

Marin County Hazardous and Solid Waste Management JPA

Final Draft Zero Waste Feasibility Study



Presented by
R3 Consulting Group

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Executive Summary

Overview

The Marin Hazardous and Solid Waste Management Joint Powers Authority (JPA¹) has established a Zero Waste Goal of achieving 80 percent waste reduction in the next five years and zero disposal by 2025. To address how best to meet this Zero Waste Goal, the JPA has initiated a two-phase process. Phase I, the “Zero Waste Feasibility Study”, focuses on **establishing** programs and policies to strengthen the countywide framework for meeting the Goal. Phase II will focus on **implementation** of specific programs and policies by the Member agencies and the JPA to meet the Goal.

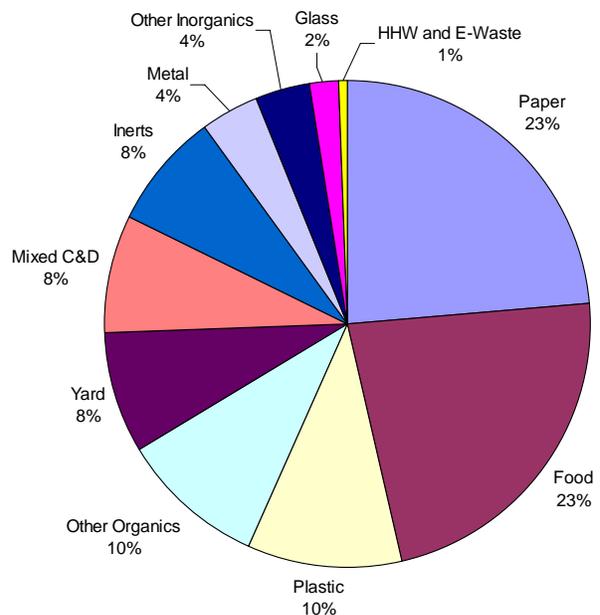
On a countywide basis, the Member Agencies, Special Districts (e.g., Sanitary Districts), and the JPA have successfully implemented programs to comply with the Integrated Waste Management Act’s (AB 939) requirements of diverting from landfill 50 percent of waste generation. As a Regional Agency, comprising of all the communities in Marin County, the JPA reports diversion progress to the California Integrated Waste Management Board (CIWMB) on a countywide basis.

The most recent calculated diversion rate by the CIWMB was for 2006, and the JPA had a diversion rate of 72 percent. Although the diversion rate is high, the amount of material disposed

¹ The JPA is comprised of 12 Member Agencies: Belvedere, Corte Madera, Fairfax, Larkspur, Mill Valley, Novato, Ross, San Anselmo, San Rafael, Sausalito, Tiburon and unincorporated Marin County. Within these areas, six haulers operate 26 franchise service areas with varying programs and requirements.

over the past 13 years has remained fairly level at about 229,000 tons. As seen in Figure 1, the major categories of disposed materials are: Food Waste, Organics and Yard Waste -- 41%, Paper -- 23%, Inerts and Mixed C&D -- 16% and Plastics -- 10%. The recommendations developed as part of this Zero Waste Feasibility Study specifically target reduction and diversion of these disposed materials.

**Figure ES - 1
Materials Disposed**



Key Findings

- **JPA Resources.** Currently, the JPA does not have the direction or staffing needed to effectively work on a countywide level and achieve the recommendations. Unless there is a strengthening of the JPA’s role to assist Member Agencies in implementing the recommendations, it is unlikely that the Zero Waste Goal will be met, and the status quo will continue.
- **Program Consistency.** It will also be necessary for the JPA, Member

Agencies, and haulers to implement programs and policies that are consistent countywide. The Member Agencies will need to adopt or revise ordinances, and modify their franchise agreements to establish the framework and standards for their waste reduction and diversion programs to meet the Zero Waste Goal.

- **Economies of Scale.** Some programs, such as ordinance enforcement and public education of programs, would be more efficiently and cost-effectively managed at the JPA countywide level than independently by each Member Agency. In addition, many of the policy related programs can be better and cheaper if administered at a countywide level.
- **Short and Long-Term Programs.** A balance will have to be drawn for short-term and long-term programs and policies that address eliminating the creation of waste (up-stream, but long-term implementation) and the disposal and diversion of waste (down-stream, but short-term implementation). Up-stream programs include public education efforts that promote reduced consumption, Extended Producer Responsibility (EPR) policies that promote product redesign for hazardous materials, product bans, etc. Down-stream programs include increasing the types of materials collected by haulers (e.g., food), revising franchise agreements and

ordinances to reflect industry standards and establish waste reduction and diversion requirements, implement food waste digestion and composting, etc.

- **Diversion Facilities.** Approximately 56 percent, or 128,000 tons of food, yard, organic waste, inerts, and mixed C&D were disposed at landfill. In order to meet the Zero Waste Goal, reduction and processing of these targeted materials is critical. However, currently there is insufficient capacity for the facilities located within the County to process these materials and it may be necessary to transport these materials to out-of-county facilities.
- **Public Education.** Finally, and most importantly, for both Phase I and Phase II programs to be successful, public education must be strong and consistent among Member Agencies, and be continuous.

Recommendations

There are 18 recommendations that will help the JPA achieve the Zero Waste Goal. Phase I recommendations are intended to provide the JPA with clear direction and support to provide assistance to Member Agencies, and for the Member Agencies to begin taking the additional steps to meet the Zero Waste Goal. Phase II recommendations address the implementation of up-stream and down-stream waste prevention and diversion programs.

**Table ES-1
Summary of Recommendations By Responsible Party
(Descriptions are after the table)**

	JPA	Member Agencies	Haulers (Via Member Agencies)
Phase I	Recommendations #1-5	Recommendations #6-10	None
Phase II	Recommendations #11	Recommendation #18	Recommendations #12-17

Table ES-1 identifies the recommendations to be implemented by the responsible party. Recommendations are briefly explained following the table.

PHASE I

1. Increase JPA Program Assistance with Other County Departments

The County Departments that manage the used oil block grant, sharps collection and sustainability teams operate separately from the JPA and do not consistently share information and aid program administration. Because meeting the Zero Waste Goal involves materials targeted in such programs, it is important for the JPA to be informed of collection results for programs such as used oil, sharps, etc., and be able to assist in public outreach on a countywide basis, as needed, to prevent waste generation and promote proper disposal of such material.

2. Increase JPA Staffing and Their Role in Assisting Administration of Member Agency and Countywide Programs

The Member Agencies currently do not have the resources to monitor all hauler and ordinance program performance or implement new programs. If adequately staffed, the JPA could cost-effectively assist the Member Agencies in program support such as compliance with the C&D ordinance, monitoring hauler contracts, public education, etc. Having a greater assistance role will help insure that the programs are consistent and potentially lead to higher diversion and impact on waste reduction, and formal action from the Member Agencies is necessary for this to occur.

3. Increase the Frequency of Board of Directors Meetings

Increasing the number of meetings held will enable the Board of Directors and Member Agencies to be more involved in addressing Zero Waste issues and provide the JPA with more constant contact with the administrators of policies throughout the County. Currently, the Board of Directors is the main contact that the JPA staff have with the Member Agencies and as recommendations are implemented and JPA seeks direction for the County, having increased communication and interaction will be essential. The increased meetings would be tied to defining the goals of the JPA and any associated staff and time needs. The increased communication could lead to improved partnership with Member Agencies and more effective implementation of programs. The Board of Directors may wish to consider developing a subcommittee to address the goals of this recommendation.

4. Help with Siting/Permitting Processes of a) Solid Waste Facilities and b) Non-Solid Waste Facilities

- A. The haulers operating in the County have the opportunity to transport material such as green waste and food waste out of the County for composting or other diversion. However, because the franchise agreements do not require specific diversion of these materials and the cost impacts of transporting the material, the material is not being diverted in the amount it could. The lack of the necessary infrastructure in the County is a constraint for the JPA to achieve high diversion programs unless franchise agreements require transporting the material to

diversion facilities. The JPA could assist prospective facilities with the siting process, but it should be noted that such a facility would be hard to site in the County due to land use and environmental issues.

- B. Non-solid waste facilities for materials, such as salvaged construction and demolition material, should be helped by JPA staff to identify potential sites and work with Member Agencies. This type of facility includes retail-focused businesses that promote reuse that do not require processing of materials. The JPA should continue to play an active role in helping site new facilities that provide diversion and reuse opportunities to the region. These facilities will also help create “green jobs” in Marin County.

5. Support Extended Producer Responsibility (EPR) and Waste Reduction Policies at State and National Level

The JPA has been active in supporting legislation that helps eliminate hazardous materials from the disposal waste stream. The JPA should continue this activity and also support any national legislation that might positively affect the JPA’s Zero Waste Goals. In addition, individual Member Agencies should support these efforts as well through Extended Producer Responsibility resolutions and letter campaigns for products, such as fluorescent lighting and paint.

6. Revise Solid Waste Ordinances

The solid waste industry and regulations have changed considerably since 1990. However, the ordinances that regulate the hauler franchise agreements in

some cases have not been updated for 45 years. Extensive revisions will likely be necessary for the ordinances so that they address construction and demolition, mandatory recycling, diversion requirements, etc. Addressing these issues in the ordinance will set the framework for implementing new diversion programs and revising franchise agreements. Another method to consider including is the requirement that commercial and multi-family dwelling material all is sorted before disposal to reclaim recyclable material. These sectors dispose of highly recyclable material, such as paper, that could be diverted through the sorting process.

7. Revise Franchise Agreement Language

Franchise agreements can be designed to encourage “green” operations and encourage maximum diversion. Many of the franchise agreements are lacking provisions that address collection hours, type of fuel vehicles use, vehicle noise and weight, explicit list of recyclable materials, diversion standards, required diversion programs, public education requirements, solid waste hierarchy, customer or hauler incentives to promote diversion, etc. Another method to consider including is the requirement that commercial and multi-family dwelling material all is sorted before disposal to reclaim recyclable material. These sectors dispose of highly recyclable material, such as paper, that could be diverted through the sorting process.

8. Adopt, Enforce, and Homogenize the Construction and Demolition Ordinance

The diversion of construction and demolition materials may not occur unless all Member Agencies adopt and enforce C&D ordinances. With only five Member Agencies adopting the

ordinance and having varying requirements, diversion of construction and demolition material is not maximized and contractors and haulers could be confused with the various requirements. Construction and demolition material has local facilities to be processed at and the absence of countywide ordinances requiring diversion misses an opportunity for immediate and effective diversion. Public education and enforcement of the haulers and permittees is an essential component to the success of the diversion.

9. Adopt and Enforce Multi-Family Dwelling and Business Recycling Ordinance

With single-family residential customers currently serviced with comprehensive diversion opportunities, multi-family dwellings and businesses are the next sectors that can achieve high diversion. Currently multi-family dwellings and businesses dispose significant amounts of recoverable paper and food. Until mandatory recycling requirements are established for these sectors, in conjunction with public education, there is little incentive for increasing diversion by the customers or haulers. In addition, each Member Agency will be required to adopt such an ordinance in the next few years to comply with the climate change bill, AB 32.

10. Encourage Consumption and Disposal Changes

Promoting reduced consumption by making better choices when shopping is a necessary element to ultimately eliminate waste generation. Efforts should be made to increase customer awareness of online and local resources that encourage material exchange, repair and reuse. Public education must be a significant and on-going element to promote the consumption and disposal changes.

PHASE II

11. Promote Countywide Sale and/or Disposal Bans

Undertaking product sale and/or disposal bans are most effective when all Member Agencies simultaneously adopt them rather than each jurisdiction implementing different bans. The Town of Fairfax has already implemented a plastic bag ban and the state is also considering charging fees. Such bans will be most effective on a countywide level and the JPA can assist Member Agencies with the public education and creating a homogeneous approach for expanding or implementing new bans.

12. Implement Wet/Dry Collection Routes

A way to potentially increase recovery of material from commercial businesses is to re-route trucks to collect similar types of material (selective routing). For example, one truck should service locations that generate mostly paper goods (dry goods) and other service businesses that generate mostly food waste (wet goods). By designing such routes, contamination of loads is minimized and more materials can potentially be diverted.

13. Offer Residential Unlimited Services of Recycling and Green Waste Containers

These programs are dependent on services offered by the haulers. While some haulers provide unlimited recycling and green waste service, there is an opportunity to improve collection because not all haulers provide a sufficient number of containers to all residents or charge a fee for extra containers. Rate structures for this service should also be reviewed as part of the franchise agreement revision to determine if there are incentives for

customers to divert material and haulers to meet diversion standards.

14. Add Materials Collected to Recycling Stream

All recyclables should be collected by haulers if there is a market for them. While the economy is slow, this may not be possible, but increasing collected materials, even if not generating profit, should be considered as a way to reduce disposal.

15. Add Food Waste Diversion to Collection Services (Residential and Commercial)

After green waste, food waste collection and composting is the big next step to reducing waste disposal. As with green waste, the availability of processing facilities is the limiting factor, but digestion and composting facilities are beginning to be established in Marin County (e.g., Redwood Landfill, Marin Sanitary Service energy projects, Pacific Biogas Energy).

16. Implement Food Waste Digestion

Marin Sanitary Service is undertaking food waste digestion with the Central Marin Sanitation Agency (CMSA). The CMSA only services a portion of Marin County and other sanitary districts serving the county should also explore combining food waste with current digestion operations.

17. Promote Backyard Composting

Getting residents engaged will help promote sustainability and waste awareness. In addition, developing a community garden where residents can bring food waste should be explored. The JPA should also assist with this recommendation.

18. Require Deconstruction/ Salvage/Resale of Construction and Demolition Materials

Salvaging materials prior to deconstruction will allow materials to be reused and diverted from the landfill. This practice has already begun in parts of the County, but support from Member Agencies in the form of ordinances and promotion will help keep useful materials from being unnecessarily disposed.

Table ES-2 Funding Options		
	Has Authority to Implement	
	JPA	Member Agencies
Customer rates		✓
AB 939 fees	✓	✓
Vehicle impact fees		✓
Franchise fees		✓
General fund		✓
Facility host fees		✓
Developer fee		✓
Ballot initiative fee/tax		✓
EPR policy/fee		✓

Funding Options

To fund the recommendations, the JPA and Member Agencies have a variety of options, but the Member Agencies have authority over most methods (see Table ES-2). Other than the AB 939 fees that are charged by the JPA, the authority to implement or adjust funding mechanisms are held by each Member Agency. In essence, these fees will ultimately be paid by the customer through service rates with the exception of Extended Producer Responsibility

(EPR) which should be paid by consumers of the product. These funding mechanisms include the following:

- Vehicle impact fees;
- Franchise fees;
- General fund;
- Facility host fee;
- Developer fee;
- Ballot initiative fee/tax; and
- EPR policy/fee.

With each of these funding mechanisms, the Member Agencies have the opportunity to use the money to support programs and policies to support the Zero Waste Goal. As the Member Agencies evaluate the recommendations, these funding options will need to be further explored to meet their needs.

Table ES-3 identifies the estimated costs and potential funding source for implementing the recommendations. ***It should also be noted, that many***

programs, such as revising an ordinance and franchise agreement, can be more cost effectively done on a countywide basis as a “model” to guide each Member Agency’s unique ordinance and franchisee agreement rather than each Member Agency developing its own ordinance or franchise agreement language.

Therefore, in Table ES-3, the estimated costs can be significantly reduced if programs are implemented on a countywide basis.

Analysis of the recommendations on a cost per ton basis shows that the following recommendations cost the least to implement for diversion or waste reduction achieved: 11, 10, 17, 18 and 8. Details are provided in Appendix B, Table 2.

**Table ES-3
Estimated Costs**

Responsible Party		Recommendation	Estimated One-Time Cost	Estimated Ongoing Cost	Potential Funding Source
Phase I					
JPA	1	Increase Communication/ Assistance of the JPA with other County Departments (e.g., used oil programs, sharps)	N/A	\$40,000+ <i>Materials and staffing</i>	AB 939 Fee
	2	Increase JPA's Staff and Role in Assisting Administration of Member Agency and Countywide Programs. <i>Could support #6-10 below.</i>	\$200,000 (Fund Phase II)	\$120,000+ <i>Materials and staffing</i>	AB 939 Fee
	3	Increase Board of Directors Meeting Frequency	N/A	N/A	AB 939 Fee

**Table ES-3
Estimated Costs**

Responsible Party		Recommendation	Estimated One-Time Cost	Estimated Ongoing Cost	Potential Funding Source
	4	Help Facilities with Siting and Permitting: a) Solid Waste and b) Non-Solid Waste <i>JPA materials and staffing</i>	N/A	\$120,000 <i>Materials and staffing</i>	AB 939 Fee
	5	Support EPR and Waste Reduction Policies at State and National Level <i>Public education</i>	N/A	\$120,000 <i>Materials and staffing</i>	AB 939 Fee
<i>Phase I JPA Subtotal</i>			\$200,000	\$400,000	
<i>Member Agencies (MA)</i>	6	Revise Solid Waste Ordinances <i>Could be done as part of #2 above.</i>	\$5,000- \$10,000 each MA	N/A	Franchise Fee, General Fund
	7	Revise Franchise Agreement Language. <i>Could be done as part of #2 above.</i>	\$25,000- \$75,000 each MA	N/A	Franchise Fee, General Fund
	8	Adopt, Enforce, and Homogenize the Construction and Demolition Ordinance. <i>Could be done as part of #2 above.</i>	\$5,000- \$10,000 each MA	\$5,000 each MA or \$60,000 for region	Franchise Fee, General Fund, AB 939 Fee
	9	Adopt and Enforce Multi-Family Dwelling and Business Recycling Ordinance. <i>Could be done as part of #2 above.</i>	\$5,000- \$10,000 each MA	\$5,000 each MA or \$60,000 for region	Franchise Fee, General Fund, AB 939 Fee
	10	Encourage Consumption and Disposal Changes. <i>Public education. Could be done as part of #2 above.</i>	\$5,000- \$10,000 each MA	\$5,000 each MA or \$60,000 for region	Franchise Fee, General Fund, AB 939 Fee
<i>Phase I Member Agencies Subtotal</i>			\$45,000- \$115,000 each MA	\$15,000 each MA-\$180,000 for region	
Phase II					

**Table ES-3
Estimated Costs**

Responsible Party		Recommendation	Estimated One-Time Cost	Estimated Ongoing Cost	Potential Funding Source
JPA	11	Promote Countywide Sale and/or Disposal Bans	\$50,000+ for public education	\$30,000+	AB 939 Fee
<i>Phase II JPA Subtotal</i>			<i>\$50,000+</i>	<i>\$30,000+</i>	
<i>Haulers (via Member Agencies)</i>	12	Implement Wet/Dry Collection Routes	Franchise Agreement Revision	2%-10% rate increase	Customer Rates
	13	Offer Residential Unlimited Services of Recycling and Green Waste Containers	Franchise Agreement Revision	1%-3% rate increase	Customer Rates
	14	Add Materials Collected to the Recycling Stream	Franchise Agreement Revision	1%-3% rate increase	Customer Rates
	15	Add Food Waste Diversion to Collection Services (Residential and Commercial)	Franchise Agreement Revision	1%-5% rate increase	Customer Rates
	16	Implement Food Waste Digestion	Franchise Agreement Revision	2%-10% rate increase	Customer Rates
	17	Promote Backyard Composting	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	Customer Rates
<i>Phase II Hauler Subtotal</i>			<i>\$5,000-\$10,000 each MA</i>	<i>\$5,000 each MA or \$60,000 for region</i>	
<i>Member Agencies</i>	18	Require Deconstruction/ Salvage/ Resale of Construction and Demolition Materials	\$5,000-\$10,000 each MA for public education	\$5,000 each MA or \$60,000 for region	C&D deposit system or fee
<i>Phase II Member Agencies Subtotal</i>			<i>\$5,000-\$10,000 each MA</i>	<i>\$5,000 each MA or \$60,000 for region</i>	
<i>Total</i>			<i>\$910,000-\$1,870,000 for the region</i>	<i>\$730,000+ for the region and 7%-31% rate increase</i>	

Projected Zero Waste Results

Implementing the recommendations could achieve a reduction of over 180,000 tons of disposal and waste generation. This would equate to approximately 94 percent diversion.

Table ES-4 identifies the estimated diversion each for each recommendation. Programs where diversion is dependent on or support recommendations are identified within the table.

**Table ES-4
Diversion Estimates by Recommendation**

Responsible Party		Recommendation	Estimated Diversion Tons
Phase I			
<i>JPA</i>	1	Increase JPA Program Assistance with other County Departments (e.g., used oil programs, sharps and pharmaceuticals)	Supports #4-18
	2	Increase JPA's Staff and Role in Assisting Administration of Member Agency and Countywide Programs	Supports #4- 18
	3	Increase Board of Directors Meeting Frequency	Supports #4- 18
	4	Help Facilities with Siting and Permitting: a) Solid Waste and b) Non-Solid Waste	Supports #18
	5	Support Extended Producer Responsibility (EPR) and Waste Reduction Policies at State and National Level	Supports #10 & 11
<i>Member Agencies</i>	6	Revise Solid Waste Ordinances	Supports #7 ,9, & 18
	7	Revise Franchise Agreement Language	Supports #8, 9, 12, 13, 14, 15 &16
	8	Adopt, Enforce, and Homogenize the Construction and Demolition Ordinance	22,900 and supports #18
	9	Adopt and Enforce Multi-Family Dwelling and Business Recycling Ordinance	29,700
	10	Encourage Consumption and Disposal Changes	2,300
Phase II			
<i>JPA</i>	11	Promote Countywide Sale and/or Disposal Bans	1,100
<i>Haulers (via Member Agencies)</i>	12	Implement Wet/Dry Collection Routes (Commercial and Multi-family)	102,000
	13	Offer Residential Unlimited Services of Recycling and Green Waste Containers	7,300
	14	Add Materials Collected to the Recycling Stream	2,300
	15	Add Food Waste Diversion to Collection Services (Residential and Commercial)	4,500 and supports #12 &16
	16	Implement Food Waste Digestion	N/A

**Table ES-4
Diversion Estimates by Recommendation**

Responsible Party		Recommendation	Estimated Diversion Tons
	17	Promote Backyard Composting	4,500 as part of food waste diversion (#15)
<i>Member Agencies</i>	18	Require Deconstruction/ Salvage/ Resale of Construction and Demolition Materials	11,500 and supports #8
<i>Total</i>			183,600

Report Organization

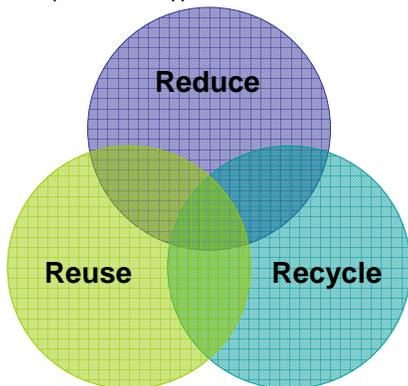
- Section I: Provides an introduction to the study.
- Section II: Identifies the goals of the study.
- Section III: Identifies the methodology used in evaluating the JPA and developing recommendations.
- Section IV: Identifies data sources used to develop the recommendations.
- Section V: Identifies challenges to achieving Zero Waste.
- Section VI: Provides analysis of existing programs and opportunities.
- Section VII: Identifies recommendations for the JPA, Member Agencies and haulers (via Member Agencies) to undertake.
- Section VIII: Identifies funding methods available to execute the recommendations.

