SQG and LQG wastes.

The household hazardous waste collection facility at the Tillamook Transfer Station accepts materials from businesses (CEGs) and households. Household hazardous waste collection events are held monthly and CEG collections are held semi-annually by appointment only.

g. Waste Pharmaceuticals and Sharps Disposal

Medical waste (pharmaceuticals) is collected in coordination with the Tillamook County Sheriff's Office. The County previously held annual collection events in cooperation with the Drug Enforcement Administration (DEA). In 2012, a permanent collection box was placed at the Tillamook County Sheriff's Office for residents to safely and properly dispose of unused and expired prescription and over-the-counter medications. Several police departments within the County are also participating in the collection. It has been shown that prescription drug abuse is increasing. Unused and expired prescription and over the counter medications pose a significant threat to human health, public safety and the environment.

City Sanitary Service (CSS) accepts syringes for a fee at their office in Tillamook. These syringes must be in a proper container, which can be obtained from the local drugstore. CSS also sells boxes for syringes, and the fee for the box includes disposal charges. WOW collects sharps once per month in their service area, through a service

that includes the container with the disposal cost. Customers can also purchase and then return sharps containers at the Fred Meyer pharmacy in Tillamook.

MOVING TO A MATERIAL MANAGEMENT SYSTEM

There is increasing interest both nationally and regionally in the concept of “materials management.” This concept is seen as a next step beyond the solid waste management approach used to date. Materials management is a broader view that avoids limitations imposed by traditional solid waste management methods (including recycling). Disposal, recycling and other current solid waste management programs tend to focus on materials only after those materials are discarded, thus overlooking the significant impacts associated with resource extraction, manufacturing processes and the transportation of goods. These “upstream” activities have significant impacts to the environment (due to mining and other resource extraction activities) and create the demand for large amounts of energy consumption (which create more environmental and social impacts). According to DEQ⁴, the upstream environmental impacts are 10 to 100 times greater than the impacts associated with recycling or disposal of the material or product. A materials management approach attempts to recognize these additional impacts by accounting for the “life cycle” of a material or product, rather than by only addressing a waste through recycling or disposal when it has reached the end of its useful life.

The Oregon DEQ is currently conducting a process to further define materials management for the state. As part of that process, they have recently drafted a “2050 Vision” for materials management in Oregon, which states:

“Oregonians in 2050 live well, responsibly producing and using materials, conserving resources and restoring the environment.”

The information that accompanies this vision notes that achieving it will require “attention to materials throughout their lifestyle and to the economic system at large.” The explanation of the draft vision also states that an action plan for the vision should focus on four elements: 1) upstream/production, 2) consumption, 3) end-of-life management, and 4) social and economic systems.

DEQ’s draft *2050 Vision and Framework for Action* proposes that additional work be conducted to assess various impacts and opportunities associated with current consumption patterns, as well as conducting research to identify the highest and best use for end-of-life management of discarded materials. Other recommendations are made for a variety of policy, regulatory actions and partnerships that could be

⁴ From “What is Materials Management” by David Allaway, DEQ, October 12, 2011.

implemented in the future. Some of the recommendations that are proposed in the draft *2050 Vision and Framework for Action* include:

- Prioritize products and materials for product stewardship programs based on DEQ's product stewardship principles and support legislation consistent with these principles.
- Develop a strategy to limit the amount of food scraps, yard debris and metal that are landfilled.
- Evaluate the potential for disposal bans for other materials.
- Increase recycling opportunities through a review and update of the Opportunity to Recycle Act.
 - Evaluate existing food waste prevention programs (such as “Love Food Hate Waste” and others) for application in Oregon. Partner with others to implement efforts in Oregon including efficient food redistribution systems.
 - Support opportunities for consumers to effectively opt out of receiving unwanted mail, if desired.
 - Develop information that can be used to help consumers understand relative impacts of actions and choices, and partner with others to disseminate the information.
 - Embed sustainable consumption concepts into existing public education programs, such as outreach under the Opportunity to Recycle Act. Revise “Rethinking Recycling” curriculum and supporting materials; expand the curriculum to include grades 6 to 12 and a broader materials management perspective.
 - Develop consistent statewide messaging on the benefits of reuse, repair, composting, recycling, and disposal, taking into account differences in programs throughout the state.
 - Work with partners such as grocery and retail stores and libraries to deliver messages related to sustainable end-of-life materials management.

Application of the materials management approach locally is an interesting challenge, since many of the potential solutions are state, national, or global in scale. Activities that can be supported locally might include educational programs related to waste prevention, and infrastructure and promotional support for the reuse industry, since activities that prevent the generation of waste in the first place or reuse products are effective materials management approaches. Another way that a materials management approach can be applied locally is through the use of “best current management practices” that clarify the preferred method for reducing or diverting materials from the waste stream. These practices could take into account the life cycle impacts of specific materials and products.

SERVICE GAPS AND OPPORTUNITIES

a. Waste Prevention

There do not appear to be any significant service gaps in Tillamook County in the area of waste prevention, although there could be additional opportunities to promote waste prevention. In reviewing the DEQ's Waste Prevention Strategy mentioned earlier (see Current Activities, Waste Prevention), Tillamook County could potentially increase their efforts in two areas: remodeling/deconstruction of buildings and business practices. In the other focus areas for waste prevention, Tillamook County could continue to rely on the State to take the lead for design and construction of buildings, large-scale business practices, and foundation research and analysis. In the final focus area, consumer education, Tillamook County is already conducting a wide variety of activities.

b. Reuse

CARTM would like to do a route for reusable materials, but may have to charge for that service (which would not be allowed by current county ordinance).

Other opportunities for reuse could include encouraging more diversion of reusable building materials, increasing promotion of the reuse network in Tillamook County, and creating a reuse shelf at the HHW facility for reusable items.

c. Recycling

The distance to recycling markets is a concern for Tillamook County. In addition, there are challenges with the low value of glass and the significant distance to markets. DEQ has supported "highest and best use" for recyclable materials, but has sometimes allowed more distant collectors to use glass in landfill applications. A local application for crushed glass or glass bottles could provide a more cost-effective market. A local MRF or re-load facility could help make recycling more cost-effective, although there is some feeling locally that a MRF could also limit the variety of materials that could be recycled since it would need to be designed to handle specific materials.

Curbside recycling is offered in the City of Tillamook but participation is very low. Residents must subscribe and then set out materials in paper bags. Providing recycling carts or other containers would help by making the program more convenient and attractive. Garbage collection is not mandatory in the City of Tillamook and recycling service is only available to garbage customers (only about 60% of the residents subscribe to garbage collection in the City). Upgrading the curbside services in the City of Tillamook may lead to demand for this service in other areas of Tillamook County. Note that Western Oregon Waste recently received approval to begin curbside recycling in the rural areas of Yamhill County.

Instituting curbside recycling services in Tillamook County (or expanding the participation rate in the case of the City of Tillamook) could lead to significant additional costs for the franchise haulers to purchase new trucks and possibly recycling containers. If this is pursued, approaches that allow them to use existing equipment or to share equipment would help make curbside service more cost-effective.

Magazines are still being collected separately at the Recycle Shacks, but this is no longer necessary. The market for this material (SP Newsprint) can accept a mixture of magazines and newspapers.

The franchise system, and related state laws and county ordinances, is a significant barrier to recycling in Tillamook County. The current county ordinance requires that recycling services be offered for free or provide a payment to the generator (state law only requires that recycling services charge less than garbage collection). This creates a requirement that the franchise haulers must handle the less-profitable materials and blocks other recycling services that would need to charge to collect those materials. It is especially a problem for materials such as C&D wastes, which can be recycled but require processing and other expenses such that these materials generally do not “pay for themselves.”

Tires from TTS could be recycled. This material is currently landfilled. In 2010, this would have meant an additional 61.5 tons of materials recycled.

Recycle Shacks are valuable for providing a local opportunity to recycle, but are problematic and expensive to maintain. For instance, OSS has calculated that they could provide curbside service for what it would cost to maintain a Recycle Shack in their area.

CARTM feels that a commercial cardboard route is needed in Manzanita and Nehalem (at least on Tuesdays and Wednesdays, when their site is closed).

Hours at MTS/CARTM are a problem for some, especially for seasonal visitors that may not be aware of the hours or may not have flexible schedules (i.e., they can't come back when site is open if they are leaving that day).

