



Recycling Potential
Assessment Model and
Environmental Benefits
Analysis

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Evan Blackwell

The Disposable Heroes series, 2005

Various plastics

22 x 10 x 17 inches

Economic Analysis of New Waste Prevention and Recycling Programs

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This paper briefly describes two economic models used to produce the recommended new waste prevention and recycling programs in Seattle’s 2011 Solid Waste Plan. The first is the Recycling Potential Assessment (RPA) Model which is a model that forecasts tonnages and financial costs and benefits. The second is Measuring the Environmental Benefits Calculator (MEBCalc™) model used to calculate the environmental benefits from the same set of programs.

Recycling Potential Assessment (RPA) Model Summary

Seattle Public Utilities uses the Recycling Potential Assessment (RPA) Model to

- forecast waste generation
- calculate estimates of tonnages that can be diverted from landfill due to recycling, waste reduction and composting
- provide financial cost and benefit estimates for each of the scenarios analyzed in the model

The purpose of this section is to give a summary of the design of the RPA and how it works.

Model Definitions

The RPA model actually consists of two separate RPA models: one for the municipal solid waste (MSW) stream and one for the construction and demolition debris (C&D) waste stream. The MSW and C&D RPA models are structured very similarly, so this overview is written generally to apply to both models. There is a slight difference between the two models, since in C&D we have beneficial uses as well as recycling. The differences will be pointed out as the models are described.

The waste streams are defined, not so much by the materials that are included in them but in the method and location of disposal. Waste collected from within Seattle, and taken to transfer stations and transferred into containers for transportation to the MSW landfill in Arlington, Oregon, is considered MSW waste (or “garbage”). The waste collected separately under the C&D collection contract--destined for disposal in a C&D landfill--is considered C&D waste.

On the other hand, recycling tonnages are credited to either the C&D sector or the MSW sector depending on the recycled material. For example, any recycled wood waste is counted towards the C&D recycling rate. Plastic film is counted towards the MSW recycling rate, even though plastic film occurs in both the C&D and MSW waste streams. The material accounting is handled in this fashion because, in a lot of cases, the recycling reports SPU uses to track recycled materials are not specific enough for us to tell where the material *would have been* disposed (in a C&D vs MSW landfill) had it not been recycled.

Four Modules

Four main modules comprise the RPA model: Waste Generation, Recycling Tonnages, Cost Module and Reporting Module.

Waste Generation Module

The first step in the RPA model is to forecast the amount of waste generation in Seattle, broken down into three sectors for the MSW model (Residential Single Family and Multi-Family, Commercial and Self Haul). The C&D model just has one overall sector. The forecast estimate equations use econometric techniques and include a variety of economic, demographic, price and weather variables.

Each forecasted waste stream is then further broken down into 20 material types, based on the waste stream composition data Seattle regularly collects. The model forecasts waste generation, by sector by material, out 30 years.

Recycling Tonnages Module

The next step is the recycling module, which contains data about existing programs and assumptions about new programs.

Existing recycling and composting programs are modeled based on how much they are currently diverting (the existing recovery rate). Detailed recycling data is collected on a regular basis for programs such as the Seattle’s curbside recycling program (which is implemented under a contract with Seattle). Daily “truck level” data is available for total tons collected for each program, and periodic recycling composition data is used to separate the tons collected into the material detail. For other programs, such as most of the commercial recycling (which is collected privately), tons recycled come from an annual report all recyclers in Seattle are required to submit as part of their business license renewal. These reports have annual tons collected by material.

New recycling programs are modeled using judgment as to the ultimate recovery rate a program is projected to achieve, and the “ramp” (or path) the program follows from the time it starts until it reaches a steady recovery rate. The model is set up to run “scenarios,” which are groups of programs that are assembled according to some overall themes or scenario descriptions. A base

scenario typically models existing recycling programs (without any new programs). Other scenarios then layer on top of the base existing programs.

For each new program, parameters are developed that include what sector and material the program will address, the year the program starts and the new program's ramp. When a new program is included in a scenario that targets the same material that an existing program does, the new program has available to it what remains after the existing program is attributed its tonnages. For example, we have a curbside organics program that diverts food waste, and if we then want to model a program that makes the food waste mandatory, the tons attributed to the new mandatory program are the additional tons diverted after the existing program tons are calculated.

Financial Costs and Benefits Module

The next step in the model is to calculate program costs and financial benefits. The calculations use the factors in the waste generation and recycling tonnages modules just described.

For **program costs**, each program can be modeled using a variety of types of costs. The intention is to model program costs at a detailed enough level so that as program recovery rates are varied, costs will vary in a meaningful way. Programs can have fixed and/or variable cost components. The variable components can vary by household, employee, or tons. Programs can also have capital costs, and the life of the capital can be set to reflect what makes sense for that program's capital types. Examples of typical program costs are: costs of collection, bin or cart cost, education, and processing costs.

The **financial benefits** of recycling include costs we do not have to incur—which is the cost to have recyclable material handled as garbage and disposed in a landfill. When we recycle, tons of material are diverted from garbage and no longer need collecting, transferring, hauling to the rail head, and landfilling. There are savings at each step of the way and these savings are the direct financial benefits to recycling. These are often described as “avoided costs”.

In order to calculate these benefits, the model needs to have, as inputs, the variable part of the cost to collect, transfer, transport and dispose of the MSW or C&D. Not all of the costs of collecting a ton of garbage are saved when the ton is diverted to recycling. Only the part of the costs that vary with tons is saved. For example, the variable part of the residential collection cost is calculated based on SPU's collector contracts. Contractors are reimbursed for collection based on a formula that has fixed and variable components. When tonnages vary, we can estimate the effect on the contractor payment using the formula in the collection contract. (The formulas in the contract were developed to try to reflect the reality of how collection costs are accrued. There are large fixed costs associated with collection, including the trucks and the costs to weekly drive by each household, for example. The variable portion of the costs is small for collection since the truck must pass by the household each week, regardless of the amount of waste that is put out for disposal.)

Similarly, we have transfer station and haul cost models which we use to determine the variable portion of these two functions. Finally, disposal costs are considered to be 100% variable with tons. This is because for MSW we have a long-term contract where we pay a per-ton fee for rail haul and disposal, and the fee does not depend on how many tons are delivered.

The cost model uses the above information in the calculation of the financial benefits of recycling. (A second group of benefits, the environmental benefits of recycling, are handled outside of the RPA model and will be described in the next section.) The result of the cost model is the additional costs of adding the recycling program (which include education, collection, any capital costs, processing, etc), and the benefits (or avoided costs) of not having to collect the material for disposal in a landfill.

Reporting Module

The final module in the RPA model is simply used to develop reports so detailed results of each model run can be presented as needed. Results reported include displaying the tons recycled by year by material and by program. Reports also show the recovery rate for each material by sector, and an overall recycling rate. The C&D model shows a second rate, that we call the “beneficial use” rate. This rate includes tons that are diverted from disposal to be used for energy production or landfill cover. The report tables following this write-up are examples of the reports generated by the reporting module.

Environmental Benefits to Recycling

Beginning with the 2004 Plan Amendment “On the Path to Sustainability” SPU has been estimating a series of external benefits to recycling. This section describes the steps used to model these external benefits. We start by introducing some background on the methodology, followed by more detail on how environmental benefits are quantified. The results of applying the methodology are shown in the 2 charts placed at the end.

Introduction

Handling and disposal of waste causes external environmental costs and benefits. Externalities are impacts on the environment that are not “counted” in the price (cost) of the activity.

For example, using recycled instead of virgin feedstock to manufacture paper, aluminum cans or tin cans creates measureable environmental benefits. Many of these benefits are from reduced energy use in the production process and associated avoided emissions. There are also measureable benefits of diverting organics from landfills. Landfilled organics produce methane, a powerful greenhouse gas. We have been working over the past couple of years to be able to both quantify and monetize these benefits.

There has been extensive research in the area of quantifying these external benefits over the past 25 years. An important early research initiative was a seminal study done by the Tellus Institute (Tellus Institute, The Council of State Governments, US EPA, and New Jersey Department of Environmental Protection and Energy, *CSG/Tellus Packaging Study: Assessing the impacts of production and disposal of packaging and public policy measures to alter its mix*, May 1992). This study examined both the upstream effects of using recycled material versus virgin material in the production of new products. It also looked at the downstream effects of additional trucks on the streets, and reduced materials at landfills.

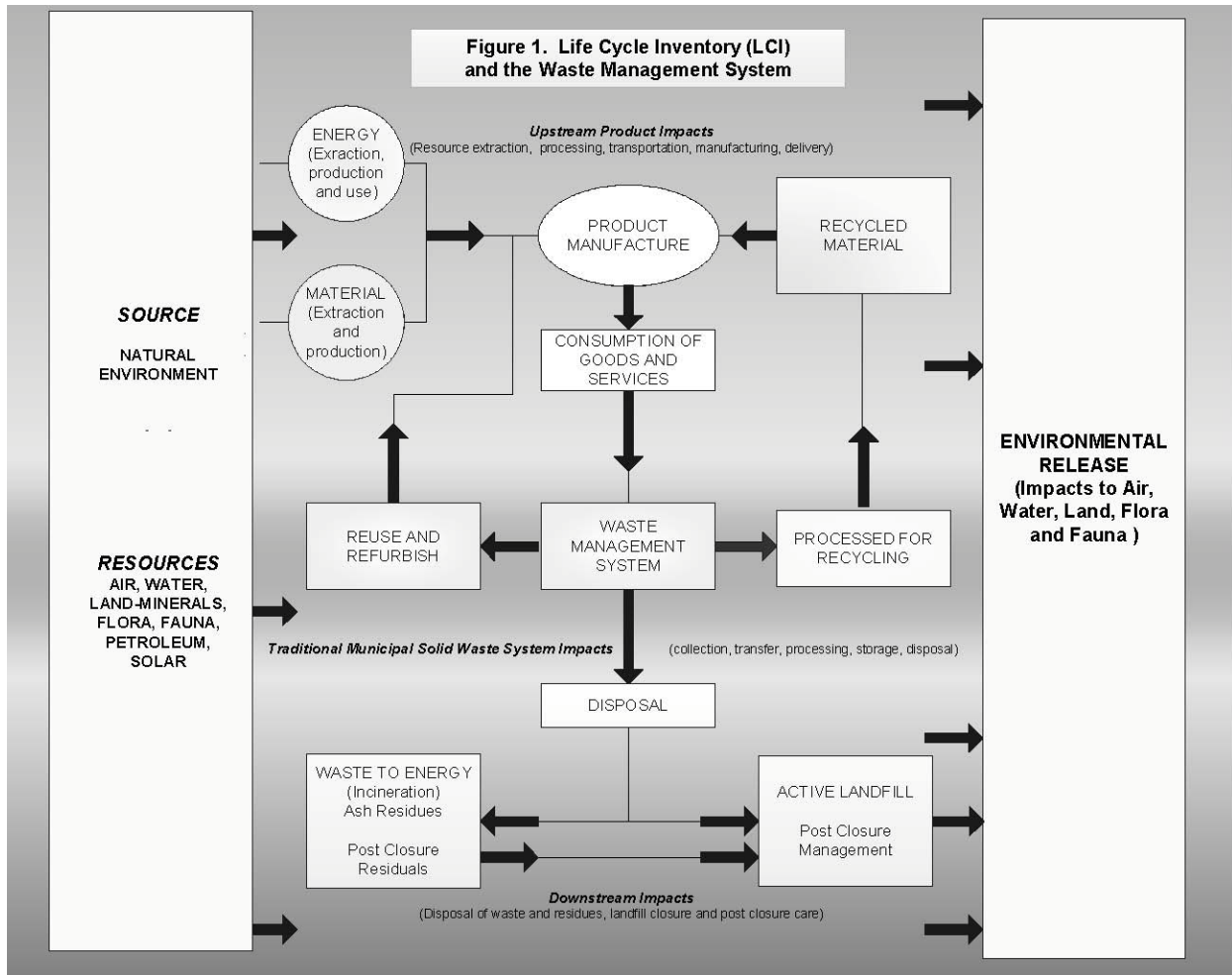
The US EPA has extensive information on their website on this topic (e.g., see <http://www.epa.gov/osw/consERVE/rrr/recycle.htm>). EPA also funded the development of a solid waste planning tool, the MSW Decision Support Tool (DST), which optimizes on cost, recycling percentage or levels of pollution (see <http://www.epa.gov/osw/nonhaz/municipal/pubs/ghg/f02024.pdf>).

SPU has used the DST tool, and upstream effects information provided in the database that supports the tool, to examine the externalized costs of some of its recycling programs.

SPU now uses the MEBCalc™ tool to estimate and quantify the environmental value of recycling programs. This tool takes into account the environmental costs of collection, processing and hauling activities needed for recycling. These environmental costs are deducted

from the environmental benefits of producing products using recycled rather than virgin feedstocks.

The following graphic illustrates material flow and the types of externalities associated with the life cycle of materials.



How External Benefits Are Quantified and Monetized

Going from the tons of a variety of recycled materials to a dollar value of the environmental benefit involves a series of steps. First, recycled/composted tons, by material, are taken from the outputs of the RPA Model. Then a variety of tools and databases (described below) provide information on quantities of pollutants that are not produced when material is recycled or composted instead of being thrown away.

For example, manufacturing a new aluminum can using a recycled can uses less energy--which results in the release of fewer pollutants due to the lower energy requirement. Less pollution

means lower public health and other environmental impacts from producing the aluminum can. Based on the costs that pollution causes for public health and the environment, we then can calculate the cost savings from making the aluminum can out of a recycled can rather than newly mined bauxite and other virgin raw materials.

Large numbers of pollutants are reduced for each of the life cycle environmental impacts (described below) for all of the recycled and composted materials. This is handled by using one pollutant as an index for each of these impacts. The most familiar example is CO₂ used as the index for global warming. If methane is one of the pollutants reduced due to recycling or composting, this is expressed in units of CO₂. All the other pollutants that contribute to global warming are also expressed in units of CO₂, and this allows them to be added together. Hence the term CO₂ equivalents. The next step is then to place a value on (i.e., monetize) the reduction in CO₂. This step of monetization allows all the life cycle impacts to be summarized in dollars, and added onto the financial costs and benefits of recycling calculated in the RPA model.

The current status of the art of quantifying external environmental benefits provides monetary values on at least 7 different types of environmental impacts. This allows us to represent some of the upstream savings when material is recycled instead of disposed. The next section describes the 7 damages (impacts) we have valued, followed by a discussion of other impact categories and benefits not quantified.

Life Cycle Impact Categories: Short Description & Estimates of Impact Cost

The following descriptions of the 7 impact categories, or indices, are based on Jane Bare, TRACI 2.0: the tool for the reduction and assessment of chemical and other environmental impacts 2.0, *Clean Technologies and Environmental Policy*, 2011 13(5) 687-696. This article provides additional detail on environmental impact categories. The 7 impact categories include

- 1. Global warming potential***
- 2. Acidification potential***
- 3. Eutrophication potential***
- 4. Respiratory Human Health Impact Potential***
- 5. Non-Cancer Human Health Impact Potential***
- 6. Cancer Human Health Impact Potential***
- 7. Ecological toxicity potential***

1. Global Warming Potential

This index characterizes greenhouse effect increase due to emissions generated by humankind. Life Cycle Analyses (LCAs) often use a 100-year time horizon to frame the global warming potential of greenhouse gases. For example, carbon dioxide (CO₂) from burning fossil fuels to generate energy is the most common source of greenhouse gases. Methane from anaerobic

decomposition of organic material is another large source of greenhouse gases. The index often used for global warming potential from greenhouse gas releases is quantities of CO₂ equivalents.

Estimates of the dollar cost of a ton of greenhouse gases, measured as CO₂ equivalents, range quite widely. At the low end, an estimate could be based on prices for emissions permits traded under voluntary greenhouse gas emission limitation agreements, which hover around \$1 per ton CO₂. A high-end estimate could be based on the \$85 per metric ton cost developed in Nicholas Stern, *The Economics of Climate Change: The Stern Review*. Cambridge and New York: Cambridge University Press, 2007. There are even higher estimates for the cost of carbon emissions. However, for this evaluation we used \$40 per ton of CO₂ emissions.

2. Acidification Potential

This index characterizes the release of acidifying compounds from human sources, principally fossil fuel and biomass combustion, which affect trees, soil, buildings, animals and humans. The main pollutants involved in acidification are sulfur, nitrogen and hydrogen compounds – e.g., sulfur oxides, sulfuric acid, nitrogen oxides, hydrochloric acid, and ammonia.

There are economic benefits of recycling due to reductions in the releases of acidifying compounds. These reductions are due to decreased reliance on virgin materials in manufacturing products. The index often used for acidification potential is sulfur dioxide (SO₂) equivalents.

One impact cost estimate (of releases of acidifying compounds) is provided by the spot market price for SO₂ emissions permit trading under the Clean Air Act's cap and trade program. EPA's spot market auctions for emissions permits for the years 2005 through 2010 averaged \$410 per ton SO₂. We used this valuation for reductions in releases of acidifying compounds.

3. Eutrophication Potential

This index characterizes the addition of mineral nutrients to soil or water. In both media, adding large quantities of mineral nutrients (such as nitrogen and phosphorous) results in generally undesirable shifts in the number of species in ecosystems, that is, a reduction in ecological diversity. In water, it tends to increase algae growth, which can lead to low oxygen, causing death of species such as fish.

There are economic benefits of recycling associated with the resulting reductions in releases of nitrifying compounds. This decreased release is due to decreased reliance on virgin materials in manufacturing products. For eutrophication potential, the index often used is quantities of nitrogen (N) equivalents.

Our estimate of the impact cost of releases of nitrifying compounds is based on EPA's cost-effectiveness analysis for the NPDES regulation on effluent discharges from concentrated animal feeding operations. That analysis estimated that costs up to \$4 per ton of nitrogen removed from wastewater effluents were economically advantageous. (*Economic Analysis of the Final Revisions to the National Pollutant Discharge Elimination System Regulation and the Effluent*

Guidelines for Concentrated Animal Feeding Operations, EPA-812-R-03-002, December 2002, p. E-9.)

4. Respiratory Human Health Impact Potential

Criteria air pollutants are solid and liquid particles commonly found in the air. These include coarse particles known to aggravate respiratory conditions such as asthma, and fine particles that can lead to more serious respiratory symptoms and disease. The particular criteria air pollutants that cause these human health effects are nitrogen oxides, sulfur oxides, and particulates.

We denominated this impact category in PM_{2.5} equivalents (particulate matter no larger than 2.5 microns). A mid-range estimate of the human health costs of PM_{2.5} emissions is \$10,000 per ton, as discussed in Eastern Research Group, *Draft Report: Cost Benefit Analysis for Six "Pure" Methods for Managing Leftover Latex Paint - Data, Assumptions and Methods*, prepared for the Paint Product Stewardship Initiative, 2006.

5. Non-Cancer Human Health Impact Potential:

Under the Life Cycle Initiative of the United Nations Environment Program (UNEP)/Society of Environmental Toxicology and Chemistry (SETAC), various international multimedia model developers created a global consensus model—USEtox—to address an expanded list of substances which might have impacts on human health cancers and non-cancers, as well as on ecotoxicity. The USEtox model adopted many of the best features of these developers' models, and yielded human health cancer and non-cancer toxicity potentials, and freshwater ecotoxicity potentials, for over 3,000 substances including organic and inorganic substances. EPA uses these potentials in its TRACI 2.0 software (*Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts*).

The economic benefits of recycling include reductions in releases of compounds toxic to humans. These toxic reductions are due to decreased reliance on virgin materials in manufacturing products. Tons of toluene is used as the human toxicity potential index.

As discussed in Jeffrey Morris and Jennifer Bagby, *Measuring Environmental Value for Natural Lawn and Garden Care Practices*. *International Journal of Life Cycle Assessment*, 2008, 13(3) 226-234, a mid-range estimate of \$118 per ton of toluene equivalents is a reasonable estimate to monetize non-cancer human health impacts caused by substances such as mercury, toluene and acrolein.

6. Cancer Human Health Impact Potential:

A mid-range estimate of \$3,030 per ton of benzene equivalent releases to air is used to monetize cancer human health impacts caused by emissions of substances such as formaldehyde, benzene and mercury.

7. Ecological Toxicity Potential:

EPA, in its TRACI 2.0 software, also provides toxicity equivalency potentials that measure the relative potential for harm to terrestrial and aquatic ecosystems from chemicals released into the environment. The estimated cost to ecosystems of chemical releases is \$3,280 per ton of 2,4-D herbicide equivalents released to waterways, as discussed in Morris and Bagby (2008). This may be a very conservative cost estimate based on the citation by Eastern Research Group (2006) of remediation costs for 2,4-D removal of \$368,000 per ton.

Impact Categories Not Yet Quantified, Material Types Not Yet Evaluated, And Externalized Costs Underestimated

Currently, economic benefits estimates for SPU recycling programs do not include any benefit estimates for several materials such as gypsum wallboard, household batteries, carpet and paint. LCA research is currently underway so that these materials can be included in future calculations of recycling's environmental benefits.

Environmental impact and resource depletion impacts include the following categories that are not presently included in our quantification of benefits. This is due to the absence of emissions data for the specific pollutants tracked under some of these categories, the lack of quantitative measures to relate emissions to impacts, and/or the absence of well-researched monetization estimates:

1. Fossil Fuel Depletion Potential
2. Habitat Alteration Potential
3. Smog Formation Potential
4. Ozone depletion Potential
5. Indoor Air Quality
6. Water Intake

Estimates of damage costs may underestimate the actual costs, to future generations, of current releases of pollutants and depletion of resources. This seems a particularly acute problem for ecosystem impacts, given our currently limited understanding of long run impacts from

- accelerated species extinctions and decreases in biodiversity, and
- associated decreases in various aspects of ecosystems' ability to, among other things, cycle nutrients, clean our air and clean our water.

Future costs from cumulative impacts of global warming are also difficult to predict.

Finally, estimates of human health costs from toxic and carcinogenic releases do not presently appear to account adequately for impacts (cumulative and interactive) of many of the chemical releases to the environment. There may be as many as 75,000 to 100,000 chemical compounds used in industrial processes and commerce.

To put this into perspective, our seven impact categories quantify releases to air and water for less than a thousand substances. The MSW Decision Support Tool (DST) developed under sponsorship of EPA provides full life cycle quantification for releases of just ten air pollutants and seventeen water pollutants. The DST database provides upstream quantification of releases for recycled-versus virgin-content manufacturing (including the extraction and refining stages) for a number of other substances. But even there, the number of tracked substances totals well under 100.

Other Benefits Not Quantified: Existence Value of Recycling

Waste disposal reduction (which lowers the need for landfills), and the conservation of limited resources, are two public goods provided by recycling programs. Within the context of present market mechanisms, the economic value of these public goods is unlikely to be reflected in market prices--and therefore likely to escape benefit-cost assessments of recycling. Consumers who choose to participate in recycling programs may not see the public good benefits from their own recycling (since their contribution is relatively small compared to the total); however, they do obtain benefits from everybody else's recycling efforts. This is a type of non-use (sometimes called existence) value of recycling programs. Likewise, consumers who choose not to participate in recycling programs also enjoy the benefits of these public goods.

Analysis Results for Seattle's Solid Waste Plan Waste Reduction and Recycling Recommendations

The following two charts illustrate the magnitude of the additional benefits from recycling MSW and C&D materials, for both past years and planned future recycling through 2030. These benefits are calculated by first starting with the tons recycled/composted from the RPA model for the recommended scenarios. Then using the techniques described above and embodied in MEBCalc™, the benefits are quantified across the life cycle impact categories using an indexed pollutant for each category. Then a monetary value is placed on each of the indexed pollutants to allow these different life cycle impact categories to be expressed in dollar terms so they can be added together.

For MSW, Chart 1 shows estimated environmental benefits for actual recycling from 1997 through 2010. For C&D, Chart 2 shows estimated environmental benefits for actual C&D material recycling for 2007 through 2010. Reductions in climate change and human health impacts account for most of the environmental value of MSW recycling. This is a result of diverting materials from disposal to recycling. Most of the environmental value for C&D recycling comes from reductions in human health and ecosystem toxicity impacts, as a result of diverting C&D materials from disposal. For the years 2007 through 2010, and a few years following 2010, reductions in climate change impacts also provide a substantial portion of the environmental benefits for C&D recycling.