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I. Introduction

The Marin Hazardous and Solid Waste Management Joint Powers Authority (JPA) is comprised of 12 Member Agencies: Belvedere, Corte Madera, Fairfax, Larkspur, Mill Valley, Novato, Ross, San Anselmo, San Rafael, Sausalito, Tiburon and unincorporated Marin County. Through the JPA, the communities have been implementing programs to comply with the Integrated Waste Management Act's (AB 939) requirements of diverting 50 percent of generated waste¹. The most recent calculated diversion rate by the California Integrated Waste Management Board (CIWMB) was for 2006 and the JPA had a diversion rate of 72 percent. It is the JPA's objective to increase the diversion rate to 80 percent by 2012 and Zero Waste by 2025.

Due to the increased diversion goals and a need to address the waste stream and make Marin County (County) more environmentally sustainable, this report analyzes the JPA's current policies and programs regarding non-hazardous and hazardous waste (includes Universal Waste (U-Waste)).



¹ Household hazardous waste is not considered in determining diversion rates, because it is not legal to dispose of the materials in landfills. However, reduction of HHW is consistent with a Zero Waste Goal.

The Zero Waste goal can be described as a community's environmental impact minimized by adopting policies and programs that promote waste prevention, product redesign to reduce toxics and consumption, and local material reuse and recycling.

In order for Zero Waste to be attained, it is necessary for the JPA, Member Agencies, and haulers to implement programs and policies that are consistent countywide.

Structure of Recommendations

To achieve Zero Waste requires a combination of short-term and long-term programs and policies that address eliminating the creation of waste (up-stream) and the disposal and diversion of waste (down-stream).

The tandem of up-stream and down-stream will reduce the waste generated over the long-term when combined with sustained and consistent public education messages. Although up-stream policies and programs will have impact on disposal over the long-term, actions must begin now to create the desired consumer behavior changes.

The down-stream waste management programs are focused on short and long-term programs and policies that divert material for higher and best use. Maximizing diversion can occur through existing and new programs to recover material for resale, compost and energy generation.

In consideration for the impacts of the short-term and long-term impacts of programs and policies, the recommendations presented in this Feasibility Study are organized into two phases: Phase I and Phase II. Phase I recommendation are intended to create a regional (countywide) foundation for recommended programs and policies to work. Phase II recommendations are

those that are to be implemented at a countywide and Member Agency level.

Regardless of the recommendation, public education is a fundamental component of enabling the recommendations to achieve consistent and desired diversion outcomes.

II. Goals

The JPA has established the goals of achieving 80 percent diversion and Zero Waste in the next five to 17 years. To determine how Marin County can attain these goals, the JPA engaged the R3 Consulting Group (R3) Team (includes California Waste Associates; Environmental Planning Consultants; and Heidi Sanborn, Product Stewardship Consultant) to evaluate current solid waste and household hazardous waste programs, suggest improvements or new programs, and solicit feedback from stakeholders. This report provides a summary of our findings and presents an analysis of potential diversion rates if suggested program changes were implemented. The analysis also includes a review of current public education material and waste-related ordinances.

III. Methodology

As part of the analysis, the JPA's current diversion and disposal practices and household hazardous waste management was evaluated, with a focus on the sectors that generated the material (e.g., single family and multi-family residential, commercial, construction and demolition, self-haul and "other/unknown"). These categories are used as a foundation to consider improvements to current programs and policies. Data was provided by the franchised haulers,

facility operators, CIWMB, JPA staff and County staff.

In addition, R3 created a model that evaluated what changes to the current waste management program could be undertaken to increase the JPA's diversion rate. The model can be adjusted to reflect anticipated participation and diversion. The diversion rate was calculated with the assumption that the increase in diversion resulted in an identical reduction in disposal.

As a way to also increase the JPA's environmental sustainability, the hauler franchise agreements and policies developed by the JPA and Member Agencies were reviewed. Stakeholder meetings/workshops were conducted with the JPA staff, JPA Board of Directors, JPA Executive Committee, Local Task Force, County of Marin Board of Supervisors, franchised haulers, and general public.

IV. Data Sources

This study provides a "big picture" view of how diversion rates can be changed by improving existing programs or implementing new programs. Information presented in this Feasibility Study is from data provided by JPA staff, Member Agency staff, facility operators, franchise agreements and franchised haulers. All franchise agreement, public education and rates were requested, but not all data was able to be obtained. Below are data sources used to conduct analysis.

- Relevant franchise agreement information from 26 franchise service areas.
- Available tonnage information from the JPA. However, data did not distinguish the tonnage of material collected and recycled from Single

Family Dwellings (SFD), Multi-Family Dwellings (MFD), Commercial, and Construction and Demolition (C&D); this information is valuable for tracking programs and targeting education efforts. Therefore, analysis in this Feasibility Study is provided only for SFD and commercial sectors.

- Waste characterization data used was based off of a study of the Marin Sanitary Service (MSS) Transfer Station conducted in 2007 for residential and light commercial loads. The study did not include the Novato waste stream.
- Disposal tonnage as reported by the Disposal Reporting System (DRS).
- Household data from the U.S. Census.
- Reports provided by franchised haulers.
- Residential food waste diversion program information was obtained from the Alameda County Waste Management Authority.

In addition, attempts were made to obtain additional program diversion information from the CIWMB, but no information was provided.

This study does not reflect the political viability of making the suggested program changes.

V. Challenges to Achieving Zero Waste

The Member Agencies and Special Districts (e.g., Sanitary Districts) in the JPA have a wide variety of programs that are intended to promote waste reduction, the recycling of products, and result in reducing the amount of material disposed. As a result, the JPA has consistently been recognized for

exceeding the state's 50 percent diversion requirement and business waste reduction efforts.

Although the JPA has a strong record of high diversion rates, in 2007 the reported disposal was 229,271 tons (70 percent reported diversion). This compares to approximately 250,000 tons of disposal as reported in 1995 (32 percent reported diversion). Accordingly, over the past 14 years, while reported diversion has increased dramatically, actual disposal has remained relatively flat. This is due to consumption rates not changing. Additional policies and programs will need to be developed and implemented to meet the JPA's Zero Waste Goals.

In order to meet the Zero Waste Goals, several major challenges must be addressed that affect program development and implementation. These are as follows:

- The JPA has a minimal role in solid waste program implementation at the Member Agency level and does not have any direct authority or resources to implement new programs and effectively increase diversion and prevent waste generation.
- Each Member Agency administers its own franchise agreement, and the agreements are not diversion-based or waste reduction-based agreements.
- Member Agencies operating individually may not have adequate resources to develop, implement and enforce the necessary program to support the Zero Waste Goals.
- There is insufficient capacity for facilities located within the County to process the amount of organic waste materials to meet the Zero Waste Goals.

- There is one C&D processing facility located within the County (Marin Resource Recovery Center-MRRC) that may have adequate **capacity** to process all C&D materials. However, this facility is privately owned and operated and not all Member Agencies and Special Districts direct their C&D materials to the MRRC. For areas not serviced by MSS, directing C&D materials this facility (or any specific facility) should be accompanied with some form of public oversight (rate review) of the tipping fees charged to process C&D materials.

The recommendations based on the analysis in Section VI are specifically designed to mitigate the impediments listed above.

VI. Analysis

The JPA, its Member Agencies, and Special Districts have a wide array of programs that help reduce the amount of materials disposed and properly manage household hazardous waste materials. This section discusses accomplishments of Marin County, current programs and provides recommendations that will help the JPA become a Zero Waste community.

Marin County Leadership in Waste Reduction and Recycling

The JPA has consistently been recognized for exceeding the state's 50 percent diversion requirement and business waste reduction efforts.

CIWMB Award-Winning Waste Reduction Practices

In 2001, JPA won a CIWMB Trash-Cutters Award for its collaborative effort between Member Agencies and

businesses to promote and support diversion programs and activities. In addition, the County of Marin created a market incentive for recycled products by instituting a 15 percent price preference for purchases.

Along with the JPA's activities, businesses have been regularly recognized over the years for their contribution to reducing the waste stream and being environmentally responsible. The CIWMB has awarded the Waste Reduction Awards Program (WRAP) Award to 213 businesses in Marin County since 1993 and seven businesses have been awarded the WRAP Winner of the Year since this honor was initiated in 1996.

Marin County Sustainability Team

The Community Development Agency (Agency) has a Sustainability Team that has the following countywide programs: C&D ordinance, green building, climate protection, waste tire collection (in partnership with the JPA), energy conservation, and promoting green living. In addition to these programs, the Agency has a reuse grant to encourage deconstruction contractors to provide services in Marin and to site a reuse facility for construction and demolition materials. The grants may not be offered depending on economic conditions.

Its website is a resource for people to learn how to take action to reduce their ecological footprint. On the main website page of the Sustainability Team, there is no link to the JPA or information related to waste reduction beyond commercial businesses. There is an opportunity to expand the website's content to increase its relevance to individual consumers and JPA efforts and resources such as the California Product Stewardship Council.

Within the website is an interactive tool that assesses the progress in making Marin County more sustainable in relation to the following categories: economy; agricultural systems; health, arts and culture, education and preparation, infrastructure; planning, energy and buildings; and natural and biological systems.

One key element buried within the infrastructure category is solid waste reduction and recycling. The application as currently designed does not highlight waste reduction as a crucial issue and also does not reflect current disposal data or JPA Zero Waste goals. Measuring waste reduction is essential to reaching the Zero Waste goals and identifying the disposal in per capita terms will allow residents and businesses to assess the role each individual has in the system.

Green Business Program

Administered by the Marin County Community Development Department, the Green Business program is a part of the Bay Area Green Business Program which is designed to encourage voluntary participation of businesses to reduce their environmental impacts and be recognized as an official “green business”. The program recognizes businesses that are in compliance with environmental laws and conserve energy, water, and other resources, and implement sound environmental practices that prevent pollution and waste generation.

To become a “green business” the company submits an application identifying the conservation and sustainable actions they have implemented. The County then verifies the information. Assistance to achieve threshold standards is also available through the Agency. As part of the

program, businesses receive the following:

- Recognition certificate;
- Green Business window decal;
- Promotional items for customers;
- Camera ready art work; and
- Ongoing promotions through local advertising and public events.

The types of businesses in Marin County that are certified as being “green” range from auto-related services to professional services such as dentists and photography. The program is available for any business or public agency. As noted on their website, the County has over 300 certified green businesses which include local solid waste and recycling haulers, Marin Sanitary Service, and Tamalpais Community Service District. Marin Sanitary Service reports that they have assisted over 100 businesses qualify for the program through their waste management services.

Green Building Program

The County, through the Agency, is promoting the “green” design of buildings to reduce energy and water use. It is through this program’s website that the Construction and Demolition ordinance for the unincorporated County areas and Single Dwelling Energy Efficiency ordinance are accessible.

Another countywide effort that involves all cities and the County is the Green Building, Energy Retrofit and Solar Transformation (Green BERST). This multi-agency collaboration is under way to work on green building ordinances, and some aspects of a construction and demolition ordinance.

Resources currently available also include the Residential Green Building

Guidelines and Rating System that identifies the criteria to become certified as green building. The Agency website also details the benefits of undergoing green building, which beside the environmental benefits, also allows the contractor/homeowner the opportunity for County assistance throughout the process, and receive fast-track permitting and a waiver for the energy review fee. Residents can also contact the Agency for rebates, tax credits, and financing opportunities for the replacement of wood-burning stoves and installation of solar panels.

JPA Role

The purpose of the Marin Hazardous and Solid Waste JPA is to provide household hazardous waste collection, recycling and disposal information, ensure Marin's compliance with State recycling mandates, and provide education for the citizens and businesses of Marin. The JPA has an annual budget of approximately \$2 million (includes HHW facility staffing) and three full-time equivalent staff members. ***Any additional programs requires a formal action by Member Agency governing boards to determine if they want to participate in and fund programs to be developed by the JPA.***

The JPA is administrated by the Marin County Department of Public Works/ Waste Management. The role of the JPA is determined by the policies that are adopted by the JPA Board and the JPA Executive Committee. Based on the JPA agreement, and the policies and direction from the Board and Executive Committee, the JPA has the following responsibilities:

- Collecting disposal and diversion tonnage information from the solid waste service providers;

- Monitoring and reporting to the CIWMB the County's disposal tonnage, diversion rate and providing an update on the 39 adopted Source Reduction and Recycling and Household Hazardous Waste programs;
- Collecting tipping fees (AB 939 fees) from material disposed at Redwood Landfill and Recycling Center (Redwood Landfill) or processed through the Marin Sanitary Service Transfer Station;
- Conducting public outreach for countywide programs:
 - ▶ Websites: www.MarinRecycles.org and www.MarinMax.org
 - ▶ Stop junk mail kits
 - ▶ Tire Amnesty events (administered by the Department of Public Works)
 - ▶ Marin County Public Works Builders Guide
 - ▶ Christmas tree recycling
 - ▶ HHW education
 - ▶ Phone book recycling guide
 - ▶ West Marin consulting and outreach (administered by the Department of Public Works)
- Tracking legislation and recommending position statements to the Board of Directors;
- Applying for grants (availability will depend on economic conditions);
- Administering grants (e.g., CIWMB HHW grant for increasing store take-back of materials);
- Developing model ordinances for Member Agencies to adopt and enforce (e.g., construction and demolition ordinance); and
- Collecting batteries from County offices.

In addition to these activities, the JPA also has partnerships with the Bay Area Recycling Outreach Coalition (BayROC) and has passed a resolution supporting the California Product Stewardship Council (CPSC).

The JPA mostly interacts with the solid waste service providers in gathering tonnage information from the haulers. However, the JPA does not receive data from all haulers on HHW materials that may also be picked through curbside operations like those provided by Mill Valley Refuse. Other solid waste related activities that the JPA does not manage for the Member Agencies are the following:

- Used oil block grant collection (program is managed by the Marin County Stormwater Pollution Prevention program (MCSTOPP)), and the Novato Sanitary District;
- Marin County Solid and Hazardous Waste Permanent Facility (program is managed by the City of San Rafael and is funded by JPA fees);
- Household Hazardous Waste collection at the Novato Household Hazardous Waste Permanent Facility for the Novato Sanitary District (NSD) (program is operated by the NSD and funded by AB 939 fees);
- Pharmaceutical and sharps collection (program is managed by the County Environmental Health Department and is partially funded by the NSD and others); and
- Battery collection (program is managed by the San Rafael Fire Departments and in Novato by the NSD).

Because a variety of entities manage these programs, the JPA may or may not be receiving information on collection or be aware of opportunities to

help improve or expand programs. For the permanent facility, sharps, and battery collection, the JPA does fund the program and has eventual oversight of the programs.

Tonnage Reports to the JPA

The JPA does not receive reports from all haulers that identify the service sectors that generated the diversion and disposal tonnages (e.g., residential, multi-family, commercial). While the JPA does receive aggregate tonnage numbers, having the tonnage identified by service sector would better enable the JPA to focus programs and public education to improve diversion. In addition, the haulers provide reports to the JPA in non-standardized format, which may result in the JPA not receiving as much information as necessary to make informed program decisions.

In addition to the hauler reports, Redwood Landfill also provides reports to the JPA which identify the amount of inerts, construction and demolition debris, green waste and ADC material is delivered to the landfill.

Marin JPA Role Compared to Other JPAs

The scope of responsibilities the Marin JPA has is limited in comparison to other JPAs in California. Two JPAs that were reviewed were the Alameda County Waste Management Authority (ACWMA), and the South Bay Waste Management Authority (SBWMA). This section highlights the main elements of the JPAs' operation. Additional information on JPAs in the state is presented in Appendix A.

Population Served

- ACWMA: 1.5 million
- SBWMA: 449,628

- JPA: 259,000

Budget

- ACWMA: \$18.5 million
- SBWMA: \$39.9 million
- JPA: \$2 million

Member Agencies

- ACWMA: 14 cities, County of Alameda and two sanitary districts
- SBWMA: 11 cities, County of Mateo and a sanitary district
- RWMA: four cities and Yuba and Sutter Counties
- JPA: 11 cities and Marin County

Dedicated Administrative Staff

- ACWMA: 26
- SBWMA: 6
- JPA: 3 full-time equivalents

Funding Sources

- ACWMA: facility fee, Measure D landfill surcharge, and Import Mitigation Fee.
- SBWMA: Shoreway Recycling and Disposal Facility tip fee, Shoreway commodity sales, and investment income.
- JPA: disposal fee (in or out of County)

Responsibilities

- ACWMA: technical assistance to public, businesses and local government; initiate programs; public policy advocate; and reports to state agencies.
 - Programs include: business outreach, long-range planning and property management; media and outreach; Member Agency services; green building/bay-friendly landscaping and gardening; school programs;

organics processing development; and administrative services.

- SBWMA: own and manage the Shoreway Recycling and Disposal Facility; support SBWMA programs; community outreach; education and focused communication; reports to state agencies.
- JPA: supports operation of the Marin County HHW facility and staffing; develops public outreach and planning documents; and reports to state agencies.

Member Agency Role

There are 12 Member Agencies in the JPA and each has a representative on the JPA's Board. The Executive Committee meets quarterly and the Board meets twice a year. At the Board meetings, the JPA staff informs the representatives of the current activities. Specific Member Agency roles include the following:

- Have a representative on the JPA Board of Directors and approves contracts;
- Administer their Franchise Agreements with solid waste collection companies and approve rate adjustments. Note that the City of Novato's franchise agreement is administered through the NSD;
- Adopt and enforce ordinances (e.g., construction and demolition);
- Approve JPA letters of support for legislation; and
- Implement programs, unless the Member Agency seeks the JPA's assistance.

JPA Solid Waste and Recyclables Collection

The JPA Member Agencies and Special Districts in the County independently contract their collection and disposal services for residential, multi-family and commercial services. Construction and demolition materials can be collected either by the franchised hauler or the contractor conducting the C&D activity. Unincorporated areas of the County are serviced by five franchised haulers and a municipal hauler. Not all areas of the County, such as West Marin, have mandatory collection which enables people to choose to take their material directly to the Marin Sanitary Transfer Station or Redwood Landfill. The six haulers operating in Marin County and the material they divert are noted in Tables 1 and 2 below.

Hauler Services

This section provides an overview of the residential and commercial collection services provided by each hauler including public education and diversion rate for calendar year 2006 (most recent data available from JPA). It also notes any additional services that the hauler might consider. *It is important to note that diversion rates stated in this section are only for the materials collected by the haulers. These diversion rates account for 30 percent of the JPA's AB 939 reported diversion, which also includes material from store back-haul recycling activities and self-haul operations that never enter the possession of the hauler.* JPA haulers diverted 129,400 tons in 2007, but this is a fraction of the total waste diverted. In the 2006, waste generation study approved by the state, 432,573 tons were documented as diverted in the County. This means the haulers are diverting approximately 30 percent of all diverted material countywide.

Overall, each hauler provides “bundled” rates in which the solid waste container size determines the rate charged and recycling and green waste containers are provided for no extra fee. Having the rate dependent on solid waste capacity is intended to be a financial incentive for customers to minimize disposal and maximize recycling of post-consumer materials and green waste. Most haulers provide co-mingled recycling services where residents do not have to sort materials. The exception to this is Marin Sanitary Service which has split-carts intended to keep paper and other materials from being contaminated.

Each hauler is responsible for promoting their solid waste and recycling services. The franchise agreement requirements vary in specificity between jurisdictions, but all have a public education component. Public education pieces described in this section were provided as part of this Feasibility Study.

As highlighted in Tables 3-8, all haulers were achieving at least 30 percent (Mill Valley Refuse Service in the unincorporated County) and a maximum of nearly 65 percent (Marin Sanitary Service in Ross). Overall, the haulers diverted approximately 42 percent of the waste collected through their services. The JPA's data, as reported by the haulers, does not provide for detailed analysis of residential and commercial sector diversion.

The difference in level of public education and diversion performance is related to often vague or non-existent requirements in the franchise agreements. In some cases, franchise agreements are automatically renewing and have not been amended except for rate adjustments. Discussion of franchise agreement language is later in this document.