The minimum fee for waste loads at TTS (for up to 400 pounds) and the similar fee at PCTS (based on volume) is a disincentive for recycling. The lower minimum fee at the Manzanita Transfer Station (to be implemented in June 2012) provides greater incentive for the customers to reduce the amount of waste disposed as much as possible. CARTM encourages people in their area to self-haul their waste to the Manzanita Transfer Station because this provides an opportunity for them to recycle. With the current rate structure at TTS and PCTS, however, self-hauling may have the opposite result.

The product stewardship program for paint is not working well for Tillamook County due to the lack of a local business interested in handling it. CARTM is interested, but some problems are preventing them from doing it. CARTM would like to re-mix and sell paint.

d. Composting

The lack of local processing options for yard debris, especially grass clippings, could be a service gap. There are currently only two drop-off points (Tillamook and Manzanita transfer stations) for woody yard debris. On the other hand, there does not appear to be much yard debris in the waste stream for Tillamook County. Much of this material is handled through backyard composting or through other informal methods (such as neighbors that garden taking it from other neighbors). The franchise haulers do sometimes receive large amounts of brush or similar materials from homes that are doing extensive landscaping, and may charge more for large amounts.

Separate collection of food waste would address this material, which is the largest remaining material in waste stream, but Tillamook County would need a local facility to process this material. Food waste collection from residential customers would be expensive and pose other problems, but food waste collections from large commercial generators (such as restaurants and grocery stores) could be done much more cost-effectively.

A central site for composting yard debris and food could provide important capabilities. Currently, the closest composting facility that can handle food scraps is in Corvallis.

Local farms and nurseries could use more of the compost generated by the Hooley digester, but the digester is receiving a better price for this material from a large nursery operation in the Willamette Valley. The Hooley Digester does sell to local users, but demand is limited by the market price of \$16 per cubic yard. Some compost is also being produced and sold locally by others, as part of “3-way” mix and other products.

Rates at MTS and TTS could be lower for clean wood, this would provide a greater incentive for customers to keep it separate and thus divert more of this material.

There is a large amount of logyard waste at the Port, approximately 1.2 million cubic yards of it. Although classified as an industrial waste and not as a solid waste, this material could present an opportunity for a composting system for food scraps or for combined management of other waste streams. There is some interest locally in mining this deposit for the organics and also to separate and market the rocks.

e. Resource Recovery / Waste to Energy

Expansion of the Hooley Digester or a new anaerobic digester to handle animal mortalities could also provide an option for food scraps.

There is some local interest in using plastics-to-fuel technology to handle large volumes of hard-to-recycle waste plastics, although the net value of this approach has been questioned by DEQ. TCCA has worked with CARTM to explore this option for plastics that the creamery generates that cannot be recycled, but to date a cost-effective approach has not been developed.

f. Hazardous Wastes

Additional promotion and public education on reducing hazardous waste quantities could decrease the cost of operating the HHW facility, and also lead to a healthier environment, less human exposure to toxic materials, and other benefits.

g. Other Service Gaps and Opportunities

Larger loads of C&D wastes, which often include bulky or hard-to-handle materials, cannot be handled at MTS due to the lack of scale and equipment to handle it.

Tillamook County, as with the rest of the nation, is still recovering a severe recession at the time this Plan was being developed. This recession is a limiting factor for implementing new programs or rate increases, and places a priority on those activities that create new jobs.

CONCLUSION

As noted at the beginning of this document, the information presented here will become part of the *Tillamook County Comprehensive Materials and Solid Waste Management Plan* (the “Plan”). As part of the Plan, this section will be expanded to address options and recommendations for changes to the waste diversion programs in Tillamook County.

ATTACHMENT E
MARKET ANALYSIS

MARKET ANALYSIS
for RECYCLABLE MATERIALS
in TILLAMOOK COUNTY



JANUARY 2012

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SECTION ONE INTRODUCTION

PURPOSE

This market analysis is being conducted as part of the preparation of a Comprehensive Materials and Solid Waste Management Plan (the Plan) for Tillamook County. The primary goals of this analysis are to:

- Review data and information on the types and quantities of recyclable materials recovered in the County.
- Discuss and assess the marketing strategies used by those entities collecting, handling, processing and aggregating these materials.
- Identify any problems or shortfalls with the existing markets or marketing activities.
- Discuss the potential for a new facility or facilities in the County that could aid in the marketing of recyclables.
- Provide recommendations for further consideration by the County, cities, and recycling service providers operating in the County.

DEFINITION OF MARKETS

For clarification, it should be noted that markets for recyclable materials typically are categorized as either “intermediate” or “end use.” An example of an end use market is a paper mill or a plant that makes glass containers. Intermediate markets are suppliers of feedstock for end use markets, which actually manufacture products from the recyclables. Material recovery facilities (MRFs) are considered intermediate markets. They do not create a consumer product but rather receive, process, and consolidate recyclable materials from a variety of sources such as the franchised haulers in Tillamook County. MRF processing generally consists of manual and mechanical methods for separating, upgrading, baling, storing, and ultimately transporting recyclables to end use markets. Brokers that do not physically handle materials are defined as intermediate markets as well. They are commodity dealers that have set up business arrangements to sell recyclables to either MRFs or end use manufacturers.

Another important distinction for markets is domestic versus export. Domestic markets can be defined as end use markets that are located within the United States, while export markets are end users located outside of the country. With the economy now

global in nature and much of the manufacturing currently being done in other countries (especially China), export markets have become a driving force. Many MRFs in the Pacific Northwest are being operated to meet export standards because the demand and prices for export markets are better in many cases than the domestic markets. The standards for export markets are also lower than for domestic markets, making it easier and less expensive for MRFs to prepare the materials for export. Domestic markets have had to lower their standards significantly in order to compete and to buy enough materials to satisfy their demand.

TILLAMOOK COUNTY'S 2010 RECOVERY RATE

In Oregon, "recovery" is a broad term that encompasses a variety of activities that divert materials from landfill disposal, including recycling, energy recovery, and composting. The statewide recovery goal is 50% based on the following formulas:

$$\begin{aligned} \text{Tons Disposed} + \text{Tons Recovered} &= \text{Total Tons Generated} \\ \text{Tons Recovered} \div \text{Tons Generated} &= \text{Calculated Recovery Rate (\%)} \end{aligned}$$

The state has been divided into "wastesheds" with recovery goals set for each according to HB 3744. Tillamook County's goal is 30%. In addition, wastesheds may be allocated 2% credits toward their recovery rate for certified programs in waste prevention, home composting, and reuse (for a total of up to 6% credits). Thus,

$$\text{Calculated Recovery Rate} + \text{Recovery Credits} = \text{Total Recovery Rate}$$

According to the Department of Environmental Quality's (DEQ) 2010 Oregon Materials Recovery and Waste Generation Rates Report, Tillamook County's calculated recovery rate was 33.6%. The County received the maximum 6% in credits for a total recovery rate of 39.6%, thus exceeding its goal of 30%.

The total tons recovered for all diversion activities (recycling, energy recovery, composting) in the County was 10,147 tons. Of that amount there are two materials, scrap metals and cardboard, that accounted for 6,177 tons or 61%. The next three top materials (wood, paper and glass) accounted for 2,537 tons. Altogether, these five materials made up 86% of the total tons recovered.

Of the 10,147 recovered tons, 6,526 tons were attributable to the services and facilities operated by franchisees of the County and cities. The remaining tonnage is determined by DEQ from private sector and industry reports submitted to the agency. The additional recovery tonnages are collected through separate systems, such as the State's container deposit law, cardboard from supermarkets and large retail stores, and material diverted by processors such as the Tillamook County Creamery Association.

SECTION TWO

CURRENT PRACTICES AND CONDITIONS

RECYCLING COLLECTION, PROCESSING AND MARKETING

In Tillamook County, recyclable materials are presently collected by several garbage franchisees and transfer station operators. The franchised waste haulers collect recyclables in their designated operating areas from commercial sources, the Recycle Shacks,¹ and from residential customers in the City of Tillamook. The transfer station operators collect a variety of materials and items for recycling and, in the case of CARTM, for repair, reuse, and resale. Many of the recyclable materials are marketed by the operator of the Tillamook Transfer Station (Don G. Averill Recycling, Inc.), but City Sanitary Service and CARTM also ship some or all of their materials directly to markets generally located in the Portland metropolitan region.