Chart 1 Environmental Value (\$millions) of Recycled MSW Tons. 1997-2030

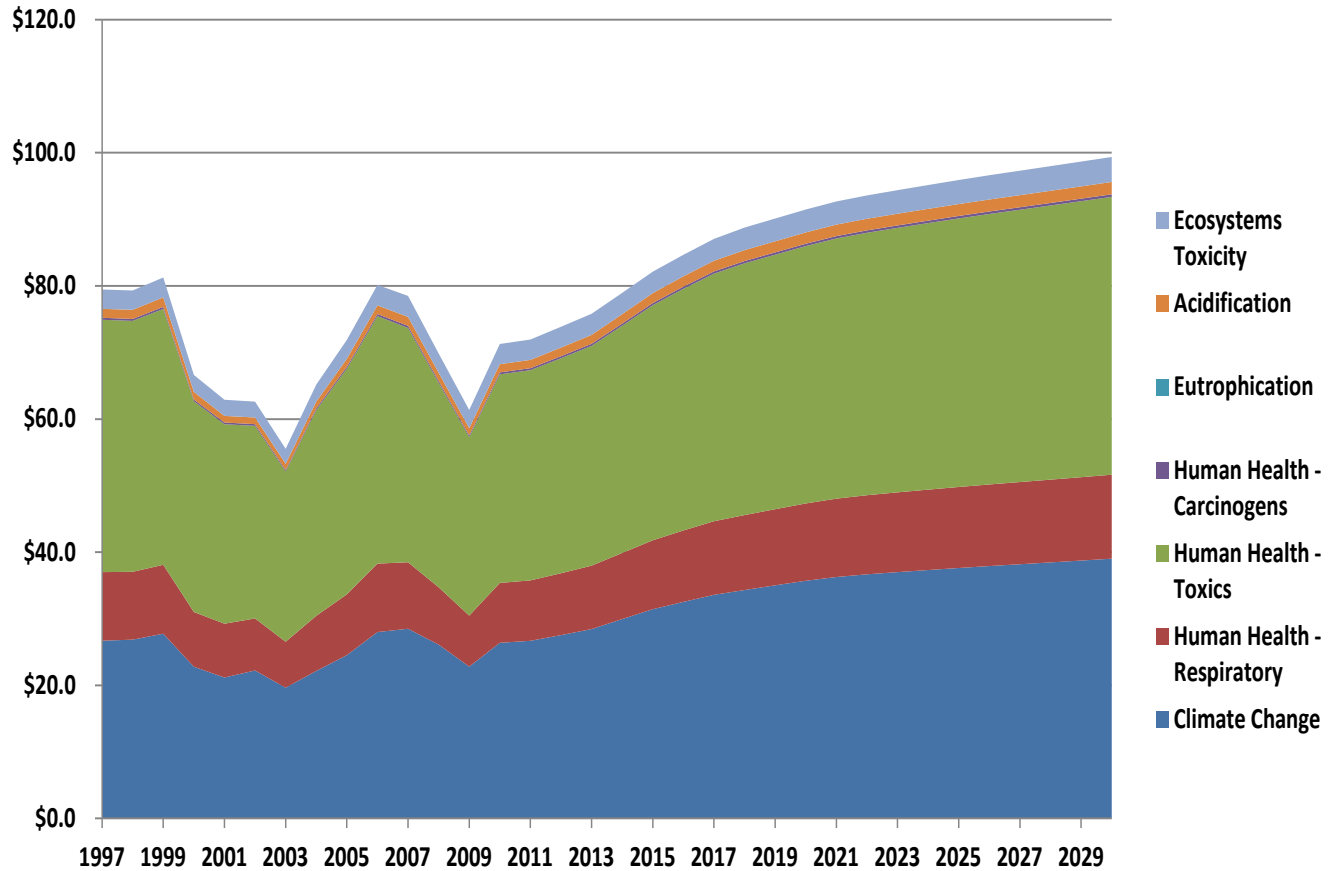


Table 1 Environmental Value (\$millions) of Recycled MSW Tons*

Year	Climate Change	Human Health - Respiratory	Human Health - Toxics	Human Health - Carcinogens	Eutrophication	Acidification	Ecosystems Toxicity	Total Environmental Value
2010	26.4	9.0	31.3	0.3	0.0	1.2	3.0	71.5
2020	35.7	11.6	38.7	0.4	0.0	1.7	3.4	92.9
2030	39.0	12.6	41.7	0.4	0.0	1.9	3.8	101.0

*Monetized Value of Specific Environmental Impacts Reductions

Chart 2 Environmental Value (\$millions) of Recycled C&D Tons, 2007-2030

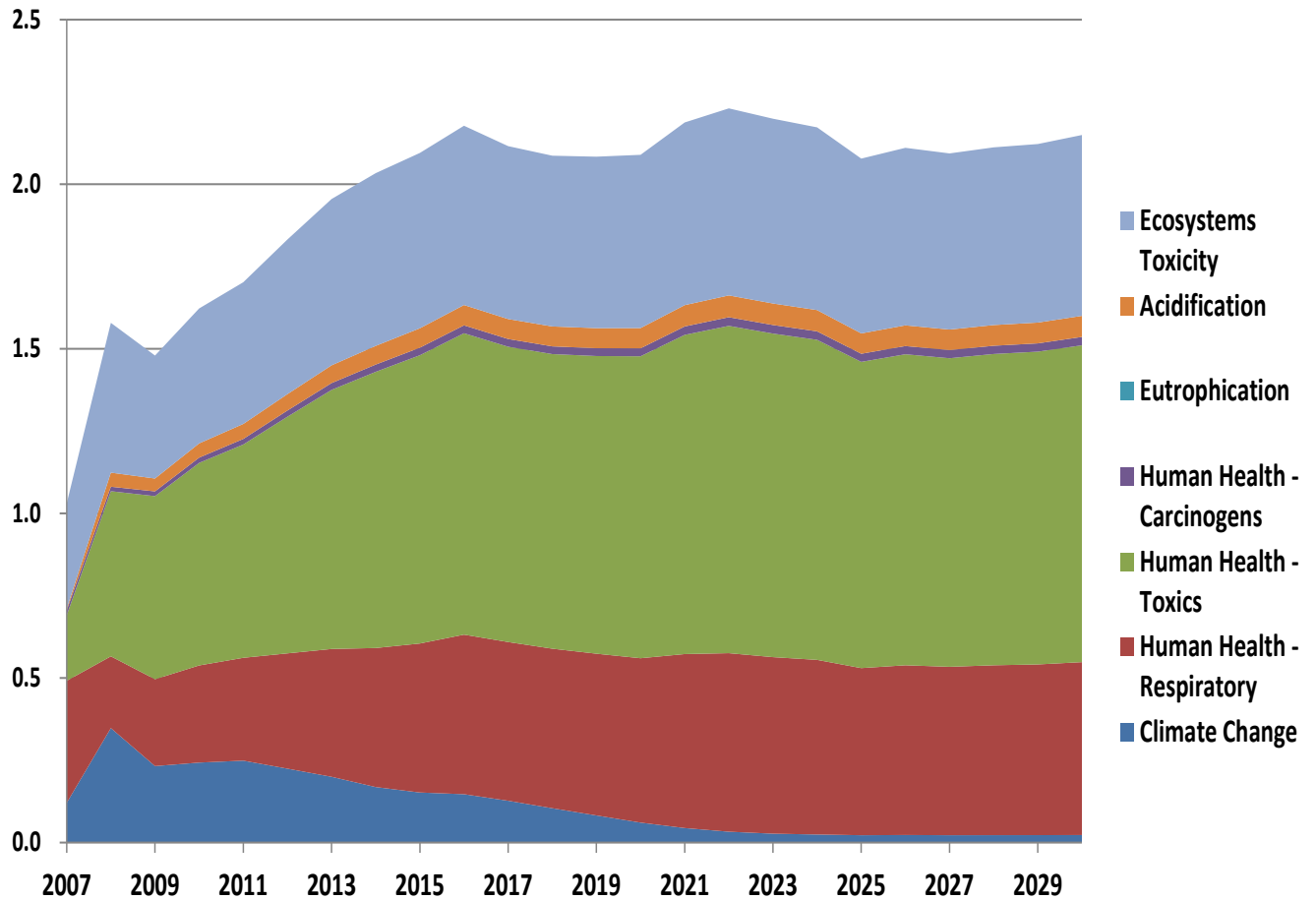


Table 2 Environmental Value (\$millions) of Recycled C&D tons*

Year	Climate Change	Human Health - Respiratory	Human Health - Toxics	Human Health - Carcinogens	Eutrophication	Acidification	Ecosystems Toxicity	Total Environmental Value
2010	0.243	0.295	0.615	0.016	0.000	0.043	0.410	1.623
2020	0.060	0.500	0.918	0.024	0.000	0.062	0.526	2.090
2030	0.023	0.525	0.963	0.025	0.000	0.064	0.550	2.150

*Monetized Value of Specific Environmental Impacts Reductions

Summary - Program Tons Per Year Scenario 1, Status Quo

Year	Recycle Rate	Total Material	Total Dipped	Total Recycled	Order ->	2	3	4	5
					Curb/Apt Rec	BY YW In City	BY FW In City	Grasscycl e	
					2	3	4	5	
1997	44.4%	816,174	453,787	362,386	67,509	6,779	16,470	5,119	
1998	44.2%	820,212	457,598	362,613	70,279	6,680	15,887	6,038	
1999	44.0%	852,299	477,433	374,866	73,478	4,002	15,590	10,660	
2000	40.0%	793,825	476,131	317,693	72,864	4,002	873	10,660	
2001	39.3%	782,894	475,270	307,623	72,382	4,002	873	10,660	
2002	39.7%	768,422	462,996	305,426	72,543	4,002	873	10,660	
2003	38.2%	741,656	458,010	283,646	73,780	4,002	873	10,660	
2004	41.2%	780,061	458,405	321,656	76,860	4,800	2,400	9,900	
2005	44.2%	789,740	440,876	348,864	81,139	4,600	2,100	9,600	
2006	47.6%	836,373	438,380	397,993	84,531	4,600	2,100	9,600	
2007	48.3%	848,125	438,845	409,280	86,621	4,600	2,100	9,600	
2008	50.0%	789,607	394,607	395,000	81,888	4,600	2,100	9,600	
2009	51.1%	719,423	351,688	367,735	76,584	2,600	1,100	7,100	
2010	50.9%	780,664	383,438	397,226	78,554	2,655	1,123	7,251	
2011	51.2%	783,186	382,112	401,074	78,487	2,640	1,117	7,211	
2012	52.1%	789,299	378,194	411,105	78,592	2,628	1,112	7,176	
2013	52.9%	791,832	372,560	419,271	78,614	2,612	1,105	7,134	
2014	53.6%	794,323	368,427	425,896	78,534	2,597	1,099	7,092	
2015	54.0%	795,698	366,081	429,617	78,380	2,582	1,093	7,053	
2016	54.2%	798,068	365,894	432,174	78,427	2,575	1,090	7,034	
2017	54.3%	802,464	367,094	435,370	79,225	2,596	1,098	7,091	
2018	54.2%	804,837	368,556	436,282	79,100	2,583	1,093	7,055	
2019	54.1%	807,071	370,133	436,938	78,880	2,568	1,087	7,015	
2020	54.1%	810,694	372,307	438,387	78,753	2,556	1,082	6,983	
2021	54.0%	816,837	375,451	441,386	79,374	2,568	1,087	7,017	
2022	54.0%	822,953	378,636	444,317	79,999	2,581	1,092	7,051	
2023	53.9%	829,180	381,876	447,305	80,671	2,595	1,098	7,089	
2024	53.9%	835,530	385,174	450,355	81,363	2,609	1,104	7,127	
2025	53.9%	842,027	388,547	453,480	82,074	2,624	1,110	7,168	
2026	53.8%	848,581	391,952	456,628	82,782	2,638	1,116	7,207	
2027	53.8%	855,143	395,363	459,780	83,494	2,652	1,122	7,246	
2028	53.7%	861,830	398,800	463,030	84,236	2,667	1,129	7,287	
2029	53.7%	868,628	402,275	466,353	85,004	2,683	1,135	7,330	
2030	53.6%	875,647	405,864	469,783	85,825	2,700	1,143	7,377	

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Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

	6	7	9	10	11	12	13	14	15
Year	BY YW	BY FW	Curb/Apt	Clean	Drop	Com Priv	Foodwar		MF
	Not City	Not City	Org	Green	Sites	Rec	e	ABC Ban	Univer
	6	7	8	21	23	30	Rec/Com	22	Org Serv
							p		13
1997	7,400	2,520	43,130	14,137	5,000	194,323	-	-	-
1998	7,700	2,823	40,546	13,034	5,376	194,251	-	-	-
1999	8,000	3,127	39,737	13,692	6,612	199,968	-	-	-
2000	8,000	3,127	34,037	14,032	7,109	162,989	-	-	-
2001	8,000	3,127	36,990	15,034	7,103	149,453	-	-	-
2002	8,000	3,127	34,503	14,353	8,340	149,025	-	-	-
2003	8,000	3,127	33,923	14,156	8,170	126,956	-	-	-
2004	5,000	1,800	38,485	14,907	8,163	159,341	-	-	-
2005	4,800	1,600	42,603	13,925	9,232	179,265	-	-	-
2006	4,800	1,600	51,482	14,277	9,745	215,258	-	-	-
2007	4,800	1,600	54,573	14,247	11,246	219,894	-	-	-
2008	4,800	1,600	56,364	11,893	8,662	213,493	-	-	-
2009	3,500	1,700	74,230	10,149	6,179	184,593	-	-	-
2010	3,575	1,736	76,624	11,351	6,907	205,610	1,840	-	-
2011	3,554	1,726	77,214	11,571	7,033	206,360	4,161	-	-
2012	3,538	1,718	78,462	11,925	7,229	208,209	7,793	1,075	1,647
2013	3,517	1,708	79,800	12,190	7,341	208,764	11,418	2,044	3,024
2014	3,496	1,698	80,962	12,414	7,373	209,507	13,795	3,043	4,285
2015	3,477	1,688	82,021	12,583	7,312	209,874	14,941	3,716	4,896
2016	3,468	1,684	83,062	12,742	7,241	210,326	15,427	4,070	5,027
2017	3,496	1,697	84,518	12,824	7,182	210,741	15,628	4,223	5,051
2018	3,478	1,688	84,526	12,992	7,223	211,433	15,737	4,327	5,046
2019	3,459	1,679	84,252	13,145	7,287	212,301	15,818	4,397	5,052
2020	3,443	1,671	83,989	13,295	7,362	213,756	15,967	4,454	5,077
2021	3,460	1,679	84,488	13,443	7,441	215,111	16,055	4,507	5,156
2022	3,476	1,687	84,974	13,602	7,528	216,391	16,137	4,561	5,238
2023	3,495	1,696	85,501	13,761	7,615	217,631	16,214	4,614	5,324
2024	3,514	1,706	86,043	13,921	7,704	218,891	16,293	4,668	5,414
2025	3,534	1,715	86,601	14,081	7,792	220,181	16,373	4,722	5,505
2026	3,553	1,725	87,150	14,241	7,881	221,505	16,456	4,776	5,598
2027	3,572	1,734	87,699	14,400	7,969	222,829	16,541	4,829	5,692
2028	3,593	1,744	88,276	14,554	8,054	224,191	16,631	4,880	5,789
2029	3,614	1,754	88,874	14,705	8,137	225,576	16,722	4,931	5,888
2030	3,637	1,765	89,524	14,861	8,224	226,940	16,811	4,984	5,993

Summary - Program Sector Materials Diversion by Program
 Status Quo Year 2025 All MSW Sectors

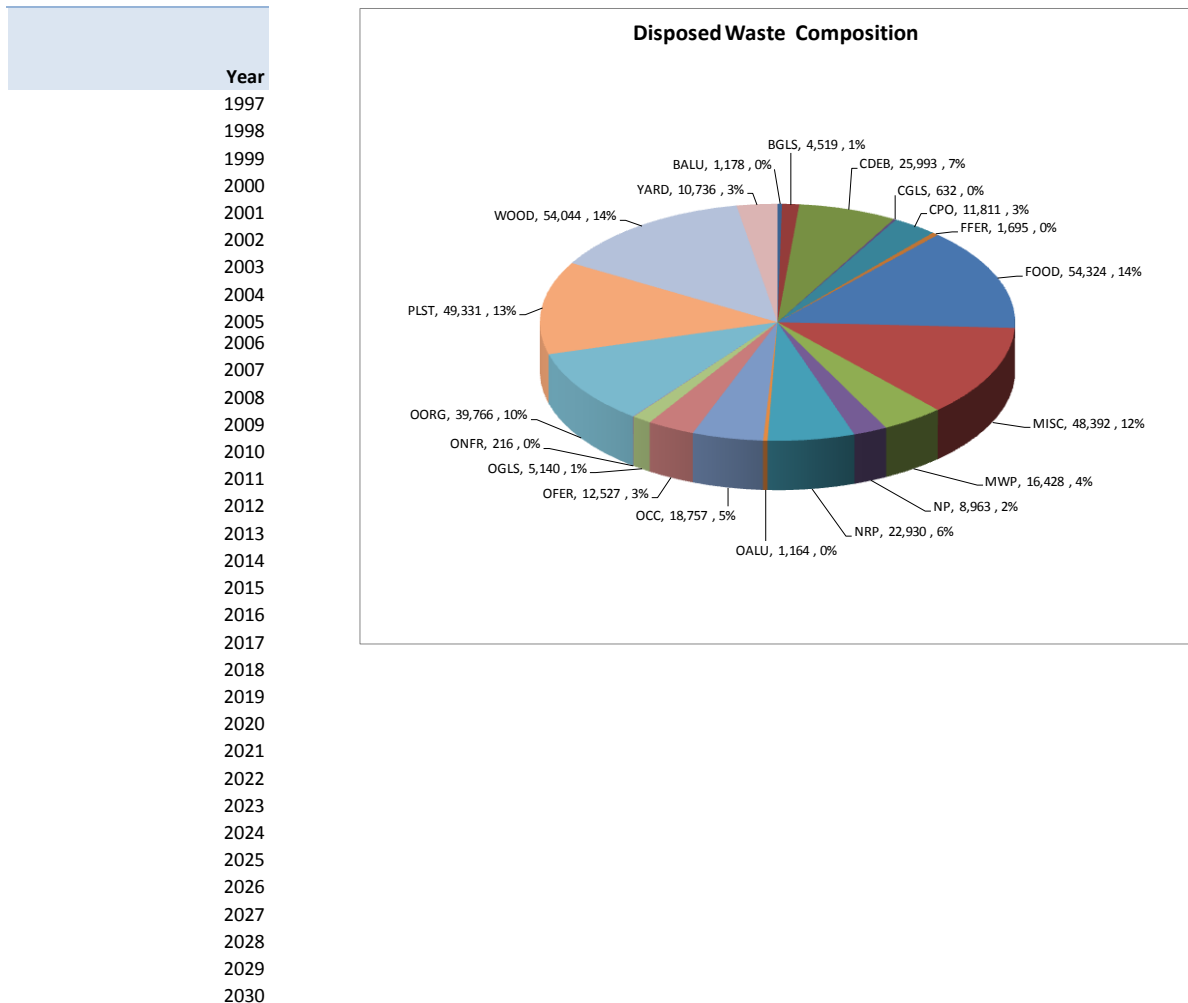
Material MSW		Total Disposed	Total Recycled	Total Generated	Percent Recycled	Curb/Apt Rec	BY YW In City	BY FW In City	Grasscycl e	BY YW Not City
		1	2	3	(2/3)	2	3	4	5	6
Aluminum Beverage	BALU	1,178	1,854	3,033	61.1%	965	-	-	-	-
Beverage Glass	BGLS	4,519	18,537	23,056	80.4%	15,229	-	-	-	-
Construction Debris	CDEB	25,993	4,722	30,715	15.4%	-	-	-	-	-
Container Glass	CGLS	632	2,981	3,613	82.5%	2,981	-	-	-	-
Computer Office Paper	CPO	11,811	16,023	27,834	57.6%	-	-	-	-	-
Food Cans	FFER	1,695	1,857	3,552	52.3%	1,082	-	-	-	-
Food	FOOD	54,324	81,510	135,834	60.0%	-	-	1,110	-	-
Miscellaneous	MISC	48,392	30,397	78,789	38.6%	-	-	-	-	-
Mixed Scrap Paper	MWSP	16,428	53,718	70,147	76.6%	28,044	-	-	-	-
Newspaper	NP	8,963	40,095	49,058	81.7%	15,792	-	-	-	-
Other Paper	NRP	22,930	12,860	35,790	35.9%	-	-	-	-	-
Other Aluminum	OALU	1,164	-	1,164	0.0%	-	-	-	-	-
Corrugated Kraft	OCC	18,757	66,462	85,219	78.0%	13,453	-	-	-	-
Other Ferrous	OFER	12,527	12,620	25,147	50.2%	630	-	-	-	-
Other Glass	OGLS	5,140	971	6,110	15.9%	-	-	-	-	-
Other NonFerrous	ONFR	216	-	216	0.0%	-	-	-	-	-
Other Organics	OORG	39,766	-	39,766	0.0%	-	-	-	-	-
Plastics	PLST	49,331	9,087	58,419	15.6%	3,899	-	-	-	-
Wood	WOOD	54,044	245	54,289	0.5%	-	-	-	-	-
Yard	YARD	10,736	99,540	110,276	90.3%	-	2,624	-	7,168	3,534
Total	Grand Tc	388,547	453,480	842,027	53.9%	82,074	2,624	1,110	7,168	3,534

(in tons per year)

Year	Total Disposed	Total Recycled	Total Generated	Percent Recycled
	1	2	3	(2/3)
1997	453,787	362,386	816,174	44.4%
1998	457,598	362,613	820,212	44.2%
1999	477,433	374,866	852,299	44.0%
2000	476,131	317,693	793,825	40.0%
2001	475,270	307,623	782,894	39.3%
2002	462,996	305,426	768,422	39.7%
2003	458,010	283,646	741,656	38.2%
2004	458,405	321,656	780,061	41.2%
2005	440,876	348,864	789,740	44.2%
2006	438,380	397,993	836,373	47.6%
2007	438,845	409,280	848,125	48.3%
2008	394,607	395,000	789,607	50.0%
2009	351,688	367,735	719,423	51.1%
2010	383,438	397,226	780,664	50.9%
2011	382,112	401,074	783,186	51.2%
2012	378,194	411,105	789,299	52.1%
2013	372,560	419,271	791,832	52.9%
2014	368,427	425,896	794,323	53.6%
2015	366,081	429,617	795,698	54.0%
2016	365,894	432,174	798,068	54.2%
2017	367,094	435,370	802,464	54.3%
2018	368,556	436,282	804,837	54.2%
2019	370,133	436,938	807,071	54.1%
2020	372,307	438,387	810,694	54.1%
2021	375,451	441,386	816,837	54.0%
2022	378,636	444,317	822,953	54.0%
2023	381,876	447,305	829,180	53.9%
2024	385,174	450,355	835,530	53.9%
2025	388,547	453,480	842,027	53.9%
2026	391,952	456,628	848,581	53.8%
2027	395,363	459,780	855,143	53.8%
2028	398,800	463,030	861,830	53.7%
2029	402,275	466,353	868,628	53.7%
2030	405,864	469,783	875,647	53.6%

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Material MSW		BY FW Not City 7	Curb/Apt Org 8	MF		Clean Green 21	ABC Ban 22	Drop Sites 23	Com Priv Rec 30	Foodware Rec/Comp 35
				Univer Org Serv 13						
Aluminum Beverage	BALU	-	-	-	-	-	-	4	885	-
Beverage Glass	BGLS	-	-	-	-	-	-	537	2,771	-
Construction Debris	CDEB	-	-	-	-	-	4,722	-	-	-
Container Glass	CGLS	-	-	-	-	-	-	-	-	-
Computer Office Paper	CPO	-	-	-	-	-	-	-	16,023	-
Food Cans	FFER	-	-	-	-	-	-	-	775	-
Food	FOOD	1,715	31,632	4,499	-	-	-	-	35,055	7,498
Miscellaneous	MISC	-	-	-	-	-	-	63	30,334	-
Mixed Scrap Paper	MWP	-	-	-	-	-	-	477	25,197	-
Newspaper	NP	-	-	-	-	-	-	385	23,919	-
Other Paper	NRP	-	3,735	1,006	-	-	-	-	-	8,119
Other Aluminum	OALU	-	-	-	-	-	-	-	-	-
Corrugated Kraft	OCC	-	-	-	-	-	-	1,006	52,004	-
Other Ferrous	OFER	-	-	-	-	-	-	5,048	6,942	-
Other Glass	OGLS	-	-	-	-	-	-	-	971	-
Other NonFerrous	ONFR	-	-	-	-	-	-	-	-	-
Other Organics	OORG	-	-	-	-	-	-	-	-	-
Plastics	PLST	-	-	-	-	-	-	27	4,407	755
Wood	WOOD	-	-	-	-	-	-	245	-	-
Yard	YARD	-	51,235	-	14,081	-	-	-	20,899	-
Total	Grand Tc	1,715	86,601	5,505	14,081	4,722	7,792	220,181	16,373	



Summary - Program Sector Materials Diversion by Program
Status Quo Year 2025 Single Family Sector

Material MSW	Row Lab	Total	Total	Total	Percent	Curb/Apt Rec 2	BY YW In City 3
		Disposed 1	Recycled 2	Generated 3	Recycled (2/3)		
Aluminum Beverage	BALU	206	742	948	78.2%	742	-
Beverage Glass	BGLS	764	10,575	11,339	93.3%	10,575	-
Construction Debris	CDEB	815	-	815	0.0%	-	-
Container Glass	CGLS	250	2,070	2,319	89.2%	2,070	-
Computer Office Paper	CPO	653	-	653	0.0%	-	-
Food Cans	FFER	437	835	1,272	65.7%	835	-
Food	FOOD	12,249	30,291	42,540	71.2%	-	-
Miscellaneous	MISC	3,252	-	3,252	0.0%	-	-
Mixed Scrap Paper	MWP	3,475	21,030	24,505	85.8%	21,030	-
Newspaper	NP	466	11,923	12,388	96.2%	11,923	-
Other Paper	NRP	6,591	2,825	9,416	30.0%	-	-
Other Aluminum	OALU	348	-	348	0.0%	-	-
Corrugated Kraft	OCC	821	8,790	9,611	91.5%	8,790	-
Other Ferrous	OFER	617	390	1,006	38.7%	390	-
Other Glass	OGLS	151	-	151	0.0%	-	-
Other NonFerrous	ONFR	3	-	3	0.0%	-	-
Other Organics	OORG	20,822	-	20,822	0.0%	-	-
Plastics	PLST	7,711	2,970	10,681	27.8%	2,970	-
Wood	WOOD	923	-	923	0.0%	-	-
Yard	YARD	922	63,067	63,989	98.6%	-	2,624
Total	Grand Total	61,474	155,508	216,982	71.7%	59,325	2,624