Table 1 Franchised Haulers			
Franchised Hauler	Service Areas*		
Bay Cities Refuse	Sausalito, <i>Marin City CSD</i> , and <i>County</i>		
Marin Sanitary Service	<i>County</i>	Larkspur	San Anselmo
	Fairfax	<i>Ross Valley SD</i>	San Rafael
	<i>Las Gallinas Valley Sanitary District</i>		
Mill Valley Refuse	<i>Almonte</i>	Corte Madera	<i>Strawberry</i>
	<i>Alto SD</i>	<i>County</i>	Tiburon
	Belvedere	<i>Homestead</i>	Mill Valley
Novato Disposal**	Novato Sanitary District (Novato and <i>County</i>)		
Redwood Empire Disposal **	<i>County (West Marin), Bolinas Community Public Utility District, and Stinson Beach County Water District</i>		
Tamalpais Community Services District	<i>Tamalpais Community Services District</i>		

**Italics note parts of Unincorporated Marin County*

***Has same parent company*

Table 2 Recyclable Materials Collected by Haulers						
Franchised Hauler	Recyclable Materials collected					Not Collected
	Paper and Cardboard	Milk cartons*	Glass Bottles/ Jars	Plastic Containers (1-7)	Metal Cans	
Bay Cities Refuse	✓		✓	✓	✓	Paper towels, waxed or coated paper**, plastic bags**, photographs, Styrofoam, ceramics or mirrors
Marin Sanitary Service	✓		✓	✓	✓	
Mill Valley Refuse	✓	✓	✓	✓	✓	
Redwood Empire Disposal	✓	✓	✓	✓	✓	
Novato Disposal	✓	✓	✓	✓	✓	
Tamalpais CSD	✓		✓	✓	✓	

**Includes juice, rice, and soy boxes*

***MSS does collect these materials*

Bay Cities Refuse

Services

Bay Cities Refuse provides manual backyard collection to residents and recyclables are placed at the curb. The hauler is willing to add food waste collection if there is a facility to take it to.

Public Education

Bay Cities Refuse provided a recycling notice provided to new customers and their recycling newsletter. Both publications identified the types of material accepted and not accepted in the recycling container.

Diversion

Service Area	Total
Sausalito	47.88%
County	30.01%
Hauler Total Diversion	42.01%

Marin Sanitary Service

Services

Marin Sanitary Service offers weekly automated and semi-automated cart collection of solid waste, recyclable and green waste. The size of solid waste containers offered range from 20 to 96 gallons, recycling is offered in 32 gallon carts, and green waste is offered in 64 gallon carts. Where space is a problem, 5 gallon buckets are also provided.

Recycling is placed in dual sort carts serviced by split-body trucks. The dual sort containers are intended to prevent paper contamination by having one side for paper and the other for plastic, glass and aluminum. Recycling services are unlimited and green waste is generally limited to 128 gallons with the exception of San Anselmo that has unlimited green waste service. MSS also has a couple food waste digestion pilot programs underway that are described

later in this study. They are also exploring the option of taking food waste to either their composting facility in Zamora or the residential food waste facility at Redwood Landfill for composting once the compost operations receive proper permits.

Bulky item collection can be provided to customers for additional cost in Ross Valley South. However, in Ross Valley North, single-family and multi-family dwelling customers can receive free semi-annual collection of up to two cubic yards of solid waste, recyclables, or green waste on their regularly scheduled collection day. This collection is separate from the Christmas tree collection that occurs for two weeks in January.

In addition to these services, MSS has a Construction and Demolition facility that accepts dirt, rock, concrete, wood, cardboard and metal. Inerts are ground and diverted. It is estimated that the facility operates at 40 percent of its capacity during a strong economy. Material is accepted from contractors and individuals. If the Member Agencies and Special Districts direct all materials to MSS, it should only be done if some type of tipping fee oversight by the participating agencies.

Public Education

Marin Sanitary Service provided multiple newsletters which contain information on clean-up days, services, holiday schedules, recycling guides, and industry news. The company also provided HHW and Conditionally Exempt Small Quantity Generator (CESQG) pamphlets, zero waste school lunch materials, a full recycling guide, a "Did You Know?" sheet, a cotton bag as an example of plastic bag alternatives, and informational sheets on plastic bags and bottled water.

MSS also produces a “Waste Not” pamphlet that provides customers with information on actions that can reduce waste. Multiple jurisdictions required public education in their respective franchise agreements.

Beyond published materials, MSS provides school outreach to promote waste reduction. In 2009, MSS was named the Partner of the Year with the California Product Stewardship Council. MSS has linked its website to CPSC and has handed out CPSC’s consumer brochure at events.

Additional Notes

MSS is striving to achieve Zero Waste through multiple methods, which includes their partnership that was established in 2007 with iReuse. The purpose of the partnership is to reduce business waste through reuse and donation. The partnership will enable the facilitation of donation and sales of reusable materials and provide clients with tax-deductible receipts.

Beyond the collection services the company provides, MSS also promotes Zero Waste and strives to become a Zero Waste business. In 2008, MSS underwent a waste characterization study of its residential and light commercial loads to determine what materials were not being recycled by customers at the curb. They are using this data to re-target education efforts. The latest step undertaken by Marin Sanitary Service is the development of a Zero Waste plan for their facility and operations, and food digestion pilot programs.

Diversion

Table 4 Marin Sanitary Service (2006)	
Service Area	Total
San Rafael	48.70%
Larkspur	49.03%
San Anselmo	62.52%
Ross	64.94%
Fairfax	57.77%
County	45.96%
Hauler Total Diversion	50.93%

Mill Valley Refuse

Services

Mill Valley Refuse provides weekly single-stream, and semi-automated recycling service and bi-weekly collection of green waste cans. All of the areas it services have mandatory collection. In addition, residents have the option of scheduling curbside collection of used motor oil and filters. Waste material is under contract to be delivered to Redwood Landfill. Recyclable materials are transported to the City of Santa Rosa and are processed there. Any household hazardous waste collected is taken to the Marin County Household Hazardous Waste Permanent Facility.

Free services offered to customers include quarterly free pick-up of up to 3 cubic yards of garden cuttings, trimmings, or debris. They also provide free collection of “reasonable amounts” (from franchise agreement) from public areas owned by the County.

Depending on whether construction and demolition materials are required to be recycled by jurisdiction ordinance, the material is either disposed or taken to a recycling facility. The recycling facilities that are used are in the City of Santa Rosa or the Marin Sanitary Service’s facility.

Public Education

Mill Valley Refuse provided a copy of their most recent Let's Talk Trash newsletter, which advertised Holiday tree and material recycling options. A Mixed Recycling Guide for new blue carts being delivered to residents was also provided. Of the jurisdictions Mill Valley Refuse services, Almonte required the most for public education.

Diversion

Service Area	Total
Mill Valley	35.62%
Belvedere	34.99%
Corte Madera	37.31%
Tiburon	38.17%
Alto	33.79%
County	35.63%
Homestead	34.44%
Strawberry	41.65%
Almonte	33.81%
Subtotal County	36.68%
Hauler Total Diversion	36.67%

Novato Disposal

Services

Novato Disposal provides automated weekly collection of solid waste, recyclables and green waste. Solid waste and green waste are collected using split-body trucks. Solid waste containers offered range in size from 20 to 95 gallons. Commingled recyclables and green waste containers are offered in 68 and 95 gallon capacity and residential customers can receive extra carts at no additional cost.

Another free service residents receive is excess waste clean up during two predetermined weeks a year. The service is limited to a 14 bags, boxes, or cans of material per household; E-Waste is not collected as part of the event. Multi-family complexes receive

bins for accumulation of material. Household Hazardous Waste and E-Waste disposal is handled at the Novato Recycling Center, which also collects TVs and CRTs. Novato Sanitary and Novato Disposal also operate 2 E-Waste events a year, 4 days each, where any Novato residents can bring any electronics for recycling.

For schools and commercial accounts, customer service representatives perform site walk-throughs to assess the waste stream and help divert material from disposal.

Public Education

As part of the franchise agreement with Novato Sanitary District, Novato Disposal advertises cleanup events, the Christmas tree program, recycling and HHW programs, and also requires a Novato Solid Waste Management Work Plan and a bi-annual newsletter. In addition, to the efforts of Novato Disposal, the Novato Sanitary District produces a comprehensive recycling guide that identifies reuse and recycling locations by material type and hauler service information. Novato Disposal also distributes backyard composters to Novato residents at a reduced cost.

Diversion

Service Area	Total
Novato	40.15%

Redwood Empire Disposal

Services

Redwood Empire Disposal provides semi-automated cans for solid waste and automated carts for commingled recyclables (includes rigid plastics) and green waste. Solid waste and recyclables collection is weekly with green waste service occurring bi-weekly. Customers are allowed

unlimited recycling and up to 10 containers for green waste. Residential customers also receive two free pick-ups of bulky waste on pre-determined weekends. All collections are by appointment and can be up to three cubic yards in volume. Disposed items are taken to Redwood Landfill, recyclables are taken to Petaluma and green waste is taken to Redwood Landfill or Bolinas.

Public Education

Redwood Empire Disposal produces a newsletter advertising curbside cleanup of bulky items, Household Hazardous Waste disposal options, and reminding customers of acceptable recycling materials. In addition, a separate recycling guide brochure is distributed. Redwood Empire Disposal also provides businesses with a Recycling Packet to provide resources and tips for businesses to start a recycling program. As part of the Packet, businesses are encouraged to sign a “Go Green” pledge that identifies at least three actions they will take. The signed pledge is mailed to Redwood Empire Disposal.

Diversions

Table 7 Redwood Empire Disposal (2006)	
Service Area	Total
County	36.85%

Tamalpais Community Services District Services

Tamalpais Community Service District (CSD) provides weekly cart collection of solid waste, recyclables and green waste. The CSD also provides residents with backyard composting workshops and worms for compost bins. The CSD also offers free curbside pick-up of E-Waste and participates in community events such as Debris Day, Green Waste Day and shredding and pharmaceutical drop-offs. Residents

can also pick-up free compost and wood chips at the CSD yard and drop-off batteries and fluorescent tubes.

Public Education

Public education provided for the CSD consisted of a four-fold Service Guide for garbage, recycling and yard waste pickup that described the acceptable materials per cart, what materials are considered toxic, and other customer service information. They also distribute PG&E Climate Change materials, newsletters promoting services.

Diversions

Table 8 Tamalpais Community Services District (2006)	
Service Area	Total
County	46.91%

Waste Disposal

In 2007, the JPA disposed 229,271 tons which was an increase of over 40,000 tons from the previous year². The chart below shows the trend in disposal over 13 years. This chart illustrates that although the JPA has been able to document diversion levels that exceed 70 percent since 2000, the disposal tonnage has remained relatively constant. This means that people over the past 14 years have been generating more waste.

The County has the highest generation (disposal + diversion) and diversion rate in the state because residents and businesses consume a lot of products and sends the material for recycling or disposal. Because the generation is based on weight, construction materials

² As economic conditions declined, so has disposal tonnage. In 2008, JPA disposal decreased to 211,000 tons. It is anticipated that disposal will increase as the economy rebounds (e.g., construction/remodeling activities, individual consumption).

could be dominating the waste stream (disposal, diversion or both sides of the waste stream). The high diversion rate is due to the recycling and reuse programs undertaken in the County and ability of the JPA to provide documentation to the state that proves an array of diversion activities and their associated tons. However, the high diversion rate does not change the need to focus on the disposal stream (in the short-term) to achieve Zero Waste.

The average disposal since 1995 was 197,450 tons and the five-year average since 2000 is slightly lower at 183,410. Of note, is that the disposal tonnage has been increasing since 2005, but the economic downturn may influence disposal patterns. Figure 1 illustrates the MSS waste characterization findings³ of the type of material disposed and Figure 2 depicts the disposal trends. Paper mostly comes from multi-family units and small businesses.

For the JPA to reach the Zero Waste goals by 2013 and 2025, the focus must be on reducing the materials disposed. This is especially true with the changes to AB 939 reporting as a result of SB 1016.

**Figure 1
Materials Disposed**

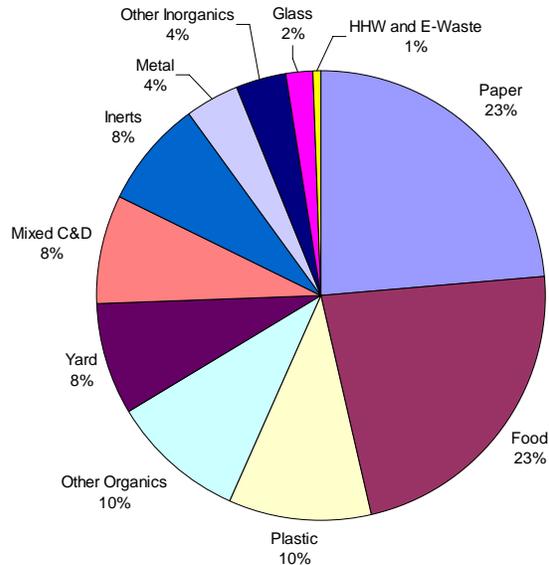
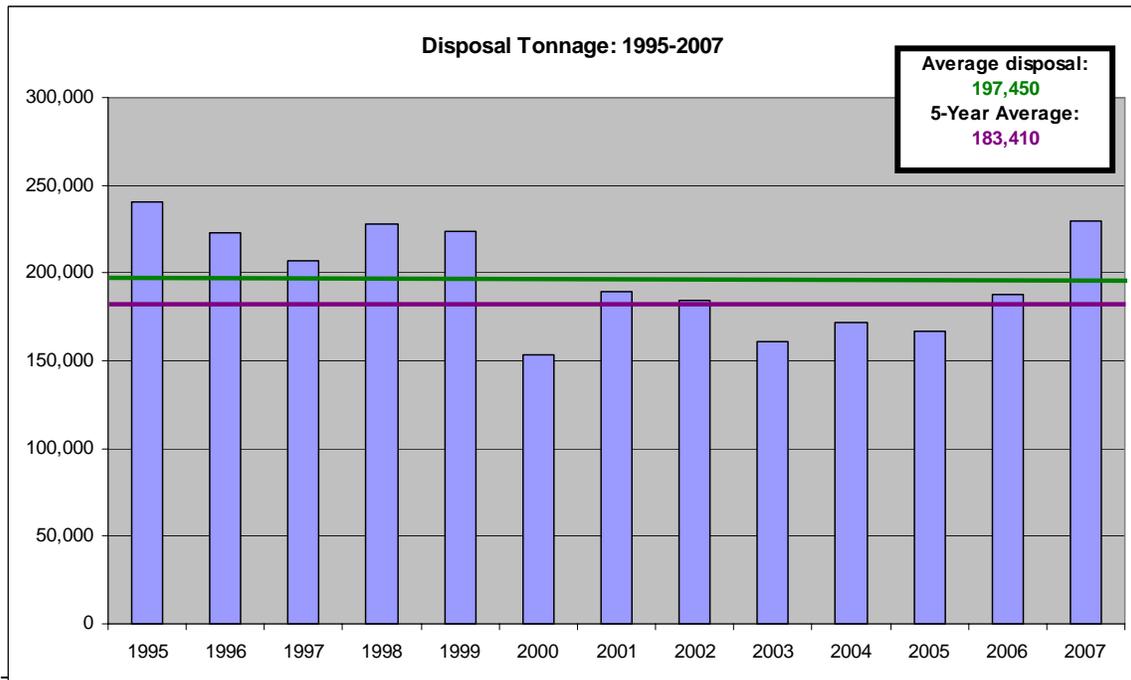


Figure 2



³ The study did not include the Novato waste stream.

SB 1016

SB 1016 measures compliance with AB 939 by the per capita disposal rate (50 percent of generation is the goal). For 2007, the JPA had a disposal target of 7.6 pounds per person per day and the actual disposal was below this threshold at 4.9 pounds. This is equivalent to 68 percent diversion. While the JPA has grown accustomed to having diversion rates in the 70 percentile, the change in diversion measurement to disposal eliminates the addition of biomass diversion as “extra credit” on top of normal diversion activities. Therefore, the disposal target calculated is an average of 2003-2006 documented diversion and disposal. This does not mean that biomass does not count as diversion; its absence from disposal tonnage is by default measured as diversion just like every other activity (e.g., curbside recyclables). In addition, the 2007 diversion rate is lower than previous years because of the increase in disposal tonnage.

The CIWMB stated that rather than basing compliance on AB 939 on the target per capita disposal, diversion programs are going to become more of a focus. Consequently, effort must be placed on reducing the amount of disposed materials to continue to meet the state’s diversion standards and also enable the JPA to achieve its Zero Waste goals. Only by developing or strengthening programs to divert disposed materials through source reduction, recycling, and composting programs will the JPA be able to achieve Zero Waste.

The JPA has embraced an aggressive goal for achieving Zero Waste based on:

- Realizing 80 percent diversion of waste from disposal by 2012; and
- Achieving Zero Waste by 2025.

In achieving these goals, there may still be residual waste after diversion processing.

Materials Disposed

The August 2008 “Audit of Residential/Light Commercial Disposed Waste” report prepared for Marin Sanitary Service by CalRecovery, Inc. was reviewed and analyzed. The study described a quantitative waste characterization of waste disposed at the MSS Transfer Station in San Rafael. The residential and light commercial waste sampled and sorted was delivered to the transfer station by MSS in its rear loader collection fleet.

The results of the waste characterization study are presented in Table 9. The percentage allocation of the material categories and types in the residential/light commercial waste sector were assumed to apply to the entire waste stream. This table identifies that there are many common material types that can have diversion programs enhanced or initiated to significantly reduce the disposal stream.

**Table 9
JPA Disposal Composition**

Material Category	Composition (%)	Quantity (Tons)
Paper	23.48%	53,833
Food	22.85%	52,382
Plastic	10.47%	24,014
Other Organic*	9.57%	21,943
Yard/ Landscape	7.98%	18,286
Mixed C&D	7.80%	17,883
Inerts	7.80%	17,883
Metal	4.07%	9,327
Other Inorganic**	3.57%	8,185
Glass	1.89%	4,335
HHW and Special Waste	0.52%	1,200
Total	100.00%	229,271

*Wood, textiles, etc.

**Rocks, dirt, etc.

Franchised and municipal haulers serving the Member Agencies disposed of 175,227 tons which is equivalent to 76 percent of the 2007 tonnage. This means that 24 percent of the waste is being disposed through self-haul operations (e.g., individuals, construction/roofing companies) or debris box companies (haulers not identified in this report).

Although the percentage allocations presented in the table are based on overall disposal, it is important to note that at least 6,500 tons of C&D material was also disposed (based on 2006 data). This is equivalent to nearly three percent of the 2007 disposed material, but likely higher due to the limited recycling facilities in the region, the varying existence of construction and demolition ordinances in the County, and subsequent enforcement. Because these materials are collected in roll-off containers, their composition was not analyzed through the CalRecovery study.

Solid Waste Facilities

The County has limited facility options for local diversion and disposal of materials. Tables 10 and 11 identify the current facilities used and their location. Marin Sanitary Service notes that their facilities are at 40 percent of capacity. With the downturn in the economy, capacity has increased, but it is uncertain what the capacity will be and if additional facilities are warranted once the economy rebounds. In addition, if the Member Agencies or franchise agencies require that the franchised hauler use a specific facility, there should be some form of tip fee rate oversight by a public agency.

There were 12 landfills that reported receiving JPA waste in 2007, but over 98 percent of the disposal occurred at three sites: Redwood Sanitary Landfill

(59.3%), Keller Canyon Landfill (24.7%), and Potrero Hills Landfill (14.2%).

**Table 10
Disposal Destination**

Facility	County Location
Altamont	Alameda
Vasco Road	Alameda
Keller Canyon	Contra Costa
Bakersfield*	Kern
Azusa Land Reclamation Co.	Los Angeles
Redwood	Marin
Foothill*	San Joaquin
Forward	Manteca
Ox Mountain	San Mateo
Guadalupe*	Santa Clara
B-J Drop Box	Solano
Potrero Hills	Solano

**Received 5 tons or less*

As shown in Table 11, there are few local facilities that can handle diversion of food waste and Construction & Demolition materials. While green waste also appears to have facility options available, a significant portion of the material is being used as erosion control at Redwood Landfill that could be composted if facilities existed in the region. The option of local facilities may not be a limiting factor, but the facilities available for consolidating the material and transporting it is another aspect that must be addressed.

Currently, Marin Sanitary Service Transfer Station is the only transfer station in the County that has the facility and potential to accept material from the region to transport it to recycling/diversion facilities. The feasibility for expanding the role of the Transfer Station to accept the regions materials and potential siting of new facilities for both transfer and processing are discussed later in this report. The ability to increase diversion by material type and facility needs will also be discussed. Because Redwood Landfill

receives the majority of the JPA's waste, a description of its operations is below.

This vehicle count does not include potential construction and demolition material traffic. Redwood Landfill also

**Table 11
Current Residential and Commercial Diversion Destination**

Material	Facility Name	City Location	Permit (TPD)
Curbside Recyclables	Smurfit Stone	Oakland	N/A
	Strategic Material	San Leandro	N/A
	Timber Cove Recycling	Santa Rosa	N/A
	Marin Recycling Center	San Rafael	N/A
Green Waste (Compost)	Redwood LF	Novato	170
	Bolinas Stinson Resource Recovery	Bolinas	N/A
	West Contra Costa SLF Compost Facility	Richmond	200
	Northern Recycling Compost	Zamora	N/A
Food Waste	Central Marin Sanitary Agency*	San Rafael	N/A
C&D	Marin Resource Recovery**	Marin	750
	Redwood LF	Novato	400

*Partnered with MSS. Currently is a pilot program that is expected to be fully operational in 2010.

**Sorts loads.

Redwood Landfill and Recycling Center

Redwood Landfill and Recycling Center is located near Novato, CA. It is the only disposal facility in Marin County and is the main recipient of green waste for diversion. The facility accepts material from self-haul and commercial haulers. For 2009, it estimated that it receives 15-30 trucks per day of residential and commercial franchise hauler loads from West Marin, Mill Valley, and Novato. The direct-haul from the franchised haulers is a result of contracts that range between one and five year terms. With its permit approved in December 2008, the facility can now handle 415-615 personal vehicles delivering material per day.

has been diverting green waste, wood, metal, biosolids and inerts. Alternative Daily Cover predominantly consists of wood waste.

Composting (Green Waste and Biosolids)

The site has a composting area with space for a grinder and turning windrows. The composting operation is limited to a maximum of 170 tons per day. Of that amount, biosolids can be a maximum of 80 tons and with the new permit, a maximum of 30 tons of food waste can be mixed in. Food waste is considered part of this tonnage if it contains meat scraps. Otherwise, unlimited vegetative food waste can be

mixed into green waste. The amount of food waste that can be included in the compost restricted in order to minimize to air emissions.