A few additional private companies (including the Tillamook County Creamery Association, Safeway, and Fred Meyer) take care of their own marketing needs for the recyclable materials that they collect or generate. While these efforts do not involve the franchised haulers or facilities, they are still considered part of the recycling conducted in the County watershed. As noted previously, DEQ's official 2010 recovery database shows 10,147 tons recovered from the County. Records submitted to the County from the franchised haulers and facilities (the three transfer stations operated by contractors for the County) document 6,638 tons of recovery. The difference is the amount attributed to activities in Tillamook County by DEQ due to independent efforts (such as cardboard recycled by a supermarket and then back-hauled to the store's warehouse). Since these activities are not subject to direct influence by the County, the focus herein is on the recovery conducted by the franchised collectors and transfer station operators. The markets used by these entities (as of 2010) are shown in the following table.

As is apparent from Table 1, recovery in Tillamook County benefits from the diversity of markets available throughout Northwest Oregon in general and in the Portland metropolitan region in particular. The Tillamook Transfer Station (TTS) handles some recyclables from City Sanitary Service and all recyclables from Nestucca Valley Sanitary Service (operator of Pacific City Transfer Station). Materials collected at the Manzanita Transfer Station are marketed directly by CARTM.

¹ The Recycle Shacks are drop-off depots located in Rockaway, Garibaldi, Bay City, and Tillamook.

Table 1
Existing Markets for Recovered Materials from Tillamook County

Company and Material	Amount Marketed in 2010, tons (1)	Intermediate or End Use Market
Averill Recycling		
Newspaper and Magazines	175.08	SP Newsprint, Newberg, OR
Cardboard	655.9	Georgia Pacific, Toledo, OR
Plastic Bottles and Containers	38.52	QM Plastics, Salem, OR
Glass Containers	69.8	Owens Brockway, Portland, OR
Aluminum	52.4	Cherry City Metals, Salem, OR
	42.23	Schnitzer Steel, Portland, OR
Tin Cans	4.17	Cherry City Metals, Salem, OR
Scrap Metal	3,061.78	Schnitzer Steel, Portland, OR
Lead Acid Batteries	12.57	Tim Fidler, Colton, OR
Tires	53.5	Coffin Butte Landfill, Corvallis, OR
Used Motor Oil	3,350 gallons	Thermo Fluids, Portland, OR
Electronics	63.75	WM Recycle America, Tigard, OR
Wood	907.04	Hampton Lumber, Tillamook, OR
CARTM Recycling		
Newspaper and Magazines	81.73	Far West Fibers, Portland, OR
Mixed Paper	38.13	Far West Fibers, Portland, OR
Cardboard	113.25	Far West Fibers, Portland, OR
Film Plastics	4.98	Far West Fibers, Portland, OR
Plastic Bottles and Containers	16.49	Far West Fibers, Portland, OR
	0.97	Pepsi Cola, Corvallis, OR
	6.09	OBRC, Portland, OR
Other Plastics	18.83	Far West Fibers, Portland, OR
Glass Containers	108.7	Owens Brockway, Portland, OR
	58.34	OBRC, Portland, OR
Aluminum	4.49	Metro Metals, Portland, OR
	0.05	Calbag Metals, Portland, OR
	0.2	Far West Fibers, Portland, OR
	0.52	Pepsi Cola, Corvallis, OR
	3.96	OBRC, Portland, OR
Tin Cans	8.33	Far West Fibers, Portland, OR
Scrap Metal	89.95	Metro Metals, Portland, OR
	2.94	Calbag Metals, Portland, OR
Lead Acid Batteries	75 batteries	Interstate Batteries, Portland, OR
Tires	52 tires	Les Schwab, Tillamook, OR
Used Motor Oil	240 gallons	CARTM
Electronics	7.42	Total Reclaim, Portland, OR
	7.11	URT, Clackamas, OR
	3.51	WOW, Warrenton, OR
Wood	0.36	Trails End, Warrenton, OR
Window Glass	0.35	Trails End, Warrenton, OR
Vegetable Oil	665 gallons	Sunbreak Biofuels, Portland, OR

Company and Material	Amount Marketed in 2010, tons (1)	Intermediate or End Use Market
City Sanitary Service (2)		
Newspaper	49.36	SP Newsprint, Newberg, OR
Office Pack/High-Grade Paper	15.53	Weyerhaeuser, Beaverton, OR
Glass Containers	66.92	Owens Brockway, Portland, OR
Tillamook County		
Hazardous Wastes	28.69	PSC Environmental Services, Kent, WA

Source: Data is from the annual reports to DEQ, the *2010 Recycling Collector Surveys*.

- Notes:**
1. The "Amount Marketed in 2010" may include amounts collected in earlier years (if there was an inventory carried over), and may exclude materials collected but not marketed in 2010. Figures are shown in annual tons unless noted otherwise.
 2. Not shown in City Sanitary's materials are those materials transferred to Don G. Averill Recycling for marketing. Likewise, no amounts are shown for Nestucca Valley Sanitary Service, Oceanside Sanitary, and R Sanitary because all of their recyclable materials are transferred to the Tillamook Transfer Station operated by Don G. Averill Recycling. A small amount of materials were also transferred by WOW to CARTM or to Trails End.

**Table 2
Total Tons Marketed from Tillamook County**

Company	Amount Marketed in 2010, tons	Percent of Total
Don G. Averill Recycling / Tillamook Transfer Station	5,101	78.2%
CARTM / Manzanita Transfer Station	629	9.6%
Trails End / Manzanita Transfer Station	635	9.7%
City Sanitary Service	132	2.0%
Tillamook County	29	0.4%
TOTAL	6,526 tons¹	100%

Note: 1. The total does not include an additional 3,621 tons collected and marketed by others.

As also can be seen in Table 1, about two-thirds of the recyclable materials from Tillamook County are marketed to MRFs, metals scrap yards, and other intermediate markets, while about one-third of the materials are marketed to (domestic) end-users such as SP Newsprint and Owens Brockway. The materials handled by MRFs also go to domestic end-users in many cases, but some of those materials are being sold to export markets.

The total quantities (in tons) marketed by each service provider and facility operator in 2010 are shown in Table 2.

The figures in Tables 1 and 2 do not include recyclable materials that are collected by other companies and programs that are not tracked as part of the County's annual report. These other amounts are tracked by DEQ's annual survey and in 2010 the other programs diverted an additional 3,621 tons of materials. The 6,526 tons tracked by the County's annual report represents about two-thirds (64.3%) of the total amount of materials diverted from Tillamook County's waste stream. As can be seen in Table 2, Don G. Averill Recycling is marketing 78% of the 6,526 tons handled by public facilities and franchise haulers. For the entire watershed, the Tillamook Transfer Station manages 50% of the total recyclable volume diverted from Tillamook County. Manzanita Transfer Station markets 12% of the total amount and 19% of the recyclables coming from Tillamook County facilities and haulers.

The handling of such a large proportion of the County's recyclables by just two facilities (62.7% of the 10,147 tons diverted from the County's waste stream in 2010 was handled by Don G. Averill Recycling and CARTM) is an efficient and cost-effective approach. The cost-effectiveness of recycling, like many other elements of the solid waste system, is typically greatly enhanced by volumes of scale. Larger amounts of recyclable materials not only decrease the per-unit cost for recycling those materials, but larger volumes can also increase access to a greater variety of markets. Market access is a key factor to receiving the best prices and is also important for stability and other benefits. Periodic assessments of the types of materials being recycled and the markets for those materials, combined with open lines of communication between all of the parties involved, however, should be used to ensure that the needs of the local residents and businesses are continuing to be met by this approach.

SECTION THREE

ANALYSIS, CONCLUSIONS AND RECOMMENDATIONS

POTENTIAL FOR ENHANCED RECOVERY

As was noted previously, five material categories – scrap metal, cardboard, wood, paper, and glass containers – comprise 86% of the total tons (10,147) diverted from disposal through recycling, energy recovery, and composting activities in Tillamook County in 2010. In determining the potential for increased recovery and the associated processing and marketing arrangements, it is helpful to quantify how effective existing recovery efforts are for a broad range of materials. This is done by estimating specific material recovery rates. Table 3 portrays this information, which helps identify those materials that could be targeted for future diversion.

Table 3 shows high recovery rates for cardboard (#2), glass containers (#6) and scrap metal (#17). While paper and wood (#12 and #21) are among the five materials that contribute most to the County's overall recovery rate, their specific recovery rates are below 50%, thus indicating they are reasonable targets for additional diversion. Other materials with low recovery rates (highlighted in red) but suitable for additional diversion are food waste (#5), rigid plastic containers (#15), tin cans (#18), and yard debris (#22). Paper, rigid plastic containers, and tin cans are found in the residential and commercial/institutional waste streams. Paper, rigid plastic containers, and tin cans have existing markets that are being accessed by Don G. Averill Recycling and CARTM Recycling. In general, these markets are in or near Portland, and transporting materials to these markets represents a significant cost.