(in tons per year)

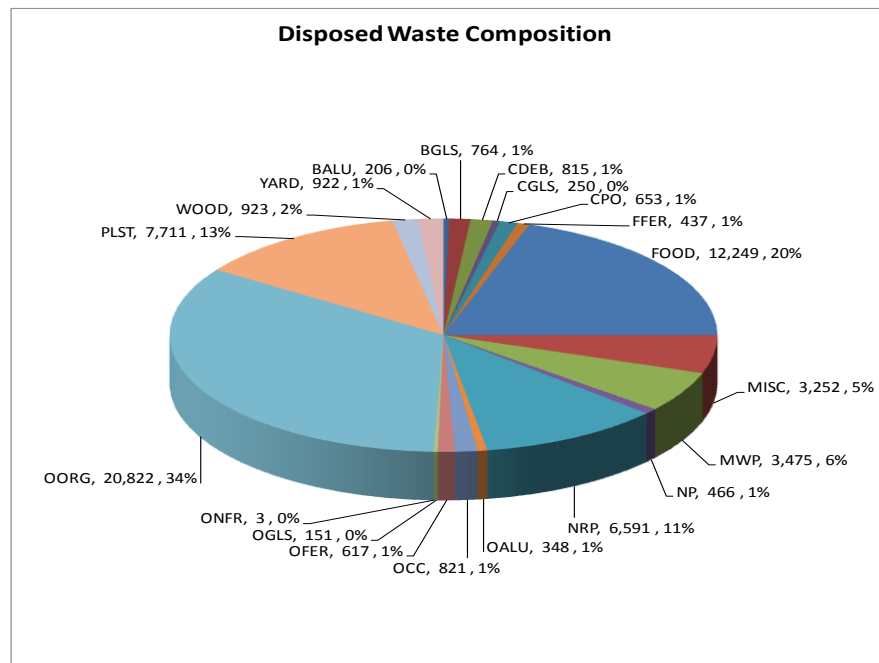
Year	Total	Total	Total	Percent
	Disposed 1	Recycled 2	Generated 3	Recycled (2/3)
1997	88,783	137,555	226,337	60.8%
1998	87,560	137,686	225,247	61.1%
1999	88,631	141,956	230,586	61.6%
2000	87,499	120,969	208,468	58.0%
2001	91,072	120,910	211,982	57.0%
2002	87,834	118,640	206,474	57.5%
2003	87,426	118,322	205,748	57.5%
2004	86,029	123,103	209,132	58.9%
2005	80,479	128,197	208,676	61.4%
2006	78,078	138,810	216,889	64.0%
2007	77,494	142,634	220,127	64.8%
2008	73,961	139,928	213,889	65.4%
2009	67,229	147,786	215,015	68.7%
2010	67,893	151,706	219,599	69.1%
2011	66,550	151,809	218,360	69.5%
2012	64,757	152,556	217,314	70.2%
2013	62,911	153,124	216,035	70.9%
2014	61,597	153,167	214,764	71.3%
2015	60,803	152,762	213,565	71.5%
2016	60,449	152,520	212,970	71.6%
2017	60,858	153,802	214,661	71.6%
2018	60,529	153,063	213,592	71.7%
2019	60,172	152,194	212,366	71.7%
2020	59,893	151,501	211,394	71.7%
2021	60,184	152,241	212,424	71.7%
2022	60,474	152,977	213,451	71.7%
2023	60,796	153,794	214,590	71.7%
2024	61,130	154,637	215,766	71.7%
2025	61,474	155,508	216,982	71.7%
2026	61,811	156,360	218,171	71.7%
2027	62,147	157,210	219,357	71.7%
2028	62,501	158,105	220,606	71.7%
2029	62,869	159,037	221,906	71.7%
2030	63,272	160,056	223,328	71.7%

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Material MSW	Row Lab	BY FW In City 4	Grasscycle 5	BY YW Not City 6	BY FW Not City 7	Curb/Apt Org 8
Aluminum Beverage	BALU	-	-	-	-	-
Beverage Glass	BGLS	-	-	-	-	-
Construction Debris	CDEB	-	-	-	-	-
Container Glass	CGLS	-	-	-	-	-
Computer Office Paper	CPO	-	-	-	-	-
Food Cans	FFER	-	-	-	-	-
Food	FOOD	1,110	-	-	1,715	27,466
Miscellaneous	MISC	-	-	-	-	-
Mixed Scrap Paper	MWP	-	-	-	-	-
Newspaper	NP	-	-	-	-	-
Other Paper	NRP	-	-	-	-	2,825
Other Aluminum	OALU	-	-	-	-	-
Corrugated Kraft	OCC	-	-	-	-	-
Other Ferrous	OFER	-	-	-	-	-
Other Glass	OGLS	-	-	-	-	-
Other NonFerrous	ONFR	-	-	-	-	-
Other Organics	OORG	-	-	-	-	-
Plastics	PLST	-	-	-	-	-
Wood	WOOD	-	-	-	-	-
Yard	YARD	-	7,168	3,534	-	49,743
Total	Grand Total	1,110	7,168	3,534	1,715	80,033

(ii)

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Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Summary - Program Sector Materials Diversion by Program

Status Quo Year 2025 Multi Family Sector

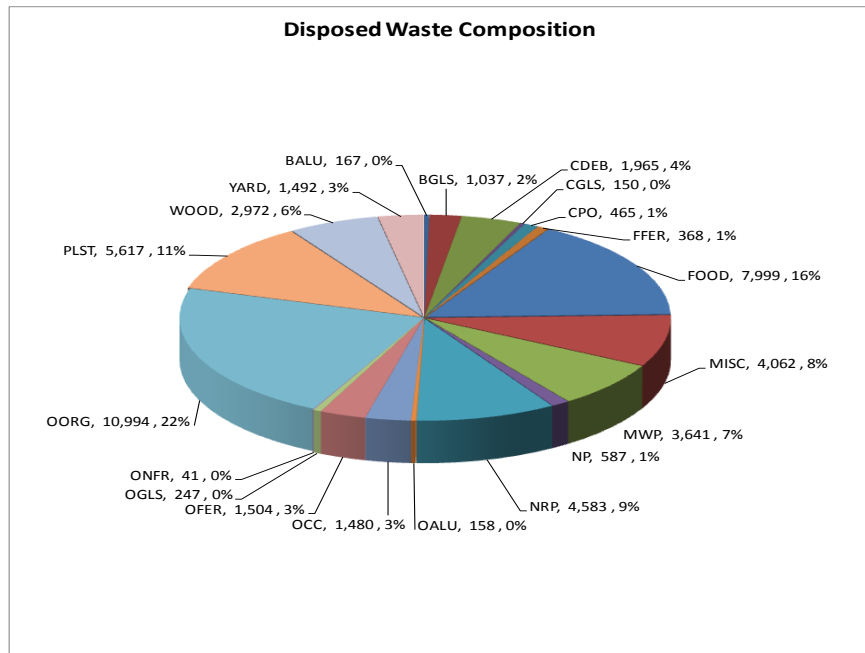
Material MSW	Row Lat	Total	Total	Total	Percent	Curb/Apt Rec	Curb/Apt Org
		Disposed	Recycled	Generated	Recycled		
		1	2	3	(2/3)	2	8
Aluminum Beverage	BALU	167	224	391	57.2%	224	-
Beverage Glass	BGLS	1,037	4,655	5,692	81.8%	4,655	-
Construction Debris	CDEB	1,965	-	1,965	0.0%	-	-
Container Glass	CGLS	150	911	1,061	85.8%	911	-
Computer Office Paper	CPO	465	-	465	0.0%	-	-
Food Cans	FFER	368	246	615	40.1%	246	-
Food	FOOD	7,999	8,665	16,664	52.0%	-	4,166
Miscellaneous	MISC	4,062	-	4,062	0.0%	-	-
Mixed Scrap Paper	MWP	3,641	7,014	10,655	65.8%	7,014	-
Newspaper	NP	587	3,869	4,456	86.8%	3,869	-
Other Paper	NRP	4,583	1,916	6,499	29.5%	-	910
Other Aluminum	OALU	158	-	158	0.0%	-	-
Corrugated Kraft	OCC	1,480	4,662	6,143	75.9%	4,662	-
Other Ferrous	OFER	1,504	240	1,744	13.8%	240	-
Other Glass	OGLS	247	-	247	0.0%	-	-
Other NonFerrous	ONFR	41	-	41	0.0%	-	-
Other Organics	OORG	10,994	-	10,994	0.0%	-	-
Plastics	PLST	5,617	928	6,545	14.2%	928	-
Wood	WOOD	2,972	-	2,972	0.0%	-	-
Yard	YARD	1,492	1,492	2,985	50.0%	-	1,492
Total	Grand T	49,530	34,823	84,353	41.3%	22,750	6,568

Year	Total	Total	Total	Percent
	Disposed	Recycled	Generated	Recycled
	1	2	3	(2/3)
1997	59,189	11,371	70,560	16.1%
1998	58,374	12,266	70,640	17.4%
1999	59,087	12,639	71,726	17.6%
2000	58,333	12,595	70,927	17.8%
2001	53,487	15,124	68,611	22.0%
2002	55,076	15,068	70,144	21.5%
2003	56,106	16,043	72,149	22.2%
2004	56,498	16,142	72,640	22.2%
2005	54,080	18,245	72,325	25.2%
2006	55,643	19,903	75,545	26.3%
2007	55,759	21,261	77,020	27.6%
2008	53,199	21,024	74,223	28.3%
2009	51,497	19,028	70,524	27.0%
2010	52,955	19,813	72,767	27.2%
2011	52,950	20,140	73,090	27.6%
2012	51,153	22,317	73,469	30.4%
2013	49,370	24,391	73,761	33.1%
2014	47,450	26,596	74,046	35.9%
2015	45,919	28,429	74,347	38.2%
2016	45,138	29,846	74,985	39.8%
2017	45,205	30,969	76,174	40.7%
2018	45,267	31,506	76,773	41.0%
2019	45,397	31,796	77,193	41.2%
2020	45,653	32,052	77,705	41.2%
2021	46,375	32,588	78,963	41.3%
2022	47,118	33,121	80,238	41.3%
2023	47,900	33,675	81,575	41.3%
2024	48,704	34,242	82,946	41.3%
2025	49,530	34,823	84,353	41.3%
2026	50,363	35,409	85,771	41.3%
2027	51,207	36,002	87,209	41.3%
2028	52,079	36,615	88,695	41.3%
2029	52,977	37,247	90,223	41.3%
2030	53,918	37,908	91,826	41.3%

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Material MSW	MF Univer Org Serv
	Row Lat 13
Aluminum Beverage	BALU -
Beverage Glass	BGLS -
Construction Debris	CDEB -
Container Glass	CGLS -
Computer Office Paper	CPO -
Food Cans	FFER -
Food	FOOD 4,499
Miscellaneous	MISC -
Mixed Scrap Paper	MWP -
Newspaper	NP -
Other Paper	NRP 1,006
Other Aluminum	OALU -
Corrugated Kraft	OCC -
Other Ferrous	OFER -
Other Glass	OGLS -
Other NonFerrous	ONFR -
Other Organics	OORG -
Plastics	PLST -
Wood	WOOD -
Yard	YARD -
Total	Grand T 5,505

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Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

**Summary - Program Sector Materials Diversion by Program
Status Quo Year 2025 Commercial Sector**

Material MSW	Row Lab	Total	Total	Total	Percent	Com Priv Rec	Foodware Rec/Comp
		Disposed	Recycled	Generated	Recycled		
		1	2	3	(2/3)	30	35
Aluminum Beverage	BALU	736	885	1,620	54.6%	885	-
Beverage Glass	BGLS	2,433	2,771	5,204	53.2%	2,771	-
Construction Debris	CDEB	6,325	-	6,325	0.0%	-	-
Container Glass	CGLS	175	-	175	0.0%	-	-
Computer Office Paper	CPO	9,862	16,023	25,886	61.9%	16,023	-
Food Cans	FFER	826	775	1,601	48.4%	775	-
Food	FOOD	31,193	42,553	73,746	57.7%	35,055	7,498
Miscellaneous	MISC	16,927	30,334	47,260	64.2%	30,334	-
Mixed Scrap Paper	MWP	7,536	25,197	32,733	77.0%	25,197	-
Newspaper	NP	7,907	23,919	31,825	75.2%	23,919	-
Other Paper	NRP	10,230	8,119	18,349	44.2%	-	8,119
Other Aluminum	OALU	499	-	499	0.0%	-	-
Corrugated Kraft	OCC	13,723	52,004	65,727	79.1%	52,004	-
Other Ferrous	OFER	5,479	6,942	12,421	55.9%	6,942	-
Other Glass	OGLS	3,009	971	3,980	24.4%	971	-
Other NonFerrous	ONFR	43	-	43	0.0%	-	-
Other Organics	OORG	5,094	-	5,094	0.0%	-	-
Plastics	PLST	29,765	5,162	34,927	14.8%	4,407	755
Wood	WOOD	12,749	-	12,749	0.0%	-	-
Yard	YARD	3,802	20,899	24,701	84.6%	20,899	-
Total	Grand Tc	168,312	236,554	404,866	58.4%	220,181	16,373

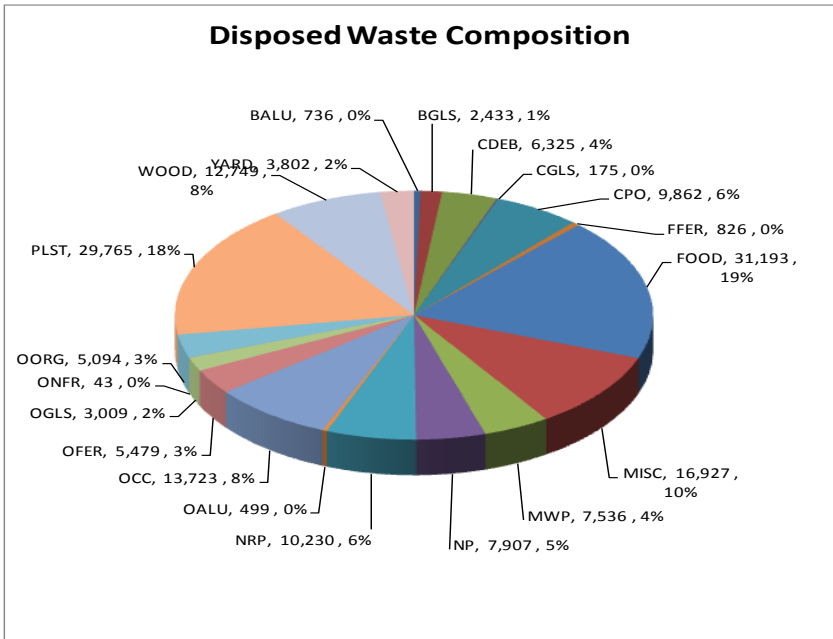
(in tons per year)

Year	Total	Total	Total	Percent
	Disposed	Recycled	Generated	Recycled
	1	2	3	(2/3)
1997	208,670	194,323	402,994	48.2%
1998	213,646	194,251	407,896	47.6%
1999	225,348	199,968	425,316	47.0%
2000	228,417	162,989	391,405	41.6%
2001	228,405	149,453	377,858	39.6%
2002	217,195	149,025	366,220	40.7%
2003	213,247	126,956	340,202	37.3%
2004	216,112	159,341	375,453	42.4%
2005	205,819	179,265	385,083	46.6%
2006	201,231	215,258	416,489	51.7%
2007	198,493	219,894	418,387	52.6%
2008	176,774	213,493	390,267	54.7%
2009	151,398	184,593	335,992	54.9%
2010	171,363	207,450	378,813	54.8%
2011	169,610	210,521	380,131	55.4%
2012	167,487	216,002	383,489	56.3%
2013	164,278	220,182	384,460	57.3%
2014	162,467	223,302	385,769	57.9%
2015	161,600	224,815	386,415	58.2%
2016	161,450	225,753	387,203	58.3%
2017	161,556	226,369	387,925	58.4%
2018	161,985	227,170	389,155	58.4%
2019	162,600	228,119	390,718	58.4%
2020	163,633	229,723	393,356	58.4%
2021	164,609	231,166	395,775	58.4%
2022	165,531	232,529	398,060	58.4%
2023	166,430	233,845	400,275	58.4%
2024	167,354	235,184	402,538	58.4%
2025	168,312	236,554	404,866	58.4%
2026	169,306	237,962	407,268	58.4%
2027	170,303	239,371	409,674	58.4%
2028	171,321	240,822	412,143	58.4%
2029	172,361	242,297	414,658	58.4%
2030	173,392	243,750	417,142	58.4%

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Material MSW	
	Row Lab
Aluminum Beverage	BALU
Beverage Glass	BGLS
Construction Debris	CDEB
Container Glass	CGLS
Computer Office Paper	CPO
Food Cans	FFER
Food	FOOD
Miscellaneous	MISC
Mixed Scrap Paper	MWP
Newspaper	NP
Other Paper	NRP
Other Aluminum	OALU
Corrugated Kraft	OCC
Other Ferrous	OFER
Other Glass	OGLS
Other NonFerrous	ONFR
Other Organics	OORG
Plastics	PLST
Wood	WOOD
Yard	YARD
Total	Grand Tt

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Summary - Program Sector Materials Diversion by Program
 Status Quo Year 2025 Self Haul Sector

Material MSW	Row Label	Total Disposed	Total Recycled	Total Generated	Percent Recycled	Clean Green	Drop Sites	ABC Ban
		1	2	3	(2/3)			
		21	23	22				
Aluminum Beverage	BALU	69	4	73	5.9%	-	4	-
Beverage Glass	BGLS	285	537	822	65.3%	-	537	-
Construction Debris	CDEB	16,889	4,722	21,611	21.8%	-	-	4,722
Container Glass	CGLS	57	-	57	0.0%	-	-	-
Computer Office Paper	CPO	830	-	830	0.0%	-	-	-
Food Cans	FFER	65	-	65	0.0%	-	-	-
Food	FOOD	2,883	-	2,883	0.0%	-	-	-
Miscellaneous	MISC	24,151	63	24,215	0.3%	-	63	-
Mixed Scrap Paper	MWP	1,777	477	2,253	21.2%	-	477	-
Newspaper	NP	3	385	388	99.3%	-	385	-
Other Paper	NRP	1,526	-	1,526	0.0%	-	-	-
Other Aluminum	OALU	160	-	160	0.0%	-	-	-
Corrugated Kraft	OCC	2,733	1,006	3,739	26.9%	-	1,006	-
Other Ferrous	OFER	4,928	5,048	9,976	50.6%	-	5,048	-
Other Glass	OGLS	1,733	-	1,733	0.0%	-	-	-
Other NonFerrous	ONFR	129	-	129	0.0%	-	-	-
Other Organics	OORG	2,857	-	2,857	0.0%	-	-	-
Plastics	PLST	6,238	27	6,265	0.4%	-	27	-
Wood	WOOD	37,400	245	37,644	0.6%	-	245	-
Yard	YARD	4,520	14,081	18,601	75.7%	14,081	-	-
Total	Grand Total	109,231	26,595	135,826	19.6%	14,081	7,792	4,722

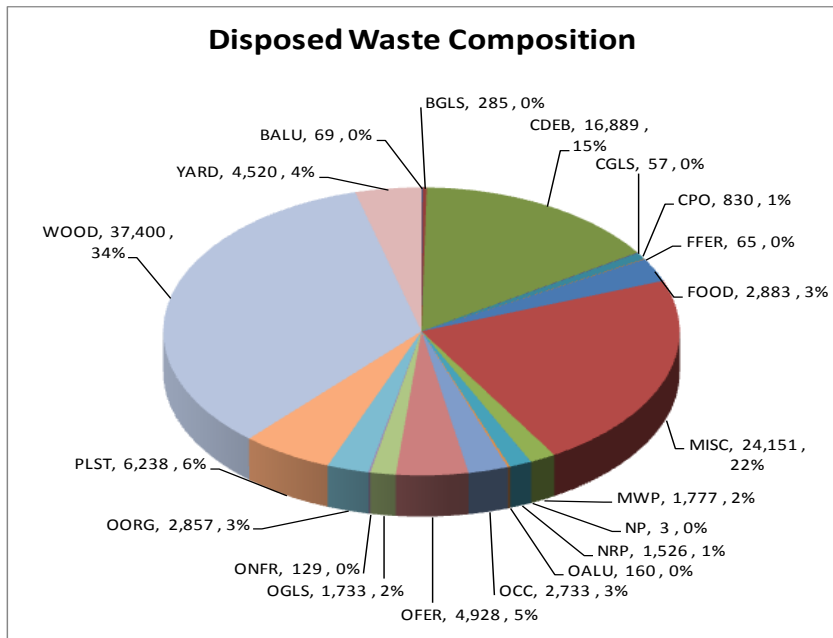
(in tons per year)

Year	Total Disposed	Total Recycled	Total Generated	Percent Recycled
	1	2	3	(2/3)
1997	97,146	19,137	116,283	16.5%
1998	98,019	18,410	116,429	15.8%
1999	104,367	20,304	124,671	16.3%
2000	101,883	21,141	123,024	17.2%
2001	102,305	22,137	124,442	17.8%
2002	102,891	22,693	125,584	18.1%
2003	101,232	22,325	123,557	18.1%
2004	99,766	23,070	122,836	18.8%
2005	100,499	23,157	123,656	18.7%
2006	103,428	24,022	127,450	18.8%
2007	107,098	25,492	132,591	19.2%
2008	90,673	20,556	111,229	18.5%
2009	81,565	16,328	97,893	16.7%
2010	91,226	18,257	109,484	16.7%
2011	93,001	18,604	111,605	16.7%
2012	94,797	20,230	115,027	17.6%
2013	96,002	21,574	117,576	18.3%
2014	96,914	22,831	119,745	19.1%
2015	97,759	23,611	121,371	19.5%
2016	98,857	24,054	122,911	19.6%
2017	99,475	24,229	123,704	19.6%
2018	100,774	24,542	125,317	19.6%
2019	101,965	24,829	126,794	19.6%
2020	103,128	25,110	128,239	19.6%
2021	104,283	25,391	129,674	19.6%
2022	105,514	25,690	131,204	19.6%
2023	106,749	25,991	132,740	19.6%
2024	107,986	26,292	134,279	19.6%
2025	109,231	26,595	135,826	19.6%
2026	110,473	26,898	137,370	19.6%
2027	111,706	27,198	138,904	19.6%
2028	112,899	27,488	140,387	19.6%
2029	114,068	27,773	141,841	19.6%
2030	115,282	28,069	143,351	19.6%

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Material MSW	
	Row Label
Aluminum Beverage	BALU
Beverage Glass	BGLS
Construction Debris	CDEB
Container Glass	CGLS
Computer Office Paper	CPO
Food Cans	FFER
Food	FOOD
Miscellaneous	MISC
Mixed Scrap Paper	MWP
Newspaper	NP
Other Paper	NRP
Other Aluminum	OALU
Corrugated Kraft	OCC
Other Ferrous	OFER
Other Glass	OGLS
Other NonFerrous	ONFR
Other Organics	OORG
Plastics	PLST
Wood	WOOD
Yard	YARD
Total	Grand Total

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**Summary of Recycling Program Benefits and Costs
Status Quo Newest Programs**

All Programs in Scenario

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	\$17,279,271	\$116,013	\$262,341	\$773,665	\$1,241,656	\$1,616,495
Program Cost	\$15,393,862	\$431,561	\$807,500	\$1,100,735	\$1,090,861	\$1,366,545
Net Benefits	\$1,885,409	(\$315,548)	(\$545,159)	(\$327,070)	\$150,795	\$249,950
Tons avoided through recycling	470,280	1,840	4,161	10,516	16,485	21,123
4/1/11 5:00 PM	(All costs in 2010 dollars)					

13 MF Univer Org Serv

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	\$6,239,071	\$ -	\$ -	\$ 228,037	\$ 418,673	\$ 593,199
Program Cost	\$3,389,494	\$ -	\$ 200,000	\$ 212,001	\$ 213,632	\$ 299,351
Net Benefits	\$2,849,577	\$ -	\$ (200,000)	\$ 16,036	\$ 205,041	\$ 293,848
Tons avoided through recycling	94,700	-	-	1,647	3,024	4,285
PV per ton	\$30					

22 ABC Ban

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	\$1,871,710	\$ -	\$ -	\$ 54,257	\$ 103,107	\$ 153,534
Program Cost	\$814,148	\$ -	\$ 10,000	\$ 31,509	\$ 50,875	\$ 70,866
Net Benefits	\$1,057,561	\$ -	\$ (10,000)	\$ 22,748	\$ 52,232	\$ 82,668
Tons avoided through recycling	78,822	-	-	1,075	2,044	3,043
PV per ton	\$13					

35 Foodware Rec/Com

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	\$9,168,490	\$ 116,013	\$ 262,341	\$ 491,371	\$ 719,876	\$ 869,762
Program Cost	\$11,190,220	\$ 431,561	\$ 597,500	\$ 857,225	\$ 826,354	\$ 996,328
Net Benefits	(\$2,021,729)	\$ (315,548)	\$ (335,159)	\$ (365,854)	\$ (106,478)	\$ (126,566)
Tons avoided through recycling	296,758	1,840	4,161	7,793	11,418	13,795
PV per ton	(\$7)					