Green waste material that is not used for composting is used as erosion control on the slopes of the landfill.

Inerts

Inerts that go to the facility are used as ADC or road base. Waste Management, Inc. (WMI) is in the planning stages to construct and operate a C&D facility to process and sell material. WMI intends to operate this facility on a regional basis (for material coming from inside and outside of Marin County), but as it is owned by Waste Management, Inc., it may take its own material first.

There is also the concept of a “reuse center” that would be a buyback center for construction material. Permitting issues would need to be overcome before retail operations could begin. Regardless, salvaging material is intended to be part of the C&D facility operations.

Food Waste Digestion

Redwood Landfill reported that they are planning a digestion pilot project in 2010. Approximately 100 tons per day would be processed consisting of residential and commercial food waste, woody waste and soiled cardboard. The project is expected to generate five to six megawatts. This is enough energy to power approximately two percent of Marin County households.

Household Hazardous Waste Collection

The County has several ways of properly disposing of hazardous waste. There is the permanent collection facility

located in San Rafael that collects all HHW material from residents and small businesses. The facility also hosts three, one-day events in Bolinas, Woodacre, and Point Reyes which are funded through the JPA. Other collection points in the County include the permanent collection facility operated by the Novato Sanitary District, curbside collection of motor oil and filters through Mill Valley Refuse, and various local collection points for batteries and fluorescent light bulbs.

Used Oil Block Grants

Used Oil Block Grants are non-competitive grants offered by the California Integrated Waste Management Board. Funding provided to a jurisdiction is based on the population. Jurisdictions also can apply for competitive grants if there are specific projects that needed funding such as market studies and expansion of permanent HHW facilities.

The County of Marin Stormwater Pollution Prevention Program handles all aspects of the Used Oil Block Grants for the County except for the City of Novato which applies for and administers the grant on their own through the NSD. For the 14th Cycle Used Oil Block Grant (FY 2008/09), the County (including Novato) received \$81,158 to maintain and increase collection of used motor oil and filters. The grant can be used for a variety of program-related expenses including purchasing equipment for certified collection centers, recruiting new centers into the program, stenciling storm drains, recycling costs for the used oil and filters, and administration of the grant.

The County of Marin has 13 certified collection centers, with six in San Rafael, four in Novato (plus the Novato Recycling Center) and one each in

Greenbrae and Pt. Reyes. These centers are concentrated in the two largest cities in the County and may not adequately serve the residents at further points in the County, such as Sausalito and Mill Valley or other agriculture areas. As recorded by the CIWMB, these centers collected 36,183 gallons of oil and 4,002 filters in 2007. This was an increase over the previous year of 13.7 percent for oil and 32.9 percent for filters.

While there has been an increase in diversion of oil and filters, it is important to note that the quantity diverted is dependent on the certified collection centers submitting reimbursement claims to the CIWMB. By determining the actual collection from all certified centers, the County of Marin and City of Novato will be able to better assess where their energy should be focused and determine if more centers must be recruited in underserved areas. In addition, curbside collection that is conducted by Mill Valley Refuse goes to the permanent HHW facility and does not get recorded separately. This becomes a record keeping issue and while reports from MVR could be submitted directly to the County, the main issue is that the County should have the information available to it to identify program progress and opportunities for improvement.

Beyond the reporting issue, because used motor oil is a component of the waste stream and part of some curbside collection programs, it is important that the JPA at least be aware of the amount of oil and filter collection occurring in the County and may be able to assist the ESD with recruitment of centers and outreach.

Universal Waste

In 2001, the Department of Toxic Substances Control (DTSC) formally

adopted the regulatory exemptions which allowed households and conditionally exempt small quantity generators (i.e. many small businesses) to temporarily dispose of certain U-Wastes in municipal landfills until February 9, 2006.

The intent behind the exemption was to allow time for the collection and recycling infrastructure and recycling capacity to develop without placing an undue burden on the hazardous waste management system. DTSC determined that the infrastructure was not being developed and on January 10, 2006, DTSC released an official notice stating that this landfill ban exemption would not be extended beyond February 8, 2006. The intent of this action was to force a public discussion about how to collect and manage universal wastes.

Sharps

In 2006, SB 1305 (Figueroa), Statutes of 2006, Chapter 64 (SB 1305), updated the Medical Waste Management Act by making it against the law for persons to knowingly place home generated sharps in the trash as of September 1, 2008. Sharps include disposable hypodermic needles, syringes, lancets, and other medical devices used for self-injection or blood testing, which may have a sharp tip or end. It also enumerated the following allowable disposal options:

1. A household hazardous waste (HHW) facility;
2. A "home-generated sharps consolidation point" ;
3. A medical waste generator's facility; and
4. A facility through the use of a medical waste mail-back container approved by the California Department of Health Services.

The legislative intent of SB 1305, as outlined in the “findings” section of the bill, is as follows:

- (a) The development of a safe, convenient, and cost-effective infrastructure for the collection of millions of home-generated sharps, and the public education programs to promote safe disposal of these sharps, will require a cooperative effort by the State Department of Health Services, the California Integrated Waste Management Board, local governments, large employers, dispensing pharmacies, as well as health care, solid waste, pharmaceutical industries, and manufacturers of sharps.
- (b) Since mail-back programs utilizing containers that have been approved by the United States Postal Service offer one of the most convenient alternatives for the collection and destruction of home-generated sharps, local government and private sector stakeholders are encouraged to implement mail-back programs and to promote their use prior to September 1, 2008.
- (c) Local governments, the California Integrated Waste Management Board, the State Department of Health Services, solid waste service providers, and manufacturers and dispensers of sharps are further encouraged to include information on their Web sites, and other public materials, that identify locations that accept home-generated sharps and provide information about available mail-back programs.
- (d) It is the intent of the Legislature that the California Integrated Waste Management Board and the State Department of Health Services, to the extent resources are available, continue to monitor the state's progress in developing the infrastructure for the collection of home-generated sharps and inform

the appropriate policy committees of any need for subsequent legislation to achieve the purposes of this act.

It is important to note that **SB 1305 does not mandate that local government fund or manage a sharps collection program**, but instead Section 1 (a) of the bill states clearly that development of the sharps collection infrastructure will require “a cooperative effort” by the state, local governments, pharmacies, manufacturers, and others to accomplish the goal. It then goes on to state in Section 1 (d) that it is the intent of the Legislature to have the state agencies continue to monitor progress on the development of infrastructure to collect sharps and of any need for subsequent legislation to achieve the purposes of SB 1305. In short, local governments cannot be held solely responsible for funding and operating sharps management programs. All stakeholders must work together to develop the required infrastructure.

Rechargeable Batteries

Rechargeable batteries have been addressed by legislation in California by AB 1125, which became effective July 1, 2006. The bill requires a person who makes a retail sale of a rechargeable battery to a consumer in the state, except for supermarkets, to take back rechargeable batteries from the consumers.

Existing Local Take-Back Disposal Options

When sharps or U-Waste are improperly disposed of, they pose serious health risks to generators, garbage haulers, landfill personnel, and the public, and

create a threat to the environment. Injuries or illnesses can result from handling these wastes. Furthermore, these wastes can enter and pollute the creeks, rivers, and water supplies.

Universal Wastes are accepted at the Marin County Solid and Hazardous Waste Permanent Facility and the Novato Recycling Center. In addition, sharps and pharmaceutical take-back programs are prominent in the County and are described below. The collection programs target human uses of the materials, but veterinarian offices may be an opportunity to expand programs because pets are a growing demographic receiving medication.

Sharps

As mentioned earlier, the County Department of Environmental Health manages the outreach in the County for the collection of home-generated sharps. This program is the result of the public/private partnership started in 1994 with the San Rafael Fire Department and the Marin Recycling Center.

Through its efforts, 27 facilities collect sharps. Tables 12 and 13 give a breakdown of the collection locations and identify the amount of sharps that have been collected. The numbers do not include any sharps that may have been generated through regular business operations (e.g., hospitals) or disposed through mail-back programs.

Table 12 Sharps Collection Locations in the County	
Jurisdiction	Number of Sites
Greenbrae	1
Larkspur	2
Marin	1
Mill Valley	4

Table 12 Sharps Collection Locations in the County	
Jurisdiction	Number of Sites
Novato	6
Pt. Reyes	1
San Anselmo	3
San Rafael	9
Total	27

Table 13 Sharps Collection in County from FY 05-06 to FY 07-08	
Time Period⁴	Pounds
FY 05-06	8,330
FY 06-07	7,642
FY 07-08	6,745
Total	22,717

Tables 12 and 13 show that there is an established network of facilities and businesses that residents have access to. Due to the recent nature of sharps being banned from disposal, it is unique that the County has been tracking the collection for so long and has such a large partnership with businesses as compared to other Counties. However, there has been a steady decrease in the amount of sharps delivered to these locations for disposal and efforts should be made to reverse the trend.

Pharmaceutical Waste Collection

Pharmaceutical materials in the waste stream are an area of growing concern and the County already has a network of 13 businesses that accept the material

⁴ FY 05-06 and FY 06-07 does not include the Novato permanent HHW facility collection.

back from the public. Like the sharps collection, the participating businesses are pharmacies and hospitals. Tables 14 and 15 identify the concentration of collection points and the amount of material residents disposed through them from FY 05-06 to FY 07-08.

Table 14 Pharmaceutical Waste Collection Locations in the County	
Jurisdiction	Number of Sites
Larkspur	1
Mill Valley	2
Novato	3
San Anselmo	3
San Rafael	4
Total	13

Table 15 Pharmaceutical Waste Collection in County from FY 05-06 to FY 07-08	
Time Period	Pounds
FY 05-06	633
FY 06-07	1,186
FY 07-08	1,462
Total	3,281

Pharmaceutical waste collection has disposal locations throughout the County. The spread out locations of the collection sites provide opportunity for residents to safely dispose of their unused medication. Because it is difficult to quantify the amount of material that is generated, there is no way to determine what percent the County's efforts are collecting.

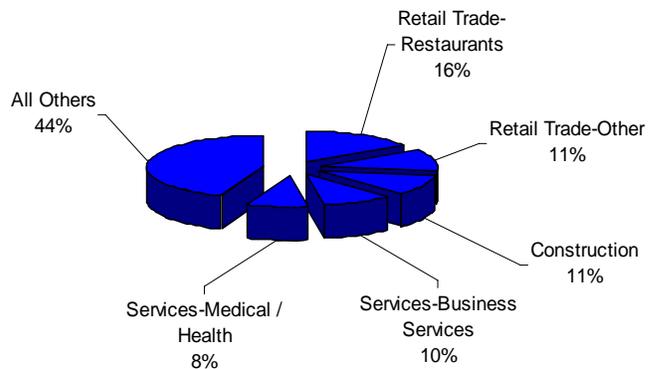
Opportunities for Increasing Diversion

Of the materials currently disposed, the franchised haulers already have curbside programs in place for the collection of the paper, yard waste and glass. Based on feedback from the haulers, the residential green waste set-out rate is 70-80 percent and the residential recycling set-out rate is over 90 percent⁵. This section identifies opportunities for increased diversion.

Paper

In addition to green waste, paper is another significant commodity that is not being collected. Because the set-out rate for recycling at residences are over 90 percent, the greatest increase in diversion will be achieved by focusing on the commercial sector. Figure 3 identifies the main business types located in the County. There are a couple methods/programs that can be implemented to increase the diversion of this and other materials generated by the commercial sector.

**Figure 3
Top 5 Commercial Business Types
by Waste Disposed**



⁵ The MSS rate is 90-95% as per a JPA commissioned study by California Waste Associates.

Wet and Dry Collection

One way of increasing diversion is to have the franchised haulers develop a wet and dry material collection route. This means that the routes are designed to pick up mostly dry loads (e.g., paper, glass) in one truck to avoid contamination that could occur if a restaurant's material was also placed in the same truck. Conversely, the businesses that generate wet loads (e.g., food, grass) would have their contents emptied into the same truck. This collection process and its benefits are described later in this Feasibility Study.

Commercial Recycling Ordinance

Another way of increasing diversion could be having each jurisdiction in the County adopt a mandatory commercial recycling ordinance. This ordinance could also work in tandem with a wet/dry collection method. The details of the ordinance and its diversion benefits are described below. Regardless, mandatory commercial recycling ordinance will need to be adopted in year 2012 as part of compliance with AB 32. The CIWMB is currently developing the regulations.

Construction and Demolition Ordinance

The JPA has 12 jurisdictions (including the County) that it recommends adopt construction and demolition (C&D) debris recycling programs. A 2004 waste characterization study by the CIWMB identified that C&D materials account for nearly 22 percent of the waste stream. Many of these materials can be salvaged or recycled. The C&D waste stream represents a potential long-term diversion opportunity for the

County. The JPA has developed a model ordinance as a guide for Marin County jurisdictions to follow to help reach this goal. The status of the 12 jurisdictions adopting the ordinance is as follows:

- Five have adopted a C&D ordinance (the County, Mill Valley, Novato, Sausalito, and Tiburon);
- Five have no provisions for C&D recycling currently (Belvedere, Bolinas, Fairfax, Ross, San Rafael).
- One is planning to adopt an ordinance in the near future (San Anselmo); and
- One requires "Build it Green" standards for permitted construction projects (Larkspur). Novato enforces "Build it Green" requirements as well in addition to their C&D ordinance.

The JPA recommends a goal of 50 percent diversion which has been universally adopted by jurisdictions with a C&D ordinance, as well as Larkspur where the "Build it Green" program requires 50 percent recycling as well.

Waste Management Feasibility Studies

Of the five jurisdictions requiring C&D ordinances, all of them require some kind of Waste Management Feasibility Study (WMFS) to assist in documenting and verifying 50 percent diversion. Construction or demolition may not commence until the plan is accepted. The JPA model ordinance also calls for a WMFS but also suggests a deposit system based on project size be implemented. However, none of the WMFS compliance enforcement measures of the five jurisdictions follow this suggestion. The WMFS plans are meant to estimate waste generation and formulate a plan for recycling 50 percent of the materials. Upon completion of the project, receipts demonstrating the

destination of the C&D loads are required by the jurisdiction.

Project Thresholds

The JPA model recommends that the project threshold for projects covered by the ordinance be 1,000 square feet. The Cities of Mill Valley and Sausalito's thresholds include all projects with the exemption of re-roofing, window replacement and drywall projects. However, Mill Valley uses its discretion which tends to include projects about 500+ square feet. Novato has the threshold at all projects over 500 square feet and the County areas include all projects without exception. The Town of Tiburon does not have a threshold but uses its discretion during permitting for which projects must comply.

Enforcement

The JPA model suggests a security deposit of three percent of project value be submitted by contractors for each project. The deposit is to be returned based on compliance. The model also suggests possible additional fines for non-compliance. None of the jurisdictions use a deposit system.

Enforcement for all Member Agencies, except Tiburon, lies in the right to withhold occupancy permits pending adequate recycling; Tiburon has a \$500 fine for non-compliance. The other four jurisdictions may also assess fines in addition to withholding permits. Fines range from \$500 to \$2,500. The City of Mill Valley has expressed that the threat alone of withholding a certificate of occupancy has caused there to be no instances of non-compliance. All the other jurisdictions with ordinances also expressed that they have had no issues with non-compliance up to this point; however, the County expressed that some contractors would lose receipts in which case the County would require a

document with an explanation of destinations for loads.

Use of Fines

None of the five jurisdictions mandate how to use funds collected from fines for non-compliance. The JPA model suggests that they be used solely for recycling purposes.

Limited Facility Options

A construction and demolition program is dependent on the facility quality that C&D materials are delivered to. No matter how closely contractors follow recycling plans, it is ultimately the facilities that determine how much material is diverted. Redwood Landfill and Marin Resource Recovery Center are the two main facilities contractors are reported to be using. MSS states that they have capacity to handle the County's C&D waste stream. If the Member Agencies or franchise agencies require the material to be taken to a specific facility, there should be some form of tip fee oversight by a public agency.

Jurisdictions also depend almost entirely upon the accuracy of weight receipts distributed by facilities that contractors attach to waste management reports as proof of diversion. Mill Valley, Sausalito, Tiburon and the County all cited the ability to verify the accuracy of receipts and assess compliance as the biggest challenge facing the success of the C&D recycling program. Since jurisdictional staff are going to be reviewing weight receipts to verify compliance regularly for C&D recycling programs, it is critical that staff be familiar with facilities or at the very least the facilities' reporting. There is also little a jurisdiction can do to verify that the attached weight receipts actually correspond to the project under consideration. The Marin County Department of Public Works'

report in June of 2007 stated that gate receipts are not proof of recycling, but that city staff must be trained to recognize proper proof.

An agreement with facilities to standardize clear and concise distinctions on weight receipts would be beneficial; MSS reports that they are already doing this. Distinctions could include origin of C&D waste and potentially a note acknowledging the material has been accepted as C&D and will be recycled accordingly. The City of Novato could offer leadership in this respect, as they were the only jurisdiction to report being satisfied with their ability to verify receipts. Novato reported that Redwood Landfill will guarantee materials are recycled for an additional charge. This guarantee is then communicated through a special stamp on the receipt that Novato staff can easily identify. For loads delivered elsewhere, staff accepts that loads that are delivered to MRFs are diverted.

Suggestions

For the full benefits of C&D debris recycling efforts to be realized, universal adoption of ordinances is essential. Six jurisdictions with no provisions for C&D recycling is a missed opportunity, for example, San Rafael (comprising about 23 percent of the County's total population) is included among those lacking an ordinance.

Thresholds for projects covered by the ordinance requirements are important to align with the goals of C&D recycling. For example, the Town of Tiburon defines the threshold as projects, "likely to generate substantial construction or demolition debris". This threshold creates opportunity for projects potentially choosing not to adhere to the ordinance despite the amount of generated debris. Alternatively, a defined threshold that is low such as

500+ square feet creates the potential for minor increases in diversion for high administrative costs. A high volume of projects being covered by the ordinance is less effective in achieving diversion goals than focused attention on high generation projects. For example, the City of Mill Valley exempts re-roofing projects from the requirements of the ordinance. Similarly, the City of San José transitioned from requiring re-roofing projects to comply to instead exempt them. This is due to the administrative burden it places on a jurisdiction's staff because of the large number of re-roofing projects that occur and the limited amount of C&D debris they generate. Other jurisdictions have found that the administrative burden of handling re-roofing projects is not worth the resources for the limited increase in C&D material diversion.

Along those same lines, non-compliance enforcement should better align with the actual goals of the ordinance. For example, in the City of Sausalito an administrative fine of \$500 is assessed for non-compliance. For smaller demolition projects, a \$500 fine might be a disincentive to recycle debris if the cost to recycle is more. The larger projects should actually be the focus of the C&D ordinance since they represent the largest tonnage generations and reasonable efforts should be made to provide compelling incentives for contractors to recycle as much material as possible. A retroactive fine of \$500 may, in some cases, not be enough incentive. The City of Mill Valley, however, has no financial incentive of enforcement, but rather solely depends on the threat of withholding certificates of occupancy and final approval. Per Mill Valley staff, the threat alone has been enough of an incentive as they have never had to exercise punishment for non-compliance.

Deconstruction/Salvage of Buildings

In addition to the C&D Ordinance, the County Community Development Agency is promoting the deconstruction and salvage of materials prior to demolition tear-out of buildings. The Agency has a reuse grant to encourage deconstruction contractors to provide services in Marin County and to site a reuse facility for construction and demolition materials. Through the grant, Marin Sonoma Deconstruction and Demolition Services, Inc., a local deconstruction/salvage company, has begun operating.

Marin-Sonoma Deconstruction and Demolition Services, Inc.

This company contacts homeowners that have pulled a permit to inform them of the option to donate to charity their soon-to-be demolished or removed fixtures. The company partners with the Reuse People and Reuse Network, amongst others, to take salvaged items for the purpose of reuse and resale.

The scope of deconstruction and salvage in the County can increase as ordinances are established that require a walk-through prior to demolition or other requirements to maximize recovery and reuse of materials and appliances. The County of Marin and the City of Mill Valley are both currently exploring such an ordinance.

Food Waste

Food waste is a significant portion of the waste stream that is generated by residential and commercial units, but does not currently have a large-scale method of recycling to eliminate it from the disposal stream. While the generation of these materials may be more concentrated with the residential sector, restaurants contribute up to 15.9

percent of the business waste stream (based on CIWMB 1990 generation tonnages). This does not account for other businesses that may have cafeterias in their facilities. Consequently, by implementing a food waste program, the amount of material disposed can be significantly reduced.

Although the concept of adding food waste recycling in the County is ideal, there are limitations with facilities can accept it. In addition, if food waste collection is to be added as a residential recycling service, the material will most likely be mixed with green waste which will require weekly collection. If a resident does not have green waste service, they will need it to participate in the program. In addition, franchised haulers will need to develop public education materials, and distribute kitchen pails to inform and encourage residents to participate. Based on findings by the Alameda County Waste Management Authority, a new food waste program can divert approximately 8 pounds per household per week and for a mature program up to 10 pounds per household per week.

While establishing the collection of food waste is one element, there also must be a facility that the material can be taken to. In the County, the only place that is currently handling some food waste is Marin Sanitary Service and it's a pilot program. The other possibility is Redwood Landfill's compost facility now that their permit has been approved. However, due to the air emission concerns, the landfill is limited to receiving a maximum of 30 tons per day of food waste. Whether the food can be mixed with the green waste or must be separate, remains to be determined. Currently, lawsuits are preventing the composting operation from beginning.

When the necessary permits are in place, which is anticipated to be in 2010,

MSS will begin co-collecting residential, kitchen food waste in the curbside green waste can for composting.

Additionally, a feasibility study has been completed, sponsored by PG&E, CMSA, the City of San Rafael, the City of Larkspur and MSS. It will allow for the development of a commercial food waste-to-energy, public/private partnership and eventual composting. This partnership will likely begin in mid-2010 from the restaurants and other points of food waste currently collected by MSS.

Other facilities that may be able to accept the mixed food waste and green waste material are presented in Table 16. The facilities are listed in order of least distance from the City of San Rafael.