Some materials shown with low recycling rates in Table 3 are not recommended for immediate action but could be pursued in the future. "Other plastics," for instance, only have a recycling rate of 1.8%, but this category represents a variety of different types of plastics that are difficult to recycle. While markets for these materials are showing signs of progress, it would not be prudent to begin collecting these materials until the markets are more stable.

A substantial portion of the reclaimed wood is being used for fuel at Hampton Lumber. Wood and yard debris tend to be bulky and it is preferable to chip or grind them for efficient transport. Food waste must be removed from the point of generation (i.e., from homes, restaurants, etc.) often for health and sanitation reasons. Food waste is also heavy and it is difficult to handle, collect and transport it from commercial and institutional sources. Thus, local utilization of wood, yard debris and food waste is preferable for reasons of cost-effectiveness, but more local opportunities for diverting yard debris and food waste are needed.

Table 3
Material Recovery Levels for Tillamook County

Material	Disposed Tons (1)	Amount Recovered (2)	Percent Recovery
1 / Aluminum (cans and other)	51.7	283	84.5 %
2 / Cardboard / Kraft	647	2,593	80.0 %
3 / Electronics	242	88.4	26.8 %
4 / Fluorescent Lamps	1.5	0.9	37.6 %
5 / Food Waste	3,558	66.5	1.8 %
6 / Glass Containers	307	635	67.4 %
7 / Glass Other	232	0.7	0.3 %
8 / Gypsum Wallboard	602	44.4	6.9 %
9 / Lead Acid Batteries	3.6	77.7	95.6 %
10 / Mixed Batteries	10.6	0.5	4.2 %
11 / Paint	31.5	13.3	29.7 %
12 / Paper Fiber	1,186	636	34.9 %
13 / Plastic Film	362	14.1	3.8 %
14 / Plastic Other	1,226	22.2	1.8 %
15 / Rigid Plastic Containers	301	105	25.9 %
16 / Roofing - Asphalt	655	35.5	5.1 %
17 / Scrap Metal - Other	1,433	3,584	71.4 %
18 / Tin Cans	159	24.1	13.2 %
19 / Tires	3.6	129	97.3 %
20 / Used Motor Oil	13.0	185	93.4 %
21 / Wood Waste	2,838	1,266	30.8 %
22 / Yard Debris	1,642	198	10.8 %

- Notes:**
1. Disposed tons are based on percentage figures from DEQ's 2009 / 2010 Waste Composition Study (for the "rest of Oregon," excluding Metro plus Marion and Lane Counties), and on Tillamook County's amount of disposed waste for 2010 (22,373 tons).
 2. Figures for the amounts recovered are from DEQ's 2010 Oregon Material Recovery Survey.

There are currently no commercial composting facilities accepting organic materials in Tillamook County, although an increasing amount of agricultural wastes are being composted or treated with anaerobic digestion. Much of the compost currently being prepared in Tillamook is going back to the farms that generated the agricultural wastes or is being shipped to large consumers in the Willamette Valley, but there appears to be a fair amount of demand, or potential for demand, for compost products in Tillamook County. Potential consumers of compost in Tillamook County are typically price-

sensitive and would likely only consume significantly more compost if the price was sufficiently low. Demand could also be increased by promoting the availability and benefits of compost. It should also be noted that part of the local demand for compost is being met by backyard composting.

CONSTRAINTS TO ENHANCED RECOVERY

The primary barriers to increased recovery in Tillamook County are posed by two sets of existing factors or conditions:

- The geography and demography of the County; and,
- The manner in which solid waste services are arranged and delivered.

Tillamook County is isolated and rural in nature with a small population that is dispersed throughout seven incorporated cities and a large unincorporated area. Only one of the seven municipalities has a population close to 5,000 (Tillamook), and the other cities have less than 2,000 residents. Current population growth is relatively low, and has only increased from 24,264 in 2000 to 25,250 in 2010 (a 4.1% growth rate for the past decade). There is one main transportation route running west to east offering access to the Portland metropolitan region (Highway 6) and one main route running north to south linking jurisdictions and communities (Highway 101). Such circumstances pose challenges to the collection of large quantities of recyclable materials and to achieving economies of scale in transporting those materials to a central point and then to markets.

These geographic and demographic constraints are compounded by the manner in which solid waste management services are presently organized and delivered. A small pie has been divided into even smaller pieces, which runs counter to a basic fact of solid waste economics, namely that economies of scale and efficiencies are directly proportional to the volumes of both refuse and recyclables.

There are five solid waste collection franchises providing services throughout the County. Services in the unincorporated areas of the County are operated through franchise agreements between each collector and the County. Services in the incorporated jurisdictions are contracted for by each jurisdiction. Thus there are a multiplicity of franchise and contract arrangements with different terms and different time periods. In addition, it has been customary for these franchises and contracts to be regularly renewed without formal performance reviews. The net effect of these arrangements and practices is to essentially guarantee a perpetual franchise to the franchisees. This approach provides a significant amount of stability to the system, but this stability could also lead to stagnation of services and lack of improvements if not coupled with periodic reviews of the performance and standards for the franchises.

SERVICE GAPS AND MARKETING ISSUES FOR EXISTING SYSTEM

Given the constraints and barriers discussed above, it is noteworthy that the County, municipalities, and private sector have developed a remarkable degree of centralization in the management of waste and recyclables. Tillamook Transfer Station is the key player within Tillamook County's solid waste system. All refuse flows through this facility for consolidation and transport to Coffin Butte Landfill near Corvallis. As well, 78% of the recovered materials collected and handled by the franchisees in 2010 were processed, stored, and marketed by Don G. Averill Recycling from this location. In essence, TTS is the "de facto" materials recovery facility (MRF) for Tillamook County and is carrying out a cooperative materials marketing approach for most of the involved parties.

CARTM is the only franchisee that does not utilize TTS for recovery but instead processes and directly markets the materials brought to the Manzanita Transfer Station. This strategy allows CARTM to collect and market a wider variety of materials and to receive payment for those materials.

It must be asked that since the County has exceeded the statutorily defined recovery goal, what incentives are there for the franchisees to invest in extended recycling efforts, especially since the franchise agreements do not address such initiatives? More fundamentally, given all the factors discussed so far, is it reasonable to expect the existing solid waste and recycling system in the County to recover significantly larger quantities of recyclables than is currently the case?

RECOMMENDATIONS

Based on the above analysis and observations, this market analysis makes the following recommendations:

1. The County should move aggressively to divert as much organic wastes as possible from the waste stream. This can be accomplished primarily by developing new programs and activities, although the possibility of including food waste in local anaerobic digestion systems, such as the Port of Tillamook Bay's Hooley Digester, should be explored further.
2. The County should encourage solid waste service providers doing business in the County (either incorporated municipalities or unincorporated areas) to create and participate in a formal organization – the Tillamook County Waste Service Providers Association (or a similar name). Examples or models of such industry groups can be found in Lincoln County, Marion County, and in the Tillamook County Creamery Association. This new organization could be responsible for achieving, maintaining,

and increasing on an ongoing basis the 30% recovery rate assigned by DEQ to the County.

3. The County should conduct discussions with appropriate stakeholders, including but not limited to the County Commissioners, City mayors and managers, the Solid Waste Advisory Committee, and franchised service providers, regarding the advantages and disadvantages of universal or mandatory collection of refuse and designated recyclables in the seven incorporated jurisdictions.
4. A periodic review of the recycling services offered by the franchise haulers and facility operators should be conducted, with the intent of:
 - Reviewing and possibly revising recycling collection methods to adjust for changes in markets.
 - Reviewing the need for additional services.
 - Reviewing other changes that could provide improvements to the Tillamook County system (in terms of the quality of services, increased amounts of recyclables collected and other benefits).

ATTACHMENT F
COLLECTION AND DISPOSAL SYSTEM REVIEW

COLLECTION AND DISPOSAL SYSTEM REVIEW

Overview

Waste collection in Tillamook County is provided by privately-owned waste collection companies with regulatory oversight by the County through the Solid Waste Service District. The terms and conditions of the exclusive franchise areas are stipulated in the agreements signed between each company and the County in June 2005. The County regulates the waste collection franchises for the unincorporated areas and the cities control the franchise agreements within their boundaries. For the contracts with the County, all five of the franchise agreements have ten-year terms with a rolling expiration date and are set to expire on June 30, 2015.