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

All Programs in Scenario

Year	2015	2016	2017	2018	2019	2020
Program Benefits	\$1,807,319	\$1,873,985	\$1,897,780	\$1,909,129	\$1,918,579	\$1,934,296
Program Cost	\$1,503,495	\$1,554,277	\$1,568,364	\$1,577,861	\$1,585,448	\$1,598,937
Net Benefits	\$303,825	\$319,708	\$329,416	\$331,268	\$333,131	\$335,359
Tons avoided through recycling	23,553	24,524	24,903	25,110	25,267	25,498

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13 MF Univer Org Serv

Year	2015	2016	2017	2018	2019	2020
Program Benefits	\$ 677,821	\$ 695,942	\$ 699,378	\$ 698,591	\$ 699,429	\$ 702,868
Program Cost	\$ 340,913	\$ 349,813	\$ 351,501	\$ 351,114	\$ 351,526	\$ 353,215
Net Benefits	\$ 336,908	\$ 346,129	\$ 347,877	\$ 347,476	\$ 347,903	\$ 349,653
Tons avoided through recycling	4,896	5,027	5,051	5,046	5,052	5,077

PV per ton

22 ABC Ban

Year	2015	2016	2017	2018	2019	2020
Program Benefits	\$ 187,493	\$ 205,347	\$ 213,059	\$ 218,318	\$ 221,829	\$ 224,709
Program Cost	\$ 84,328	\$ 91,406	\$ 89,463	\$ 91,548	\$ 92,940	\$ 94,082
Net Benefits	\$ 103,165	\$ 113,941	\$ 123,595	\$ 126,770	\$ 128,889	\$ 130,627
Tons avoided through recycling	3,716	4,070	4,223	4,327	4,397	4,454

PV per ton

35 Foodware Rec/Com

Year	2015	2016	2017	2018	2019	2020
Program Benefits	\$ 942,005	\$ 972,696	\$ 985,344	\$ 992,220	\$ 997,320	\$ 1,006,719
Program Cost	\$ 1,078,253	\$ 1,113,057	\$ 1,127,400	\$ 1,135,198	\$ 1,140,982	\$ 1,151,640
Net Benefits	\$ (136,248)	\$ (140,361)	\$ (142,056)	\$ (142,978)	\$ (143,661)	\$ (144,921)
Tons avoided through recycling	14,941	15,427	15,628	15,737	15,818	15,967

PV per ton

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

All Programs in Scenario

Year	2021	2022	2023	2024	2025	2026
Program Benefits	\$1,953,405	\$1,972,659	\$1,992,267	\$2,012,292	\$2,032,766	\$2,053,537
Program Cost	\$1,661,639	\$1,624,161	\$1,636,672	\$1,649,437	\$1,662,484	\$1,675,805
Net Benefits	\$291,766	\$348,498	\$355,595	\$362,855	\$370,282	\$377,732

Tons avoided through recycling	25,717	25,935	26,153	26,375	26,600	26,830
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13 MF Univer Org Serv

Year	2021	2022	2023	2024	2025	2026
Program Benefits	\$ 713,784	\$ 725,135	\$ 737,150	\$ 749,515	\$ 762,220	\$ 775,030
Program Cost	\$ 408,576	\$ 364,152	\$ 370,053	\$ 376,126	\$ 382,366	\$ 388,657
Net Benefits	\$ 305,207	\$ 360,983	\$ 367,097	\$ 373,389	\$ 379,854	\$ 386,372

Tons avoided through recycling	5,156	5,238	5,324	5,414	5,505	5,598
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PV per ton

22 ABC Ban

Year	2021	2022	2023	2024	2025	2026
Program Benefits	\$ 227,354	\$ 230,086	\$ 232,798	\$ 235,503	\$ 238,219	\$ 240,928
Program Cost	\$ 95,131	\$ 96,213	\$ 97,289	\$ 98,361	\$ 99,438	\$ 100,512
Net Benefits	\$ 132,224	\$ 133,872	\$ 135,509	\$ 137,142	\$ 138,782	\$ 140,417

Tons avoided through recycling	4,507	4,561	4,614	4,668	4,722	4,776
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PV per ton

35 Foodware Rec/Com

Year	2021	2022	2023	2024	2025	2026
Program Benefits	\$ 1,012,267	\$ 1,017,439	\$ 1,022,319	\$ 1,027,274	\$ 1,032,327	\$ 1,037,579
Program Cost	\$ 1,157,932	\$ 1,163,796	\$ 1,169,331	\$ 1,174,950	\$ 1,180,681	\$ 1,186,636
Net Benefits	\$ (145,665)	\$ (146,358)	\$ (147,012)	\$ (147,676)	\$ (148,353)	\$ (149,057)

Tons avoided through recycling	16,055	16,137	16,214	16,293	16,373	16,456
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PV per ton

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

All Programs in Scenario

Year	2027	2028	2029	2030
Program Benefits	\$2,074,575	\$2,096,221	\$2,118,328	\$2,141,066
Program Cost	\$1,689,327	\$1,703,326	\$1,717,633	\$1,732,156
Net Benefits	\$385,248	\$392,895	\$400,694	\$408,910
Tons avoided through recycling	27,062	27,300	27,541	27,787

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13 MF Univer Org Serv

Year	2027	2028	2029	2030
Program Benefits	\$ 788,021	\$ 801,443	\$ 815,257	\$ 829,741
Program Cost	\$ 395,038	\$ 401,630	\$ 408,415	\$ 415,529
Net Benefits	\$ 392,983	\$ 399,813	\$ 406,842	\$ 414,212
Tons avoided through recycling	5,692	5,789	5,888	5,993

PV per ton

22 ABC Ban

Year	2027	2028	2029	2030
Program Benefits	\$ 243,618	\$ 246,220	\$ 248,771	\$ 251,418
Program Cost	\$ 101,578	\$ 102,610	\$ 103,621	\$ 104,670
Net Benefits	\$ 142,040	\$ 143,611	\$ 145,150	\$ 146,748
Tons avoided through recycling	4,829	4,880	4,931	4,984

PV per ton

35 Foodware Rec/Com

Year	2027	2028	2029	2030
Program Benefits	\$ 1,042,936	\$ 1,048,558	\$ 1,054,300	\$ 1,059,908
Program Cost	\$ 1,192,711	\$ 1,199,086	\$ 1,205,597	\$ 1,211,957
Net Benefits	\$ (149,775)	\$ (150,528)	\$ (151,298)	\$ (152,049)
Tons avoided through recycling	16,541	16,631	16,722	16,811

PV per ton

Summary - Program Tons Per Year Scenario 31, Recommended

					Order ->	15	1	2	3	4	5
Year	Recycle Rate	Total Material	Total Disposed	Total Recycled	Curb/ Apt Rec	BY YW In City	BY FW In City	Grass-cycle	BY YW Not City	BY FW Not City	
		-	-	-	2	3	4	5	6	7	
1997	44.4%	816,174	453,787	362,386	67,509	6,779	16,470	5,119	7,400	2,520	
1998	44.2%	820,212	457,598	362,613	70,279	6,680	15,887	6,038	7,700	2,823	
1999	44.0%	852,299	477,433	374,866	73,478	4,002	15,590	10,660	8,000	3,127	
2000	40.0%	793,825	476,131	317,693	72,864	4,002	873	10,660	8,000	3,127	
2001	39.3%	782,894	475,270	307,623	72,382	4,002	873	10,660	8,000	3,127	
2002	39.7%	768,422	462,996	305,426	72,543	4,002	873	10,660	8,000	3,127	
2003	38.2%	741,656	458,010	283,646	73,780	4,002	873	10,660	8,000	3,127	
2004	41.2%	780,061	458,405	321,656	76,860	4,800	2,400	9,900	5,000	1,800	
2005	44.2%	789,740	440,876	348,864	81,139	4,600	2,100	9,600	4,800	1,600	
2006	47.6%	836,373	438,380	397,993	84,531	4,600	2,100	9,600	4,800	1,600	
2007	48.3%	848,125	438,845	409,280	86,621	4,600	2,100	9,600	4,800	1,600	
2008	50.0%	789,607	394,607	395,000	81,888	4,600	2,100	9,600	4,800	1,600	
2009	51.1%	719,423	351,688	367,735	76,584	2,600	1,100	7,100	3,500	1,700	
2010	50.9%	780,664	383,438	397,226	78,554	2,655	1,123	7,251	3,575	1,736	
2011	51.2%	783,186	382,112	401,074	78,487	2,640	1,117	7,211	3,554	1,726	
2012	52.2%	789,299	377,271	412,028	78,285	2,628	1,112	7,176	3,538	1,718	
2013	54.1%	791,832	363,453	428,379	77,923	2,612	1,105	7,134	3,517	1,708	
2014	56.9%	794,323	342,118	452,205	77,247	2,597	1,099	7,092	3,496	1,698	
2015	60.0%	795,698	318,222	477,476	76,491	2,582	1,093	7,053	3,477	1,688	
2016	62.5%	798,068	299,551	498,517	76,135	2,575	1,090	7,034	3,468	1,684	
2017	64.7%	802,464	283,490	518,974	76,708	2,596	1,098	7,091	3,496	1,697	
2018	65.6%	804,837	277,168	527,669	76,507	2,583	1,093	7,055	3,478	1,688	
2019	67.3%	807,071	264,284	542,787	76,266	2,568	1,087	7,015	3,459	1,679	
2020	68.7%	810,694	253,741	556,953	76,136	2,556	1,082	6,983	3,443	1,671	
2021	69.6%	816,837	248,245	568,592	76,738	2,568	1,087	7,017	3,460	1,679	
2022	70.1%	822,953	246,242	576,711	77,347	2,581	1,092	7,051	3,476	1,687	
2023	70.4%	829,180	245,651	583,529	78,002	2,595	1,098	7,089	3,495	1,696	
2024	70.6%	835,530	245,254	590,276	78,677	2,609	1,104	7,127	3,514	1,706	
2025	70.9%	842,027	245,233	596,795	79,372	2,624	1,110	7,168	3,534	1,715	
2026	71.0%	848,581	246,070	602,511	80,063	2,638	1,116	7,207	3,553	1,725	
2027	71.0%	855,143	247,654	607,489	80,758	2,652	1,122	7,246	3,572	1,734	
2028	71.0%	861,830	249,647	612,183	81,483	2,667	1,129	7,287	3,593	1,744	
2029	71.0%	868,628	251,839	616,789	82,232	2,683	1,135	7,330	3,614	1,754	
2030	71.0%	875,647	254,180	621,467	83,034	2,700	1,143	7,377	3,637	1,765	

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Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

	17	22	25	27	28	20	33	42	30	9
Year	Curb/ Apt Org	Clean Green	Drop Sites	Com Priv Rec	Food- ware Rec/ Comp	MF Univer Org Serv	Incr Res Ban Enforce	Carpet	Enhance Com Paper Ban Enforce	Phone & Junk Opt Out
	8	21	23	30	35	13	19	36	38	44
1997	43,130	14,137	5,000	194,323	-	-	-	-	-	-
1998	40,546	13,034	5,376	194,251	-	-	-	-	-	-
1999	39,737	13,692	6,612	199,968	-	-	-	-	-	-
2000	34,037	14,032	7,109	162,989	-	-	-	-	-	-
2001	36,990	15,034	7,103	149,453	-	-	-	-	-	-
2002	34,503	14,353	8,340	149,025	-	-	-	-	-	-
2003	33,923	14,156	8,170	126,956	-	-	-	-	-	-
2004	38,485	14,907	8,163	159,341	-	-	-	-	-	-
2005	42,603	13,925	9,232	179,265	-	-	-	-	-	-
2006	51,482	14,277	9,745	215,258	-	-	-	-	-	-
2007	54,573	14,247	11,246	219,894	-	-	-	-	-	-
2008	56,364	11,893	8,662	213,493	-	-	-	-	-	-
2009	74,230	10,149	6,179	184,593	-	-	-	-	-	-
2010	76,624	11,351	6,907	205,610	1,840	-	-	-	-	-
2011	77,214	11,571	7,033	206,360	4,161	-	-	-	-	-
2012	78,462	11,925	7,229	208,209	7,793	1,647	1,052	93	790	371
2013	79,800	12,190	7,341	208,764	11,418	3,024	2,325	237	1,993	834
2014	80,962	12,414	7,373	209,507	13,795	4,285	4,235	543	4,511	1,552
2015	82,021	12,583	7,309	209,800	14,941	4,896	6,086	1,021	8,403	2,281
2016	83,062	12,742	7,235	210,186	15,427	5,027	7,272	1,509	12,311	2,770
2017	84,518	12,824	7,173	210,536	15,628	5,051	7,911	1,830	14,860	3,041
2018	84,526	12,992	7,213	211,185	15,737	5,046	8,141	1,356	16,121	3,132
2019	84,252	13,145	7,276	212,031	15,818	5,052	8,219	1,415	16,686	3,157
2020	83,989	13,295	7,350	213,477	15,967	5,077	8,253	1,447	16,992	3,160
2021	84,488	13,443	7,429	214,826	16,055	5,156	8,346	1,470	17,157	3,183
2022	84,974	13,602	7,515	216,103	16,137	5,238	8,432	1,490	17,275	3,203
2023	85,501	13,761	7,603	217,340	16,214	5,324	8,521	1,508	17,374	3,224
2024	86,043	13,921	7,691	218,598	16,293	5,414	8,611	1,526	17,467	3,244
2025	86,601	14,081	7,779	219,885	16,373	5,505	8,703	1,543	17,562	3,266
2026	87,150	14,241	7,868	221,207	16,456	5,598	8,795	1,561	17,659	3,286
2027	87,699	14,400	7,955	222,528	16,541	5,692	8,888	1,578	17,756	3,307
2028	88,276	14,554	8,040	223,887	16,631	5,789	8,984	1,595	17,857	3,329
2029	88,874	14,705	8,124	225,269	16,722	5,888	9,084	1,612	17,960	3,351
2030	89,524	14,861	8,210	226,630	16,811	5,993	9,190	1,629	18,060	3,376

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

	23	52	44	45	38	41	46	21	6	32
Year	ABC Ban	Ban Asphalt Shingles	Floor Sort 50% C&D	Enhanc Com Org	Restore Educa- tion	Educa- tion Audits	Plast Film Ban	SF Org Ban	Reuse Bag Res	Extend Com Ban
1997	-	-	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-
2013	1,401	646	2,216	935	519	400	336	-	-	-
2014	2,642	693	4,935	2,020	1,141	907	618	1,881	10	733
2015	3,903	628	8,961	3,670	2,044	1,682	892	4,114	22	1,655
2016	4,748	542	12,715	-	2,870	2,396	1,053	7,545	43	3,084
2017	5,159	486	15,069	-	3,371	2,852	1,115	11,073	67	4,520
2018	4,278	463	16,319	-	3,615	3,091	95	13,254	85	5,466
2019	4,378	457	16,937	-	3,729	3,209	97	14,244	95	5,938
2020	4,447	458	17,293	-	3,790	3,276	98	14,614	100	6,170
2021	4,504	461	17,548	-	3,839	3,325	99	14,853	102	6,284
2022	4,560	466	17,778	-	3,882	3,368	101	14,987	104	6,352
2023	4,614	471	17,995	-	3,923	3,409	102	15,091	105	6,402
2024	4,668	476	18,206	-	3,963	3,449	103	15,182	106	6,448
2025	4,722	482	18,417	-	4,003	3,489	104	15,271	107	6,492
2026	4,776	487	18,627	-	4,044	3,529	105	15,356	108	6,537
2027	4,829	493	18,835	-	4,084	3,568	107	15,440	109	6,582
2028	4,880	498	19,036	-	4,124	3,606	108	15,528	110	6,628
2029	4,931	503	19,234	-	4,164	3,644	109	15,619	111	6,675
2030	4,984	508	19,438	-	4,205	3,682	110	15,720	113	6,723

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

	53	31	18	13	10	49	29	26	55	50
Year	Latex									
	Ban Clean Wood	MF Org Ban	Plast Bag Ban Res	Paint Prod Stew	Divert Reuse-ables	Textile Market Dev	Ban Com Org	Pre Scale Recycle	Com C&D Ban	Pet Waste & Diapers
	45	14	16	42	52	12	32	51	46	15
1997	-	-	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-	-	-	-
2014	4,219	-	-	-	-	-	-	-	-	-
2015	7,536	255	155	209	26	-	-	-	-	-
2016	10,570	589	288	390	48	87	1,234	786	-	-
2017	12,377	1,277	425	575	71	222	3,093	1,164	-	-
2018	6,666	2,333	512	696	87	512	6,984	1,424	3,935	-
2019	6,870	3,395	552	756	95	997	13,017	1,560	7,339	-
2020	6,996	4,101	569	784	99	1,563	19,180	1,627	10,752	159
2021	7,092	4,500	581	801	102	2,032	23,244	1,665	13,041	418
2022	7,183	4,712	589	812	103	2,311	25,266	1,692	14,193	1,049
2023	7,269	4,844	595	822	105	2,454	26,168	1,714	14,727	2,376
2024	7,354	4,946	602	831	106	2,527	26,587	1,735	15,000	4,442
2025	7,439	5,038	608	841	107	2,572	26,812	1,755	15,177	6,537
2026	7,524	5,125	614	851	108	2,605	26,967	1,775	15,319	7,929
2027	7,608	5,212	620	860	110	2,635	27,089	1,795	15,448	8,633
2028	7,689	5,302	626	870	111	2,664	27,212	1,815	15,568	8,963
2029	7,769	5,393	633	881	112	2,693	27,323	1,833	15,691	9,132
2030	7,852	5,489	640	892	113	2,724	27,421	1,853	15,819	9,243

Summary - Program Sector Materials Diversion by Program
Recommended Year 2025 All MSW Sectors

Material MSW		Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)	Curb/Apt Rec 2	BY YW In City 3	BY FW In City 4	Grasscycle 5	BY YW Not City 6	BY FW Not City 7	Curb/Apt Org 8
Aluminum Beverage	BALU	405	2,628	3,033	86.6%	965	-	-	-	-	-	-
Beverage Glass	BGLS	1,703	21,354	23,056	92.6%	15,229	-	-	-	-	-	-
Construction Debris	CDEB	16,407	14,308	30,715	46.6%	-	-	-	-	-	-	-
Container Glass	CGLS	257	3,356	3,613	92.9%	2,981	-	-	-	-	-	-
Computer Office Paper	CPO	6,533	21,301	27,834	76.5%	-	-	-	-	-	-	-
Food Cans	FFER	616	2,936	3,552	82.7%	1,082	-	-	-	-	-	-
Food	FOOD	16,591	119,243	135,834	87.8%	-	-	1,110	-	-	1,715	31,632
Miscellaneous	MISC	45,917	32,872	78,789	41.7%	-	-	-	-	-	-	-
Mixed Scrap Paper	MWP	8,343	61,803	70,147	88.1%	25,367	-	-	-	-	-	-
Newspaper	NP	4,665	44,393	49,058	90.5%	15,792	-	-	-	-	-	-
Other Paper	NRP	13,182	22,608	35,790	63.2%	-	-	-	-	-	-	3,735
Other Aluminum	OALU	763	401	1,164	34.5%	-	-	-	-	-	-	-
Corrugated Kraft	OCC	9,386	75,833	85,219	89.0%	13,453	-	-	-	-	-	-
Other Ferrous	OFER	5,162	19,985	25,147	79.5%	630	-	-	-	-	-	-
Other Glass	OGLS	5,140	971	6,110	15.9%	-	-	-	-	-	-	-
Other NonFerrous	ONFR	145	71	216	33.0%	-	-	-	-	-	-	-
Other Organics	OORG	30,657	9,109	39,766	22.9%	-	-	-	-	-	-	-
Plastics	PLST	44,588	13,831	58,419	23.7%	3,874	-	-	-	-	-	-
Wood	WOOD	26,177	28,112	54,289	51.8%	-	-	-	-	-	-	-
Yard	YARD	8,596	101,680	110,276	92.2%	-	2,624	-	7,168	3,534	-	51,235
Total	Grand 1	245,233	596,795	842,027	70.9%	79,372	2,624	1,110	7,168	3,534	1,715	86,601

(in tons per year)

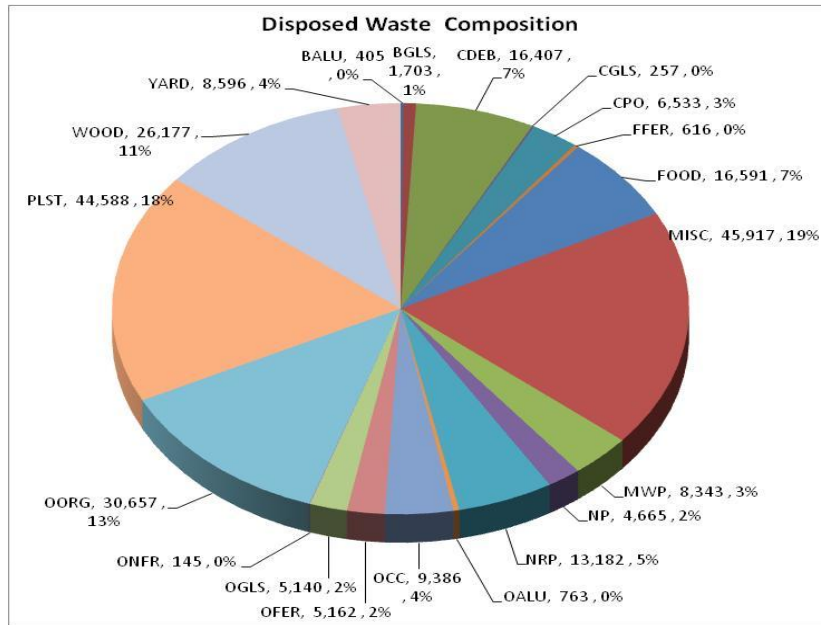
Year	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)
1997	453,787	362,386	816,174	44.4%
1998	457,598	362,613	820,212	44.2%
1999	477,433	374,866	852,299	44.0%
2000	476,131	317,693	793,825	40.0%
2001	475,270	307,623	782,894	39.3%
2002	462,996	305,426	768,422	39.7%
2003	458,010	283,646	741,656	38.2%
2004	458,405	321,656	780,061	41.2%
2005	440,876	348,864	789,740	44.2%
2006	438,380	397,993	836,373	47.6%
2007	438,845	409,280	848,125	48.3%
2008	394,607	395,000	789,607	50.0%
2009	351,688	367,735	719,423	51.1%
2010	383,438	397,226	780,664	50.9%
2011	382,112	401,074	783,186	51.2%
2012	377,271	412,028	789,299	52.2%
2013	363,453	428,379	791,832	54.1%
2014	342,118	452,205	794,323	56.9%
2015	318,222	477,476	795,698	60.0%
2016	299,551	498,517	798,068	62.5%
2017	283,490	518,974	802,464	64.7%
2018	277,168	527,669	804,837	65.6%
2019	264,284	542,787	807,071	67.3%
2020	253,741	556,953	810,694	68.7%
2021	248,245	568,592	816,837	69.6%
2022	246,242	576,711	822,953	70.1%
2023	245,651	583,529	829,180	70.4%
2024	245,254	590,276	835,530	70.6%
2025	245,233	596,795	842,027	70.9%
2026	246,070	602,511	848,581	71.0%
2027	247,654	607,489	855,143	71.0%
2028	249,647	612,183	861,830	71.0%
2029	251,839	616,789	868,628	71.0%
2030	254,180	621,467	875,647	71.0%

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Material MSW		MF										
		Textile Market Dev	Univer Org Serv	MF Org Ban	Pet Waste & Diapers	Plast Bag Ban Res	SF Org Ban	Incr Res Ban Enforce	Reuse Bag Res	Clean Green	ABC Ban	Drop Sites
		12	13	14	15	16	18	19	20	21	22	23
Aluminum Beverage	BALU	-	-	-	-	-	-	202	-	-	-	4
Beverage Glass	BGLS	-	-	-	-	-	-	925	-	-	-	537
Construction Debris	CDEB	-	-	-	-	-	-	-	-	-	4,722	-
Container Glass	CGLS	-	-	-	-	-	-	223	-	-	-	-
Computer Office Paper	CPO	-	-	-	-	-	-	558	-	-	-	-
Food Cans	FFER	-	-	-	-	-	-	434	-	-	-	-
Food	FOOD	-	4,499	3,916	-	-	11,053	-	-	-	-	-
Miscellaneous	MISC	-	-	-	-	-	-	-	-	-	-	63
Mixed Scrap Paper	MWP	-	-	-	-	-	-	3,452	-	-	-	477
Newspaper	NP	-	-	-	-	-	-	545	-	-	-	385
Other Paper	NRP	-	1,006	1,122	-	-	4,218	-	-	-	-	-
Other Aluminum	OALU	-	-	-	-	-	-	-	-	-	-	-
Corrugated Kraft	OCC	-	-	-	-	-	-	1,147	-	-	-	1,006
Other Ferrous	OFER	-	-	-	-	-	-	-	-	-	-	5,036
Other Glass	OGLS	-	-	-	-	-	-	-	-	-	-	-
Other NonFerrous	ONFR	-	-	-	-	-	-	-	-	-	-	-
Other Organics	OORG	2,572	-	-	6,537	-	-	-	-	-	-	-
Plastics	PLST	-	-	-	-	608	-	-	107	-	-	27
Wood	WOOD	-	-	-	-	-	-	-	-	-	-	244
Yard	YARD	-	-	-	-	-	-	1,217	-	14,081	-	-
Total	Grand Total	2,572	5,505	5,038	6,537	608	15,271	8,703	107	14,081	4,722	7,779