A future potential facility for consideration is Zamora. The facility is partly owned by Marin Sanitary Service and they are interested in having the facility permit changed to accept food

waste. If this change occurs, the County will have another potential site to deliver the food waste to be composted.

Facilities accept food waste were researched to determine if there are any limitations to the type of food waste accepted and if the food waste can be combined with green waste upon delivery to the facility. All of the composting facilities that accepted the material stated that there is a problem with receiving glass and plastic in the deliveries. If food waste were to be added to the City's collection services, public education will be a crucial element to minimize "contamination".

Digestion of the material for energy and compost production is another option that is discussed later in this report. An alternative method of diverting food waste is also being pioneered by Waste to Water, LLC using a vessel that can digest 1,000 pounds of food waste per day with water as the discharge.

**Table 16
Summary of Compost Facilities That Accept Food Waste**

Facility Name	Location (County)	Miles From San Rafael	Type of Food Waste Accepted	Can Be Mixed with Green Waste?
Jepson Prairie Composting*	Vacaville (Solano)	57.6	Accepts all food waste	Yes
Grover Landscape Services, Inc. **	Modesto (Stanislaus)	80	Accepts all food waste	Yes
South Valley Organic Composting Facility	(Santa Clara)	100	Accepts all food waste	Yes
Z-Best Products	Gilroy (Santa Clara)	100	Accepts all food waste	No
Kochergen Farms Composting	Avenal (Kings)	214	Accepts all food waste	Yes

* Currently does San Francisco's food waste

**Livermore is transferring material to the facility using Davis Street TS

Green Waste

The CIWMB is currently considering several options to encourage more composting and discourage green material use as ADC. Options to change material use include the following:

- Assessing additional fees to green materials being used as ADC at a landfill.
- Phasing in of increased fees assessed to green materials being used as ADC.
- Defining green material ADC usage as disposal rather than diversion.
- Phasing in a definition of green material ADC as disposal rather than diversion.

In any case, the forecast of green material regulation in the State of California warrants the case for jurisdictions to seek alternatives to ADC usage of green materials and increase composting. Marin County may face the need to find a solution for green materials other than Alternative Daily Cover at Redwood Landfill in the near future.

Marin County jurisdictions already provide residential curbside collection of yard waste. Redwood Landfill uses the material for use as ADC, erosion control and compost. Novato Disposal notes that green waste sent to Redwood Landfill from them is not being used for ADC. Seventeen composting facilities have been identified within 100 miles of the City of San Rafael. Table 17 below lists these facilities by distance.

**Table 17
Green Waste Compost Facilities Within 100 Miles of the City of San Rafael**

Location	Facility Name	Facility Type	Miles from San Rafael	Capacity/ Day	Capacity Available (Tons)
Sonoma	Central Compost Site/Sonoma Compost	Composting	28.6	300	None
Napa	Napa Garbage Service Mat. Diversion Facility	Transfer/ Processing	31.2	360 tons	N/A
Alameda	Fremont Recycling & TS	Transfer/ Processing	51.1	2,400 tons	N/A
Vacaville	Jepson Prairie Composting*	Composting	57.6	750	300/day
Santa Clara	Greenwaste Recovery Facility	Transfer/ Processing	63	934 tons	N/A
Modesto	Grover Landscape Services, Inc.	Composting	80	2,000	1000
Zamora	Northern Recycling Compost- Zamora	Composting	82.7	N/A	N/A
Gilroy	South Valley Organic Composting Facility	Composting	100	750	70-90/day
Gilroy	Z-Best Products	Composting	100	1,500	300/day
Avenal (Kings)	Kochergen Farms Composting	Composting	214	1,000	500/day

Other than Redwood Landfill, hauling distance remains a difficulty as the next nearest composting facility is 28 miles away in Sonoma County. Capacity also poses a concern as many of the facilities listed are near heavily populated and high waste generating areas.

Since there are no composting facilities within the County, the option exists to haul green materials to a transfer station. MSS reports that they are currently composting all green waste they collect. Table 18 below lists transfer stations accepting green materials within 100 miles of the City of San Rafael.

**Table 18
Transfer Stations that Accept Green Waste**

County	Facility Type	Facility Name	Capacity/ Day	Miles from San Rafael
Marin	Transfer / Processing	Marin Sanitary Service TS	2,640 tons	0
Alameda	Transfer / Processing	Berkeley Solid Waste TS	560 tons	17.8
Sonoma	Transfer / Processing	Sonoma TS	760 tons	22.8
Sonoma	Transfer / Processing	Central Disposal Site/ Sonoma Compost	2,500 tons	28.7
Napa	Transfer / Processing	Devlin Road TS	1,440 tons	30.9
Napa	Transfer / Processing	Napa Garbage Service Mat. Diversion Facility	360 tons	31.2
Alameda	Transfer / Processing	Davis St TS / Recovery Complex	9,600 tons	33.5
San Francisco	Transfer / Processing	SF SW Trans & Recycling Center	3,000 tons	33.9
Sonoma	Transfer / Processing	West College TS	99 tons	37.7
Alameda	Transfer / Processing	Fremont Recycling & TS	2,400 tons	51.1
Sonoma	Transfer / Processing	Healdsburg TS	720 tons	54.8
Santa Clara	Transfer / Processing	BFI's Recyclery (Newby Island)	1,600 tons	56.3
Napa	Transfer / Processing	Pacific Union College Trans Facility	90 tons	58.1
Santa Clara	Transfer / Processing	Zanker Road Landfill	1,300 tons	60.7
Santa Clara	Transfer / Processing	Greenwaste Recovery Facility	934 tons	63
Santa Clara	Transfer / Processing	Mission Trail TS	375 tons	67

**Table 18
Transfer Stations that Accept Green Waste**

County	Facility Type	Facility Name	Capacity/ Day	Miles from San Rafael
Santa Clara	Transfer / Processing	Guadalupe San Landfill	3,650 tons	77.5
Santa Clara	Transfer / Processing	San Martin Transfer & Recycling	100 tons	90
Santa Clara	Transfer / Processing	Pacific Coast recycling	480 tons	97.7
Sonoma	Transfer / Processing	Annapolis TS	99 tons	100

Jurisdictions being served by Bay Cities Refuse, Inc. could use the Berkeley Solid Waste Transfer Station and the remainder might be able to use Marin Sanitary Service Transfer Station (the facility has approximately 1,320 tons per day available for transferring material).

Other Strategies for Increasing Diversion

Other jurisdictions across California have come up with a wide variety of unique strategies for increasing diversion of green materials.

Replicating these programs may be difficult with the limited-to-no facility siting options in the County due to land use restrictions (e.g., wetlands).

The City of Modesto operates its own composting facility. The benefits of doing so have been to save on landfilling costs and to realize the revenues generated from selling composts products produced at the facility. The compost products are also used at parks, on median strips and beautification projects. Modesto diverted 31,000 tons of green waste in 2001.

The City of Burbank has gone another route by partnering with its hauler and an orange grove in the nearby area. Green materials collected from within

the city are hauled to the 1,300-acre orange grove where the materials are composted and then used on-site as compost products. Over 19,000 tons of green material is diverted annually. The City also hosts 4 to 5 compost workshops each year which has helped lead to an annual total of 750 tons of green waste diverted through backyard composting.

The City of Los Angeles operates a compost facility in a large park where green material and zoo manure are composted. Finished compost product is used then to improve parkland landscapes or is sold to some private vendors. Some is donated to nonprofit organizations and schools for gardening or community improvement projects.

The facility's central location allows it to double as a convenient education center where citizens may learn how to compost in their own backyard and buy the necessary equipment to do so. Citizens may also buy compost products for their own landscapes and gardens. The key benefits have been to help Los Angeles reach diversion goals and save over \$170,000 annually from collection and disposal costs.

The benefits from the three models above of siting a facility are multi-

faceted. The following are examples of benefits:

- Extended landfill life expectancy;
- Avoided disposal costs;
- Revenues from sale of compost products;
- Convenient location allows for public education; and
- Highest and best use of green materials.

Another method of increasing diversion is to encourage backyard composting either through individual household or community efforts. The County of Marin has a Master Gardeners program that can be a resource to educating the public on best practices. In addition for people who do not want to compost in their backyards, or do not have space, a community garden could be an activity undertaken where residents can bring their food scraps, raise crops/vegetation and potentially receive compost for home use. Having a local and tangible method for people to divert resources and observe the benefits of the diversion can be positive reinforcement for sustaining diversion activities.

Maximizing Diversion

Wet vs. Dry Material Collection Routes

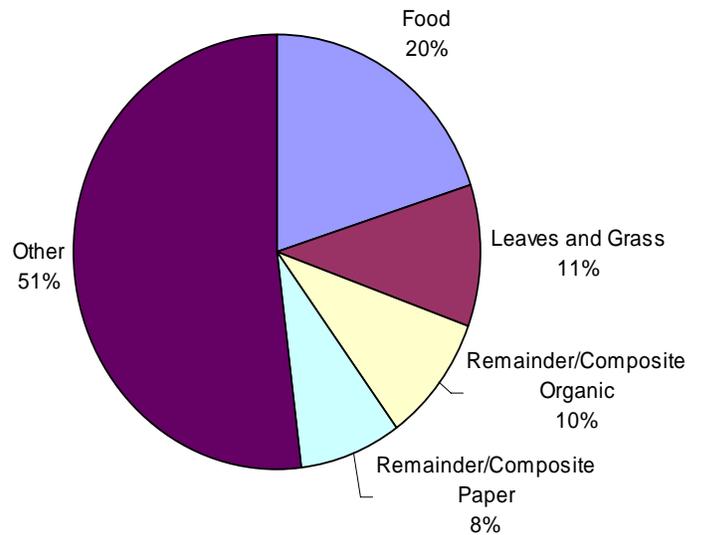
Waste Diversion Projections

Based on waste characterization data available on the California Integrated Waste Management Board's website, and shown in Figure 4, the four largest components of the residential waste stream disposed (in 1999) in Marin County are food, leaves and grass, other organics, and other paper. These four categories total to almost half of the total residential waste disposed.

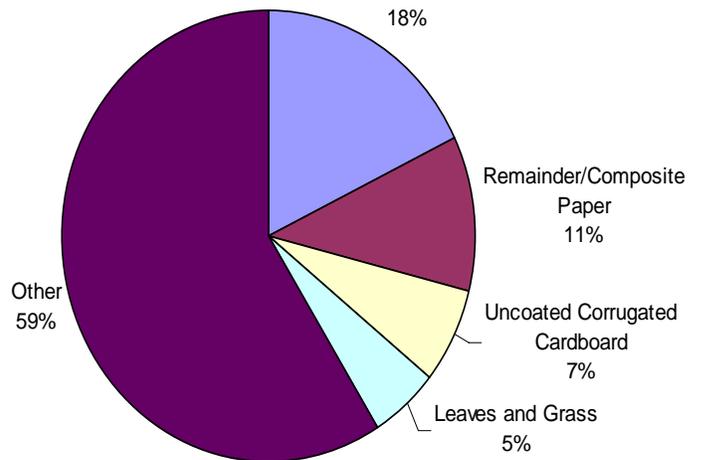
Of the non-residential materials disposed, the four primary components

are food, other paper. Corrugated cardboard, and leaves and grass (see Figure 5). These four categories total to about 40 percent of the total non-residential waste disposed.

**Figure 4
Top Four Residential Materials Disposed**



**Figure 5
Top Four Commercial Materials Disposed**



Some (unknown) amount of the paper and cardboard are recoverable as fiber for recycling, but much of it is soiled and not suitable for recycling. However, all of the materials previously identified make

good feedstock materials for composting.

Residential Collection Services

The dual-stream collection of recyclables would continue to collect paper fiber and other recyclables. Recyclables would include all materials for which there is an existing market, plus a few material types collected to make recycling easier for the residents. For example, the plastics industry has found that when all plastic containers are collected, more PET and HDPE containers are recovered than when only PET and HDPE containers are collected.

But instead of collecting yard waste and garbage as the other two components of the waste stream, haulers would collect all compostables and rubbish.

Compostables would include all plant trimmings, food scraps, and food soiled paper. Compostables would need to be collected weekly, but none of the other category groupings would need to be collected weekly; although for convenience of the residents, it is recommended that all four categories should be collected weekly.

Collected rubbish would include all materials not included in the other three categories (recyclable paper, other recyclable materials, and compostable materials). More specifically, rubbish would include mixed material products (such as toys), aseptic packaging, and film plastics. Rubbish would be classified as those materials for which there is no viable market. Ultimately, these are the materials that will be addressed by Extended Producer Responsibility mandates.

These two pairs of materials would each be collected in a two compartment truck. The compostables and rubbish in one

truck, and the paper fiber and other recyclables in the other truck.

Changing the categories of materials collected provides a major opportunity to increase diversion. With the proposed four categories, most of the organics and more of the recyclable materials will be recovered than in the current system. Letting the residents and businesses know that if they keep the organics stream 'clean' [no glass and no chemicals], it does not have to go to the landfill, and will not produce methane, a very potent greenhouse gas. This will allow them to change the mindset from 'I don't want to bother recycling so I just throw everything I'm not sure what to do with in the garbage' attitude, into 'the only stuff that goes in the rubbish bin is stuff that is not recyclable or compostable.'

Based on a similar system implemented in the Town of Los Altos Hills in October 2008, it is possible to achieve a diversion rate of over 85 percent of the franchise collected residential waste materials with this type of program.

Costs of Services

It is clear that there are both added costs and savings to reorganizing the collection system.

Some of the features are:

1. New collection vehicles

To collect the four streams of materials, two split-bodied trucks would be used; instead of the three trucks currently collecting garbage, green waste and recyclables. This would mean retiring the single compartment garbage and green waste collection vehicles and buying additional split bodied trucks.

2. Lower collection costs

This could reduce the total number of trucks on the street by as much as 40 percent, and would also reduce the

number of drivers needed to collect from all households.

3. *Smaller carbon footprint*

Fewer trucks on the street burning less fuel means that less air pollution is produced.

4. *Organics processing at higher cost than landfill*

The cost of processing mixed organics, as compared to the costs of processing clean green plant trimmings, is considerably higher (possibly three times as much). This added cost is offset by the reduction in tons hauled to landfill and the reduced landfill tipping fees. Since there is no mixed organics processing facility in the County currently, one would need to be opened, or the organic materials would need to be hauled greater distances.

5. *Much smaller carbon footprint*

Removing all of the organic materials from disposal at landfill will greatly reduce the methane generated at the Redwood Landfill. Even though there is a methane recovery system in place at the landfill, much of the methane is still released into the atmosphere. The nitrogen rich food scraps landfilled are a significant part of the methane generation problem.

6. *Higher diversion rate*

Collecting organic wastes separately from other wastes so that they can be composted, allow the jurisdictions to reduce the number of tons landfilled, thus increasing the diversion rate.

Commercial Collection Services

To accomplish a similar recovery rate in the commercial sector, it will be necessary to implement or expand 'selective routing' services.

Routes will be designed to bring high percentage materials in for processing.

Dry recyclables in a dual stream collection system (fiber as one component and metals, glass and marketable plastics as the other component) can be collected in a split body front loader, or on separate routes.

Office buildings and retail stores would be provided with a bin for paper fiber, and a small bin for other dry recyclables, and a bin for organics from breakrooms and bathrooms.

Organic wastes from restaurants, bars, florists, grocery stores, and other food service accounts (and any accounts disposing of landscape wastes) will be collected in a separate route.

Other types of commercial accounts would receive the appropriate services to maximize recovery of materials.

Education and Promotion of the New Four-Sort Program

One important key to the success of both the residential and commercial four-stream programs will be to inform the public of how these new programs operate, and the results that can be achieved if individuals participate fully.

A multi-dimensional promotion and education program should be used to reach as much of the community as possible. Printed materials with lots of clear graphics are a key to the success of the new program. It might be beneficial to provide each house with a food scrap container so that they can easily store materials in their kitchen for deposit into the organics cart, or into their backyard compost bin. The food scrap containers should be sized to conveniently fit into a dishwasher; and have a detachable lid (e.g., ½-gallon juice pitcher). Containers can be purchased through grants. The distribution of containers would be most efficiently conducted by the haulers.

Commercial Recycling Ordinance

Jurisdictions in California are beginning to focus on the commercial sector to achieve increased diversion rates and AB 32 requires the adoption mandatory recycling ordinance. While the regulations are being developed, the Sacramento Regional Solid Waste Authority's (SWA) ordinance provides an example of what the JPA can model.

In 2007, the SWA, which includes the City of Sacramento and the County of Sacramento, was the first to implement a mandatory recycling ordinance that required any business that generated more than four cubic yards of disposal in a week must recycle. As required by the ordinance, franchised haulers must have recycling containers at all of the businesses they service and each business must have a recycling plan on file with their hauler. It is then the responsibility of the business to ensure that all recyclable materials are placed in the proper container. If the ordinance is not followed, they can be subject to fines.

While the SWA established the ordinance and developed and distributed public education materials, they have contracted with the County of Sacramento Environmental Management Department (EMD) to enforce the ordinance. Enforcement is conducted by visiting the businesses to determine if a business recycling plan has been developed and checking to ensure that recyclable materials are not being disposed. It is anticipated that the EMD will inspect one-third of the businesses every two years.

After six months of being enforced, the ordinance had resulted in increasing business diversion tonnage by 21 percent. As the program continues, the diversion tonnage is expected to

increase. The success of the ordinance in the SWA can be duplicated in the County of Marin if administration partnerships are developed between the Member Agencies and the JPA.

Conversion Technologies

Conversion technologies are the processes that transform municipal solid waste into heat, steam, electricity, natural gas, and liquid fuels. The main types of conversion include thermal, digestion and hydrolysis. Below is a summary of the technologies.

Pursuing any of these technologies locally (within the County of Marin) will require the siting and development of infrastructure to pre-process material to recover recyclable materials and perform the conversion. As noted previously, lack of siting options in the County will likely prevent such infrastructure from being developed.

Thermal

Under controlled conditions, the thermal process uses or produces heat to change the composition of the material in to a gas form to generate electricity. Products of the process include synthesis gas or fuel gads, fuels, vitrified residue or char, and recovered metals. Most waste-to-energy (WTE) technologies are this form of conversion. WTE of municipal solid waste can produce steam that can be used for generating electricity.

Plasma Arc

This technology is an alternative of thermal conversion technology and uses combustion temperatures inside a pressured chamber with little to no oxygen. This environment enables the materials to be made into gas, liquid, and solids. The gas can be used to make a gas similar to methane, liquids

can be cooled into a variety of metals, and solids are a waste to be disposed.

Because this conversion process requires uniform material size, pre-processing of material is required.

Digestion (Aerobic and Anaerobic)

The digestion process decomposes organic material using microbes. The aerobic process generates compost as the end product and anaerobic digestion produces biogas (can be captured to produce electricity) and compost. This method of conversion is combined with a presorting of material to eliminate recyclable materials from the digestion process.

Biomass

Biomass is energy produced through the burning of wood chips and other similar materials. The material must be clean of other materials before this technology can be used. A byproduct of the process is also fly ash which is commonly used as a soil amendment. Haulers currently send some wood material to biomass facilities located outside of Marin County. MSS reports that they are currently using biomass technology in the development of on-site fuel for MRRC.

Hydrolysis

Hydrolysis is the chemical reaction where water reacts with another substance (usually acid) to form new substances. The cellulose is removed from the waste to create sugar which is then fermented to ethanol or other acids.

These types of conversion technologies would be used for material destined for the landfill after all recyclables and green waste is removed for higher and best use. The main benefits of using such technologies is that the material is used to generate electricity, possible greenhouse gas emissions from

disposal are avoided, and the resulting product is significantly less in weight and volume to be disposed or it is reusable in the form of compost. The thermal process of gasification, pyrolysis and plasma arc can divert between 72-100 percent of the disposal weight. In contrast, anaerobic digestion can divert 68-85 percent of the material.

As of May 2008, countries that had employed diversion technologies for the waste included Israel and Spain for Anaerobic digestion, Japan and Malaysia for gasification, United Kingdom for pyrolysis, and Mexico, Japan, and Canada for plasma arc. The only technology that has been undertaken in the United States so far has been pyrolysis in Romoland, California that is permitted for 18,250 tons per year.

As noted above, demonstration of these projects in the United States is lacking partly due to access to feedstock and regulatory restrictions. For example, thermal technology is not eligible for renewable energy credit and there may be limitations to using the conversion technologies.

Marin County Food Waste Anaerobic Digestion and Composting Pilot Projects

There are several food digestion projects that are in the early stages of development (planning or test pilots) and intend on being fully operational within the next five years. The three projects include a partnership between MSS and the Central Marin Sanitation Agency (CMSA) for commercial food waste, MSS and Redwood Landfill for residential food waste, and Pacific Biomass for residential and commercial food waste. The overview of the pending facilities and ability to handle

the JPA's waste stream is discussed below.

Marin Sanitary Service

Anaerobic digestion is currently being performed at Waste Water Treatment Plants (WWTP), but the addition of food waste to the feedstock enhances the amount of biogas produced therefore increasing electricity generation. In October 2008, Marin Sanitary Service initiated a bio-cell/bio-filter program for commercial food waste composting. In December 2008, Marin Sanitary Service began a commercial food waste-to-energy feasibility study. It is anticipated that the food waste digestion will be fully implemented in early 2010. The pilot program is discussed below.

Based on the waste composition survey conducted by CalRecovery in 2008, it is estimated that the MSS service area collects 15 tons per day of commercial food waste (equivalent to a transfer trailer). In addition to the anaerobic digestion program, MSS is also conducting a pilot in-vessel composting project where food waste is mixed with green waste.

For the purpose of the digestion study, food waste had to be separated into the appropriate components before the material could be mixed with the biosolids at the Central Marin Sanitation Agency Waste Water Treatment Plant (WWTP). As with other diversion methods, having a facility capable of handling the material is a limiting factor. A variety of locations were explored for the processing including NorCal Jepson Prairie Facility in Vacaville, CMSA WWTP, or retrofitting the MSS transfer station where the truck parking currently is located.