The District owns the property and the fixed assets of all three of the disposal and recycling facilities, but subcontracts the operations to entities outside of the District. With its central location in Tillamook City, the Tillamook Transfer Station is the primary disposal site in the County with the two smaller facilities strategically located to the north and south. All waste is funneled through the Tillamook Transfer Station for final disposal at Coffin Butte Landfill.

Waste Collection

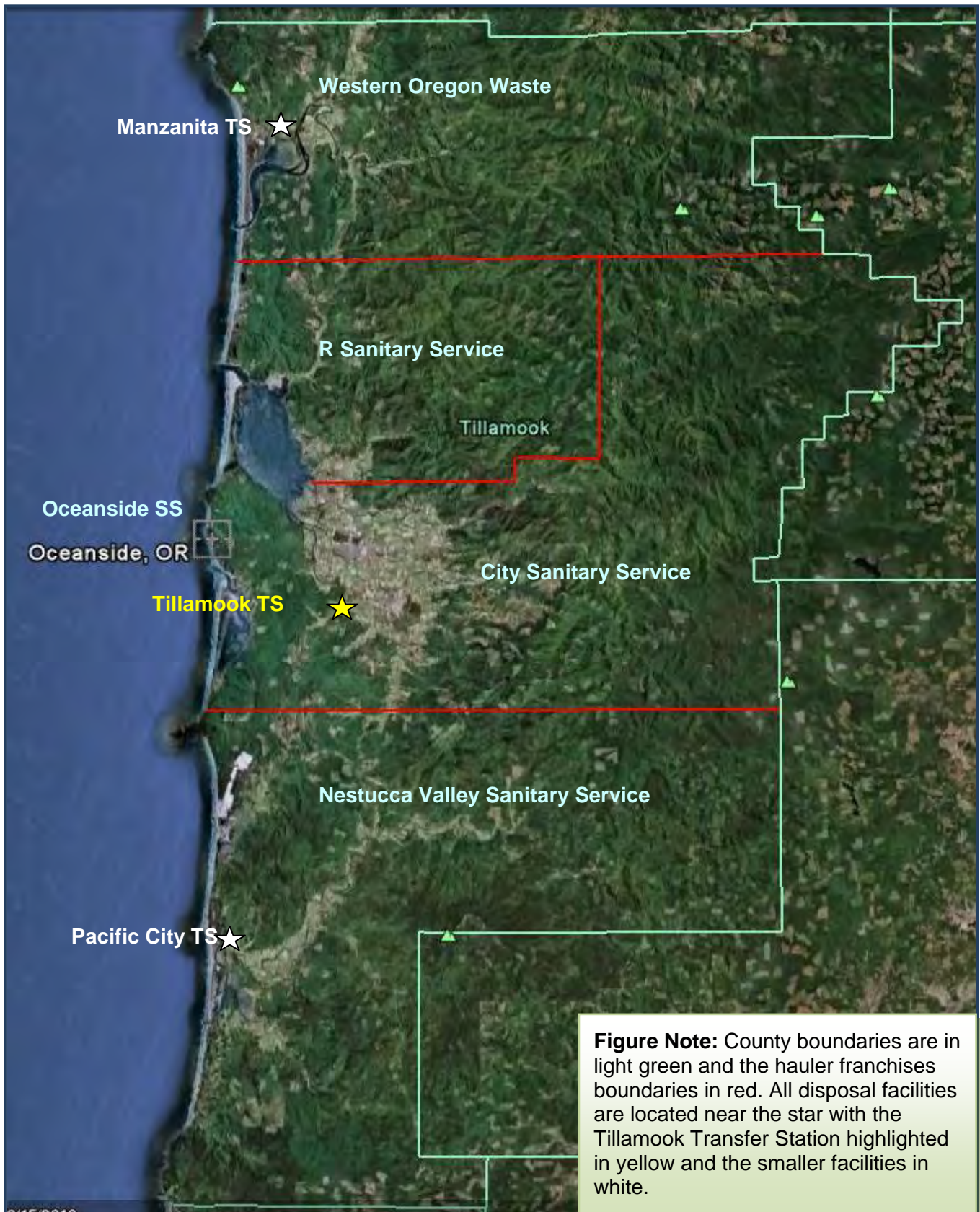
According to the 2010 US Census, 25,250 people live in Tillamook County with the majority of them, 62%, living in the unincorporated areas. The County has seven incorporated cities with a combined population of 9,595 people. Waste collection in the unincorporated areas of the County is by subscription and is provided to residents by one of five private companies.

The County covers 1,125 square miles with the Pacific Ocean as its western boundary. One of the primary issues that the franchised haulers must contend with is the sparse population in the rural areas. Collection costs in the County's rural areas are considerably higher when compared to urban areas due to the distance between stops. Full utilization of equipment and expanding the customer base can keep hauler profits at a level necessary to provide the service; however, offering additional services such as curbside recycling present logistical and financial difficulties.

Another issue for the haulers is the large seasonal increase in population and waste generation. The coastal areas are a vacation destination during the summer months, and these areas have a large number of vacation rentals and second homes. There are also a large number of campers that fill the parks and campgrounds in Tillamook County in the summer. The coastal areas and campgrounds generate more garbage in the summer due to the increase in population from short-term renters and vacationers, plus these temporary residents rely more on disposables items than do long-term residents. A majority of the disposable items consumed by the transient population are recyclable, thereby presenting an opportunity to recycle. The service areas for all five franchised companies are impacted by this issue.

Figure 1 shows a map of Tillamook County and the franchise areas, with the county boundaries shown in green and the franchise boundaries in red. The five haulers that currently collect waste and recyclables in Tillamook County are described below.

Figure 1: Tillamook County Solid Waste Service District



Western Oregon Waste (WOW): Western Oregon Waste's service area is the northernmost portion of the county, including the cities of Manzanita, Nehalem, Wheeler, and parts of Rockaway Beach. WOW was recently bought by Recology, a regional waste company with operations in Oregon, California, Washington, and Nevada. WOW utilizes a semi-automated cart collection system for residential and small business customers. Large commercial generators are served with front load containers ranging in size from 1 cubic yard to 8 cubic yards. WOW is the only hauler in Tillamook County to utilize a front-load collection system.



R Sanitary Service (RSS): R Sanitary Service is a family-owned business located in Garibaldi servicing customers from Bay City to Rockaway Beach. R Sanitary has approximately 600 residential customers in the Rockaway Beach/Twin Rocks area with an additional 1,400 customers in Garibaldi and Bay City area. RSS services three recycle shacks that are north of Tillamook. The shacks are checked daily due to use by commercial customers. Commercial customers can receive cardboard collection at no charge. RSS utilizes a manual rear load collection system for both residential and commercial customers.



City Sanitary Service (CSS): City Sanitary Service is the hauler for the City of Tillamook and surrounding unincorporated areas. Service is not mandatory in Tillamook; however, CSS has a 60 to 65% subscription rate for garbage collection services in their franchised areas. Residential waste is collected using a semi-automated loader and commercial service is provided using a rear load system with containers varying in size from 1 yard up to 2 yards. Recyclables are collected from business and residential customers in Tillamook. Approximately

80% of the business customers receive recycling services for high-grade paper and cardboard. Most of their recycling collections are done using 55-gallon barrels which are loaded onto a pick-up truck with a lift-gate. Residential customers who sign up are provided curbside recycling service. At one time, CSS had as many as 90 residential customers signed up for recycling, but that figure has dropped to only ten. A drop off depot for recyclable materials is available at the CSS office.

Oceanside Sanitary Service (OSS): Oceanside Sanitary Service is operated by a trucking firm that is involved in a variety of other activities. Collection service is provided to approximately 315 residential and 10 commercial customers within the city limits of Oceanside. Collection is conducted once a week for most of the year and up to two times a week during the summer. OSS utilizes a manual rear load collection system for both residential and commercial customers.

Nestucca Valley Sanitary Service (NVSS): Nestucca Valley Sanitary Service collects at the southern end of the County. Their franchised area is the largest in the County at approximately 350 square miles and is comprised primarily of farms and forest. Approximately 30% of their customers are part-time or seasonal residents located on the coast. There are no incorporated cities in their service area and few commercial businesses. Roads are a problem in their area, due to lack of maintenance and other issues. NVSS conducts semi-automated collections and also has a lift-truck to handle roll-off containers. Unlike most hauling companies, NVSS does not lease the garbage carts used for residential collections but instead sells the carts. This is largely due to the issue of part-time and seasonal customers, which would require repeated deliveries and returns of the carts if they were being leased.