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Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Material MSW		Ban	Floor	Com Priv	Ban Com	Foodware	Enhanc	Enhance	Extend	Restore	
		Asphalt	Sort 50%								Com Priv
		Shingles	C&D	Rec	Org	Rec/Comp	Carpet	Org	Ban Enforce	Com Ban	Education
		26	29	30	32	35	36	37	38	39	41
Aluminum Beverage	BALU	-	-	885	-	-	-	-	-	539	17
Beverage Glass	BGLS	-	-	2,771	-	-	-	-	-	1,781	46
Construction Debris	CDEB	482	7,167	-	-	-	-	-	-	-	-
Container Glass	CGLS	-	-	-	-	-	-	-	-	128	11
Computer Office Paper	CPO	-	-	16,023	-	-	-	-	4,438	-	52
Food Cans	FFER	-	-	775	-	-	-	-	-	604	26
Food	FOOD	-	-	35,055	22,404	7,498	-	-	-	-	-
Miscellaneous	MISC	-	-	30,038	-	-	1,543	-	-	-	-
Mixed Scrap Paper	MWP	-	-	25,197	-	-	-	-	3,391	-	185
Newspaper	NP	-	-	23,919	-	-	-	-	3,558	-	194
Other Paper	NRP	-	-	-	4,408	8,119	-	-	-	-	-
Other Aluminum	OALU	-	-	-	-	-	-	-	-	365	27
Corrugated Kraft	OCC	-	750	52,004	-	-	-	-	6,175	-	438
Other Ferrous	OFER	-	1,533	6,942	-	-	-	-	-	-	466
Other Glass	OGLS	-	-	971	-	-	-	-	-	-	-
Other NonFerrous	ONFR	-	42	-	-	-	-	-	-	-	-
Other Organics	OORG	-	-	-	-	-	-	-	-	-	-
Plastics	PLST	-	-	4,407	-	755	-	-	-	3,075	-
Wood	WOOD	-	8,925	-	-	-	-	-	-	-	2,160
Yard	YARD	-	-	20,899	-	-	-	-	-	-	381
Total	Grand 1	482	18,417	219,885	26,812	16,373	1,543	-	17,562	6,492	4,003

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Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Material MSW		Latex	Educatio	Phone &	Ban	Com C&D	Plast	Divert	
		Paint	n Audits	Junk Opt	Clean	Ban	Film	Pre Scale	Reuseab
		Prod Stew	43	Out	Wood	Ban	Ban	Recycle	les
		42	43	44	45	46	50	51	52
Aluminum Beverage	BALU	-	4	-	-	-	-	12	-
Beverage Glass	BGLS	-	14	-	-	-	-	50	-
Construction Debris	CDEB	-	665	-	-	1,272	-	-	-
Container Glass	CGLS	-	3	-	-	-	-	10	-
Computer Office Paper	CPO	-	139	91	-	-	-	-	-
Food Cans	FFER	-	3	-	-	-	-	11	-
Food	FOOD	-	360	-	-	-	-	-	-
Miscellaneous	MISC	841	-	-	-	351	-	-	35
Mixed Scrap Paper	MWP	-	248	3,175	-	-	-	311	-
Newspaper	NP	-	-	-	-	-	-	0	-
Other Paper	NRP	-	-	-	-	-	-	-	-
Other Aluminum	OALU	-	10	-	-	-	-	-	-
Corrugated Kraft	OCC	-	382	-	-	-	-	478	-
Other Ferrous	OFER	-	246	-	-	4,248	-	860	25
Other Glass	OGLS	-	-	-	-	-	-	-	-
Other NonFerrous	ONFR	-	7	-	-	-	-	23	-
Other Organics	OORG	-	-	-	-	-	-	-	-
Plastics	PLST	-	36	-	-	839	104	-	-
Wood	WOOD	-	829	-	7,439	8,467	-	-	47
Yard	YARD	-	542	-	-	-	-	-	-
Total	Grand 1	841	3,489	3,266	7,439	15,177	104	1,755	107

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Summary - Program Sector Materials Diversion by Program
Recommended Year 2025 Single Family Sector

Material MSW		Total	Total	Total	Percent	Curb/Apt Rec	BY YW In City	BY FW In City	Grasscycl e	BY YW Not City	BY FW Not City
		Disposed 1	Recycled 2	Generated 3	Recycled (2/3)						
Aluminum Beverage	BALU	71	877	948	92.5%	742	-	-	-	-	-
Beverage Glass	BGLS	264	11,075	11,339	97.7%	10,575	-	-	-	-	-
Construction Debris	CDEB	815	-	815	0.0%	-	-	-	-	-	-
Container Glass	CGLS	86	2,233	2,319	96.3%	2,070	-	-	-	-	-
Computer Office Paper	CPO	199	455	653	69.6%	-	-	-	-	-	-
Food Cans	FFER	151	1,121	1,272	88.1%	835	-	-	-	-	-
Food	FOOD	1,196	41,345	42,540	97.2%	-	-	1,110	-	-	1,715
Miscellaneous	MISC	3,164	88	3,252	2.7%	-	-	-	-	-	-
Mixed Scrap Paper	MWP	1,057	23,448	24,505	95.7%	18,507	-	-	-	-	-
Newspaper	NP	161	12,227	12,388	98.7%	11,923	-	-	-	-	-
Other Paper	NRP	2,373	7,042	9,416	74.8%	-	-	-	-	-	-
Other Aluminum	OALU	334	14	348	4.0%	-	-	-	-	-	-
Corrugated Kraft	OCC	284	9,328	9,611	97.0%	8,790	-	-	-	-	-
Other Ferrous	OFER	592	414	1,006	41.2%	390	-	-	-	-	-
Other Glass	OGLS	151	-	151	0.0%	-	-	-	-	-	-
Other NonFerrous	ONFR	3	-	3	0.0%	-	-	-	-	-	-
Other Organics	OORG	13,601	7,221	20,822	34.7%	-	-	-	-	-	-
Plastics	PLST	7,293	3,388	10,681	31.7%	2,951	-	-	-	-	-
Wood	WOOD	886	37	923	4.0%	-	-	-	-	-	-
Yard	YARD	319	63,671	63,989	99.5%	-	2,624	-	7,168	3,534	-
Total	Grand	32,999	183,983	216,982	84.8%	56,782	2,624	1,110	7,168	3,534	1,715

(in tons per year)

Year	Total	Total	Total	Percent
	Disposed 1	Recycled 2	Generated 3	Recycled (2/3)
1997	88,783	137,555	226,337	60.8%
1998	87,560	137,686	225,247	61.1%
1999	88,631	141,956	230,586	61.6%
2000	87,499	120,969	208,468	58.0%
2001	91,072	120,910	211,982	57.0%
2002	87,834	118,640	206,474	57.5%
2003	87,426	118,322	205,748	57.5%
2004	86,029	123,103	209,132	58.9%
2005	80,479	128,197	208,676	61.4%
2006	78,078	138,810	216,889	64.0%
2007	77,494	142,634	220,127	64.8%
2008	73,961	139,928	213,889	65.4%
2009	67,229	147,786	215,015	68.7%
2010	67,893	151,706	219,599	69.1%
2011	66,550	151,809	218,360	69.5%
2012	64,092	153,222	217,314	70.5%
2013	61,391	154,644	216,035	71.6%
2014	56,935	157,829	214,764	73.5%
2015	52,567	160,998	213,565	75.4%
2016	47,829	165,141	212,970	77.5%
2017	44,073	170,588	214,661	79.5%
2018	41,145	172,447	213,592	80.7%
2019	39,404	172,962	212,366	81.4%
2020	38,275	173,119	211,394	81.9%
2021	37,834	174,590	212,424	82.2%
2022	37,290	176,161	213,451	82.5%
2023	36,258	178,332	214,590	83.1%
2024	34,627	181,139	215,766	84.0%
2025	32,999	183,983	216,982	84.8%
2026	31,995	186,176	218,171	85.3%
2027	31,598	187,758	219,357	85.6%
2028	31,543	189,063	220,606	85.7%
2029	31,638	190,268	221,906	85.7%
2030	31,806	191,521	223,328	85.8%

**Summary - Program Sector Materials Diversion by Program
Recommended Year 2025 Multi Family Sector**

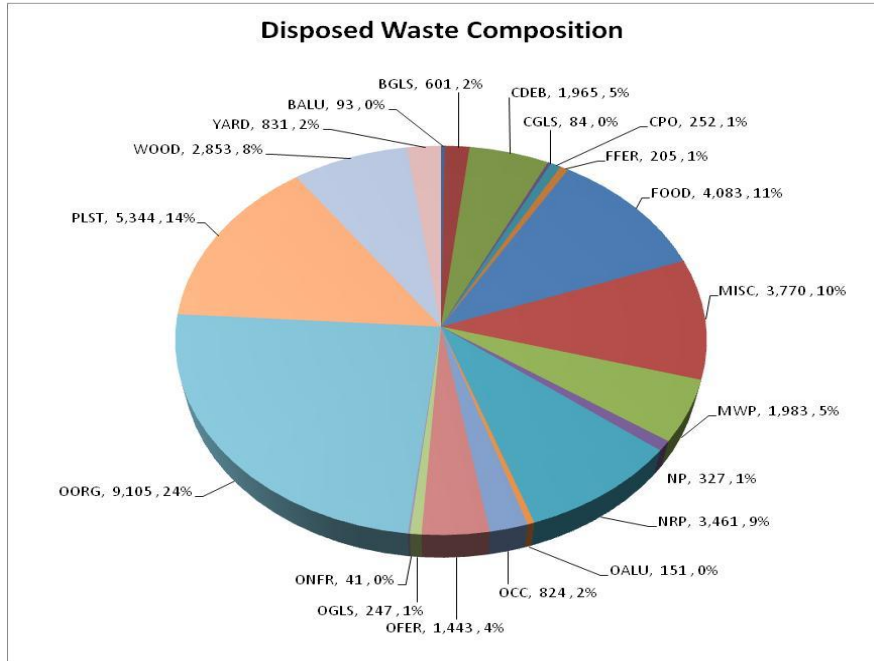
Material MSW	Row Lal	Total	Total	Total	Percent	Curb/Apt Rec	Curb/Apt Org	Market Dev	Waste & Diapers	Bag Ban Res
		Disposed	Recycled	Generated	Recycled					
		1	2	3	(2/3)	2	8	12	15	16
Aluminum Beverage	BALU	93	298	391	76.2%	224	-	-	-	-
Beverage Glass	BGLS	601	5,090	5,692	89.4%	4,655	-	-	-	-
Construction Debris	CDEB	1,965	-	1,965	0.0%	-	-	-	-	-
Container Glass	CGLS	84	978	1,061	92.1%	911	-	-	-	-
Computer Office Paper	CPO	252	213	465	45.8%	-	-	-	-	-
Food Cans	FFER	205	409	615	66.6%	246	-	-	-	-
Food	FOOD	4,083	12,581	16,664	75.5%	-	4,166	-	-	-
Miscellaneous	MISC	3,770	292	4,062	7.2%	-	-	-	-	-
Mixed Scrap Paper	MWP	1,983	8,672	10,655	81.4%	6,860	-	-	-	-
Newspaper	NP	327	4,129	4,456	92.7%	3,869	-	-	-	-
Other Paper	NRP	3,461	3,038	6,499	46.7%	-	910	-	-	-
Other Aluminum	OALU	151	6	158	4.0%	-	-	-	-	-
Corrugated Kraft	OCC	824	5,318	6,143	86.6%	4,662	-	-	-	-
Other Ferrous	OFER	1,443	300	1,744	17.2%	240	-	-	-	-
Other Glass	OGLS	247	-	247	0.0%	-	-	-	-	-
Other NonFerrous	ONFR	41	-	41	0.0%	-	-	-	-	-
Other Organics	OORG	9,105	1,888	10,994	17.2%	-	-	1,092	796	-
Plastics	PLST	5,344	1,201	6,545	18.4%	923	-	-	-	240
Wood	WOOD	2,853	119	2,972	4.0%	-	-	-	-	-
Yard	YARD	831	2,154	2,985	72.2%	-	1,492	-	-	-
Total	Grand T	37,665	46,688	84,353	55.3%	22,590	6,568	1,092	796	240

Year	Total	Total	Total	Percent
	Disposed	Recycled	Generated	Recycled
	1	2	3	(2/3)
1997	59,189	11,371	70,560	16.1%
1998	58,374	12,266	70,640	17.4%
1999	59,087	12,639	71,726	17.6%
2000	58,333	12,595	70,927	17.8%
2001	53,487	15,124	68,611	22.0%
2002	55,076	15,068	70,144	21.5%
2003	56,106	16,043	72,149	22.2%
2004	56,498	16,142	72,640	22.2%
2005	54,080	18,245	72,325	25.2%
2006	55,643	19,903	75,545	26.3%
2007	55,759	21,261	77,020	27.6%
2008	53,199	21,024	74,223	28.3%
2009	51,497	19,028	70,524	27.0%
2010	52,955	19,813	72,767	27.2%
2011	52,950	20,140	73,090	27.6%
2012	50,703	22,766	73,469	31.0%
2013	48,330	25,431	73,761	34.5%
2014	45,536	28,509	74,046	38.5%
2015	42,736	31,612	74,347	42.5%
2016	40,879	34,106	74,985	45.5%
2017	39,760	36,414	76,174	47.8%
2018	38,460	38,313	76,773	49.9%
2019	37,266	39,926	77,193	51.7%
2020	36,497	41,208	77,705	53.0%
2021	36,457	42,506	78,963	53.8%
2022	36,664	43,574	80,238	54.3%
2023	36,983	44,592	81,575	54.7%
2024	37,304	45,642	82,946	55.0%
2025	37,665	46,688	84,353	55.3%
2026	38,125	47,646	85,771	55.6%
2027	38,681	48,529	87,209	55.6%
2028	39,305	49,390	88,695	55.7%
2029	39,969	50,255	90,223	55.7%
2030	40,674	51,153	91,826	55.7%

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Material MSW	Row Lat	Ban	Reuse	Univer	MF Org	Educatio	Junk Opt	Paint
		Enforce	Bag Res	Org Serv	Ban	n	Out	Prod
		19	20	13	14	41	44	42
Aluminum Beverage	BALU	70	-	-	-	4	-	-
Beverage Glass	BGLS	436	-	-	-	-	-	-
Construction Debris	CDEB	-	-	-	-	-	-	-
Container Glass	CGLS	63	-	-	-	3	-	-
Computer Office Paper	CPO	190	-	-	-	11	12	-
Food Cans	FFER	155	-	-	-	9	-	-
Food	FOOD	-	-	4,499	3,916	-	-	-
Miscellaneous	MISC	-	-	-	-	-	-	292
Mixed Scrap Paper	MWP	1,495	-	-	-	83	234	-
Newspaper	NP	247	-	-	-	14	-	-
Other Paper	NRP	-	-	1,006	1,122	-	-	-
Other Aluminum	OALU	-	-	-	-	6	-	-
Corrugated Kraft	OCC	622	-	-	-	34	-	-
Other Ferrous	OFER	-	-	-	-	60	-	-
Other Glass	OGLS	-	-	-	-	-	-	-
Other NonFerrous	ONFR	-	-	-	-	-	-	-
Other Organics	OORG	-	-	-	-	-	-	-
Plastics	PLST	-	38	-	-	-	-	-
Wood	WOOD	-	-	-	-	119	-	-
Yard	YARD	627	-	-	-	35	-	-
Total	Grand T	3,905	38	5,505	5,038	377	247	292

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Summary - Program Sector Materials Diversion by Program
Recommended Year 2025 Commercial Sector

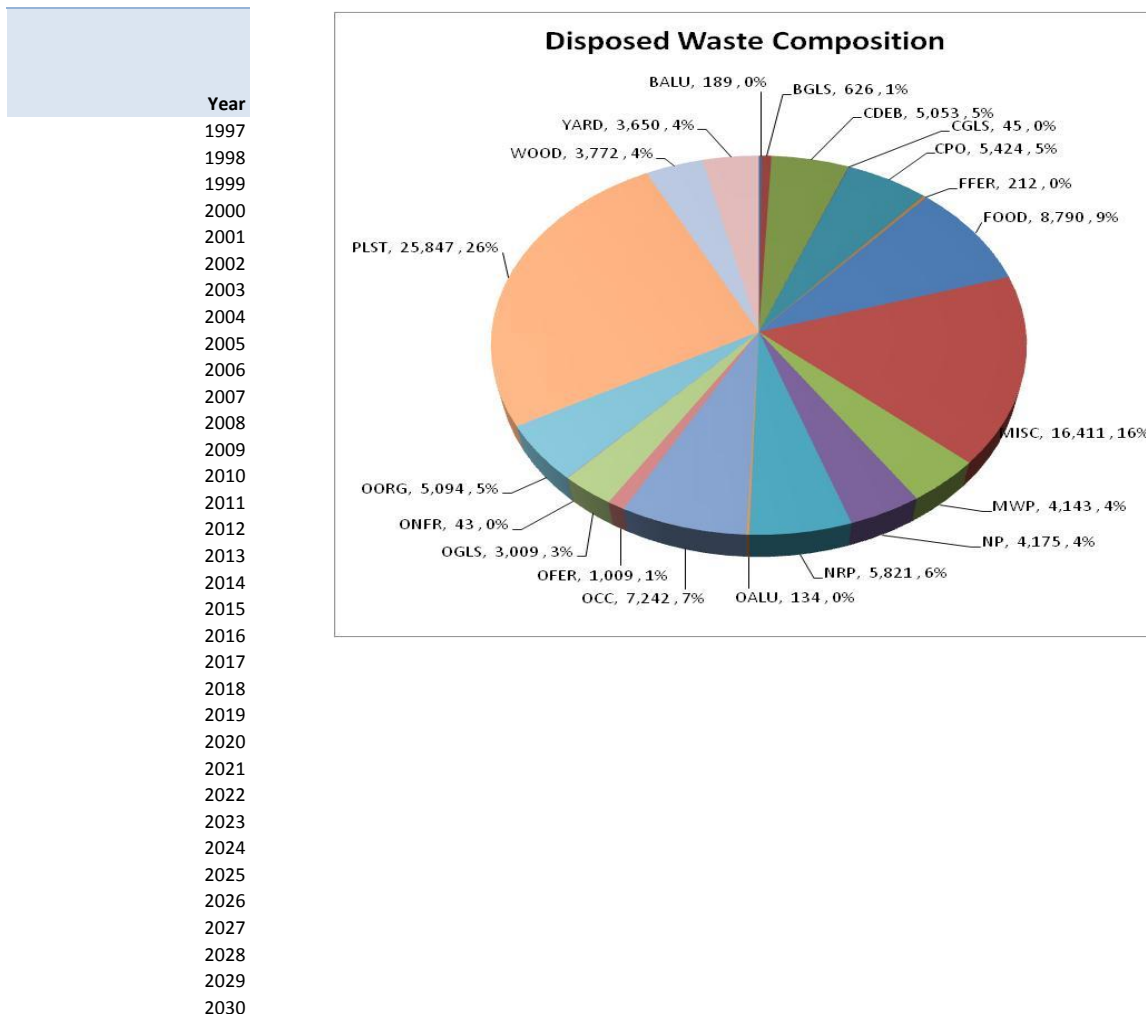
Material MSW		Total	Total	Total	Percent	Com Priv Rec 30	Ban Com Org 32	Foodware Rec/Comp 35	Enhanc Com Org 37
		Disposed 1	Recycled 2	Generated 3	Recycled (2/3)				
Aluminum Beverage	BALU	189	1,431	1,620	88.3%	885	-	-	-
Beverage Glass	BGLS	626	4,578	5,204	88.0%	2,771	-	-	-
Construction Debris	CDEB	5,053	1,272	6,325	20.1%	-	-	-	-
Container Glass	CGLS	45	130	175	74.3%	-	-	-	-
Computer Office Paper	CPO	5,424	20,461	25,886	79.0%	16,023	-	-	-
Food Cans	FFER	212	1,388	1,601	86.7%	775	-	-	-
Food	FOOD	8,790	64,957	73,746	88.1%	35,055	22,404	7,498	-
Miscellaneous	MISC	16,411	30,850	47,260	65.3%	30,038	-	-	-
Mixed Scrap Paper	MWP	4,143	28,590	32,733	87.3%	25,197	-	-	-
Newspaper	NP	4,175	27,651	31,825	86.9%	23,919	-	-	-
Other Paper	NRP	5,821	12,528	18,349	68.3%	-	4,408	8,119	-
Other Aluminum	OALU	134	365	499	73.2%	-	-	-	-
Corrugated Kraft	OCC	7,242	58,484	65,727	89.0%	52,004	-	-	-
Other Ferrous	OFER	1,009	11,412	12,421	91.9%	6,942	-	-	-
Other Glass	OGLS	3,009	971	3,980	24.4%	971	-	-	-
Other NonFerrous	ONFR	43	0	43	0.0%	-	-	-	-
Other Organics	OORG	5,094	-	5,094	0.0%	-	-	-	-
Plastics	PLST	25,847	9,080	34,927	26.0%	4,407	-	755	-
Wood	WOOD	3,772	8,977	12,749	70.4%	-	-	-	-
Yard	YARD	3,650	21,052	24,701	85.2%	20,899	-	-	-
Total	..	100,690	304,177	404,866	75.1%	219,885	26,812	16,373	-

(in tons per year)

Year	Total Disposed 1	Total Recycled 2	Total Generated 3	Percent Recycled (2/3)
1997	208,670	194,323	402,994	48.2%
1998	213,646	194,251	407,896	47.6%
1999	225,348	199,968	425,316	47.0%
2000	228,417	162,989	391,405	41.6%
2001	228,405	149,453	377,858	39.6%
2002	217,195	149,025	366,220	40.7%
2003	213,247	126,956	340,202	37.3%
2004	216,112	159,341	375,453	42.4%
2005	205,819	179,265	385,083	46.6%
2006	201,231	215,258	416,489	51.7%
2007	198,493	219,894	418,387	52.6%
2008	176,774	213,493	390,267	54.7%
2009	151,398	184,593	335,992	54.9%
2010	171,363	207,450	378,813	54.8%
2011	169,610	210,521	380,131	55.4%
2012	166,665	216,824	383,489	56.5%
2013	160,445	224,014	384,460	58.3%
2014	151,526	234,242	385,769	60.7%
2015	141,536	244,879	386,415	63.4%
2016	136,103	251,099	387,203	64.8%
2017	128,921	259,003	387,925	66.8%
2018	128,020	261,135	389,155	67.1%
2019	118,120	272,598	390,718	69.8%
2020	109,019	284,337	393,356	72.3%
2021	103,348	292,427	395,775	73.9%
2022	100,897	297,162	398,060	74.7%
2023	100,201	300,074	400,275	75.0%
2024	100,283	302,255	402,538	75.1%
2025	100,690	304,177	404,866	75.1%
2026	101,232	306,036	407,268	75.1%
2027	101,824	307,849	409,674	75.1%
2028	102,442	309,701	412,143	75.1%
2029	103,084	311,574	414,658	75.1%
2030	103,730	313,412	417,142	75.1%

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Material MSW		Com Paper			Plast Film Ban	Educati on Audits	ABC Ban	Latex Paint	
		Enforce	Extend Com Ban	Restore Education				Prod Stew	Ban Clean Wood
		38	39	41	50	43	22	42	45
Aluminum Beverage	BALU	-	539	8	-	0	-	-	-
Beverage Glass	BGLS	-	1,781	26	-	0	-	-	-
Construction Debris	CDEB	-	-	-	-	-	-	-	-
Container Glass	CGLS	-	128	2	-	0	-	-	-
Computer Office Paper	CPO	4,438	-	-	-	-	-	-	-
Food Cans	FFER	-	604	9	-	0	-	-	-
Food	FOOD	-	-	-	-	-	-	-	-
Miscellaneous	MISC	-	-	-	-	-	-	461	-
Mixed Scrap Paper	MWP	3,391	-	-	-	2	-	-	-
Newspaper	NP	3,558	-	174	-	-	-	-	-
Other Paper	NRP	-	-	-	-	-	-	-	-
Other Aluminum	OALU	-	365	-	-	0	-	-	-
Corrugated Kraft	OCC	6,175	-	302	-	4	-	-	-
Other Ferrous	OFER	-	-	219	-	3	-	-	-
Other Glass	OGLS	-	-	-	-	-	-	-	-
Other NonFerrous	ONFR	-	-	-	-	0	-	-	-
Other Organics	OORG	-	-	-	-	-	-	-	-
Plastics	PLST	-	3,075	-	-	5	-	-	-
Wood	WOOD	-	-	510	-	-	-	-	-
Yard	YARD	-	-	152	-	-	-	-	-
Total	..	17,562	6,492	1,402	-	14	-	461	-



Summary - Program Sector Materials Diversion by Program
Recommended Year 2025 Self Haul Sector