The benefits of adding food waste to the digestion process as summarized by the Methane Capture Feasibility Study conducted by Kennedy/Jenkins

Consultants in December 2008, were the following:

- Extend landfill life by diverting commercial food waste from Redwood Landfill;
- Reduce truck traffic from solid waste transport to Redwood Landfill;
- Increased financial benefits and reduced tip fee;
- Capture the energy content of food waste for beneficial use;
- Reduce greenhouse gas emissions and reduce carbon footprint;
- Provide 230kW of renewable energy;
- Minimize use of natural gas purchased by CMSA;
- Produce minimal residual from digestion process;
- Conform with the City's and County's green initiatives; and
- Accommodate the future processing of other food wastes.

Potential Drawbacks

As mentioned previously, there is a lack of infrastructure currently available to handle the potential 15 tons per day of commercial food waste from MSS. In order for the project to be viable, transportation and processing of the material must be determined and executed; the Kennedy/Jenkins Consultants investigated the options. However, the facility recommended to process the food waste is projected to handle around 40 tons per day. While this would serve the MSS collection and potentially the addition of residential food waste, the other areas of the JPA would not have the option having the over 200 tons per day of material use the food processing facility, potential transfer station or having the material be used by CMSA.

Pacific Biogas Energy, LLC: Digestion

Another biogas digestion project that is currently in the planning stages is being undertaken by Pacific Biogas. The proposed organics (green waste only) digester is planned to be sited in Marin County and will accept residential and commercial food waste and yard waste. The digestion process will also accept soiled paper products, waxy old corrugated cardboard, etc., and no presorting/screening of the material is needed. It is anticipated that the facility will accept material six days a week and between 15,000-30,000 tons per year.

Once the permitting process is completed, it will take one year to develop and build. The project and digestion will occur in two phases: Phase I-aerobic and Phase II-anaerobic. Phase I is anticipated to begin in 2009 and Phase II will begin in the second or third quarter of 2010. Once the facility is operating at capacity, it is anticipated that up to 1 Mega Watt will be generated and sold to the Marin Energy Authority; this equates to powering approximately 1,000 homes. Compost that is created as a byproduct will be sold for commercial use.

Extended Producer Responsibility

The intent of EPR is to focus on the creation of 'cradle to cradle' recycling systems that are designed, financed, and managed by the producers themselves. The JPA has been supportive of California legislation that promotes more producers responsibility for the handling and disposal of products at the end of their useful life. The JPA also supports the non-profit California Product Stewardship Council. This section identifies current options for products.

Rechargeable batteries

Options for collection and proper disposal of rechargeable batteries exist. A stewardship program was founded by the rechargeable battery industry in 1994 called the Rechargeable Battery Recycling Corporation (RBRC). RBRC is a national non-profit, public service organization comprised of environmentally-aware rechargeable battery manufacturers, retailers, businesses, communities and public agencies that are committed to the responsible recycling of rechargeable batteries and cell phones in the United States and Canada.

RBRC's easy and free recycling program, Call2Recycle™, collects and recycles cell phones and Nickel Cadmium (Ni-Cd), Nickel Metal Hydride (Ni-MH), Lithium Ion (Li-ion), and Small Sealed Lead (Pb)* rechargeable batteries – the types of batteries that power a variety of popular cordless products, such as power tools, cellular and cordless phones, laptop computers, camcorders, two-way radios, and digital cameras. While there are options for rechargeable batteries, they collect about 10 percent of total batteries generated by the public, the rest being alkaline batteries, which have no stewardship program. However, RBRC submitted a plan to the provincial government of Ontario in July 2009 to also accept alkaline batteries and the plan is to do it in Canada first, and then the US.

Mercury Thermostats

Mercury thermostats use mercury switches to sense and control temperature, with each thermostat containing about three grams of mercury. As such, if they are discarded as solid waste the mercury can be emitted to the environment. There are no collection options for thermostats

outside of the public HHW facilities and events and the EPR program discussed below.

Extended Producer Responsibility –The Thermostat Recycling Corporation (TRC), funded by Honeywell, GE and White-Rogers, offers HVAC contractors, builders and homeowners a safe, easy way to properly dispose of thermostats. The program collects used thermostats free of charge through participating wholesalers. Shipping the containers to TRC is free and they return the container for unlimited subsequent uses.

Progressive Container Rates

Progressive container rates means that there is a distinction in the solid waste collection rates that encourage people to reduce waste disposal and increase recycling. All of the franchised haulers provided their collection rates and noted that the recycling and green waste collection services are provided at no additional cost to customers. Upon reviewing the service area rates, all areas have progressive rate structures.

There is no established or recommended rate difference between container sizes. While the rates seem like they can be compared to other service areas in the County, each service provider offers variations of services which prevents equal comparison (e.g., curbside oil collection or not), limitations on recyclables and green waste collection, transportation and disposal costs depending on the end destination of the material, and the way the franchise agreement is structured (e.g., rates based on cost or have cushion to sustain variance in economic conditions).

Tables 19 and 20 below are informational and present the highest and lowest rates charged by haulers. Stinson Beach has most of the lowest rates for flat areas and Mill Valley has most of the highest rates. For the hill areas, the Unincorporated Franchise Areas 1-6 have the lowest rates for the smaller capacity containers and Christmas Tree Hill in Corte Madera has the highest rates.

**Table 19
Flat Areas**

Container Capacity (Gallons)	Lowest Rate/ Jurisdiction	Highest Rate/ Jurisdiction	Difference Between Rates
20	\$10.76/ Novato	\$26.86/ Mill Valley (unincorporated)	\$16.10
32	\$14.73/ Stinson Beach	\$29.52/ Mill Valley (unincorporated)	\$14.79
45	\$28.75/ Fairfax	\$43.04/ Mill Valley (unincorporated)	\$14.29
64	\$29.44/ Stinson Beach	\$48.88/ Larkspur	\$20.29
96	\$44.17/ Stinson Beach	\$75.43/ Shoreline and Gibson (unincorporated)	\$31.26

**Table 20
Hill Areas**

Container Capacity (Gallons)	Lowest Rate/ Jurisdiction	Highest Rate/ Jurisdiction	Difference Between Rates
20	\$21.48/ Unincorporated Franchise Areas 1-6	\$30.78/ Christmas Tree Hill (Corte Madera)	\$9.30
32	\$25.27/ Unincorporated Franchise Areas 1-6	\$34.74/ Belvedere	\$9.47
45	\$32.40/ Fairfax	\$51.15/ Christmas Tree Hill (Corte Madera)	\$18.75
64	\$48.71/ Tiburon	\$67.78/ Christmas Tree Hill (Corte Madera)	\$19.07
96	\$70.29/ Tiburon	\$102.39/ Christmas Tree Hill (Corte Madera)	\$32.10

As noted in the tables, there is a large contrast between rates charged. Although there may be interest in making the rates more encouraging of recycling, each jurisdiction will have to look at its rate structure to determine if diversion is maximized. Another consideration is that if the rate structure is too distinct between container capacities, customers may downsize their containers, but place garbage in the recycling containers. This problem was experienced in the City of San José.

Consumption and Disposal Changes

Achieving Zero Waste requires that consumers change their purchasing and disposal habits in addition to more diversion programs being implemented. One method is to encourage people to use GoodGuide.com to make purchasing decisions based on ecological footprints and promote repair and reuse options in the County. Product bans is another method and is discussed below.

Product Sale and Disposal Bans

In late 2008, the JPA began exploring product sales bans which include, but are not limited to, plastic shopping bags and Styrofoam containers. These materials do not biodegrade and often end up in the ocean which poses hazards to aquatic life.

Unless all the jurisdictions in the County adopt the ordinance on consistent terms, bans could result in unintended economic impacts to the businesses that are required to provide the reusable or paper bags. If the JPA or its Member Agencies decide to postpone ordinances on banning materials, the JPA should increase public education and points of collection and could promote reusable bags and require hotels and restaurants to use biodegradable to-go containers.

Plastic Bags

While the JPA is currently investigating options, the Town of Fairfax had a ballot initiative Measure "C" on the November 4, 2008 election which bans plastic shopping bags from being distributed by

stores. The Town of Fairfax residents passed the measure which became effective on May 4, 2009.

The Town of Fairfax's ordinance requires all retail establishments, except dry cleaners, to provide bags that are either cloth reusable bags or paper bags. If a retailer is found to be distributing a plastic bag, the fines of \$100, \$200 and \$500 for subsequent violations. The ordinance that the Town has adopted will have a significant scope of influence because it affects all stores, and food venues (restaurants, vendors and retail food outlets).

Polystyrene (Styrofoam)⁶

An ordinance banning this material from being distributed at businesses is also an option of the JPA and its member jurisdictions. Specifically, restaurants are required to only provide take-out food in recyclable or biodegradable containers. As of the end of 2008, eight cities in the Bay Area have banned Styrofoam including San Francisco, Berkeley, Oakland and Emeryville. In addition, the beginning of 2009 has seen an increase in attention of banning this material at the statewide level by proposals from the California Oceanic Protection Council and public support from the Lt. Governor John Garamendi. In the past few years, cities throughout California have begun collecting Styrofoam, condensing it and selling it to recyclers. Multiple cities in California have collection sites and retailers, such as Best Buy, are also accepting the material for recycling.

⁶ BPI certification is needed for material to be recycled.

VII. Findings and Recommendations

Key Findings

- **JPA Resources.** Currently, the JPA does not have the direction or staffing needed to effectively work on a countywide level and achieve the recommendations. Unless there is a strengthening of the JPA's role to assist Member Agencies in implementing the recommendations, it is unlikely that the Zero Waste Goal will be met, and the status quo will continue.
- **Program Consistency.** It will also be necessary for the JPA, Member Agencies, and haulers to implement programs and policies that are consistent countywide. The Member Agencies will need to adopt or revise ordinances, and modify their franchise agreements to establish the framework and standards for their waste reduction and diversion programs to meet the Zero Waste Goal.
- **Economies of Scale.** Some programs, such as ordinance enforcement and public education of programs, would be more efficiently and cost-effectively managed at the JPA countywide level than independently by each Member Agency. In addition, many of the policy related programs can be better and cheaper if administered at a countywide level.
- **Short and Long-Term Programs.** A balance will have to be drawn for short-term and long-term programs and policies that address eliminating the creation of waste (up-stream, but long-term implementation) and the disposal and diversion of waste (down-stream, but short-term

implementation). Up-stream programs include public education efforts that promote reduced consumption, Extended Producer Responsibility (EPR) policies that promote product redesign for hazardous materials, product bans, etc. Down-stream programs include increasing the types of materials collected by haulers (e.g., food), revising franchise agreements and ordinances to reflect industry standards and establish waste reduction and diversion requirements, implement food waste digestion and composting, etc.

- **Diversion Facilities.** Approximately 56 percent, or 128,000 tons of food, yard, organic waste, inerts, and mixed C&D, were disposed at landfill. In order to meet the Zero Waste Goal, reduction and processing of these targeted materials is critical. However, currently there is insufficient capacity for the facilities located within the County to process these materials and it may be necessary to transport these materials to out-of-county facilities.
- **Public Education.** Finally, and most importantly, for both Phase I and Phase II programs to be successful, public education must be strong and consistent among Member Agencies, and be continuous.

Recommendations

This section identifies recommendations for Marin County to achieve 80 percent diversion by 2012 and Zero Waste by 2025. This equates to diverting over 229,000 tons.

The recommendations were developed after evaluating the current conditions in the JPA as described and analyzed in Section VI.

Implementing these recommendations will maximize diversion of the currently disposed 229,271 tons of material. The recommendations presented below provides a summary of the recommendation including, estimated diversion, steps to achieving the recommendation, responsible parties and implementation cost. Appendix B provides additional detail about the recommendations relating to the following:

- Estimated one-time and ongoing cost;
- Potential funding sources;
- Projected additional JPA and Member Agency staff needed for program implementation;
- Advantages and disadvantages of recommendations;
- Facility infrastructure availability in the County; and
- Timeline for implementation.

The recommendations are divided into two phases. Phase I recommendations lay the foundation for Phase II. In some cases, aspects of Phase II may already be occurring in some capacity (e.g., food waste), but larger scale operations may need developing. Therefore, some Phase II recommendations can be implemented simultaneously with Phase I if programs are currently underway.

Estimated diversion of the most disposed materials are the following:

- ▶ Paper: 35,000 tons
- ▶ Food: 4,500 tons
- ▶ Organics (e.g., green waste, wood): 6,000 tons
- ▶ C&D: 40,000 tons

While each material individually, may not seem to reach the Zero Waste goals, implementation of the recommendations will collectively

reduce disposal by increasing diversion or preventing waste generation.

Diversion calculations are based on the assumption that an equal amount of material is eliminated from the disposal tonnage resulting in a no net change to overall generation.

Potential financial impacts are estimated based on industry knowledge, staff, and hauler time impacts. Haulers were contacted to identify potential costs and Marin Sanitary Service, Mill Valley Refuse, Redwood Empire Disposal/Novato Disposal, and Tamalpais Community Services District responded; Tamalpais was unable to estimate any costs.

PHASE I

The purpose of Phase I is to establish the foundation of roles and responsibilities to enable countywide coordination and leadership of programs that will attain Zero Waste.

To date, the JPA and Member Agencies have had limited interaction and coordination when designing and implementing programs, franchise agreements, and ordinances. This structure has enabled the JPA to meet the diversion and reporting requirements of AB 939, but greater coordination and potentially responsibilities will be necessary to achieve the Zero Waste goals. Without countywide coordination and leadership, the Zero Waste goals will be difficult to achieve.

The recommendations for Phase I are categorized into actions that affect the JPA and Member Agencies. Some recommendations, such as ordinance enforcement and public education of programs would be more efficiently managed at the JPA countywide level than independently by each Member Agency.

JPA

Recommendations for the JPA focus on shifting the role of the organization to give it more authority in developing policies, countywide program implementation, and provide greater assistance to Member Agency staff.

1. Increase JPA Program Assistance with Other County Departments

The County Departments that manage the used oil block grant, sharps collection and sustainability teams are some County programs that operate separately from the JPA and do not consistently share information and aid program administration. Because integrated waste management involves materials targeted in such programs, it is important for the JPA to be informed of collection results and be able to assist in outreach, etc. as needed to prevent waste generation and promote proper disposal of such material.

Estimated Diversion: Supports #4-18

Steps to Achieve:

- *JPA meet with County departments to determine reporting frequency (e.g., monthly, quarterly).*
- *Determine the detail of information wanted (e.g., collection amounts, number of participating locations, compliance with ordinances (C&D, etc.)).*
- *Coordinate with County ways for the JPA to assist programs (e.g., outreach, enforcement).*
- *Update the County's Sustainability Team's website to more prominently present solid waste reduction and management on main page and interactive application to reflect Zero Waste goals.*

Responsible Parties: JPA (coordinate with County departments)

Implementation Cost: \$40,000 (1/3 Full Time Equivalent Employee (FTE)). The level of assistance will determine if current JPA staff is sufficient or if additional staff is needed.

2. Increase JPA Staffing and Their Role in Assisting Administration of Member Agency and Countywide Programs

The Member Agencies currently do not have the resources to monitor all programs and implementation. There is opportunity for the JPA staff to assist the Member Agencies in roles as needed such as compliance with the C&D ordinance, monitoring hauler contracts, public education, etc. Having a greater assistance role will help insure that the programs are consistent and potentially lead to higher diversion and impact on waste reduction, and formal action from the Member Agencies is necessary for this to occur.

In addition, The JPA is beginning outreach for the unincorporated County while Member Agencies run their own program. Given the universal nature of this issue in the County, it is recommended that the JPA administer the education and outreach on behalf of the Member Agencies.

Estimated Diversion: Supports #4-18

Steps to Achieve: JPA meet with Member Agencies to determine how much assistance they would like the JPA to provide and get formal approval from the Member Agencies.

Responsible Parties: JPA and each Member Agency.

Implementation Cost: \$120,000 (1 FTE). The level of assistance will determine if current JPA staff is sufficient or if additional staff is needed. \$200,000 has already been funded for Phase II.

3. Increase the Frequency of Board of Directors Meetings

Increasing the number of meetings held will enable the Board of Directors and Member Agencies to be more involved in addressing waste issues and provide the JPA with more constant contact with the administrators of policies throughout the County. The increased meetings would be tied to defining the goals of the JPA and any associated staff and time needs. The increased communication could lead to improved partnership with Member Agencies and more effective implementation of programs. The Board of Directors may wish to consider developing a subcommittee to address the goals of this recommendation.

Estimated Diversion: Supports #4-18

Steps to Achieve: Increase meeting schedule

Responsible Parties: JPA and Board of Directors

Implementation Cost: \$0. No change to current staff levels.

4. Help Solid Waste and Non-Solid Waste Facilities with Siting/ Permitting Processes

The lack of the necessary infrastructure is the biggest constraint for the County to achieve high diversion programs that include green waste, food waste, and construction and demolition materials. Facilities should include retail-focused businesses that promote reuse that do not require processing of materials. The JPA should continue to play an active role in helping site new facilities that provide diversion and reuse opportunities to the region. These facilities will also help create "green jobs" in the County.

Estimated Diversion: 92,000+ tons per year if facilities become operational in County and in conjunction with C&D and salvage ordinances. Also supports #18.

Steps to Achieve:

- *Work with the County and City Planning Departments to site and permit the appropriate facilities.*
- *Work with companies or individuals that offer services that could benefit the reduction of the County's waste stream.*
- *Assist companies/ individuals through the siting and permit process as possible.*

Responsible Parties: JPA

Implementation Cost: \$120,000 (1 FTE). The level of assistance will determine if current JPA staff is sufficient or if additional staff is needed.

5. Support Extended Producer Responsibility (EPR) and Waste Reduction Policies at State and National Level

The JPA has been active in issuing letters of support for legislation that helps eliminate materials from the waste stream. The JPA should continue this activity and also support any national legislation that might positively affect the County's Zero Waste goals.

In addition, individual Member Agencies should support these efforts as well through Extended Producer Responsibility resolutions and letter campaigns.

Estimated Diversion: Supports #10 and 11

Steps to Achieve:

- *Issue letters of support for state or national legislation that promotes waste reduction.*

Responsible Parties: JPA, Member Agencies

Implementation Cost: \$120,000 (1 FTE).

Member Agencies

6. Revise Solid Waste Ordinances

The solid waste industry and regulations have changed considerably since 1990. However, the ordinances that regulate the hauler franchise agreements in some cases have not been updated for 45 years. Extensive revisions will likely be necessary for the ordinances.

Estimated Diversion: Supports #7, 9, &18

Steps to Achieve:

- *All Member Agencies review their solid waste ordinance.*
- *Update ordinances to reflect current solid waste practices.*

Responsible Parties: Member Agencies

Implementation Cost: \$5,000-\$10,000 each Member Agency

7. Revise Franchise Agreement Language

Franchise Agreements can be designed to encourage "green" operations and encourage maximum diversion. Most of the franchise agreements are lacking provisions that address collection hours, type of fuel vehicles use, explicit definitions of recyclable materials, etc. Below is a list of elements that should be included in franchise agreements to obtain maximum diversion and minimal environmental impact. Becoming more "green" could result in less disposal, lower customer rates, and more profit for haulers.

- *Specific diversion requirements*
 - ▶ *Based on actual tons collected by hauler.*
- *Overall tonnage collected*
 - ▶ *By service area/type (e.g., residential, commercial, bulky item, special event, etc.).*

- *Financial incentives for the customer*
 - *Bundled service rates*
 - *Cost for recycling, green waste, food waste and bulky waste are included in the basic garbage bill*
 - *Variable rates*
 - *Based on the amount of garbage generated*
 - *Provide unlimited/free recyclables and green/organic waste collection*
 - *Financial incentives for the hauler*
 - *Rate increases for exceeding diversion requirements*
 - *Term extension for meeting/exceeding diversion requirements*
 - *Allow hauler to keep revenue for recyclable materials sales*
 - *Set a disposal tonnage cap (limit the tonnage that can be landfilled; or charge a penalty if more than the tonnage limit is landfilled)*
 - *Liquidated damages for not meeting diversion requirements or other service standards*
 - *Require program expansion for not meeting diversion requirements*
 - *Air quality*
 - *Require specific fuel and fuel management requirements*
 - *CNG/LNG*
 - *Bio-diesel*
 - *Idle shut-off*
 - *Idle speed packing*
 - *Hybrid electric support trucks*
 - *Reduce collection vehicle traffic*
 - *Frequency of collection*
 - *Efficient routing*
 - *Co-collection (use split-body trucks)*
 - *Wet/dry collection*
 - *Mixed waste collection*
 - *Include all collection sectors*
 - *Single family dwelling residential*
 - *Multi-family dwelling residential*
 - *Commercial*
 - *Construction and demolition (if part of agreement)*
 - *Public facilities (if part of agreement)*
 - *Collection Days and Hours*
 - *Residential versus commercial service days and time restrictions*
 - *Alternative hours for commercial properties near residential units*
 - *Material definitions*
 - *Identify specific materials that can be collected through residential, multi-family, commercial, bulky item and special event service*
- In addition to these provisions, the Member Agencies may want to consider making the rate structure more stable for both the haulers and customers by using an indexed calculation to determine rate adjustments.
- Estimated Diversion: Supports #8, 9, 12, 13, 14, 15, & 16*
- Steps to Achieve:*
- *Meet with hauler to determine options of revising the current contract.*
 - *Possibly issue a Request for Proposals two years before the contract expires.*
 - *Identify in the RFP the service types and requirements desired by the hauler*

- ▶ *Bids submitted by haulers will reflect the level of services and requirements desired.*

Responsible Parties: Member Agencies

Implementation Cost: \$25,000-\$75,000 each Member Agency

8. Adopt, Enforce, and Homogenize the Construction and Demolition Ordinance

The diversion of construction and demolition materials will not occur unless all Member Agencies adopt and enforce C&D ordinances. While five jurisdictions have adopted the ordinance, none have maintained the same provisions as the JPA's model C&D ordinance which does not help the haulers easily comply.

It is recommended that the JPA administer the program on behalf of the Member Agencies to maximize efficiencies.