The tables on the following page compare the service levels and the current collection fees for the five franchised haulers at the various container sizes

Table 1: Comparison of Collection Systems in Tillamook County (2010 data)

Service Levels	WOW	RSS	CSS	OSS	NVSS
Residential Collection	Semi-Auto	Manual	Semi-Auto	Manual	Semi-Auto
Commercial Collection	Front Load	Rear Load	Rear Load	Rear Load	Rear Load
Drop Box Service	Yes	No	Yes	No	Yes
Collection of Recycling	No	No	Yes	No	No
Customers	1,576	2,009	2,581	306	1,206
Weekly Routes	6	5	16	1	6
Collected Waste Tons	1,846	1,948	6,995	169	2,371

Table 2: Comparison of Collection Fees in Tillamook County

Weekly Curbside	WOW	RSS	CSS	OSS	NVSS
32 gallon can	\$25.14	\$22.25	\$16.80	\$26.70	\$28.50
32 gallon cart	\$23.81	n/a	\$19.80	n/a	\$28.50
64 gallon cart	n/a	n/a	\$34.10	n/a	n/a
96 gallon cart	\$39.71	n/a	\$48.40	n/a	n/a
32 gal EOW	\$15.48	n/a	\$15.10	n/a	\$21.00
32 gal monthly	\$8.33	\$11.25	\$7.55	n/a	\$7.15
Weekly Commercial					
1 yard container	\$129.22	\$85.90	\$98.70	\$113.50	\$112.58
2 yard container	\$196.77	\$162.25	\$167.00	\$202.60	\$216.50
3 yard container	\$262.50	n/a	n/a	n/a	\$303.10

Note: rates shown are as of late 2011.

Transfer and Disposal

Manzanita Transfer Station (MTS): CARTM operates the Manzanita Transfer Station and operates a recycling center and resale shop at that location. CARTM serves the residents and businesses in North Tillamook County, including the cities of Manzanita, Nehalem, and Wheeler.



The primary mission of CARTM is to divert

materials and usable items from the landfill to either the recycling facility or their resale shop.

Yard debris and construction/demolition (C&D) waste is collected separately on-site. All solid waste from CARTM is delivered to the Tillamook Transfer Station in 40-yard drop boxes and diverted materials are delivered to various outlets, primarily in the Portland area. Although the infrastructure at CARTM is owned by the County, its operations are overseen by the non-profit corporation and operated by staff and volunteers. The following table details the reported materials disposed and diverted at CARTM and Trails End over the last three years.

Table 3: CARTM Waste and Recovery Tons

Year	2010		2009		2008	
Disposed SW Tons	298.36		291.74		546.76	
Recyclable Material	Tons	%	Tons	%	Tons	%
ONP / Magazines	110.73	7.9%	144.90	3.2%	129.86	13.7%
Mixed Paper	41.28	3.0%	51.93	1.2%	40.16	4.2%
OCC	102.25	7.3%	115.65	2.6%	133.60	14.1%
Film	4.60	0.3%	5.58	0.1%	5.18	0.5%
Rigid Plastic Container	25.64	1.8%	27.35	0.6%	17.73	1.9%
Other Plastic	20.17	1.4%	16.56	0.4%	10.42	1.1%
Glass	168.54	12.1%	169.77	3.8%	109.97	11.6%
Aluminum	12.63	0.9%	9.50	0.2%	15.49	1.6%
Tin Cans	9.52	0.7%	83.97	1.9%	9.95	1.1%
Scrap Metal	126.43	9.1%	471.90	10.5%	136.30	14.4%
Lead Acid Batteries	73.00	5.2%	110.00	2.4%	117.00	12.4%
Tires	59.00	4.2%	55.00	1.2%	124.00	13.1%
Used Motor Oil	3.67	0.3%	1.35	0.0%	3.33	0.4%
Electronics	18.13	1.3%	14.86	0.3%	3.34	0.4%
Roofing	35.50	2.5%	293.35	6.5%	18.61	2.0%
Wood / Lumber	304.55	21.9%	1,833.47	40.7%		
Yard Debris	198.21	14.2%	550.04	12.2%	44.50	4.7%
Other C&D	75.44	5.4%	550.03	12.2%	27.18	2.9%
Other waste oil	4.44	0.3%	3.61	0.1%		
Total Recyclable Tons	1,393.72		4,508.82		946.62	



Pacific City Transfer Station (PCTS): South Tillamook County has a small transfer station and recycling depot in Pacific City. The facility is open two days a week for local self-haulers and drop-off of recyclable materials. Nestucca Valley Sanitary Service has the franchise with Tillamook County for operating PCTS. All recyclables collected at PCTS are transported via drop box to Tillamook Transfer Station. Self-haul waste is compacted in a roll-off compactor and also delivered to the Tillamook

Transfer Station. An open-top 40-yard roll-off container is also used at the site for over-sized wastes that don't fit into the compactor. The following table details the reported materials handled at the PCTS over the last three years.

Table 4: PCTS Waste and Recovery Tons

Year	2010		2009		2008	
Disposed SW Tons	97.40		95.06		116.40	
Recyclable Material	Tons	%	Tons	%	Tons	%
ONP / Magazines	5.91	9.4%	18.43	18.6%	6.09	6.0%
OCC	20.90	33.3%	21.45	21.6%	16.87	16.6%
Rigid Plastic Container	2.24	3.6%	2.16	2.2%	0.86	0.8%
Glass	7.43	11.8%	21.1	21.3%	31.56	31.0%
Scrap Metal	26.26	41.9%	36.06	36.4%	46.46	45.6%
Total Recyclables	62.74		99.20		101.84	

Tillamook Transfer Station (TTS): All waste collected within the County by the franchised haulers or at the Manzanita and Pacific City Transfer Stations is delivered to the Tillamook Transfer Station. The Tillamook Transfer Station is set up with two segregated tipping floor areas; one for self-haulers and the other for commercial haulers. The area is large enough for a simple floor sort. Large materials such as clean wood, cardboard, and metal are pulled from the loads dumped on the tipping floor. Waste is pushed from the tipping floors to a 48-foot trailer that sits between the two areas in a below grade load-out tunnel.

Recyclable materials and scrap metal are also



consolidated and baled for delivery to Portland area markets. Clean wood waste is ground up and used locally by Hampton Lumber Company as hog fuel. Over the last three years, the amount of waste handled at the Tillamook Transfer Station has diminished in conjunction with the slow economy and efforts to encourage waste prevention and recycling. The Tillamook Transfer Station is owned by the County and operated under contract with Don G. Averill Recycling. All equipment and personnel necessary to process, transfer and transport waste from Tillamook County is provided by Don G. Averill Recycling. Currently, waste is transported via long-haul tractor and trailer to Coffin Butte Landfill near Corvallis. The following table details the reported materials handled at the Tillamook Transfer Station over the last three years. The amounts of recyclable materials reported include the materials transferred to the Tillamook Transfer Station from PCTS, City Sanitary Service, Oceanside Sanitary Service, and R Sanitary.

Table 5: Tillamook Transfer Station Waste and Recovery Tons

Year	2010		2009		2008	
Solid Waste by Source	Tons	%	Tons	%	Tons	%
Franchised Haulers, Compacted	10,138.12	49.1%	9,914.03	47.0%	10,199.80	41.3%
Franchised Haulers, Drop Boxes	3,208.24	15.5%	3,119.0	14.8%	4,496.86	18.2%
Self-Haul	6,916.97	33.5%	7,657.97	36.3%	9,320.06	37.8%
Transferred from MTS, PCTS	395.76	1.9%	386.8	1.8%	663.16	2.7%
Total Incoming Waste	20,659.09		21,077.80		24,679.88	
Recovered from Floor Sort	576.11		165.08		889.22	
Disposed Solid Waste Tons	20,082.98		20,912.72		23,790.66	
Recyclable Material	Tons	%	Tons	%	Tons	%
ONP / Magazines	159.08	3.1%	221.19	4.8%	188.55	3.8%
OCC	655.40	12.8%	743.23	16.0%	591.62	11.9%
Rigid Plastic Containers	29.52	0.6%	39.18	0.8%	59.74	1.2%
Glass	62.8	1.2%	82.82	1.8%	86.39	1.7%
Aluminum	81.63	1.6%	86.69	1.9%	40.1	0.8%
Tin Cans	14.67		16.5	0.4%	16.35	0.3%
Scrap Metal	3,045.63	59.7%	2,308.17	49.7%	2,954.73	59.5%
Lead Acid Batteries	12.57		11.70	0.3%	3.59	0.1%
Tires	53.50	1.0%	39.35	0.8%	90.80	1.8%
Used Motor Oil	12.41		7.58	0.2%	12.10	0.2%
Electronics	66.75	1.3%	61.33	1.3%	2.55	0.1%
Wood / Lumber	907.04	17.8%	1,022.24	22.0%	921.55	18.5%
Total Recyclable Tons	5,101.00		4,639.98		4,968.07	

Conclusion

The collection and disposal system in Tillamook County is operating well but opportunities do exist for improvements. These options will be addressed in detail in the next set of documents that will be produced for the Tillamook County Comprehensive Materials and Solid Waste Management Plan.