Material MSW		Total	Total	Total	Percent	Clean Green	Drop Sites	Carpet	Ban	
		Disposed	Recycled	Generated	Recycled				Asphalt Shingles	Floor Sort 50% C&D
	.	1	2	3	(2/3)	21	23	36	26	29
Aluminum Beverage	BALU	51	22	73	30.1%	-	4	-	-	-
Beverage Glass	BGLS	211	610	822	74.3%	-	537	-	-	-
Construction Debris	CDEB	8,575	13,036	21,611	60.3%	-	-	-	482	7,167
Container Glass	CGLS	42	15	57	25.7%	-	-	-	-	-
Computer Office Paper	CPO	657	173	830	20.8%	-	-	-	-	-
Food Cans	FFER	48	17	65	25.7%	-	-	-	-	-
Food	FOOD	2,523	360	2,883	12.5%	-	-	-	-	-
Miscellaneous	MISC	22,573	1,642	24,215	6.8%	-	63	1,543	-	-
Mixed Scrap Paper	MWP	1,161	1,093	2,253	48.5%	-	477	-	-	-
Newspaper	NP	2	386	388	99.4%	-	385	-	-	-
Other Paper	NRP	1,526	-	1,526	0.0%	-	-	-	-	-
Other Aluminum	OALU	144	16	160	10.0%	-	-	-	-	-
Corrugated Kraft	OCC	1,036	2,703	3,739	72.3%	-	1,006	-	-	750
Other Ferrous	OFER	2,117	7,859	9,976	78.8%	-	5,036	-	-	1,533
Other Glass	OGLS	1,733	-	1,733	0.0%	-	-	-	-	-
Other NonFerrous	ONFR	58	71	129	55.1%	-	-	-	-	42
Other Organics	OORG	2,857	-	2,857	0.0%	-	-	-	-	-
Plastics	PLST	6,103	162	6,265	2.6%	-	27	-	-	-
Wood	WOOD	18,665	18,979	37,644	50.4%	-	244	-	-	8,925
Yard	YARD	3,797	14,804	18,601	79.6%	14,081	-	-	-	-
Total	..	73,879	61,947	135,826	#N/A	14,081	7,779	1,543	482	18,417

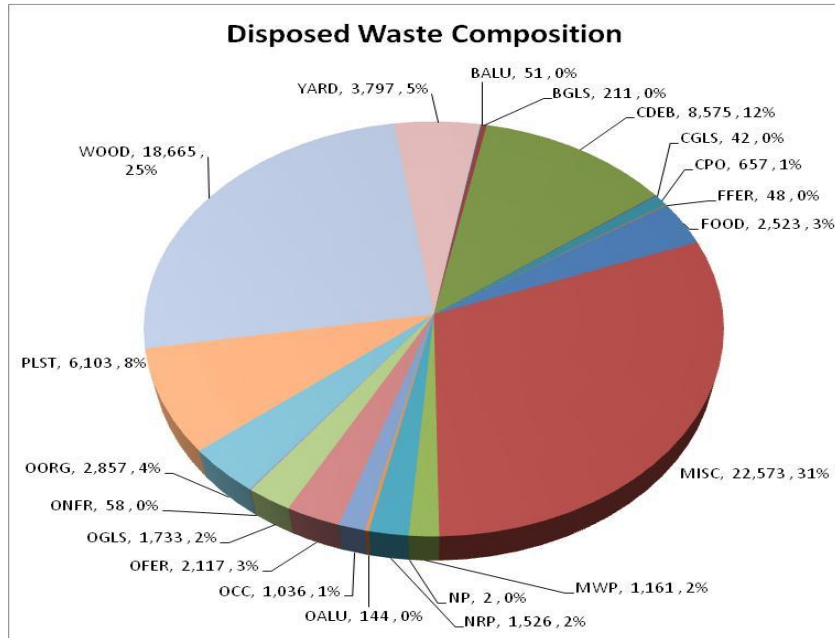
(in tons per year)

Year	Total	Total	Total	Percent
	Disposed	Recycled	Generated	Recycled
	1	2	3	(2/3)
1997	97,146	19,137	116,283	16.5%
1998	98,019	18,410	116,429	15.8%
1999	104,367	20,304	124,671	16.3%
2000	101,883	21,141	123,024	17.2%
2001	102,305	22,137	124,442	17.8%
2002	102,891	22,693	125,584	18.1%
2003	101,232	22,325	123,557	18.1%
2004	99,766	23,070	122,836	18.8%
2005	100,499	23,157	123,656	18.7%
2006	103,428	24,022	127,450	18.8%
2007	107,098	25,492	132,591	19.2%
2008	90,673	20,556	111,229	18.5%
2009	81,565	16,328	97,893	16.7%
2010	91,226	18,257	109,484	16.7%
2011	93,001	18,604	111,605	16.7%
2012	95,811	19,216	115,027	16.7%
2013	93,287	24,290	117,576	20.7%
2014	88,120	31,624	119,745	26.4%
2015	81,383	39,988	121,371	32.9%
2016	74,740	48,171	122,911	39.2%
2017	70,736	52,968	123,704	42.8%
2018	69,543	55,774	125,317	44.5%
2019	69,493	57,300	126,794	45.2%
2020	69,949	58,290	128,239	45.5%
2021	70,605	59,069	129,674	45.6%
2022	71,391	59,813	131,204	45.6%
2023	72,209	60,531	132,740	45.6%
2024	73,039	61,239	134,279	45.6%
2025	73,879	61,947	135,826	45.6%
2026	74,718	62,653	137,370	45.6%
2027	75,551	63,352	138,904	45.6%
2028	76,358	64,029	140,387	45.6%
2029	77,149	64,692	141,841	45.6%
2030	77,970	65,381	143,351	45.6%

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Material MSW		Restore Education	Plast		Education Audits	Divert		Ban Clean Wood
			Film Ban	Pre Scale Recycle		Reuseables	ABC Ban	
	.	41	50	51	43	52	22	45
Aluminum Beverage	BALU	2	-	12	3	-	-	-
Beverage Glass	BGLS	9	-	50	14	-	-	-
Construction Debris	CDEB	-	-	-	665	-	4,722	-
Container Glass	CGLS	2	-	10	3	-	-	-
Computer Office Paper	CPO	33	-	-	139	-	-	-
Food Cans	FFER	2	-	11	3	-	-	-
Food	FOOD	-	-	-	360	-	-	-
Miscellaneous	MISC	-	-	-	-	35	-	-
Mixed Scrap Paper	MWP	59	-	311	246	-	-	-
Newspaper	NP	0	-	0	-	-	-	-
Other Paper	NRP	-	-	-	-	-	-	-
Other Aluminum	OALU	6	-	-	10	-	-	-
Corrugated Kraft	OCC	90	-	478	379	-	-	-
Other Ferrous	OFER	162	-	860	243	25	-	-
Other Glass	OGLS	-	-	-	-	-	-	-
Other NonFerrous	ONFR	-	-	23	7	-	-	-
Other Organics	OORG	-	-	-	-	-	-	-
Plastics	PLST	-	104	-	31	-	-	-
Wood	WOOD	1,494	-	-	829	47	-	7,439
Yard	YARD	181	-	-	542	-	-	-
Total	..	2,041	104	1,755	3,476	107	4,722	7,439

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**Summary of Recycling Program Benefits and Costs
Scenario 31, Recommended**

All Programs in Scenario

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$93,144,347	\$116,013	\$262,341	\$972,064	\$2,126,512	\$3,988,811	\$6,018,053
Program Cost	\$74,041,214	\$431,561	\$1,194,000	\$1,910,605	\$2,798,128	\$3,973,167	\$5,016,887
Net Benefits	\$19,103,133	(\$315,548)	(\$931,659)	(\$938,540)	(\$671,616)	\$15,644	\$1,001,166
Tons avoided through recycling	2,492,448	1,840	4,161	11,746	26,284	48,719	73,379

1/13/2012 (All costs in 2010 dollars)

12 Textile Market Dev

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$1,594,928	\$0	\$0	\$0	\$0	\$0	\$0
Program Cost	\$287,692	\$0	\$0	\$0	\$0	\$0	\$75,000
Net Benefits	\$1,307,236	\$0	\$0	\$0	\$0	\$0	(\$75,000)
Tons avoided through recycling	28,596	-	-	-	-	-	-
PV per ton	\$46						

13 MF Univer Org Serv

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$6,239,071	\$0	\$0	\$228,037	\$418,673	\$593,199	\$677,821
Program Cost	\$3,389,494	\$0	\$200,000	\$212,001	\$213,632	\$299,351	\$340,913
Net Benefits	\$2,849,577	\$0	(\$200,000)	\$16,036	\$205,041	\$293,848	\$336,908
Tons avoided through recycling	94,700	-	-	1,647	3,024	4,285	4,896
PV per ton	\$30						

14 MF Org Ban

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$3,599,830	\$0	\$0	\$0	\$0	\$0	\$35,281
Program Cost	\$1,981,153	\$0	\$0	\$0	\$0	\$135,000	\$97,328
Net Benefits	\$1,618,677	\$0	\$0	\$0	\$0	(\$135,000)	(\$62,047)
Tons avoided through recycling	62,510	-	-	-	-	-	255
PV per ton	\$26						

15 Pet Waste & Diapers

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$2,938,090	\$0	\$0	\$0	\$0	\$0	\$0
Program Cost	\$3,534,864	\$0	\$0	\$0	\$0	\$0	\$0
Net Benefits	(\$596,774)	\$0	\$0	\$0	\$0	\$0	\$0
Tons avoided through recycling	58,881	-	-	-	-	-	-
PV per ton	(\$10)						

16 Plast Bag Ban Res

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$520,976	\$0	\$0	\$0	\$0	\$0	\$21,465
Program Cost	(\$733,543)	\$0	\$0	\$0	\$0	\$0	(\$100,000)
Net Benefits	\$1,254,519	\$0	\$0	\$0	\$0	\$0	\$121,465
Tons avoided through recycling	8,609	-	-	-	-	-	155
PV per ton	\$146						

18 SF Org Ban

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$13,414,355	\$0	\$0	\$0	\$0	\$260,454	\$569,524
Program Cost	\$11,470,744	\$0	\$0	\$0	\$90,000	\$241,043	\$483,344
Net Benefits	\$1,943,612	\$0	\$0	\$0	(\$90,000)	\$19,411	\$86,179
Tons avoided through recycling	219,771	-	-	-	-	1,881	4,114
PV per ton	\$9						

19 Incr Res Ban Enforce

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$9,051,551	\$0	\$0	\$145,663	\$321,920	\$586,320	\$842,646
Program Cost	\$3,277,034	\$0	\$50,000	\$108,064	\$158,998	\$235,380	\$309,372
Net Benefits	\$5,774,517	\$0	(\$50,000)	\$37,599	\$162,921	\$350,940	\$533,274
Tons avoided through recycling	141,049	-	-	1,052	2,325	4,235	6,086
PV per ton	\$41						

20 Reuse Bag Res

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$90,348	\$0	\$0	\$0	\$0	\$1,346	\$3,082
Program Cost	\$200,307	\$0	\$0	\$0	\$0	\$25,000	\$25,000
Net Benefits	(\$109,959)	\$0	\$0	\$0	\$0	(\$23,654)	(\$21,918)
Tons avoided through recycling	1,498	-	-	-	-	10	22
PV per ton	(\$73)						

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

All Programs in Scenario

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$7,732,125	\$9,291,304	\$10,108,935	\$11,240,107	\$12,200,744	\$12,880,873
Program Cost	\$5,630,296	\$6,374,595	\$7,275,358	\$8,620,722	\$9,035,307	\$9,714,416
Net Benefits	\$2,101,830	\$2,916,709	\$2,833,577	\$2,619,385	\$3,165,437	\$3,166,457
Tons avoided through recycling	93,306	111,237	119,349	134,011	146,972	155,856

1/13/2012

12 Textile Market Dev

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$11,995	\$30,741	\$70,891	\$137,975	\$216,397	\$281,276
Program Cost	\$100,000	\$60,000	\$35,000	\$25,000	\$25,000	\$25,000
Net Benefits	(\$88,005)	(\$29,259)	\$35,891	\$112,975	\$191,397	\$256,276
Tons avoided through recycling	87	222	512	997	1,563	2,032

PV per ton

13 MF Univer Org Serv

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$695,942	\$699,378	\$698,591	\$699,429	\$702,868	\$713,784
Program Cost	\$349,813	\$351,501	\$351,114	\$351,526	\$353,215	\$408,576
Net Benefits	\$346,129	\$347,877	\$347,476	\$347,903	\$349,653	\$305,207
Tons avoided through recycling	5,027	5,051	5,046	5,052	5,077	5,156

PV per ton

14 MF Org Ban

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$81,480	\$176,832	\$323,021	\$469,985	\$567,753	\$623,040
Program Cost	\$48,019	\$94,851	\$166,653	\$238,834	\$286,853	\$314,007
Net Benefits	\$33,461	\$81,981	\$156,369	\$231,151	\$280,900	\$309,032
Tons avoided through recycling	589	1,277	2,333	3,395	4,101	4,500

PV per ton

15 Pet Waste & Diapers

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$0	\$0	\$0	\$0	\$22,076	\$57,821
Program Cost	\$0	\$0	\$0	\$345,000	\$39,679	\$117,145
Net Benefits	\$0	\$0	\$0	(\$345,000)	(\$17,603)	(\$59,324)
Tons avoided through recycling	-	-	-	-	159	418

PV per ton

16 Plast Bag Ban Res

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$39,909	\$58,899	\$70,870	\$76,481	\$78,797	\$80,427
Program Cost	(\$100,000)	(\$100,000)	(\$100,000)	(\$100,000)	(\$100,000)	(\$100,000)
Net Benefits	\$139,909	\$158,899	\$170,870	\$176,481	\$178,797	\$180,427
Tons avoided through recycling	288	425	512	552	569	581

PV per ton

18 SF Org Ban

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$1,044,600	\$1,533,082	\$1,835,049	\$1,972,062	\$2,023,274	\$2,056,354
Program Cost	\$886,533	\$1,301,099	\$1,557,373	\$1,673,653	\$1,717,116	\$1,745,190
Net Benefits	\$158,067	\$231,983	\$277,676	\$298,409	\$306,158	\$311,164
Tons avoided through recycling	7,545	11,073	13,254	14,244	14,614	14,853

PV per ton

19 Incr Res Ban Enforce

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$1,006,795	\$1,095,267	\$1,127,063	\$1,137,923	\$1,142,668	\$1,155,518
Program Cost	\$356,693	\$382,177	\$391,237	\$394,262	\$395,519	\$399,110
Net Benefits	\$650,101	\$713,090	\$735,826	\$743,661	\$747,149	\$756,407
Tons avoided through recycling	7,272	7,911	8,141	8,219	8,253	8,346

PV per ton

20 Reuse Bag Res

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$5,948	\$9,292	\$11,797	\$13,166	\$13,777	\$14,149
Program Cost	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Net Benefits	(\$19,052)	(\$15,708)	(\$13,203)	(\$11,834)	(\$11,223)	(\$10,851)
Tons avoided through recycling	43	67	85	95	100	102

PV per ton

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

All Programs in Scenario

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$13,333,450	\$13,734,561	\$14,175,003	\$14,596,232	\$14,911,114	\$15,127,302
Program Cost	\$10,114,484	\$10,498,902	\$10,880,129	\$11,278,861	\$11,490,449	\$11,767,100
Net Benefits	\$3,218,966	\$3,235,658	\$3,294,874	\$3,317,371	\$3,420,666	\$3,360,203
Tons avoided through recycling	161,282	165,350	169,287	172,926	175,743	177,821

1/13/2012

12 Textile Market Dev

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$319,996	\$339,693	\$349,856	\$356,078	\$360,719	\$364,793
Program Cost	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Net Benefits	\$294,996	\$314,693	\$324,856	\$331,078	\$335,719	\$339,793
Tons avoided through recycling	2,311	2,454	2,527	2,572	2,605	2,635

PV per ton

13 MF Univer Org Serv

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$725,135	\$737,150	\$749,515	\$762,220	\$775,030	\$788,021
Program Cost	\$364,152	\$370,053	\$376,126	\$382,366	\$388,657	\$395,038
Net Benefits	\$360,983	\$367,097	\$373,389	\$379,854	\$386,372	\$392,983
Tons avoided through recycling	5,238	5,324	5,414	5,505	5,598	5,692

PV per ton

14 MF Org Ban

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$652,310	\$670,669	\$684,788	\$697,475	\$709,602	\$721,648
Program Cost	\$328,384	\$337,401	\$384,335	\$350,566	\$356,522	\$362,439
Net Benefits	\$323,927	\$333,269	\$300,453	\$346,909	\$353,079	\$359,209
Tons avoided through recycling	4,712	4,844	4,946	5,038	5,125	5,212

PV per ton

15 Pet Waste & Diapers

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$145,244	\$328,919	\$614,978	\$905,070	\$1,097,753	\$1,195,242
Program Cost	\$172,381	\$377,643	\$697,123	\$1,020,801	\$1,235,419	\$1,343,601
Net Benefits	(\$27,138)	(\$48,724)	(\$82,145)	(\$115,731)	(\$137,666)	(\$148,359)
Tons avoided through recycling	1,049	2,376	4,442	6,537	7,929	8,633

PV per ton

16 Plast Bag Ban Res

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$81,507	\$82,426	\$83,289	\$84,147	\$84,991	\$85,838
Program Cost	(\$100,000)	(\$100,000)	(\$100,000)	(\$100,000)	(\$100,000)	(\$100,000)
Net Benefits	\$181,507	\$182,426	\$183,289	\$184,147	\$184,991	\$185,838
Tons avoided through recycling	589	595	602	608	614	620

PV per ton

18 SF Org Ban

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$2,075,009	\$2,089,326	\$2,101,983	\$2,114,270	\$2,126,024	\$2,137,634
Program Cost	\$1,761,023	\$1,793,173	\$1,783,915	\$1,794,343	\$1,804,318	\$1,814,171
Net Benefits	\$313,987	\$296,153	\$318,068	\$319,928	\$321,706	\$323,463
Tons avoided through recycling	14,987	15,091	15,182	15,271	15,356	15,440

PV per ton

19 Incr Res Ban Enforce

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$1,167,440	\$1,179,721	\$1,192,194	\$1,204,964	\$1,217,705	\$1,230,553
Program Cost	\$402,431	\$405,853	\$409,327	\$412,884	\$416,430	\$420,004
Net Benefits	\$765,009	\$773,868	\$782,867	\$792,080	\$801,275	\$810,549
Tons avoided through recycling	8,432	8,521	8,611	8,703	8,795	8,888

PV per ton

20 Reuse Bag Res

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$14,369	\$14,538	\$14,690	\$14,837	\$14,980	\$15,123
Program Cost	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
Net Benefits	(\$10,631)	(\$10,462)	(\$10,310)	(\$10,163)	(\$10,020)	(\$9,877)
Tons avoided through recycling	104	105	106	107	108	109

PV per ton

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

All Programs in Scenario

Year	2028	2029	2030
Program Benefits	\$15,292,710	\$15,437,208	\$15,577,702
Program Cost	\$11,785,818	\$11,899,828	\$11,979,021
Net Benefits	\$3,506,892	\$3,537,380	\$3,598,681
Tons avoided through recycling	179,523	181,068	182,586

1/13/2012

12 Textile Market Dev

Year	2028	2029	2030
Program Benefits	\$368,789	\$372,828	\$377,085
Program Cost	\$25,000	\$25,000	\$25,000
Net Benefits	\$343,789	\$347,828	\$352,085
Tons avoided through recycling	2,664	2,693	2,724

PV per ton

13 MF Univer Org Serv

Year	2028	2029	2030
Program Benefits	\$801,443	\$815,257	\$829,741
Program Cost	\$401,630	\$408,415	\$415,529
Net Benefits	\$399,813	\$406,842	\$414,212
Tons avoided through recycling	5,789	5,888	5,993

PV per ton

14 MF Org Ban

Year	2028	2029	2030
Program Benefits	\$733,996	\$746,669	\$759,942
Program Cost	\$368,504	\$374,728	\$381,247
Net Benefits	\$365,492	\$371,941	\$378,695
Tons avoided through recycling	5,302	5,393	5,489

PV per ton

15 Pet Waste & Diapers

Year	2028	2029	2030
Program Benefits	\$1,240,905	\$1,264,347	\$1,279,678
Program Cost	\$1,393,871	\$1,439,312	\$1,435,686
Net Benefits	(\$152,965)	(\$174,965)	(\$156,007)
Tons avoided through recycling	8,963	9,132	9,243

PV per ton

16 Plast Bag Ban Res

Year	2028	2029	2030
Program Benefits	\$86,718	\$87,625	\$88,591
Program Cost	(\$100,000)	(\$100,000)	(\$100,000)
Net Benefits	\$186,718	\$187,625	\$188,591
Tons avoided through recycling	626	633	640

PV per ton

18 SF Org Ban

Year	2028	2029	2030
Program Benefits	\$2,149,829	\$2,162,505	\$2,176,368
Program Cost	\$1,824,521	\$1,835,278	\$1,847,044
Net Benefits	\$325,308	\$327,226	\$329,324
Tons avoided through recycling	15,528	15,619	15,720

PV per ton

19 Incr Res Ban Enforce

Year	2028	2029	2030
Program Benefits	\$1,243,900	\$1,257,678	\$1,272,305
Program Cost	\$423,718	\$427,554	\$444,131
Net Benefits	\$820,181	\$830,124	\$828,174
Tons avoided through recycling	8,984	9,084	9,190

PV per ton

20 Reuse Bag Res

Year	2028	2029	2030
Program Benefits	\$15,271	\$15,425	\$15,588
Program Cost	\$25,000	\$25,000	\$25,000
Net Benefits	(\$9,729)	(\$9,575)	(\$9,412)
Tons avoided through recycling	110	111	113

PV per ton

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

22 ABC Ban

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$2,308,287	\$0	\$0	\$0	\$88,349	\$166,598	\$246,094
Program Cost	\$831,746	\$0	\$0	\$10,000	\$48,025	\$72,846	\$98,063
Net Benefits	\$1,476,541	\$0	\$0	(\$10,000)	\$40,324	\$93,751	\$148,031
Tons avoided through recycling	78,424	-	-	-	1,401	2,642	3,903
PV per ton	\$19						

26 Ban Asphalt Shingles

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$230,189	\$0	\$0	\$0	\$32,575	\$34,977	\$31,684
Program Cost	\$201,298	\$0	\$0	\$0	\$26,142	\$27,333	\$25,701
Net Benefits	\$28,892	\$0	\$0	\$0	\$6,433	\$7,645	\$5,983
Tons avoided through recycling	9,218	-	-	-	646	693	628
PV per ton	\$3						

29 Floor Sort 50% C&D

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$6,355,579	\$0	\$0	\$0	\$111,795	\$248,965	\$452,080
Program Cost	\$13,152,521	\$0	\$0	\$100,000	\$332,516	\$590,815	\$973,290
Net Benefits	(\$6,796,942)	\$0	\$0	(\$100,000)	(\$220,721)	(\$341,849)	(\$521,210)
Tons avoided through recycling	279,558	-	-	-	2,216	4,935	8,961
PV per ton	(\$24)						

32 Ban Com Org

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$7,910,477	\$0	\$0	\$0	\$0	\$0	\$0
Program Cost	\$9,563,565	\$0	\$0	\$0	\$0	\$0	\$165,000
Net Benefits	(\$1,653,087)	\$0	\$0	\$0	\$0	\$0	(\$165,000)
Tons avoided through recycling	307,598	-	-	-	-	-	-
PV per ton	(\$5)						

35 Foodware Rec/Comp

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$9,168,490	\$116,013	\$262,341	\$491,371	\$719,876	\$869,762	\$942,005
Program Cost	\$11,190,220	\$431,561	\$597,500	\$857,225	\$826,354	\$996,328	\$1,078,253
Net Benefits	(\$2,021,729)	(\$315,548)	(\$335,159)	(\$365,854)	(\$106,478)	(\$126,566)	(\$136,248)
Tons avoided through recycling	296,758	1,840	4,161	7,793	11,418	13,795	14,941
PV per ton	(\$7)						

36 Carpet

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$726,189	\$0	\$0	\$5,845	\$14,937	\$34,218	\$64,362
Program Cost	\$125,119	\$0	\$0	\$50,000	\$50,000	\$50,000	\$10,000
Net Benefits	\$601,070	\$0	\$0	(\$44,155)	(\$35,063)	(\$15,782)	\$54,362
Tons avoided through recycling	24,962	-	-	93	237	543	1,021
PV per ton	\$24						

37 Enhanc Com Org

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$277,278	\$0	\$0	\$0	\$58,981	\$127,345	\$231,411
Program Cost	\$490,601	\$0	\$0	\$95,000	\$149,605	\$180,805	\$296,324
Net Benefits	(\$213,323)	\$0	\$0	(\$95,000)	(\$90,624)	(\$53,461)	(\$64,913)
Tons avoided through recycling	6,625	-	-	-	935	2,020	3,670
PV per ton	(\$32)						

38 Enhance Com Paper Ban Enforce

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$7,670,922	\$0	\$0	\$49,837	\$125,637	\$284,447	\$529,783
Program Cost	(\$429,133)	\$0	\$62,500	\$61,649	\$50,468	\$27,044	(\$9,144)
Net Benefits	\$8,100,056	\$0	(\$62,500)	(\$11,812)	\$75,169	\$257,403	\$538,927
Tons avoided through recycling	268,793	-	-	790	1,993	4,511	8,403
PV per ton	\$30						

39 Extend Com Ban

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$2,568,181	\$0	\$0	\$0	\$0	\$46,190	\$104,365
Program Cost	\$58,214	\$0	\$0	\$0	\$0	\$133,187	\$74,606
Net Benefits	\$2,509,967	\$0	\$0	\$0	\$0	(\$86,996)	\$29,759
Tons avoided through recycling	92,689	-	-	-	-	733	1,655
PV per ton	\$27						