Estimated Diversion: 22,900+ tons per year and supports #18

Steps to Achieve:

- *These seven Member Agencies should adopt the C&D ordinance.*
 - ▶ *Belvedere*
 - ▶ *Corte Madera*
 - ▶ *Fairfax*
 - ▶ *Larkspur*
 - ▶ *Ross*
 - ▶ *San Anselmo*
 - ▶ *San Rafael*
- *Ordinances should be consistent throughout the County. The ordinance should require that no C&D material is landfilled, except residue from processing.*
- *Enforce the ordinance (recommend the City of Los Angeles system).*

- *Lower the project threshold to 500 sq. ft.*
- *JPA should verify compliance (review paperwork, etc.).*
- *Consider an ordinance administration fee that is rebated if diversion facilities are used (e.g., City of Los Angeles system).*
- *Educate haulers of C&D recycling facilities.*

Responsible Parties: Member Agencies for adoption/modification of ordinance, enforcement and educating haulers. JPA might be able to assist in determining ordinance compliance. JPA should work with Member Agencies to have consistent ordinances.

Implementation Cost: \$5,000-\$10,000 each Member Agency. Ongoing: \$5,000 for each Member Agency or \$60,000 for the region.

9. Adopt and Enforce Multi-Family Dwelling and Business Recycling Ordinance

This ordinance will be required to be adopted by 2012 as a result of AB 32. The JPA should consider implementing a countywide ordinance to require recycling of all recyclable materials generated at businesses and multi-family dwellings similar to Sacramento County. With residential customers currently with full diversion options, Multi-family dwellings and businesses are the next sectors that can achieve high diversion.

Estimated Diversion: ~29,700 tons

Steps to Achieve:

- *Meet with associations and business chambers to inform them of changes.*
- *Meet with Member Agencies to determine how the ordinance will be enforced (e.g., local staff, JPA,*

County Environmental Management Department).

- Train enforcement staff.
- Haulers provide account information for database creation (enforcement agency will maintain database).
- Submit reports to JPA to keep informed.

Responsible Parties: JPA, Member Agencies, and haulers. Enforcement entity to be determined by the parties.

Implementation Cost: \$5,000-\$10,000 each Member Agency. *Ongoing:* \$5,000 for each Member Agency or \$60,000 for the region.

10. Encourage Consumption and Disposal Changes

Promoting reduced consumption by making better choices when shopping is a necessary element to ultimately eliminate waste generation. Efforts should be made to increase customer awareness of online and local resources that encourage material exchange, repair and reuse. All sectors should be targeted to maximize awareness of opportunities. Public education on better consumption habits is a crucial element of this recommendation. Programs such as Alameda County Waste Management Authority's Business Partnership Program should be considered.

Estimated Diversion: 2,300 tons

Steps to Achieve:

- JPA work with the public and environmental groups to identify campaigns.
 - Choose a few topics a year to promote and educate the public on (e.g., reusable bags, purchase in bulk, encourage reuse through thrift stores and garage sales).

- Develop education campaigns with haulers and Member Agencies.

- Advertise businesses that encourage reusable bags, mugs, etc. and identify how it is encouraged (e.g., discount, donation to charity).
- Promote GoodGuide.com and MarinMax.org through haulers and Member Agencies.
- Haulers include information in their newsletters.

- Attend community events to promote the consumption changes and perhaps distribute reusable items.

Responsible Parties:

- JPA to coordinate the identification of campaign topics with public input.
- Member Agencies to work with haulers to include information in outreach materials; and
- All parties to share in promoting the campaign to the public.

Implementation Cost: \$5,000-\$10,000 each Member Agency. *Ongoing:* \$5,000 for each Member Agency or \$60,000 for the region.

PHASE II

This phase is when programs are developed and implemented. The recommendations consist of policies, haulers changing/restructuring services, and enhancing current programs.

JPA

11. Promote Countywide Sale and/or Disposal Bans

Undertaking product sale and/or disposal bans are most effective when all Member Agencies simultaneously adopt them rather than each jurisdiction implementing different bans.

Estimated Diversion: 1,100 tons

Steps to Achieve:

- *JPA use Local Task Force, Executive Committee and Board of Directors meetings to determine what bans are needed.*
 - *Advertise meetings to public to solicit feedback*
- *JPA to develop model ordinance language.*
 - *Language should be consistent with previously adopted ordinances (e.g., Town of Fairfax plastic bag ban).*
- *JPA to attend council meetings as needed to speak on the ban.*
- *JPA and Member Agencies educate public and businesses.*
- *Member Agencies to enforce the bans.*

Responsible Parties: JPA, JPA Executive Committee and Board of Directors and Member Agencies.

Implementation Cost: \$50,000 for public education. Ongoing: \$30,000.

Haulers (via Member Agencies)

12. Implement Wet/Dry Collection Routes

A way to potentially increase recovery of material from commercial businesses is to re-route trucks to collect similar types of material (selective routing). For example, one truck should service locations that generate mostly paper goods (dry goods) and other service businesses that generate mostly food waste (wet goods). By designing such routes, contamination of loads is minimized and more materials can potentially be diverted.

Estimated Diversion: ~102,000 tons per year

Steps to Achieve:

- *Review current routes and material types generated.*
- *Restructure routes if necessary.*
- *Educate customers on any changes to how they dispose of material.*
- *Deliver material to facilities that can divert them (e.g., food waste/organics).*

Responsible Parties: Haulers

Implementation Cost: Franchise agreement revision; 2%-10% rate increase.

13. Offer Residential Unlimited Services of Recycling and Green Waste Containers

These programs are dependent on services offered by the haulers. While some haulers provide unlimited recycling and green waste service, there is an opportunity to improve collection because not all haulers provide a sufficient number of containers to all residents or charge a fee for extra containers.

In the MSS service areas, only one recycling cart is provided and unlimited green waste collection is available. Although residents can provide their own containers for recycling, the reduced convenience of having only one cart provided can minimize willingness to recycle material that exceeds the capacity of the cart.

Novato Disposal and Redwood Empire Disposal each provides up to 2, 95 gallon carts each for recyclables and green wastes. This capacity may be enough, but the option for an extra container may increase diversion during the fall or other high debris landscape seasons.

Mill Valley Refuse customers in the Homestead area have the option to

decline green waste service because they compost in their backyard. It is unclear how much green waste is being disposed by Homestead residents, but regardless, those with services are limited to 68 gallons and are charged \$3 for each extra can. This smaller container size and fee for extra service is a disincentive to diverting green waste material. As an alternative, Mill Valley Refuse could consider providing weekly collection during periods of greater generation (e.g., autumn)

Estimated Diversion: 7,300+ tons per year in combination with other programs

Steps to Achieve:

- *Haulers should provide option of extra free containers for recyclables and green waste.*
- *Jurisdictions could require hauler to provide unlimited collection of green waste.*
- *Mill Valley Refuse should consider increasing green waste collection to at least 96 gallons and eliminating the extra container charge.*

Responsible Parties: Haulers

Implementation Cost: Franchise agreement revision; 1%-3% rate increase.

14. Add Materials Collected to Recycling Stream

All recyclables should be collected by haulers if there is a market for them. While the economy is slow, this may not be possible, but increasing collected materials, even if not generating profit, should be considered as a way to reduce disposal.

Estimated Diversion: ~2,300 tons per year

Steps to Achieve:

- *Meet with associations and business chambers to inform them of changes.*

- *Meet with Member Agencies to determine how the ordinance will be enforced (e.g., local staff, JPA, County Environmental Management Department).*
- *Train enforcement staff (hire new staff if needed).*
- *Haulers provide account information for database creation (enforcement agency will maintain database).*
- *Submit reports to JPA to keep informed.*

Responsible Parties: Haulers

Implementation Cost: Franchise agreement revision; 1%-3% rate increase.

15. Add Food Waste Diversion to Collection Services (Residential and Commercial)

After green waste, food waste collection and composting is the big next step to reducing waste disposal. As with green waste, the availability of processing facilities is the limiting factor, but digestion and composting facilities are beginning to be established in Marin County (e.g., Redwood Landfill, MSS energy projects, Pacific Biogas Energy).

Estimated Diversion: 4,500+ tons per year and supports #12 & 16

Steps to Achieve:

- *Haulers and Member Agencies amend franchise agreements.*
- *Haulers identify facilities and determine ability to deliver material to it.*
 - ▶ *Determine if transfer facilities are needed for long-haul delivery.*
- *Haulers build into the contract compost give-aways.*
- *Haulers provide customers backyard compost bins, kitchen pails, and education materials.*

Responsible Parties: Haulers for program implementation and education.

Implementation Cost: Franchise agreement revision; 1%-5% rate increase.

16. Implement Food Waste Digestion

Marin Sanitary Service is undertaking food waste digestion with the CMSA. The CMSA only services a portion of the County and other sanitation districts serving the region should also explore combining food waste with current digestion operations.

Estimated Diversion: N/A; 4,500+ tons per year in conjunction with the food waste diversion (Recommendation 16).

Steps to Achieve:

- *Haulers and sanitation districts develop pilot programs and determine facility needs.*
- *Develop or arrange infrastructure needs to make food waste suitable for digestion.*
- *Haulers and sanitation districts develop agreements for material.*

Responsible Parties: Haulers and sanitation districts.

Implementation Cost: Franchise agreement revision; 2%-10% rate increase.

17. Promote Backyard Composting

Getting residents engaged will help promote sustainability and waste awareness. In addition, developing a community garden where residents can bring food waste should be explored.

Estimated Diversion: 4,500+ tons per year in combination with other food waste programs (#15)

Steps to Achieve:

- *Haulers and Member Agencies amend franchise agreements.*

- *Haulers provide customers backyard compost bins, kitchen pails, and education materials.*

Responsible Parties: Haulers for program implementation and education.

Implementation Cost: \$5,000-\$10,000 each Member Agency. Ongoing: \$5,000 for each Member Agency or \$60,000 for the region.

Member Agencies

18. Require Deconstruction/ Salvage/Resale of Construction and Demolition Materials

Salvaging materials prior to deconstruction will allow materials to be reused and be diverted from the landfill. This practice has already begun in parts of the County, but support from Member Agencies in the form of ordinances and promotion will help keep useful materials from being unnecessarily disposed.

The JPA can administer the program to promote efficiencies rather than implementation individually by Member Agencies.

Estimated Diversion: ~11,500 in conjunction with C&D ordinance and resale facilities. Supports #8.

Steps to Achieve:

- *Each Member Agency adopt a deconstruction and salvage ordinance.*
- *Require salvage be conducted before demolition.*
- *Educate contractors on the requirements through trade groups and permits.*
- *Include deconstruction and salvage companies more prominently in the County's Public Works Builders Guide and increase the prominence*

of the guide through community outreach.

- Educate residents of facilities that have salvaged materials or perform deconstruction (e.g., non-profits, Marin-Sonoma Deconstruction and Demolition).

Responsible Parties: Member Agencies adopt and enforce ordinance, Public Works department to modify the Builder's Guide, and the JPA might be able to assist with outreach and public education.

Implementation Cost: \$5,000-\$10,000 each Member Agency for public education. Ongoing: \$5,000 for each Member Agency or \$60,000 for the region.

VIII. Costs and Funding Options

Estimated Solid Waste System Cost

The Marin County solid waste collection system is complex and involves multiple entities that extend beyond the haulers identified in this study. To determine the cost to run the current system as a basis for incremental cost is difficult to determine. As noted previously, haulers accounted for **diverting** 30 percent of the diversion tonnage identified in 2006 (129,400 tons out of 432,600 tons diverted countywide) and collecting 31 percent of the reported total AB 939 reported (193,700 tons out of 620,400 tons) generation. Identifying the cost of the waste management system, would therefore include the gathering of data from the companies and facilities handling the other 70 percent of material which includes regulated and non-regulated entities. The range of entities to acquire costs from include:

**Table 21
Estimated Countywide Costs**

Total Waste Generation (2006)	620,400
Total Franchised Tonnage (2006)	193,700
Percent Franchised Tonnage	31%
Franchised Hauler Cost	\$54,700,000
Per Capita Cost	\$213
Total Per Capita Cost	\$687
County Wide Population (2008)	256,500
Estimated County Wide Cost	\$176,215,500

- Franchised and municipal residential and commercial haulers;
- Permitted debris box haulers;
- Non-franchised/permitted recycling companies collecting source separated materials, such a glass recyclers, rendering companies, paper recyclers, etc.;
- Facilities regulated or not regulated such as transfer stations; landfills; C&D processing facilities (in county and out of county); reuse/ donation stores, such as Goodwill; store back-haul and take-back operations, etc.;
- Buy-back and drop off centers; and
- State and federal operations, such as Fire Safe Marin and CalTrans.

With the above limitations notes, a general estimated cost for the current

solid waste management system is approximately \$176,200,000/ year.

This estimate is based on applying the estimated average per capita cost for hauler provided services of \$213/year, to the tonnage collected by the haulers as a percentage of total countywide waste generation.

Developing a more specific and detailed cost estimate for the current system would entail conducted a detailed economic study.

The cost estimates to implement the recommendations in Section IIV are as follows:

**Table 22
Estimated Costs**

Responsible Party		Recommendation	Estimated One-Time Cost	Estimated Ongoing Cost	Potential Funding Source
Phase I					
JPA	1	Increase JPA Program Assistance with other County Departments (e.g., used oil programs, sharps)	N/A	\$40,000+ <i>Materials and staffing</i>	AB 939 Fee
	2	Increase JPA's Staff and Role in Assisting Administration of Member Agency and Countywide Programs. <i>Could support #6-10 below.</i>	\$200,000 (Fund Phase II)	\$120,000+ <i>Materials and staffing</i>	AB 939 Fee
	3	Increase Board of Directors Meeting Frequency	N/A	N/A	AB 939 Fee
	4	Help Facilities with Siting and Permitting: a) Solid Waste and b) Non-Solid Waste <i>JPA materials and staffing</i>	N/A	\$120,000 <i>Materials and staffing</i>	AB 939 Fee
	5	Support EPR and Waste Reduction Policies at State and National Level <i>Public education</i>	N/A	\$120,000 <i>Materials and staffing</i>	AB 939 Fee
<i>Phase I JPA Subtotal</i>			\$200,000	\$400,000	
Member Agencies (MA)	6	Revise Solid Waste Ordinances <i>Could be done as part of #2 above.</i>	\$5,000- \$10,000 each MA	N/A	Franchise Fee, General Fund
	7	Revise Franchise Agreement Language. <i>Could be done as part of #2 above.</i>	\$25,000- \$75,000 each MA	N/A	Franchise Fee, General Fund
	8	Adopt, Enforce, and Homogenize the Construction and Demolition Ordinance. <i>Could be done as part of #2 above.</i>	\$5,000- \$10,000 each MA	\$5,000 each MA or \$60,000 for region	Franchise Fee, General Fund, Disposal Fee

**Table 22
Estimated Costs**

Responsible Party		Recommendation	Estimated One-Time Cost	Estimated Ongoing Cost	Potential Funding Source
	9	Adopt and Enforce Multi-Family Dwelling and Business Recycling Ordinance. <i>Could be done as part of #2 above.</i>	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	Franchise Fee, General Fund, AB 939 Fee
	10	Encourage Consumption and Disposal Changes. <i>Public education. Could be done as part of #2 above.</i>	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	Franchise Fee, General Fund, AB 939 Fee
<i>Phase I Member Agencies Subtotal</i>			<i>\$45,000-\$115,000 each MA</i>	<i>\$150,000 each MA-\$180,000 for region</i>	
Phase II					
<i>JPA</i>	11	Promote Countywide Sale and/or Disposal Bans	\$50,000+ for public education	\$30,000+	AB 939 Fee
<i>Phase II JPA Subtotal</i>			<i>\$50,000+</i>	<i>\$30,000+</i>	
<i>Haulers (via Member Agencies)</i>	12	Implement Wet/Dry Collection Routes	Franchise Agreement Revision	2%-10% rate increase	Customer Rates
	13	Offer Residential Unlimited Services of Recycling and Green Waste Containers	Franchise Agreement Revision	1%-3% rate increase	Customer Rates
	14	Add Materials Collected to the Recycling Stream	Franchise Agreement Revision	1%-3% rate increase	Customer Rates
	15	Add Food Waste Diversion to Collection Services (Residential and Commercial)	Franchise Agreement Revision	1%-5% rate increase	Customer Rates
	16	Implement Food Waste Digestion	Franchise Agreement Revision	2%-10% rate increase	Customer Rates
	17	Promote Backyard Composting	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	Customer Rates

**Table 22
Estimated Costs**

Responsible Party		Recommendation	Estimated One-Time Cost	Estimated Ongoing Cost	Potential Funding Source
		<i>Phase II Hauler Subtotal</i>	\$5,000- \$10,000 each MA	\$5,000 each MA or \$60,000 for region	
<i>Member Agencies</i>	18	Require Deconstruction/ Salvage/ Resale of Construction and Demolition Materials	\$5,000- \$10,000 each MA for public education	\$5,000 each MA or \$60,000 for region	C&D deposit system or fee
		<i>Phase II Member Agencies Subtotal</i>	\$5,000- \$10,000 each MA	\$5,000 each MA or \$60,000 for region	
		<i>Total</i>	\$910,000- \$1,870,000 for the region	\$730,000+ for the region and 7%-31% rate increase	

As shown above, the one-time costs for implementing the recommendations is estimated to range from at \$910,000 – \$1,870,000. This represents less than 1 percent of the total countywide costs. On an ongoing basis, using the estimated hauler costs of \$54.7 million (\$213.25 per capita) and the estimated rate increases ranging between 7 – 31 percent, the hauler costs would increase to \$58.5 – \$71.7 million. This represents a total estimated hauler cost increase of between 2.2 and 9.7 percent.

Analysis of the recommendations on a cost per ton basis shows that the following recommendations cost the least to implement for diversion or waste reduction achieved: 11, 10, 17, 18 and 8. Details are provided in Appendix B, Table 2.

Because the JPA is funded through AB 939 fees (from disposal tip fees) that are incorporated into current customer rates, unless the JPA’s budget is increased, there is no additional cost impact. However, if the JPA’s budget is increased to pay for recommended programs to be supported by the JPA (estimated to be approximately \$730,000/year) the current JPA AB 939 fee will need to be increased, with this cost passed on to users of Redwood Landfill through higher tip fees. Likewise, the Member Agencies may opt to fund recommendations through increased franchise fees or AB 939 fees, with the cost to be paid for by customers through the franchised hauler rates. The following section describes various methods that can be used to pay for implementing the recommendations.

Funding Options

As noted in Section VII, implementing the recommendations will require one or more methods to pay for expanded or new programs. As shown in Table 21 below, there is a variety of ways to collect money to fund the programs and policies, but the main funding source remains the same: customer rates.

Under the category of customer rates, are AB 939 fees which the JPA currently uses and Member Agencies can also include in their franchise agreements.

In addition to the AB 939 fees that are charged by the JPA, each Member Agency has the authority to implement or adjust funding mechanisms. These funding mechanisms include the following:

- **Vehicle impact fee.** This fee is based on the wear-and-tear the collection vehicles make on roadways. It can be a flat fee every contract year or one-time.
- **Franchise fee.** This fee is charged by the Member Agency and is used to fund programs and staff.
- **General fund.** This is the main fund source for Member Agency programs and staff.
- **Facility host fee.** This fee can be charged to solid waste facilities that are located within Member Agency boundaries. The amount can be determined by the jurisdiction.
- **Developer fee.** This fee can cover partial or all costs associated with providing new trucks and carts to new developments rather than sharing the costs over all customers.
- **Ballot initiative fee/tax.** The County or Member Agencies can propose a fee or tax related to solid waste that would be used to support the implementation of programs and

policies. An example would be Measure D that was passed in Alameda County.

- **EPR policy/fee.** This fee could be charged to products that an EPR solution is desired and would pay for the proper handling and disposal of materials. An example of this on the statewide level is Electronic Waste Recycling Act of 2003 (SB 20).

With each of these funding mechanisms, the Member Agencies have the opportunity to use the money to support programs and policies to support the Zero Waste goal.

It should be noted that any fee structure based on tons disposed will need to be changed because as tons disposed decrease the per ton fee would need to increase significantly to generate the same amount of revenue. Ultimately, in a Zero Waste system, paying for programs on a disposal fee basis is not sustainable. Other communities that fund programs on disposal fees are actively exploring other funding options that may prove to be more sustainable as disposal tonnage decreases. Specifically, Sonoma County is looking

at establishing AB 939 fees more on a total generation basis by assigning a flat fee based on historical tons disposed to be paid by franchised haulers, adding new fees on diversion facilities (MRFs, C&D facilities, organic processing), and in increasing disposal fees on self-haulers.