ATTACHMENT G
ASSET MANAGEMENT PLAN

Asset Identification and Replacement Plan for Tillamook County Solid Waste Management

Introduction

This part of Tillamook County's Comprehensive Materials and Solid Waste Management Plan (Solid Waste Plan) is intended to identify the County's solid waste assets, estimate future replacements costs for those assets, and assess the fiscal impacts of those costs. The focus is on the three public solid waste facilities in the County; private facilities are not addressed. All of these facilities are owned by Tillamook County and operated by other entities based on franchise agreements with the County, as follows:

- Manzanita Transfer Station – operated by CARTM (a non-profit organization)
- Pacific City Transfer Station – operated by Nestucca Valley Recycling Garbage Service, Inc. (a private, for-profit company)
- Tillamook Transfer Station – operated by Don G. Averill Recycling, Inc. (a private, for-profit company)

It is a reasonable objective of the Solid Waste Plan to determine a reliable and sufficient asset replacement reserve. Therefore a method to accrue and encumber the estimated costs for future replacement of assets necessary for the management of solid waste in Tillamook County is provided below.

Approach

The historical cost of the asset was used to calculate the future replacement cost. Assets were assigned an expected life. Building and associated improvements were assigned a 40-year life. Other assets were assigned a 20-year life¹. The four Recycle Shacks are estimated to need maintenance and repairs every three years. Estimated inflation is assumed at 3% annually. Assets purchased prior to 2012 were inflated to calculate the replacement cost today. The 2012 asset costs establish the baseline to project future replacement costs. Table 1 details the assets and future replacement costs.

Interest earned on the fund balance was estimated at 1.5% on the beginning balances. The fund balance was projected over a 30-year period. Incoming waste tons to the Tillamook Transfer Station are estimated at 21,000 tons a year over the 30-year span. Annual deposits to the reserve fund should remain fixed at \$7.00 per ton of incoming waste over the next 30 years. This would provide all amounts necessary to replace the fixed assets. If the level of incoming waste increases then the tonnage fee can be reduced. Table 2 details the fund balance calculations.

¹ Building and infrastructure life estimates are based on IRS depreciation rules for buildings and improvements.

Flexibility of the Fund Balance

The replacement costs are conservative estimates that assume average replacement lives; however, history may prove that many of the assets will experience longer lives due to regular repair and maintenance. If the service life of an asset can be extended or if the actual cost is less than estimated, then the deposit amount could be reduced in the short – term. The same logic can be applied if service lives are shortened or costs are higher than expected and then the deposit amount can be increased. Another aspect of this account is to utilize the funds to repair assets to extend the service life. The amount accrued in the fund balance allows County managers the flexibility to manage as needed.

Recommendations

It is recommended that the County implement a mechanism to accrue for future replacement or repair of solid waste assets. The replacement balance would be assessed during the annual budget process to ensure an adequate amount is funded. The projected \$7.00 charge per ton would raise the 2013 tip fee from \$71.50 to \$78.50 for franchised collection companies and from \$84.50 to \$91.50 for public and self-haul customers, an increase of 9.7% and 8.2% respectively.

The County should review this information every two years at a minimum. That review should include an assessment of the stability of the asset replacement fund (by comparing the fund balance to anticipated near-term expenditures), as well as a review of the condition of those assets that are nearing their replacement dates. The review could also include an assessment by a licensed structural engineer of those assets that have been identified as needing repairs, with corresponding adjustments in the estimated useful life and replacement schedule as appropriate.

Table 1: Tillamook County Solid Waste Asset List

Asset	Location	Cost	Year	Useful Life	Replace Year	Replacement Cost in 2012	Remaining Life	Replacement Cost (End Life)
Transfer Building - public drop-off	Tillamook TS	\$429,386	1995	40	2035	\$689,039	23	\$1,359,877
Transfer Building - commercial drop-off	Tillamook TS	\$480,000	2002	40	2042	\$626,291	30	\$1,520,173
Scale House	Tillamook TS	\$79,113	2000	20	2020	\$109,511	8	\$138,726
Metal Recycling Building	Tillamook TS	\$180,000	1995	40	2035	\$288,847	23	\$570,065
Pump House	Tillamook TS	\$228,157	1985	40	2025	\$492,042	13	\$722,580
PIO Scale House	Tillamook TS	\$4,038	2008	20	2028	\$4,412	16	\$7,080
Recycle Shed	Tillamook TS	\$26,784	2000	20	2020	\$37,075	8	\$46,965
Inbound Scale	Tillamook TS	\$36,575	2008	20	2028	\$39,966	16	\$64,134
Outbound Scale	Tillamook TS	\$36,575	2008	20	2028	\$39,966	16	\$64,134
Bailing Building	Tillamook TS	\$343,000	2008	40	2048	\$374,805	36	\$1,056,290
Land Improvement	Tillamook TS	\$18,200	1995	40	2035	\$29,206	23	\$57,640
Water Tank & Wash down Pump System	Tillamook TS	\$32,260	2011	20	2031	\$32,260	19	\$56,568
Landfill 37 KW Generator	Tillamook TS	\$6,615	2011	20	2031	\$6,615	19	\$11,599
HHW Facility	Tillamook TS	\$293,112	2012	40	2052	\$284,575	40	\$928,294
Retail Building	Manzanita TS	\$375,000	1998	40	2038	\$550,700	26	\$1,187,635
Metal Pole Building	Manzanita TS	\$138,200	2008	40	2048	\$151,015	36	\$437,683
Office Trailer	Manzanita TS	\$15,675	1990	20	2010	\$29,160	0	\$29,160
Canopy & Guardrail for self-haulers	Manzanita TS	\$67,114	2009	20	2029	\$71,201	17	\$117,685
Land Improvements and Gate	Manzanita TS	\$5,000	2009	20	2029	\$5,305	17	\$8,768
Land Improvements and Gate	Pacific City TS	\$5,000	2009	20	2029	\$5,305	17	\$8,768
Guardrail	Pacific City TS	\$25,000	2012	20	2032	\$25,000	20	\$45,153
Recycle Shacks	Various	\$10,000	2013	NA	Every 3 years	\$10,000	NA	NA
Transfer Station Asphalt Overlay	Tillamook TS	\$73,150	2011	7	2018	\$73,150	6	\$87,345

Table 2: Asset Replacement Fund Balance Account

Fiscal Year	Beginning Fund Balance	Deposits	Interest Earned	Expenditures	Ending Fund Balance
2012	\$608,727	\$0	\$9,131	\$(25,000)	\$592,858
2013	\$592,858	\$147,000	\$11,098	\$-	\$750,956
2014	\$750,956	\$147,000	\$13,469	\$-	\$911,425
2015	\$911,425	\$147,000	\$15,876	\$-	\$1,074,301
2016	\$1,074,301	\$147,000	\$18,320	\$(10,609)	\$1,229,012
2017	\$1,229,012	\$147,000	\$20,640	\$-	\$1,396,652
2018	\$1,396,652	\$147,000	\$23,155	\$(87,345)	\$1,479,462
2019	\$1,479,462	\$147,000	\$24,397	\$(11,593)	\$1,639,266
2020	\$1,639,226	\$147,000	\$26,794	\$(185,691)	\$1,627,369
2021	\$1,627,369	\$147,000	\$26,616	\$-	\$1,800,985
2022	\$1,800,985	\$147,000	\$29,220	\$(12,668)	\$1,964,537
2023	\$1,964,537	\$147,000	\$31,673	\$-	\$2,143,210
2024	\$2,143,210	\$147,000	\$34,353	\$-	\$2,324,563
2025	\$2,324,563	\$147,000	\$37,073	\$(736,422)	\$1,772,214
2026	\$1,772,214	\$147,000	\$28,788	\$-	\$1,948,003
2027	\$1,948,003	\$147,000	\$31,425	\$-	\$2,126,428
2028	\$2,126,428	\$147,000	\$34,101	\$(150,475)	\$2,157,054
2029	\$2,157,054	\$147,000	\$34,561	\$(135,220)	\$2,203,395
2030	\$2,203,395	\$147,000	\$35,256	\$-	\$2,385,651
2031	\$2,385,651	\$147,000	\$37,990	\$(84,696)	\$2,485,945
2032	\$2,485,945	\$147,000	\$39,494	\$(45,153)	\$2,627,286
2033	\$2,627,286	\$147,000	\$41,614	\$-	\$2,815,900
2034	\$2,815,900	\$147,000	\$44,444	\$(18,061)	\$2,989,283
2035	\$2,989,283	\$147,000	\$47,044	\$(1,987,582)	\$1,195,745
2036	\$1,195,745	\$147,000	\$20,141	\$-	\$1,362,886
2037	\$1,362,886	\$147,000	\$22,648	\$(19,736)	\$1,512,799
2038	\$1,512,799	\$147,000	\$24,897	\$(1,187,635)	\$497,060
2039	\$497,060	\$147,000	\$9,661	\$-	\$653,721
2040	\$653,721	\$147,000	\$12,011	\$(21,566)	\$791,166
2041	\$791,166	\$147,000	\$14,072	\$-	\$952,239
2042	\$952,239	\$147,000	\$16,489	\$(1,520,173)	\$(404,446)