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

22 ABC Ban

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$299,355	\$325,260	\$269,741	\$276,059	\$280,392	\$283,973
Program Cost	\$114,958	\$123,175	\$90,564	\$92,568	\$93,943	\$95,079
Net Benefits	\$184,397	\$202,084	\$179,177	\$183,490	\$186,449	\$188,894
Tons avoided through recycling	4,748	5,159	4,278	4,378	4,447	4,504
PV per ton						

26 Ban Asphalt Shingles

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$27,368	\$24,501	\$23,372	\$23,052	\$23,084	\$23,256
Program Cost	\$23,562	\$22,141	\$21,582	\$21,423	\$21,439	\$21,524
Net Benefits	\$3,806	\$2,360	\$1,790	\$1,629	\$1,645	\$1,732
Tons avoided through recycling	542	486	463	457	458	461
PV per ton						

29 Floor Sort 50% C&D

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$641,490	\$760,225	\$823,276	\$854,456	\$872,429	\$885,288
Program Cost	\$1,329,959	\$1,553,544	\$1,672,272	\$1,730,986	\$1,764,831	\$1,789,043
Net Benefits	(\$688,469)	(\$793,319)	(\$848,996)	(\$876,530)	(\$892,401)	(\$903,755)
Tons avoided through recycling	12,715	15,069	16,319	16,937	17,293	17,548
PV per ton						

32 Ban Com Org

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$77,806	\$195,007	\$440,365	\$820,744	\$1,209,317	\$1,465,540
Program Cost	\$267,864	\$285,214	\$560,287	\$989,836	\$1,428,636	\$1,717,980
Net Benefits	(\$190,057)	(\$90,207)	(\$119,923)	(\$169,091)	(\$219,319)	(\$252,439)
Tons avoided through recycling	1,234	3,093	6,984	13,017	19,180	23,244
PV per ton						

35 Foodware Rec/Comp

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$972,696	\$985,344	\$992,220	\$997,320	\$1,006,719	\$1,012,267
Program Cost	\$1,113,057	\$1,127,400	\$1,135,198	\$1,140,982	\$1,151,640	\$1,157,932
Net Benefits	(\$140,361)	(\$142,056)	(\$142,978)	(\$143,661)	(\$144,921)	(\$145,665)
Tons avoided through recycling	15,427	15,628	15,737	15,818	15,967	16,055
PV per ton						

36 Carpet

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$95,171	\$115,378	\$85,477	\$89,190	\$91,256	\$92,674
Program Cost	\$10,000	\$10,000	\$0	\$0	\$0	\$0
Net Benefits	\$85,171	\$105,378	\$85,477	\$89,190	\$91,256	\$92,674
Tons avoided through recycling	1,509	1,830	1,356	1,415	1,447	1,470
PV per ton						

37 Enhanc Com Org

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Program Cost	\$0	\$0	\$0	\$0	\$0	\$0
Net Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Tons avoided through recycling	-	-	-	-	-	-
PV per ton						

38 Enhance Com Paper Ban Enfor

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$776,181	\$936,894	\$1,016,419	\$1,052,028	\$1,071,324	\$1,081,746
Program Cost	(\$45,488)	(\$69,194)	(\$80,924)	(\$86,176)	(\$89,022)	(\$90,560)
Net Benefits	\$821,669	\$1,006,088	\$1,097,343	\$1,138,204	\$1,160,346	\$1,172,306
Tons avoided through recycling	12,311	14,860	16,121	16,686	16,992	17,157
PV per ton						

39 Extend Com Ban

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$194,471	\$285,008	\$344,648	\$374,420	\$389,036	\$396,205
Program Cost	\$11,315	(\$2,039)	(\$10,836)	(\$15,228)	(\$17,384)	(\$18,441)
Net Benefits	\$183,155	\$287,047	\$355,485	\$389,647	\$406,419	\$414,646
Tons avoided through recycling	3,084	4,520	5,466	5,938	6,170	6,284
PV per ton						

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

22 ABC Ban

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$287,489	\$290,917	\$294,312	\$297,712	\$301,100	\$304,462
Program Cost	\$96,194	\$97,281	\$98,358	\$99,437	\$100,511	\$101,578
Net Benefits	\$191,295	\$193,636	\$195,953	\$198,275	\$200,588	\$202,884
Tons avoided through recycling	4,560	4,614	4,668	4,722	4,776	4,829
PV per ton						

26 Ban Asphalt Shingles

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$23,498	\$23,761	\$24,032	\$24,307	\$24,583	\$24,857
Program Cost	\$21,644	\$21,774	\$21,909	\$22,045	\$22,182	\$22,318
Net Benefits	\$1,854	\$1,986	\$2,123	\$2,262	\$2,401	\$2,539
Tons avoided through recycling	466	471	476	482	487	493
PV per ton						

29 Floor Sort 50% C&D

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$896,889	\$907,823	\$918,504	\$929,149	\$939,735	\$950,233
Program Cost	\$1,910,889	\$1,831,478	\$1,851,591	\$1,871,637	\$1,891,570	\$1,911,339
Net Benefits	(\$1,014,000)	(\$923,655)	(\$933,087)	(\$942,488)	(\$951,835)	(\$961,106)
Tons avoided through recycling	17,778	17,995	18,206	18,417	18,627	18,835
PV per ton						

32 Ban Com Org

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$1,593,043	\$1,649,899	\$1,676,297	\$1,690,482	\$1,700,269	\$1,707,975
Program Cost	\$1,861,964	\$1,926,169	\$1,955,979	\$2,046,998	\$1,983,050	\$1,991,753
Net Benefits	(\$268,921)	(\$276,270)	(\$279,682)	(\$356,516)	(\$282,781)	(\$283,777)
Tons avoided through recycling	25,266	26,168	26,587	26,812	26,967	27,089
PV per ton						

35 Foodware Rec/Comp

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$1,017,439	\$1,022,319	\$1,027,274	\$1,032,327	\$1,037,579	\$1,042,936
Program Cost	\$1,163,796	\$1,169,331	\$1,174,950	\$1,180,681	\$1,186,636	\$1,192,711
Net Benefits	(\$146,358)	(\$147,012)	(\$147,676)	(\$148,353)	(\$149,057)	(\$149,775)
Tons avoided through recycling	16,137	16,214	16,293	16,373	16,456	16,541
PV per ton						

36 Carpet

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$93,916	\$95,071	\$96,194	\$97,310	\$98,419	\$99,519
Program Cost	\$0	\$0	\$0	\$0	\$0	\$0
Net Benefits	\$93,916	\$95,071	\$96,194	\$97,310	\$98,419	\$99,519
Tons avoided through recycling	1,490	1,508	1,526	1,543	1,561	1,578
PV per ton						

37 Enhanc Com Org

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Program Cost	\$0	\$0	\$0	\$0	\$0	\$0
Net Benefits	\$0	\$0	\$0	\$0	\$0	\$0
Tons avoided through recycling	-	-	-	-	-	-
PV per ton						

38 Enhance Com Paper Ban Enfor

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$1,089,206	\$1,095,400	\$1,101,313	\$1,107,282	\$1,113,391	\$1,119,540
Program Cost	(\$91,660)	(\$92,574)	(\$93,446)	(\$94,326)	(\$95,227)	(\$96,134)
Net Benefits	\$1,180,866	\$1,187,974	\$1,194,759	\$1,201,608	\$1,208,619	\$1,215,674
Tons avoided through recycling	17,275	17,374	17,467	17,562	17,659	17,756
PV per ton						

39 Extend Com Ban

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$400,488	\$403,665	\$406,522	\$409,316	\$412,132	\$414,974
Program Cost	(\$19,073)	(\$19,541)	\$20,037	(\$20,375)	(\$20,790)	(\$21,210)
Net Benefits	\$419,561	\$423,206	\$386,485	\$429,691	\$432,922	\$436,184
Tons avoided through recycling	6,352	6,402	6,448	6,492	6,537	6,582
PV per ton						

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

22 ABC Ban

Year	2028	2029	2030
Program Benefits	\$307,714	\$310,902	\$314,210
Program Cost	\$102,609	\$103,621	\$104,670
Net Benefits	\$205,104	\$207,281	\$209,540
Tons avoided through recycling	4,880	4,931	4,984
PV per ton			

26 Ban Asphalt Shingles

Year	2028	2029	2030
Program Benefits	\$25,122	\$25,382	\$25,652
Program Cost	\$22,449	\$22,578	\$22,712
Net Benefits	\$2,673	\$2,804	\$2,941
Tons avoided through recycling	498	503	508
PV per ton			

29 Floor Sort 50% C&D

Year	2028	2029	2030
Program Benefits	\$960,384	\$970,334	\$980,660
Program Cost	\$1,930,454	\$1,949,189	\$1,968,634
Net Benefits	(\$970,070)	(\$978,856)	(\$987,974)
Tons avoided through recycling	19,036	19,234	19,438
PV per ton			

32 Ban Com Org

Year	2028	2029	2030
Program Benefits	\$1,715,690	\$1,722,742	\$1,728,883
Program Cost	\$2,000,464	\$2,008,428	\$2,015,363
Net Benefits	(\$284,774)	(\$285,686)	(\$286,480)
Tons avoided through recycling	27,212	27,323	27,421
PV per ton			

35 Foodware Rec/Comp

Year	2028	2029	2030
Program Benefits	\$1,048,558	\$1,054,300	\$1,059,908
Program Cost	\$1,199,086	\$1,205,597	\$1,211,957
Net Benefits	(\$150,528)	(\$151,298)	(\$152,049)
Tons avoided through recycling	16,631	16,722	16,811
PV per ton			

36 Carpet

Year	2028	2029	2030
Program Benefits	\$100,582	\$101,624	\$102,706
Program Cost	\$0	\$0	\$0
Net Benefits	\$100,582	\$101,624	\$102,706
Tons avoided through recycling	1,595	1,612	1,629
PV per ton			

37 Enhanc Com Org

Year	2028	2029	2030
Program Benefits	\$0	\$0	\$0
Program Cost	\$0	\$0	\$0
Net Benefits	\$0	\$0	\$0
Tons avoided through recycling	-	-	-
PV per ton			

38 Enhance Com Paper Ban Enfor

Year	2028	2029	2030
Program Benefits	\$1,125,893	\$1,132,356	\$1,138,703
Program Cost	(\$97,071)	(\$98,025)	(\$98,961)
Net Benefits	\$1,222,965	\$1,230,381	\$1,237,664
Tons avoided through recycling	17,857	17,960	18,060
PV per ton			

39 Extend Com Ban

Year	2028	2029	2030
Program Benefits	\$417,872	\$420,874	\$423,879
Program Cost	(\$21,637)	(\$22,080)	(\$22,523)
Net Benefits	\$439,509	\$442,953	\$446,402
Tons avoided through recycling	6,628	6,675	6,723
PV per ton			

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

41 Restore Education

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$3,838,317	\$0	\$0	\$0	\$71,854	\$157,914	\$282,982
Program Cost	\$4,734,109	\$0	\$0	\$300,000	\$589,387	\$574,752	\$551,123
Net Benefits	(\$895,791)	\$0	\$0	(\$300,000)	(\$517,534)	(\$416,838)	(\$268,140)
Tons avoided through recycling	61,311	-	-	-	519	1,141	2,044
PV per ton	(\$15)						

42 Latex Paint Prod Stew

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$717,130	\$0	\$0	\$0	\$0	\$0	\$28,924
Program Cost	\$18,000	\$0	\$0	\$0	\$0	\$0	\$7,500
Net Benefits	\$699,130	\$0	\$0	\$0	\$0	\$0	\$21,424
Tons avoided through recycling	11,872	-	-	-	-	-	209
PV per ton	\$59						

43 New Education - Com

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$1,501,482	\$0	\$0	\$0	\$25,251	\$57,196	\$106,036
Program Cost	(\$341,914)	\$0	\$0	\$0	\$92,333	\$63,660	\$19,839
Net Benefits	\$1,843,395	\$0	\$0	\$0	(\$67,082)	(\$6,463)	\$86,198
Tons avoided through recycling	52,883	-	-	-	400	907	1,682
PV per ton	\$35						

44 Phone & Junk Opt Out

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$3,410,079	\$0	\$0	\$51,311	\$115,481	\$214,916	\$315,807
Program Cost	\$1,245,287	\$0	\$284,000	\$116,666	\$100,666	\$83,266	\$183,266
Net Benefits	\$2,164,791	\$0	(\$284,000)	(\$65,355)	\$14,815	\$131,650	\$132,541
Tons avoided through recycling	53,068	-	-	371	834	1,552	2,281
PV per ton	\$41						

45 Ban Clean Wood

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$3,868,789	\$0	\$0	\$0	\$0	\$265,990	\$475,172
Program Cost	\$2,367,728	\$0	\$0	\$0	\$10,000	\$177,358	\$301,109
Net Benefits	\$1,501,061	\$0	\$0	\$0	(\$10,000)	\$88,632	\$174,063
Tons avoided through recycling	130,015	-	-	-	-	4,219	7,536
PV per ton	\$12						

46 Com C&D Ban

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$4,388,718	\$0	\$0	\$0	\$0	\$0	\$0
Program Cost	\$5,846,353	\$0	\$0	\$0	\$0	\$0	\$0
Net Benefits	(\$1,457,634)	\$0	\$0	\$0	\$0	\$0	\$0
Tons avoided through recycling	172,010	-	-	-	-	-	-
PV per ton	(\$8)						

50 Plast Film Ban

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$194,859	\$0	\$0	\$0	\$21,184	\$38,973	\$56,231
Program Cost	\$92,767	\$0	\$0	\$0	\$60,000	\$60,000	\$10,000
Net Benefits	\$102,093	\$0	\$0	\$0	(\$38,816)	(\$21,027)	\$46,231
Tons avoided through recycling	5,351	-	-	-	336	618	892
PV per ton	\$19						

51 Pre Scale Recycle

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$527,198	\$0	\$0	\$0	\$0	\$0	\$0
Program Cost	\$1,479,653	\$0	\$0	\$0	\$0	\$0	\$0
Net Benefits	(\$952,455)	\$0	\$0	\$0	\$0	\$0	\$0
Tons avoided through recycling	24,194	-	-	-	-	-	-
PV per ton	(\$39)						

52 Divert Reuseables

Year	Present Value	2010	2011	2012	2013	2014	2015
Program Benefits	\$33,032	\$0	\$0	\$0	\$0	\$0	\$1,299
Program Cost	\$7,335	\$0	\$0	\$0	\$0	\$0	\$1,000
Net Benefits	\$25,696	\$0	\$0	\$0	\$0	\$0	\$299
Tons avoided through recycling	1,503	-	-	-	-	-	26
PV per ton	\$17						

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

41 Restore Education

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$397,322	\$466,760	\$500,552	\$516,215	\$524,704	\$531,568
Program Cost	\$528,028	\$513,360	\$505,488	\$501,571	\$499,325	\$497,880
Net Benefits	(\$130,705)	(\$46,600)	(\$4,936)	\$14,645	\$25,380	\$33,688
Tons avoided through recycling	2,870	3,371	3,615	3,729	3,790	3,839
PV per ton						

42 Latex Paint Prod Stew

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$54,024	\$79,638	\$96,407	\$104,724	\$108,531	\$110,879
Program Cost	\$7,500	\$7,500	\$7,500	\$0	\$0	\$0
Net Benefits	\$46,524	\$72,138	\$88,907	\$104,724	\$108,531	\$110,879
Tons avoided through recycling	390	575	696	756	784	801
PV per ton						

43 New Education - Com

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$151,093	\$179,793	\$194,889	\$202,310	\$206,576	\$209,622
Program Cost	(\$20,538)	(\$46,181)	(\$59,608)	(\$66,189)	(\$69,977)	(\$72,692)
Net Benefits	\$171,632	\$225,974	\$254,497	\$268,498	\$276,553	\$282,314
Tons avoided through recycling	2,396	2,852	3,091	3,209	3,276	3,325
PV per ton						

44 Phone & Junk Opt Out

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$383,543	\$421,062	\$433,660	\$437,043	\$437,461	\$440,720
Program Cost	\$83,266	\$83,266	\$83,266	\$83,266	\$83,266	\$83,266
Net Benefits	\$300,277	\$337,796	\$350,394	\$253,777	\$354,195	\$357,454
Tons avoided through recycling	2,770	3,041	3,132	3,157	3,160	3,183
PV per ton						

45 Ban Clean Wood

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$666,444	\$780,351	\$420,299	\$433,179	\$441,113	\$447,169
Program Cost	\$409,264	\$476,651	\$253,646	\$261,266	\$265,960	\$269,543
Net Benefits	\$257,180	\$303,700	\$166,652	\$171,913	\$175,153	\$177,627
Tons avoided through recycling	10,570	12,377	6,666	6,870	6,996	7,092
PV per ton						

46 Com C&D Ban

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$0	\$0	\$248,128	\$462,739	\$677,892	\$822,218
Program Cost	\$0	\$70,000	\$410,156	\$660,443	\$911,374	\$1,083,055
Net Benefits	\$0	(\$70,000)	(\$162,028)	(\$197,704)	(\$233,482)	(\$260,837)
Tons avoided through recycling	-	-	3,935	7,339	10,752	13,041
PV per ton						

50 Plast Film Ban

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$66,374	\$70,280	\$5,959	\$6,097	\$6,193	\$6,272
Program Cost	\$5,000	\$0	\$0	\$0	\$0	\$0
Net Benefits	\$61,374	\$70,280	\$5,959	\$6,097	\$6,193	\$6,272
Tons avoided through recycling	1,053	1,115	95	97	98	99
PV per ton						

51 Pre Scale Recycle

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$39,674	\$58,713	\$71,852	\$78,707	\$82,098	\$83,984
Program Cost	\$125,490	\$104,129	\$259,390	\$251,699	\$247,894	\$245,778
Net Benefits	(\$85,816)	(\$45,416)	(\$187,538)	(\$172,992)	(\$165,796)	(\$161,794)
Tons avoided through recycling	786	1,164	1,424	1,560	1,627	1,665
PV per ton						

52 Divert Reuseables

Year	2016	2017	2018	2019	2020	2021
Program Benefits	\$2,445	\$3,598	\$4,391	\$4,805	\$5,010	\$5,124
Program Cost	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Net Benefits	\$1,445	\$2,598	\$3,391	\$3,805	\$4,010	\$4,124
Tons avoided through recycling	48	71	87	95	99	102
PV per ton						

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

41 Restore Education

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$537,510	\$543,123	\$548,669	\$554,264	\$559,881	\$565,474
Program Cost	\$496,602	\$495,423	\$494,278	\$493,142	\$492,010	\$490,894
Net Benefits	\$40,907	\$47,700	\$54,391	\$61,122	\$67,871	\$74,580
Tons avoided through recycling	3,882	3,923	3,963	4,003	4,044	4,084
PV per ton						

42 Latex Paint Prod Stew

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$112,473	\$113,822	\$115,114	\$116,429	\$117,755	\$119,112
Program Cost	\$0	\$0	\$0	\$0	\$0	\$0
Net Benefits	\$112,473	\$113,822	\$115,114	\$116,429	\$117,755	\$119,112
Tons avoided through recycling	812	822	831	841	851	860
PV per ton						

43 New Education - Com

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$212,366	\$214,951	\$217,476	\$219,993	\$222,495	\$224,977
Program Cost	(\$75,147)	(\$77,463)	(\$79,726)	(\$81,983)	(\$84,226)	(\$86,451)
Net Benefits	\$287,514	\$292,414	\$297,203	\$301,975	\$306,721	\$311,428
Tons avoided through recycling	3,368	3,409	3,449	3,489	3,529	3,568
PV per ton						

44 Phone & Junk Opt Out

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$443,498	\$446,339	\$449,199	\$452,125	\$454,996	\$457,863
Program Cost	\$83,266	\$183,266	\$83,266	\$83,266	\$83,266	\$183,266
Net Benefits	\$360,232	\$263,073	\$365,933	\$368,859	\$371,730	\$274,597
Tons avoided through recycling	3,203	3,224	3,244	3,266	3,286	3,307
PV per ton						

45 Ban Clean Wood

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$452,863	\$458,321	\$463,691	\$469,056	\$474,397	\$479,696
Program Cost	\$272,911	\$276,140	\$279,317	\$282,491	\$285,650	\$288,785
Net Benefits	\$179,952	\$182,181	\$184,374	\$186,565	\$188,747	\$190,911
Tons avoided through recycling	7,183	7,269	7,354	7,439	7,524	7,608
PV per ton						

46 Com C&D Ban

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$894,866	\$928,529	\$945,742	\$956,882	\$965,894	\$974,009
Program Cost	\$1,169,471	\$1,209,516	\$1,229,991	\$1,243,242	\$1,253,962	\$1,263,615
Net Benefits	(\$274,606)	(\$280,986)	(\$284,249)	(\$286,360)	(\$288,068)	(\$289,606)
Tons avoided through recycling	14,193	14,727	15,000	15,177	15,319	15,448
PV per ton						

50 Plast Film Ban

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$6,349	\$6,425	\$6,500	\$6,575	\$6,650	\$6,724
Program Cost	\$0	\$0	\$0	\$0	\$0	\$0
Net Benefits	\$6,349	\$6,425	\$6,500	\$6,575	\$6,650	\$6,724
Tons avoided through recycling	101	102	103	104	105	107
PV per ton						

51 Pre Scale Recycle

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$85,341	\$86,477	\$87,530	\$88,558	\$89,572	\$90,574
Program Cost	\$244,256	\$242,981	\$241,800	\$240,647	\$239,509	\$238,384
Net Benefits	(\$158,915)	(\$156,504)	(\$154,269)	(\$152,089)	(\$149,937)	(\$147,810)
Tons avoided through recycling	1,692	1,714	1,735	1,755	1,775	1,795
PV per ton						

52 Divert Reuseables

Year	2022	2023	2024	2025	2026	2027
Program Benefits	\$5,207	\$5,276	\$5,340	\$5,403	\$5,465	\$5,526
Program Cost	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Net Benefits	\$4,207	\$4,276	\$4,340	\$4,403	\$4,465	\$4,526
Tons avoided through recycling	103	105	106	107	108	110
PV per ton						

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

41 Restore Education

Year	2028	2029	2030
Program Benefits	\$570,995	\$576,523	\$582,242
Program Cost	\$489,830	\$488,799	\$487,736
Net Benefits	\$81,164	\$87,725	\$94,506
Tons avoided through recycling	4,124	4,164	4,205
PV per ton			

42 Latex Paint Prod Stew

Year	2028	2029	2030
Program Benefits	\$120,486	\$121,927	\$123,441
Program Cost	\$0	\$0	\$0
Net Benefits	\$120,486	\$121,927	\$123,441
Tons avoided through recycling	870	881	892
PV per ton			

43 New Education - Com

Year	2028	2029	2030
Program Benefits	\$227,377	\$229,730	\$232,171
Program Cost	(\$88,603)	(\$90,711)	(\$92,900)
Net Benefits	\$315,980	\$320,441	\$325,071
Tons avoided through recycling	3,606	3,644	3,682
PV per ton			

44 Phone & Junk Opt Out

Year	2028	2029	2030
Program Benefits	\$460,871	\$463,995	\$467,383
Program Cost	\$83,266	\$83,266	\$83,266
Net Benefits	\$377,605	\$380,729	\$384,117
Tons avoided through recycling	3,329	3,351	3,376
PV per ton			

45 Ban Clean Wood

Year	2028	2029	2030
Program Benefits	\$484,819	\$489,842	\$495,055
Program Cost	\$291,816	\$294,788	\$297,871
Net Benefits	\$193,003	\$195,054	\$197,183
Tons avoided through recycling	7,689	7,769	7,852
PV per ton			

46 Com C&D Ban

Year	2028	2029	2030
Program Benefits	\$981,573	\$989,344	\$997,392
Program Cost	\$1,272,612	\$1,281,857	\$1,291,429
Net Benefits	(\$291,040)	(\$292,512)	(\$294,038)
Tons avoided through recycling	15,568	15,691	15,819
PV per ton			

50 Plast Film Ban

Year	2028	2029	2030
Program Benefits	\$6,796	\$6,866	\$6,939
Program Cost	\$0	\$0	\$0
Net Benefits	\$6,796	\$6,866	\$6,939
Tons avoided through recycling	108	109	110
PV per ton			

51 Pre Scale Recycle

Year	2028	2029	2030
Program Benefits	\$91,543	\$92,491	\$93,476
Program Cost	\$237,298	\$236,234	\$235,129
Net Benefits	(\$145,755)	(\$143,743)	(\$141,654)
Tons avoided through recycling	1,815	1,833	1,853
PV per ton			

52 Divert Reuseables

Year	2028	2029	2030
Program Benefits	\$5,585	\$5,643	\$5,703
Program Cost	\$1,000	\$1,000	\$1,000
Net Benefits	\$4,585	\$4,643	\$4,703
Tons avoided through recycling	111	112	113
PV per ton			