**Table 23
Funding Options**

	Has Authority to Implement	
	JPA	Member Agencies
Customer rates		✓
AB 939 fees	✓	✓
Vehicle impact fees		✓
Franchise fees		✓
General fund		✓
Facility host fees		✓
Developer fee		✓
Ballot initiative fee/tax		✓
EPR policy/fee		✓

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Appendix A

Northern California Solid Waste Management Authorities

Appendix A
Northern California
Solid Waste Management Authorities

Name of Authority										
Item	Marin Hazardous and Solid Waste JPA	Western Placer County Waste Management Authority	Sonoma County Waste Management Agency	Salinas Valley Solid Waste Authority	Humboldt Waste Management Authority	Del Norte Solid Waste Management Authority	Monterey Regional Waste Management Authority	Central Contra Costa Solid Waste Authority	South Bayside Waste Management Authority	West Contra Costa Solid Waste Authority
Member Agencies	City of Belvedere Town of Corte Madera Town of Fairfax City of Larkspur City of Mill Valley City of Novato Town of Ross Town of San Anselmo City of San Rafael Town of Tiburon County of Marin	Lincoln Rocklin Roseville County of Placer Auburn Loomis	Cloverdale Cotati Healdsburg Petaluma Rohnert Park Santa Rosa Sebastopol City of Sonoma Windsor County of Sonoma	City of Salinas City of Gonzales City of Greenfield City of King City of Soledad County of Monterey (South)	City of Eureka City of Arcata City of Blue Lake City of Rio Del City of Ferndale County of Humboldt	Crescent City County of Del Norte	Carmel-by-the-Sea Del Rey Oaks Marina Monterey Pacific Grove Sand City Seaside County of Monterey (North)	Town of Danville City of Lafayette Town of Moraga City of Orinda City of Walnut Creek Contra Costa County (east)	Atherton Belmont Burlingame East Palo Alto Foster City Hillsborough Menlo Park Redwood City San Carlos City of San Mateo County of San Mateo West Bay Sanitary District	El Cerrito Hercules Pinole Richmond San Pablo Contra Costa County (west)
Board Members	One member per jurisdiction – Either an elected official or Member Agency staff.	2 – County of Placer 1 – Lincoln 1 – Rocklin 1 – Roseville Auburn & Loomis – non voting members	One member per jurisdiction – an elected official or appointee	3 – City of Salinas 2 – County of Monterey 1 – each City of Gonzales City of Greenfield City of King City of Soledad	One member per jurisdiction – an elected official or appointee <u>Executive Committee</u> consists of City & County Managers from each jurisdiction.	2 – Board of Supervisors 2 – City Council 1 – Public member	One member per jurisdiction – an elected official or appointee	12 Total 2 per jurisdiction – an elected official or appointee	One member per jurisdiction. Position is filled by: City Manager, Asst. City Manager, Finance Director, or Public Works Director. No elected officials.	3 – Richmond 1 -member per jurisdiction – 1 – County of Contra Costa (non-voting) Members are an elected official or appointee
Voting Process	One vote per member	One vote per member	One vote per member	One vote per member	One vote per member	One vote per member	One vote per member	One vote per member	One vote per member	One vote per member except County seat
Residential / Commercial Accounts (approx)	70,400 / 5,800	86,000 / 20,000	34,000 / 2,300	48,000 / 5,000	40,000 / 5,000	10,000 / 1,100	47,000 / 6,200	62,000 / 3,000	86,000 / 10,000	25,000 / 5,000
Annual Disposal Tons	229,000	230,000	532,000	193,000	85,000	22,000	220,000	100,000	200,000	145,000
CIWMB Diversion Rate (Year)	72% (2006)	59% - 65% (2004)	59% (2005)	47% - 74% (2004)	30% - 74% (2004)	46% (2004)	47% - 71% (2006)	42% - 52% (2005)	42% - 83% (2005)	38% (2005)
AB 939 Reporting	Regional Authority	No	Regional Authority	Individual Jurisdictions	Individual Jurisdictions	Regional Authority	Individual Jurisdictions	Individual Jurisdictions	Individual Jurisdictions	Individual Jurisdictions

Appendix A
Northern California
Solid Waste Management Authorities

Name of Authority										
Item	Marin Hazardous and Solid Waste JPA	Western Placer County Waste Management Authority	Sonoma County Waste Management Agency	Salinas Valley Solid Waste Authority	Humboldt Waste Management Authority	Del Norte Solid Waste Management Authority	Monterey Regional Waste Management Authority	Central Contra Costa Solid Waste Authority	South Bayside Waste Management Authority	West Contra Costa Solid Waste Authority
Annual Budget	\$1.7 Million	\$25 - \$30 Million	Not Available	\$21 Million	\$10 Million	\$2.5 Million	\$16 Million	\$2 - \$3 Million	\$35 Million	\$14 Million
Source of Revenue ¹	Tipping Fees and grants	Tipping Fees	Tipping Fees	Tipping Fees	Tipping Fees	Franchise Fees	Tipping Fees	Franchise Fees & Recycling Revenue	Tipping Fees	Tipping Fees
Agency Staff (# of full time staff)	Program Manager and staff (5)	Assigned from County Solid Waste Department (7)	Assigned from County Solid Waste Department (5)	Director and Staff (22)	Director and Staff (27)	Director and Staff (8)	General Manager and Staff (over 100)	Director and Staff (4)	Director and Staff (6)	Director and Staff (6)
Staff Employer	Contracted from County	Waste Authority	Contracted from County	Waste Authority	Waste Authority	Waste Authority	Waste Authority	Waste Authority	Waste Authority	Waste Authority
Publicly Owned Facilities	None	None	1 – Landfill 4 – Transfer Stations	None	None	None	None	None	None	None
Issue Revenue Bonds	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Facilities Owned by Waste Authority	None	1 – Landfill 1 – MRF 1 – HHW Facility 1 – Composting (all on same site)	None	3 – Landfills 3 – Transfer Stations 1 - HHW	1 – Landfill 2 – Transfer Stations 1 – HHW 1 - Composting	1 – Transfer Station 1 – HHW Facility (all on same site)	1 – Landfill 1 – MRF 1 – HHW Facility 1 – Composting (all on same site)	1 – Buy Back & Drop off Center 1 – Green Waste Drop off 1 – HHW Facility	1 – Transfer Station 1 – MRF 1 – HHW facility (all on same site)	1 – Landfill (closed)
Public & Agency Owned Facility Operations	None	Contracted	By County and Private operators	Contracted	Waste Authority staff	Waste Authority staff	Operated by Waste Authority staff	Private	Contracted	Contracted
Privately Owned Facilities	None	None	MRF's	Transfer Station, MRF & Composting	1 – MRF 1 – C&D	1- MRF	2 - Transfer Station, 1 - MRF & 1 - Composting	2 – Landfills 5 – Transfer Stations/MRF 2 – Composting	1 – Landfill	2 – Transfer Stations 1 – MRF 1 – HHW Facility 1 – Composting (all on same site)
Facility Designation (Flow Control)	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rate Setting/Approval	No; Approved by Member Agencies	Review & Recommend Rates, approved by member agencies	No	Yes	Yes	Yes	Yes	Yes	Review & Recommend Rates, approved by member agencies	Yes

¹ These include dedicated sources of revenue. Revenue received through various grant programs is not listed, however most JPA's receive some funding through grants.

Appendix A
Northern California
Solid Waste Management Authorities

Name of Authority										
Item	Marin Hazardous and Solid Waste JPA	Western Placer County Waste Management Authority	Sonoma County Waste Management Agency	Salinas Valley Solid Waste Authority	Humboldt Waste Management Authority	Del Norte Solid Waste Management Authority	Monterey Regional Waste Management Authority	Central Contra Costa Solid Waste Authority	South Bayside Waste Management Authority	West Contra Costa Solid Waste Authority
Rates for Member Agencies	Vary based on service requirements of member agencies	Same	Vary based on service requirements of member agencies	Equalized	Equalized	Same	Same	Same	Vary based on service requirements of member agencies	Same
Closure & Post Closure Monitoring & Maintenance	No	Yes	County	Yes	Yes	Yes	Yes	Yes	No	Yes
Solid Waste Planning	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Public Education & Outreach	Some; most done by Member Agency haulers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enter into Collection Franchise Agreements	No	Yes	No	No	No	No	No	Yes	Negotiate – Approved by member agencies	No
Enter into Facility Operating Agreements	No	Yes	No	Yes	Operated by Authority	Yes	Operated by Authority	Yes	Yes	Yes
Enter into Disposal Agreements	No	Yes	No	Yes	Yes	Yes	Operated by Authority	Yes	Yes	Yes
Enter into Processing Agreements	No	Yes	No	No	No	Yes	Operated by Authority	Yes	Yes	Yes
Permanent HHW Facility in region	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HHW Program Management	Yes	Yes	Yes	Yes	Operated by Authority	Yes	Operated by Authority	Yes	Yes	Yes
Enter into HHW Operating Agreements	Yes	Yes	Yes	Yes	Operated by Authority	Yes	Operated by Authority	Yes	Yes	Yes

Appendix B

Summary of Recommendations

Appendix B
Table 1: Summary of Recommendations

Responsible Party	Item	Recommendation	Estimated One-Time Cost	Estimated Ongoing Cost	Potential Funding Source	JPA or Member Agency (MA) Staff Required	Disposal Reduction Percent	Disposal Reduction Tons	Advantages	Disadvantages	Facility Infrastructure Exists in County?	Time Needed for Implementation
Phase I												
JPA	1	Increase JPA Program Assistance with other County Departments (e.g., used oil programs, sharps and pharmaceuticals)	N/A	\$40,000 + <i>Materials and staffing</i>	AB 939 Fee	1/3 Full-Time Equivalent (FTE)	N/A	Supports #4-18	Enables JPA/County to identify programs that joint efforts can be of benefit. Most benefit could be related to countywide programs such as grants and EPR publicity to businesses and residents.	Coordination may be hindered by authority restrictions on the JPA.	N/A	A couple months to discuss programs, JPA/County roles/authority and determine protocol.
	2	Increase JPA's Role in Assisting Administration of Member Agency and Countywide Programs <i>Could support #6-10 below.</i>	\$200,000 (Fund Phase II)	\$120,000 + <i>Materials and staffing</i>	AB 939 Fee	1 FTE	N/A	Supports #4-18	JPA's technical knowledge can be a resource and help increase diversion potential.	JPA role would have to be defined to ensure communication and prevent overlapping of efforts.	N/A	Approximately six months-1 year. Will require increased authority to the JPA and parameters for level of assistance to provide.
	3	Increase Board of Directors Meeting Frequency	N/A	N/A	AB 939 Fee	No change to current staff levels.	N/A	Supports #4-18	Increases communication with Member Agencies. Opportunity to get more feedback on programs and areas for the JPA to assist with.	Depending on frequency, there may not be enough time in between meetings to warrant updates. Requires Board of Directors to increase JPA efforts.	N/A	A couple months to get consensus on meeting schedule.
	4	Help Facilities with Siting and Permitting a) Solid Waste and b) Non-Solid Waste <i>JPA materials and staffing</i>	N/A	\$120,000 + <i>Materials and staffing</i>	AB 939 Fee	1 FTE	40%	Supports #18	Opportunity to create "green jobs" and divert reusable material from disposal.	Siting options are very limited for non-processing facilities (resale) and siting solid waste processing facilities is not foreseen.	No. Land use restrictions and permitting make new solid waste facilities improbable.	Ongoing.
	5	Support Extended Producer Responsibility (EPR) and Waste Reduction Policies at State and National Level <i>Public education</i>	N/A	\$120,000 + <i>Materials and staffing</i>	AB 939 Fee	1 FTE	N/A	Supports #10 & 11	State law and national programs enables the JPA to promote EPR responsibilities to businesses and disposal options to residents. Education on the countywide level will be the most efficient way of business outreach and promotion.	Requires JPA staff time to develop education materials and meet with businesses. Tonnage diverted may not be quantifiable.	Yes.	A couple months to develop the materials and identify businesses that should be complying. Outreach should be continued on an annual basis.
<i>Phase I JPA Subtotal</i>			<i>\$200,000</i>	<i>\$400,000</i>								
Member Agencies	6	Revise Solid Waste Ordinances <i>Could be done as part of #2 above.</i>	\$5,000-\$10,000 each MA	N/A	Franchise Fee, General Fund	1/4 FTE	N/A	Supports #7, 9 & 18	Will update standards to reflect current solid waste practices and issues.	Will require staff time to revise ordinances.	N/A	Three months to 1 year.
	7	Revise Franchise Agreement Language <i>Could be done as part of #2 above.</i>	\$25,000-\$75,000 each MA	N/A	Franchise Fee, General Fund	Contract staff/consultants	10%	Supports #8, 9, 12, 13, 14, 15, & 16	Explicitly requiring 50% diversion in contracts would increase the diversion achieved. Only one hauler achieved at least 50% in 2006.	Haulers that dispose of material may have to change operations and use new facilities. Could result in rate increases or decreases depending on processing versus disposal tip fees.	Yes.	Three to six months for franchise agreement revisions.
	8	Adopt, Enforce, and Homogenize the Construction and Demolition Ordinance <i>Could be done as part of #2 above.</i>	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	Franchise Fee, General Fund, AB 939 Fee	1/2 FTE (MA and JPA)	10%	22,900 and supports #18	Improves operations of haulers if multiple Member Agencies have the same requirements. Also creates opportunity for JPA to help education regionally.	Coordination of Member Agency needs and negotiation to develop requirements.	Yes.	Three months to 1 year (time to develop the ordinance and adopt it).
	9	Adopt and Enforce Multi-Family Dwelling and Business Recycling Ordinance <i>Could be done as part of #2 above.</i>	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	Franchise Fee, General Fund, AB 939 Fee	1/2 FTE	10% (as part of wet/dry collection)	29,700	Would increase efforts to the sectors and help make higher grade recycling loads. Recommended that ordinance remain consistent for all Member Agencies. Ordinance will help make diversion goals as part of franchise agreement more attainable.	Education efforts are needed to implement. Can be require significant staff time to visit premises and promote ordinance.	Yes.	Three months to 1 year (time to develop the ordinance and adopt it).
	10	Encourage Consumption and Disposal Changes <i>Public education. Could be done as part of #2 above.</i>	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	Franchise Fee, General Fund, AB 939 Fee	1/2 FTE	1%	2,300	Reduces the waste generated upstream and promotes reuse and repair of material.	Can be a long process to change consumption and have impact in reducing disposal.	Yes.	Immediately; ongoing process
<i>Phase I Member Agencies Subtotal</i>			<i>\$45,000-\$115,000 each MA</i>	<i>\$15,000 each MA-\$180,000 for region</i>								
Phase II												

Appendix B												
Table 1: Summary of Recommendations												
Responsible Party	Item	Recommendation	Estimated One-Time Cost	Estimated Ongoing Cost	Potential Funding Source	JPA or Member Agency (MA) Staff Required	Disposal Reduction Percent	Disposal Reduction Tons	Advantages	Disadvantages	Facility Infrastructure Exists in County?	Time Needed for Implementation
JPA	11	Promote Countywide Sale and/or Disposal Bans	\$50,000 + for public education	\$30,000+	AB 939 Fee	1/4 FTE	0.50%	1,100	Encourages recyclable products to be sold and therefore remove disposable items from the waste stream.	Requires ordinances to be passed. Will only be effective if all Member Agencies have similar ordinances. Will require compliance oversight.	N/A	Immediately; ongoing process
Phase II JPA Subtotal			\$50,000+	\$30,000+								
Haulers (via Member Agencies)	12	Implement Wet/Dry Collection Routes	Franchise Agreement Revision	2%-10% rate increase	Customer Rates	N/A	44%	102,000	Based on re-routing of trucks rather than new equipment purchases. Enables homogenous, high grade recyclable materials to be collected with little contamination as compared to non-wet/dry routes.	Time and effort in developing new route and retraining drivers.	N/A	Approximately six months-1 year. Will require rerouting of trucks and potentially changing collection days.
	13	Offer Residential Unlimited Services of Recycling and Green Waste Containers	Franchise Agreement Revision	1%-3% rate increase	Customer Rates	N/A	1%	7,300	Free service could have people that dispose of green waste rather than pay for an extra container.	Haulers may have more containers to service and may lose current revenue.	Yes.	Up to 1 year; franchise agreement would need to be amended.
	14	Add Materials Collected to the Recycling Stream	Franchise Agreement Revision	1%-3% rate increase	Customer Rates	N/A	1%	2,300	Increased diversion of currently disposed materials.	Recycling markets will be needed to effectively divert material and minimize potential rate increases due to larger material stream.	Yes, for sorting, but recycling markets need to exist.	One year to get program underway (determine facilities to accept the material for diversion, public education, etc.)
	15	Add Food Waste Diversion to Collection Services (Residential and Commercial)	Franchise Agreement Revision	1%-5% rate increase	Customer Rates	N/A	2%	4,500 and supports #12 & 16	Food waste is the next material in the residential stream that can result in significant diversion.	Lack of facilities exist locally to process the material. Transport and tip fees may result in a rate increase.	Not locally. Material would need to be transferred.	Two to five years to identify potential facilities and amend franchise agreements.
	16	Implement Food Waste Digestion	Franchise Agreement Revision	2%-10% rate increase	Customer Rates	N/A	N/A; tonnage accounted for with collecting food waste	N/A	Method of diversion that can provide energy benefits and reduce carbon emissions.	Does not increase diversion. Need facilities to process material.	Limited infrastructure is being developed and siting is difficult in the County.	Between 1-5 years. There are a variety of pilot to small scale projects planned/underway. Infrastructure to handle material for the whole region would need to be developed, permitted and built.
	17	Promote Backyard Composting	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	Customer Rates	N/A	N/A; tonnage accounted for with collecting food waste	4,500 as part of food waste diversion(#15)	Direct benefit for the homeowner to divert material. May help promote overall improvements in waste generation.	Education programs and workshops are needed to begin and sustain efforts.	N/A	Two to five years to develop programs and actively promote it.
Phase II Hauler Subtotal			\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region								
Member Agencies	18	Require Deconstruction/ Salvage/ Resale of Construction and Demolition Materials	\$5,000-\$10,000 each MA for public education	\$5,000 each MA or \$60,000 for region	C&D deposit system or fee	N/A	5% in conjunction with C&D ordinance and resale facilities	11,500 and supports #8	Opportunity to create "green jobs" and divert reusable material from disposal. Material is generally heavy and can have a significant impact on disposal tonnage.	Assistance is needed to educate homeowners of possibilities. Will require staff time to conduct outreach and provide incentives for these types of enterprises to come to the County (ReStore, etc.)	Small operations exist. More operations are needed to promote deconstruction and create "green jobs".	Two to five years to identify potential deconstruction groups and solicit interest and barriers to operating in County. Allows time to identify non-profits, and if needed, help with the siting of non-processing facilities (resale only).
Phase II Member Agencies Subtotal			\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region								
Total			\$910,000-\$1,870,000 for the region	\$730,000+ for the region and 7%-31% rate increase								
Estimated Total Diversion								183,600				

Appendix B
Table 2: Costs Per Ton of Waste Reduction

Item	Recommendation	Estimated One-Time Cost	Estimated Ongoing Cost	Disposal Reduction Percent	Disposal Reduction Tons	One-time Cost per Ton of Disposal Reduction*	Ongoing Cost per Ton of Disposal Reduction*
11	Promote Countywide Sale and/or Disposal Bans	\$50,000 + for public education	\$30,000+	0.50%	1,100	\$0.02	\$0.04
10	Encourage Consumption and Disposal Changes <i>Public education. Could be done as part of #2 above.</i>	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	1%	2,300	\$0.23 - \$0.46 each member agency	\$0.46 each MA or \$0.04 for region
17	Promote Backyard Composting	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	N/A; tonnage accounted for with collecting food waste	4,500 as part of food waste diversion(#15)	\$0.45 - \$0.90 each MA	\$0.90 each MA or \$0.08 for region
18	Require Deconstruction/ Salvage/ Resale of Construction and Demolition Materials	\$5,000-\$10,000 each MA for public education	\$5,000 each MA or \$60,000 for region	5% in conjunction with C&D ordinance and resale facilities	11,500 and supports #8	\$1.15 - \$2.30 each MA	\$2.30 each MA or \$0.19 for region
8	Adopt, Enforce, and Homogenize the Construction and Demolition Ordinance <i>Could be done as part of #2 above.</i>	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	10%	22,900 and supports #18	\$2.29 - \$4.58 each member agency	\$4.58 each MA or \$0.38 for region
9	Adopt and Enforce Multi-Family Dwelling and Business Recycling Ordinance <i>Could be done as part of #2 above.</i>	\$5,000-\$10,000 each MA	\$5,000 each MA or \$60,000 for region	10% (as part of wet/dry collection)	29,700	\$2.97 - \$5.94 each member agency	\$5.94 each MA or \$0.50 for region
14	Add Materials Collected to the Recycling Stream	Franchise Agreement Revision	1%-3% rate increase	1%	2,300		\$748.77 - \$2,246.31
15	Add Food Waste Diversion to Collection Services (Residential and Commercial)	Franchise Agreement Revision	1%-5% rate increase	2%	4,500 and supports #12 & 16		\$878.99 - \$4,394.96
13	Offer Residential Unlimited Services of Recycling and Green Waste Containers	Franchise Agreement Revision	1%-3% rate increase	1%	7,300		\$2,376.53 - \$7,129.60
12	Implement Wet/Dry Collection Routes	Franchise Agreement Revision	2%-10% rate increase	44%	102,000		\$9,961.91 - \$49,809.55
1	Increase JPA Program Assistance with other County Departments (e.g., used oil programs, sharps and pharmaceuticals)	N/A	\$40,000 + <i>Materials and staffing</i>	N/A	Supports #4-18	N/A	N/A

Appendix B
Table 2: Costs Per Ton of Waste Reduction

Item	Recommendation	Estimated One-Time Cost	Estimated Ongoing Cost	Disposal Reduction Percent	Disposal Reduction Tons	One-time Cost per Ton of Disposal Reduction*	Ongoing Cost per Ton of Disposal Reduction*
2	Increase JPA 's Role in Assisting Administration of Member Agency and Countywide Programs <i>Could support #6-10 below.</i>	\$200,000 (Fund Phase II)	\$120,000 + <i>Materials and staffing</i>	N/A	Supports #4-18	N/A	N/A
3	Increase Board of Directors Meeting Frequency	N/A	N/A	N/A	Supports #4-18	N/A	N/A
4	Help Facilities with Siting and Permitting a) Solid Waste and b) Non-Solid Waste <i>JPA materials and staffing</i>	N/A	\$120,000 + <i>Materials and staffing</i>	40%	Supports #18	N/A	N/A
5	Support Extended Producer Responsibility (EPR) and Waste Reduction Policies at State and National Level <i>Public education</i>	N/A	\$120,000 + <i>Materials and staffing</i>	N/A	Supports #10 &11	N/A	N/A
6	Revise Solid Waste Ordinances <i>Could be done as part of #2 above.</i>	\$5,000- \$10,000 each MA	N/A	N/A	Supports #7, 9 & 18	N/A	N/A
7	Revise Franchise Agreement Language <i>Could be done as part of #2 above.</i>	\$25,000- \$75,000 each MA	N/A	10%	Supports #8, 9, 12, 13, 14, 15, & 16	N/A	N/A
16	Implement Food Waste Digestion	Franchise Agreement Revision	2%-10% rate increase	N/A; tonnage accounted for with collecting food waste	N/A	N/A	N/A

*Cost per ton was calculated using the highest noted rate in the County at \$102.39 from Christmas Tree Hill (Corte Madera).
(Source: Table 20: Hill Areas)