ATTACHMENT H
SYSTEM COSTS AND FINANCING

System Costs and Financing

The three funds that support the operations and obligations of the Tillamook County Solid Waste Service District are detailed in the following table:

Table 1. Tillamook County Solid Waste Service District Funds

Fund Number	Fund Purpose	Funding Source(s)	Fund Balance (6/30/2011)
410	Daily Operations	Tip Fees, Property Assessment, and Grants	\$ 540,400
420	Sinking (Asset Replacement)	Transfer from Fund 410	\$ 959,800
430	Landfill Closure	Transfer from Fund 410	\$ 0

Fund 410 Solid Waste

All revenue generated by the District and grants are reported in Fund 410. Daily operations of the District, the Tillamook Transfer Station, the monitoring of the closed landfill, and the household hazardous waste program are recognized in this fund. Interfund revenue transfers to the asset replacement fund (Fund 420) and the landfill closure fund (Fund 430) originate from this fund as well. The following table summarizes the activity of Fund 410 over the last three years.

Table 2. Fund 410 Financial Summary

Description	FY 08-09 Actual	FY 09-10 Actual	FY 10-11 Actual
Beginning 410 Balance	813,006	760,245	631,827
Revenue	1,738,482	1,648,852	1,791,205
Less 41001 Administration	(128,426)	(199,915)	(228,063)
Less 41002 Transfer Station	(1,269,976)	(1,240,592)	(1,286,267)
Less 41003 Landfill	(51,769)	(100,125)	(101,632)
Less 41004 RHC	(121,072)	(36,638)	(66,652)
Less Transfer to Fund 420	(220,000)	(200,000)	(200,000)
Less Transfer to Fund 430	0	0	0
Net of Revenue and Expense	(52,761)	(128,418)	(91,409)
Ending 410 Balance¹	760,245	631,827	540,418

¹ Ending balance is the beginning balance plus the Net of Revenue and Expense.

The District’s principal funding source is the disposal fee or “tipping fee” charged at the Tillamook Transfer Station for the disposal of solid waste. The tipping fee accounts for approximately 80% of the incoming revenue. Fees vary by customer: County franchised haulers pay \$68.25 per ton and self-haulers pay \$74.75 per ton. The rate is set to increase on July 1, 2012 to \$71.50 for franchised haulers and \$84.50 for self-haulers. In addition to the tipping fee, there is a small assessment on property owners within the County. The assessment generates approximately \$220,000 a year or 12% of the total revenue. Grants add to total revenue and are awarded on a project basis, varying from year to year.

The District’s largest expense is for the operation and disposal cost of the Tillamook Transfer Station. Over the last four years, approximately \$0.70 of each incoming revenue dollar² was paid to Don G. Averill Recycling (Averill) for the operation of the Tillamook Transfer Station. The contract between the County and Averill covers the operation and maintenance of the Transfer Station, operation and maintenance of the closed landfill, transport of waste and recycling, and waste disposal at Coffin Butte Landfill in Corvallis, Oregon.

Fund 420 Sinking

Saving for long-term capital projects is the objective of Solid Waste Sinking Fund. The District’s approach is to allocate a portion of the annual revenues from the operational fund (Fund 410) to ensure adequate capital for future infrastructure, safety updates, fixed asset replacement, as well as unscheduled expenses. Over the last three years, the District has allocated \$0.12 of every incoming revenue dollar to Fund 420. The following table summarizes Fund 420 activities over the last three years.

Table 3. Fund 420 Financial Summary

Description	FY 08-09 Actual	FY 09-10 Actual	FY 10-11 Actual
Beginning Balance	1,239,966	841,666	974,989
Revenue (Transfers & Interest Income)	244,820	207,831	204,543
Less Expenses	(643,120)	(74,508)	(219,776)
Net of Revenue and Expense	(398,300)	133,323	(15,234)
Ending 420 Fund Balance	841,666	974,989	959,755

Projects that were paid for from this fund include infrastructure updates to the Tillamook and Manzanita transfer stations and the new household hazardous waste facility.

Fund 430 Closure

Fund 430 was established to meet the financial assurance obligations of the Tillamook Closed Landfill as required by Department of Environmental Quality permit #148. This fund was established in the 2011-2012 fiscal year. Infrastructure and monitoring costs of the closed landfill are funded from Fund 410.

² This is all revenue sources: tipping fees, tax assessments, grant revenues, and miscellaneous revenues.

BEFORE THE BOARD OF COUNTY COMMISSIONERS
FOR THE COUNTY OF TILLAMOOK IN THE STATE OF OREGON
SITTING AS THE BOARD OF THE SOLID WASTE SERVICE DISTRICT

In the Matter of the Adoption of the)	O R D E R
Comprehensive Materials and Solid Waste)	#12 - <u>071</u>
Management Plan for Tillamook County)	SWSD Order #12- <u>009</u>

This matter came before the Tillamook County Board of Commissioners on December 12, 2012, at the request of David McCall, Solid Waste Program Manager.

The Board of Commissioners, being fully apprised of the representations of the above named person, finds as follows:

1. The Solid Waste Management Plan for Tillamook County was last revised in 1996.
2. A proposed Comprehensive Materials and Solid Waste Management Plan has been developed, reviewed by and approved by the Solid Waste Advisory Committee to replace the existing Solid Waste Management Plan.
3. The Comprehensive Materials and Solid Waste Management Plan was presented to the incorporated cities and various community organizations in the county, and opportunity for public comment was given.


NOW THEREFORE, IT IS HEREBY ORDERED THAT:

4. The Board of County Commissioners hereby adopts the attached Comprehensive Materials and Solid Waste Management Plan, replacing the previous plan.

DATED THIS 12th DAY OF December, 2012.

BOARD OF COUNTY COMMISSIONERS
FOR TILLAMOOK COUNTY, OREGON
SITTING AS THE BOARD OF THE SOLID
WASTE SERVICE DISTRICT

Aye Nay Abstain/Absent



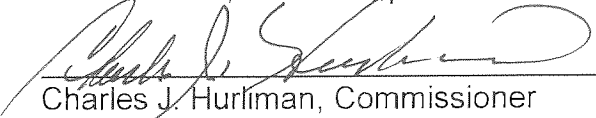
Tim Josi, Chairperson

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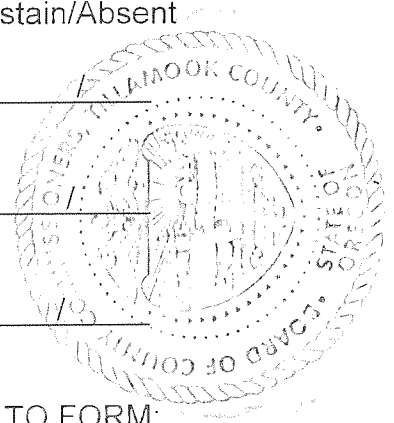
Mark Labhart, Vice Chairperson

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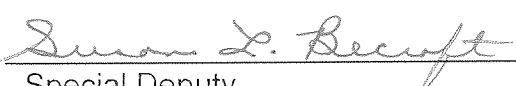
Charles J. Hurliman, Commissioner

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ATTEST: Tassi O'Neil, County Clerk

APPROVED AS TO FORM:

BY: 

Special Deputy



William K. Sargent, County Counsel