**Construction and Demolition Debris - Program Tons Per Year
Scenario 78, Recommended**

					Order ->	7	6	1	4	5	2	8	10	12	13
Year	Recycle Rate	Total Material	Total Disposed	Total Diverted	Beneficial Uses	C&D Priv Rec	Deconstruction Single Family	Built Green	LEED Program	Voluntary Assessment	Facility Certification	ABC BAN	Bans beyond ABC 2013	Bans beyond ABC 2014	
ALL MATERIALS					90	99	80	82	83	81	94	92	78	77	
2007	49.3%	415,801	201,156	214,645	9,738	204,907	-	-	-	-	-	-	-	-	
2008	50.6%	397,052	181,241	215,811	14,961	200,851	-	-	-	-	-	-	-	-	
2009	56.4%	288,551	115,446	173,105	10,362	162,742	-	-	-	-	-	-	-	-	
2010	57.2%	313,461	123,165	190,295	10,971	171,595	4	317	7,409	-	-	-	-	-	
2011	57.6%	327,334	127,449	199,885	11,306	176,445	10	833	11,291	-	-	-	-	-	
2012	58.1%	351,228	134,996	216,232	11,998	186,873	30	2,017	14,539	59	257	459	-	-	
2013	58.7%	371,060	140,583	230,477	12,558	195,293	86	3,960	16,509	168	694	884	325	-	
2014	60.2%	375,819	137,147	238,672	12,612	196,063	231	5,860	17,121	448	1,666	1,276	761	2,635	
2015	61.9%	370,548	129,038	241,510	12,319	192,068	572	6,947	16,974	1,109	3,384	1,467	1,473	5,198	
2016	64.1%	368,871	120,413	248,458	12,082	190,141	1,284	7,447	16,864	2,489	5,669	1,525	2,309	8,648	
2017	66.4%	348,631	106,101	242,530	11,106	178,735	2,256	7,207	15,844	4,365	7,277	1,435	2,782	11,522	
2018	68.2%	339,571	97,680	241,891	10,270	173,603	3,213	7,053	15,333	6,205	8,186	1,351	2,992	13,683	
2019	69.4%	337,796	93,952	243,844	9,275	173,270	3,851	7,016	15,188	7,428	8,604	1,248	3,058	14,905	
2020	70.3%	338,772	92,653	246,120	7,965	175,395	4,177	7,032	15,200	8,052	8,760	1,105	3,055	15,378	
2021	70.9%	355,170	96,353	258,818	7,015	185,791	4,515	7,370	15,923	8,701	9,187	1,005	3,160	16,150	
2022	71.2%	362,478	97,964	264,514	6,305	190,912	4,661	7,521	16,245	8,981	9,352	925	3,193	16,419	
2023	71.4%	357,540	96,475	261,065	5,822	188,931	4,617	7,418	16,022	8,896	9,210	865	3,134	16,151	
2024	71.5%	353,337	95,281	258,056	5,594	186,962	4,570	7,331	15,833	8,806	9,095	835	3,090	15,942	
2025	71.5%	343,254	92,540	250,714	5,375	181,720	4,442	7,122	15,381	8,559	8,833	804	2,999	15,479	
2026	71.5%	337,940	91,099	246,841	5,270	178,942	4,374	7,012	15,142	8,428	8,695	789	2,952	15,237	
2027	71.5%	340,503	91,787	248,716	5,301	180,312	4,407	7,065	15,257	8,493	8,761	794	2,974	15,351	
2028	71.5%	343,496	92,593	250,903	5,345	181,902	4,446	7,127	15,391	8,568	8,838	801	3,000	15,486	
2029	71.5%	345,141	93,036	252,105	5,369	182,775	4,468	7,161	15,465	8,609	8,880	804	3,014	15,560	
2030	71.5%	349,601	94,238	255,363	5,438	185,137	4,525	7,253	15,665	8,720	8,995	815	3,053	15,761	
WITHOUT CONCRETE															
2007	16.0%	231,093	184,455	46,638	9,738	36,900	-	-	-	-	-	-	-	-	
2008	12.1%	207,802	167,760	40,043	14,961	25,082	-	-	-	-	-	-	-	-	
2009	23.1%	151,017	105,816	45,201	10,362	34,838	-	-	-	-	-	-	-	-	
2010	24.4%	164,054	113,032	51,022	10,971	36,996	2	106	2,947	-	-	-	-	-	
2011	25.1%	171,315	117,041	54,274	11,306	38,191	4	279	4,494	-	-	-	-	-	
2012	25.7%	183,820	124,496	59,324	11,998	40,583	13	675	5,792	59	204	-	-	-	
2013	26.5%	194,199	130,111	64,088	12,558	42,536	37	1,325	6,586	168	554	-	325	-	
2014	28.8%	196,690	127,423	69,267	12,612	42,778	98	1,960	6,837	448	1,349	-	761	2,425	
2015	31.6%	193,931	120,299	73,632	12,319	41,878	242	2,319	6,776	1,109	2,808	-	1,473	4,708	
2016	35.4%	193,054	112,706	80,347	12,082	41,294	543	2,476	6,716	2,489	4,840	-	2,309	7,599	
2017	39.2%	182,461	99,920	82,540	11,106	38,570	954	2,382	6,282	4,365	6,349	-	2,782	9,751	
2018	42.1%	177,719	92,698	85,020	10,270	37,306	1,358	2,316	6,051	6,205	7,244	-	2,992	11,277	
2019	43.9%	176,790	89,827	86,963	9,275	37,353	1,628	2,295	5,975	7,428	7,708	-	3,058	12,242	
2020	45.2%	177,301	89,200	88,101	7,965	38,206	1,766	2,296	5,971	8,052	7,958	-	3,055	12,833	
2021	46.0%	185,883	93,284	92,599	7,015	40,940	1,908	2,404	6,251	8,701	8,454	-	3,160	13,764	
2022	46.5%	189,708	95,167	94,540	6,305	42,387	1,970	2,452	6,376	8,981	8,677	-	3,193	14,199	
2023	46.7%	187,123	93,870	93,254	5,822	42,098	1,952	2,419	6,288	8,896	8,578	-	3,134	14,068	
2024	46.8%	184,924	92,768	92,156	5,594	41,720	1,932	2,390	6,214	8,806	8,485	-	3,090	13,926	
2025	46.8%	179,646	90,121	89,525	5,375	40,573	1,878	2,322	6,036	8,559	8,245	-	2,999	13,538	
2026	46.9%	176,865	88,726	88,139	5,270	39,962	1,849	2,286	5,943	8,428	8,119	-	2,952	13,331	
2027	46.9%	178,207	89,399	88,807	5,301	40,271	1,863	2,303	5,988	8,493	8,181	-	2,974	13,434	
2028	46.9%	179,773	90,185	89,588	5,345	40,627	1,880	2,323	6,041	8,568	8,253	-	3,000	13,552	
2029	46.9%	180,634	90,617	90,017	5,369	40,822	1,889	2,335	6,069	8,609	8,292	-	3,014	13,617	
2030	46.9%	182,968	91,788	91,180	5,438	41,350	1,913	2,365	6,148	8,720	8,399	-	3,053	13,793	

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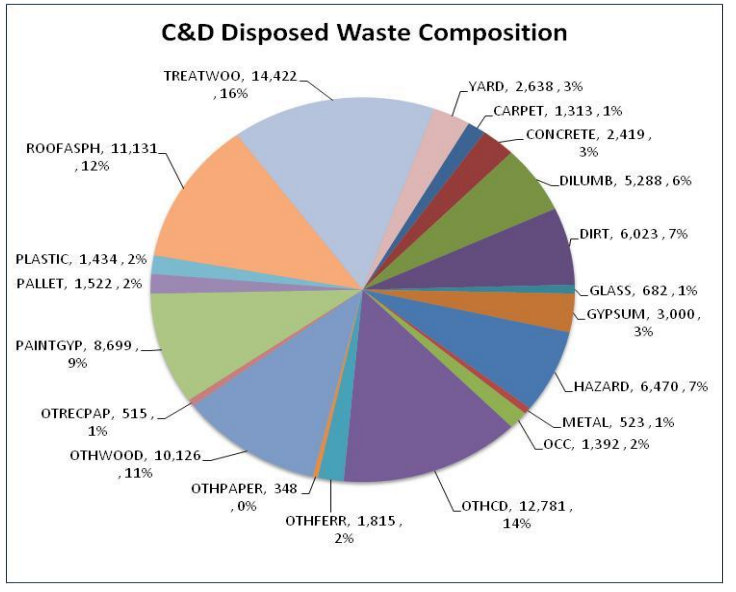
Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Summary - Construction and Demolition Program Tons Per Year Scenario 78, Recommended Year 2025

(in tons per year)

All Material C&D		Total Disposed	Total Generated	Total Beneficial Uses	Total Recycled	Percent Recycled	C&D Priv Rec	Facility Certification	Beneficial Uses	ABC BAN	Deconstruction Single Family	Voluntary Assessment	Built Green	LEED Program	Bans beyond ABC 2013	Bans beyond ABC 2014	Total
		a	d = a + b + c	b	c	c/d	99	94	90	92	80	81	82	83	78	77	
Carpet	CARPET	1,313	1,946	-	633	32.5%	103	134	-	-	28	-	21	118	229	-	633
Rock/ Concrete/ Brick/ Ceramic & Porcelain	CONCRETE	2,419	163,607	-	161,189	98.5%	141,147	588	-	804	2,564	-	4,800	9,344	-	1,942	161,189
Dimension lumber	DILUMB	5,288	21,402	1,587	14,528	67.9%	6,775	1,109	1,587	-	320	861	506	1,077	-	3,879	16,115
Sand/Soil/Dirt	DIRT	6,023	7,510	-	1,487	19.8%	-	763	-	-	107	-	95	523	-	-	1,487
Glass	GLASS	682	682	-	-	0.0%	-	-	-	-	-	-	-	-	-	-	-
Clean Gypsum Board	GYPSUM	3,000	10,807	-	7,807	72.2%	5,389	449	-	-	104	-	222	376	1,267	-	7,807
Hazardous & Other	HAZARD	6,470	6,512	-	42	0.6%	-	-	-	-	-	42	-	-	-	-	42
Metal	METAL	523	7,345	-	6,822	92.9%	4,036	110	-	-	110	1,754	137	292	384	-	6,822
Corrugated Kraft (OCC)	OCC	1,392	1,392	-	-	0.0%	-	-	-	-	-	-	-	-	-	-	-
Other C&D	OTHCD	12,781	26,563	877	12,905	48.6%	10,759	1,119	877	-	220	-	109	699	-	-	13,781
Other ferrous	OTHFERR	1,815	3,835	-	2,020	52.7%	159	333	-	-	55	221	74	174	1,005	-	2,020
Other Paper	OTHPAPER	348	419	-	71	16.9%	-	42	-	-	4	-	6	20	-	-	71
Other recyclable wood	OTHWOOD	10,126	32,813	2,458	20,229	61.6%	10,495	1,514	2,458	-	468	1,321	643	1,511	-	4,277	22,687
Other Recyclable Paper	OTRECPAP	515	601	-	86	14.3%	-	71	-	-	8	-	8	-	-	-	86
Painted/Demolition Gypsum	PAINTGYP	8,699	9,382	-	683	7.3%	-	439	-	-	79	-	19	146	-	-	683
Pallets & crates	PALLET	1,522	5,854	453	3,880	66.3%	1,932	293	453	-	88	-	144	307	-	1,116	4,333
Plastic	PLASTIC	1,434	1,993	-	558	28.0%	-	143	-	-	22	180	19	79	115	-	558
Roofing (asphalt & comp)	ROOFASPH	11,131	19,334	-	8,203	42.4%	926	1,728	-	-	249	-	320	714	-	4,266	8,203
Treated and contaminated wood	TREATWOC	14,422	18,618	-	4,196	22.5%	-	-	-	-	16	4,180	-	-	-	-	4,196
Yard waste & other organics	YARD	2,638	2,638	-	-	0.0%	-	-	-	-	-	-	-	-	-	-	-
Total	Grand Total	92,540	343,254	5,375	245,339	71.5%	181,720	8,833	5,375	804	4,442	8,559	7,122	15,381	2,999	15,479	250,714

Year	Total Disposed	Total Generated	Total Beneficial Uses	Total Recycled	Percent Recycled
2007	201,156	415,801	9,738	204,907	49.3%
2008	181,241	397,052	14,961	200,851	50.6%
2009	115,446	288,551	10,362	162,742	56.4%
2010	123,165	313,461	10,971	179,325	57.2%
2011	127,449	327,334	11,306	188,579	57.6%
2012	134,996	351,228	11,998	204,235	58.1%
2013	140,583	371,060	12,558	217,919	58.7%
2014	137,147	375,819	12,612	226,060	60.2%
2015	129,038	370,548	12,319	229,191	61.9%
2016	120,413	368,871	12,082	236,376	64.1%
2017	106,101	348,631	11,106	231,424	66.4%
2018	97,680	339,571	10,270	231,621	68.2%
2019	93,952	337,796	9,275	234,569	69.4%
2020	92,653	338,772	7,965	238,155	70.3%
2021	96,353	355,170	7,015	251,803	70.9%
2022	97,964	362,478	6,305	258,209	71.2%
2023	96,475	357,540	5,822	255,243	71.4%
2024	95,281	353,337	5,594	252,463	71.5%
2025	92,540	343,254	5,375	245,339	71.5%
2026	91,099	337,940	5,270	241,571	71.5%
2027	91,787	340,503	5,301	243,415	71.5%
2028	92,593	343,496	5,345	245,558	71.5%
2029	93,036	345,141	5,369	246,736	71.5%
2030	94,238	349,601	5,438	249,925	71.5%



**Summary of Recycling Program Benefits and Costs
Construction and Demolition Scenario 78, Recommended**

Total

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	\$42,963,512	\$429	\$1,215	\$93,480	\$250,213	\$813,888
Program Cost	\$2,236,516	\$20,000	\$65,000	\$100,000	\$125,000	\$165,000
Net Benefits	\$40,726,996	(\$19,571)	(\$63,785)	(\$6,520)	\$125,213	\$648,888
Tons avoided through recycling	608,188	4	10	806	2,157	7,016

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All costs in 2010 dollars

New Programs (existing programs 90 and 99 not included)

77 Bans beyond ABC 2014

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	\$16,205,753	\$0	\$0	\$0	\$0	\$305,675
Program Cost	\$586,650	\$0	\$0	\$0	\$35,000	\$20,000
Net Benefits	\$15,619,104	\$0	\$0	\$0	(\$35,000)	\$285,675
Tons avoided through recycling	229,505	-	-	-	-	2,635

PV per ton \$68

78 Bans beyond ABC 2013

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	\$3,386,016	\$0	\$0	\$0	\$37,670	\$88,224
Program Cost	\$636,225	\$0	\$0	\$35,000	\$20,000	\$55,000
Net Benefits	\$2,749,791	\$0	\$0	(\$35,000)	\$17,670	\$33,224
Tons avoided through recycling	47,325	-	-	-	325	761

PV per ton \$58

80 Deconstruction Single Family

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	\$4,218,528	\$429	\$1,215	\$3,530	\$10,021	\$26,763
Program Cost	\$423,737	\$20,000	\$25,000	\$30,000	\$30,000	\$30,000
Net Benefits	\$3,794,791	(\$19,571)	(\$23,785)	(\$26,470)	(\$19,979)	(\$3,237)
Tons avoided through recycling	60,741	4	10	30	86	231

PV per ton \$62

81 Voluntary Assessment

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	\$8,131,930	\$0	\$0	\$6,855	\$19,461	\$51,960
Program Cost	\$234,676	\$0	\$0	\$10,000	\$15,000	\$20,000
Net Benefits	\$7,897,254	\$0	\$0	(\$3,145)	\$4,461	\$31,960
Tons avoided through recycling	117,087	-	-	59	168	448

PV per ton \$67

92 ABC BAN

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	\$1,475,275	\$0	\$0	\$53,232	\$102,551	\$148,019
Program Cost	\$82,124	\$0	\$5,000	\$10,000	\$10,000	\$10,000
Net Benefits	\$1,393,150	\$0	(\$5,000)	\$43,232	\$92,551	\$138,019
Tons avoided through recycling	19,187	-	-	459	884	1,276

PV per ton \$73

94 Facility Certification

Year	Present Value	2010	2011	2012	2013	2014
Program Benefits	\$9,546,010	\$0	\$0	\$29,863	\$80,509	\$193,247
Program Cost	\$273,104	\$0	\$35,000	\$15,000	\$15,000	\$30,000
Net Benefits	\$9,272,906	\$0	(\$35,000)	\$14,863	\$65,509	\$163,247
Tons avoided through recycling	134,344	-	-	257	694	1,666

PV per ton \$69

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Total

Year	2015	2016	2017	2018	2019	2020
Program Benefits	\$1,531,475	\$2,543,242	\$3,437,967	\$4,133,172	\$4,535,080	\$4,701,184
Program Cost	\$215,000	\$215,000	\$190,000	\$180,000	\$180,000	\$175,000
Net Benefits	\$1,316,475	\$2,328,242	\$3,247,967	\$3,953,172	\$4,355,080	\$4,526,184
Tons avoided through recycling	13,202	21,925	29,638	35,631	39,096	40,527

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New Programs

77 Bans beyond ABC 2014

Year	2015	2016	2017	2018	2019	2020
Program Benefits	\$602,970	\$1,003,207	\$1,336,516	\$1,587,192	\$1,728,984	\$1,783,824
Program Cost	\$55,000	\$85,000	\$60,000	\$45,000	\$65,000	\$45,000
Net Benefits	\$547,970	\$918,207	\$1,276,516	\$1,542,192	\$1,663,984	\$1,738,824
Tons avoided through recycling	5,198	8,648	11,522	13,683	14,905	15,378

PV per ton

78 Bans beyond ABC 2013

Year	2015	2016	2017	2018	2019	2020
Program Benefits	\$170,836	\$267,837	\$322,679	\$347,090	\$354,770	\$354,325
Program Cost	\$85,000	\$60,000	\$45,000	\$65,000	\$45,000	\$45,000
Net Benefits	\$85,836	\$207,837	\$277,679	\$282,090	\$309,770	\$309,325
Tons avoided through recycling	1,473	2,309	2,782	2,992	3,058	3,055

PV per ton

80 Deconstruction Single Family

Year	2015	2016	2017	2018	2019	2020
Program Benefits	\$66,325	\$148,964	\$261,749	\$372,761	\$446,765	\$484,569
Program Cost	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
Net Benefits	\$36,325	\$118,964	\$231,749	\$342,761	\$416,765	\$454,569
Tons avoided through recycling	572	1,284	2,256	3,213	3,851	4,177

PV per ton

81 Voluntary Assessment

Year	2015	2016	2017	2018	2019	2020
Program Benefits	\$128,696	\$288,705	\$506,370	\$719,817	\$861,701	\$934,085
Program Cost	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
Net Benefits	\$108,696	\$268,705	\$486,370	\$699,817	\$841,701	\$914,085
Tons avoided through recycling	1,109	2,489	4,365	6,205	7,428	8,052

PV per ton

92 ABC BAN

Year	2015	2016	2017	2018	2019	2020
Program Benefits	\$170,150	\$176,872	\$166,477	\$156,765	\$144,771	\$128,169
Program Cost	\$10,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Net Benefits	\$160,150	\$171,872	\$161,477	\$151,765	\$139,771	\$123,169
Tons avoided through recycling	1,467	1,525	1,435	1,351	1,248	1,105

PV per ton

94 Facility Certification

Year	2015	2016	2017	2018	2019	2020
Program Benefits	\$392,498	\$657,657	\$844,177	\$949,546	\$998,089	\$1,016,211
Program Cost	\$15,000	\$15,000	\$30,000	\$15,000	\$15,000	\$30,000
Net Benefits	\$377,498	\$642,657	\$814,177	\$934,546	\$983,089	\$986,211
Tons avoided through recycling	3,384	5,669	7,277	8,186	8,604	8,760

PV per ton

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Total

Year	2021	2022	2023	2024	2025	2026
Program Benefits	\$4,955,366	\$5,049,612	\$4,973,231	\$4,911,127	\$4,769,547	\$4,695,173
Program Cost	\$180,000	\$180,000	\$175,000	\$180,000	\$180,000	\$175,000
Net Benefits	\$4,775,366	\$4,869,612	\$4,798,231	\$4,731,127	\$4,589,547	\$4,520,173
Tons avoided through recycling	42,719	43,531	42,873	42,337	41,117	40,476

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New Programs

77 Bans beyond ABC 2014

Year	2021	2022	2023	2024	2025	2026
Program Benefits	\$1,873,416	\$1,904,547	\$1,873,552	\$1,849,254	\$1,795,604	\$1,767,480
Program Cost	\$45,000	\$65,000	\$45,000	\$45,000	\$65,000	\$45,000
Net Benefits	\$1,828,416	\$1,839,547	\$1,828,552	\$1,804,254	\$1,730,604	\$1,722,480
Tons avoided through recycling	16,150	16,419	16,151	15,942	15,479	15,237

PV per ton

78 Bans beyond ABC 2013

Year	2021	2022	2023	2024	2025	2026
Program Benefits	\$366,610	\$370,390	\$363,487	\$358,451	\$347,936	\$342,445
Program Cost	\$65,000	\$45,000	\$45,000	\$65,000	\$45,000	\$45,000
Net Benefits	\$301,610	\$325,390	\$318,487	\$293,451	\$302,936	\$297,445
Tons avoided through recycling	3,160	3,193	3,134	3,090	2,999	2,952

PV per ton

80 Deconstruction Single Famil

Year	2021	2022	2023	2024	2025	2026
Program Benefits	\$523,724	\$540,647	\$535,547	\$530,080	\$515,250	\$507,382
Program Cost	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
Net Benefits	\$493,724	\$510,647	\$505,547	\$500,080	\$485,250	\$477,382
Tons avoided through recycling	4,515	4,661	4,617	4,570	4,442	4,374

PV per ton

81 Voluntary Assessment

Year	2021	2022	2023	2024	2025	2026
Program Benefits	\$1,009,329	\$1,041,849	\$1,031,988	\$1,021,440	\$992,859	\$977,694
Program Cost	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
Net Benefits	\$989,329	\$1,021,849	\$1,011,988	\$1,001,440	\$972,859	\$957,694
Tons avoided through recycling	8,701	8,981	8,896	8,806	8,559	8,428

PV per ton

92 ABC BAN

Year	2021	2022	2023	2024	2025	2026
Program Benefits	\$116,623	\$107,301	\$100,299	\$96,876	\$93,275	\$91,523
Program Cost	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Net Benefits	\$111,623	\$102,301	\$95,299	\$91,876	\$88,275	\$86,523
Tons avoided through recycling	1,005	925	865	835	804	789

PV per ton

94 Facility Certification

Year	2021	2022	2023	2024	2025	2026
Program Benefits	\$1,065,664	\$1,084,877	\$1,068,357	\$1,055,026	\$1,024,622	\$1,008,650
Program Cost	\$15,000	\$15,000	\$30,000	\$15,000	\$15,000	\$30,000
Net Benefits	\$1,050,664	\$1,069,877	\$1,038,357	\$1,040,026	\$1,009,622	\$978,650
Tons avoided through recycling	9,187	9,352	9,210	9,095	8,833	8,695

PV per ton

Appendix D: Economic Analysis of New Waste Prevention and Recycling Programs

Total

Year	2027	2028	2029	2030
Program Benefits	\$4,730,579	\$4,772,086	\$4,794,913	\$4,856,863
Program Cost	\$180,000	\$180,000	\$175,000	\$180,000
Net Benefits	\$4,550,579	\$4,592,086	\$4,619,913	\$4,676,863
Tons avoided through recycling	40,781	41,139	41,335	41,870

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New Programs

77 Bans beyond ABC 2014

Year	2027	2028	2029	2030
Program Benefits	\$1,780,762	\$1,796,369	\$1,804,955	\$1,828,273
Program Cost	\$45,000	\$65,000	\$45,000	\$45,000
Net Benefits	\$1,735,762	\$1,731,369	\$1,759,955	\$1,783,273
Tons avoided through recycling	15,351	15,486	15,560	15,761

PV per ton

78 Bans beyond ABC 2013

Year	2027	2028	2029	2030
Program Benefits	\$345,002	\$348,020	\$349,682	\$354,198
Program Cost	\$65,000	\$45,000	\$45,000	\$65,000
Net Benefits	\$280,002	\$303,020	\$304,682	\$289,198
Tons avoided through recycling	2,974	3,000	3,014	3,053

PV per ton

80 Deconstruction Single Famil

Year	2027	2028	2029	2030
Program Benefits	\$511,269	\$515,778	\$518,254	\$524,953
Program Cost	\$30,000	\$30,000	\$30,000	\$30,000
Net Benefits	\$481,269	\$485,778	\$488,254	\$494,953
Tons avoided through recycling	4,407	4,446	4,468	4,525

PV per ton

81 Voluntary Assessment

Year	2027	2028	2029	2030
Program Benefits	\$985,185	\$993,873	\$998,644	\$1,011,552
Program Cost	\$20,000	\$20,000	\$20,000	\$20,000
Net Benefits	\$965,185	\$973,873	\$978,644	\$991,552
Tons avoided through recycling	8,493	8,568	8,609	8,720

PV per ton

92 ABC BAN

Year	2027	2028	2029	2030
Program Benefits	\$92,102	\$92,869	\$93,298	\$94,498
Program Cost	\$5,000	\$5,000	\$5,000	\$5,000
Net Benefits	\$87,102	\$87,869	\$88,298	\$89,498
Tons avoided through recycling	794	801	804	815

PV per ton

94 Facility Certification

Year	2027	2028	2029	2030
Program Benefits	\$1,016,258	\$1,025,176	\$1,030,080	\$1,043,389
Program Cost	\$15,000	\$15,000	\$30,000	\$15,000
Net Benefits	\$1,001,258	\$1,010,176	\$1,000,080	\$1,028,389
Tons avoided through recycling	8,761	8,838	8,880	8,995

PV per ton