



Alameda County Source Reduction and Recycling Board



"5-Year Audit" Program Assessment Revised Final Report

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January 31, 2008

Mr. Tom Padia
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Dear Mr. Padia,

It is with pleasure that we transmit the revised final version of the Program Assessment to the Alameda Source Reduction and Recycling Board, the third conducted pursuant to Measure D requirements. This Assessment documents the efforts of the member agencies and of StopWaste.Org in working to reach the 75 percent diversion goal. We hope that this Assessment will be helpful to the member agencies and to StopWaste.Org in enhancing current programs and policies and in shaping those of the future. The revised final version reflects revisions to disposal reporting data for 2006.

The Assessment is a collaborative effort and we wish to thank everyone involved in its development, and in particular to acknowledge the assistance of the staff of the 17 member agencies that provided information, data, and review for the Assessment. Many thanks also to our team members for the Assessment: Kies Strategies, Skumatz Economic Research Associates and Environmental Planning Consultants.

We appreciate the opportunity to work on this project and look forward to discussing its findings and recommendations with the Recycling Board, the Authority Board, and StopWaste.Org staff.

Very truly yours,
HF&H CONSULTANTS, LLC

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EXECUTIVE SUMMARY

OVERVIEW

The Waste Reduction and Recycling Initiative Charter Amendment

The Waste Reduction and Recycling Initiative Charter Amendment (Measure D) was adopted by the voters in November 1990. Measure D sets forth countywide goals for the reduction and diversion of non-hazardous solid wastes from landfill; creates a framework for comprehensive source reduction and recycling programs; imposes a surcharge (currently \$7.43 and increasing to \$7.67 per ton effective January 1, 2008) on wastes landfilled in the unincorporated county to fund these programs; and, establishes a Source Reduction and Recycling Board (Recycling Board) to oversee the distribution of funds and the conduct of countywide programs.

About the Recycling Board

The 11-member Recycling Board is made up of five elected public officials from the Alameda County Waste Management Authority and six professional experts in specified areas of waste reduction, who are appointed by the Alameda County Board of Supervisors. Funding for the Recycling Board is derived from the Measure D per-ton disposal fee. Fifty percent of the landfill surcharge revenues are distributed to participating municipalities for the maintenance and expansion of municipal recycling programs, and 50 percent are budgeted and spent by the Recycling Board.

About the Authority

The Alameda County Waste Management Authority (Authority) operates under an agreement for joint exercise of powers among the County of Alameda, each of the fourteen cities within the County, and two sanitary districts that also provide refuse and recycling collection services. The Authority, established in 1976, is governed by a 17-member board composed of elected officials appointed by each member agency. Primary funding for the Authority is derived from waste import mitigation fees and facility fees (AB 939 fees) at the Altamont, Tri-Cities, and Vasco Road landfills.

The Authority is responsible for the preparation of Alameda County's Integrated Waste Management Plan and Hazardous Waste Management Plan and provides support to member agencies in the implementation of those plans. The Authority manages a long-range program for development of solid waste facility capacity and offers a wide variety of other programs in the areas of waste reduction, market development, technical assistance, and public education.

About the Agency

The Authority and the Recycling Board, now collectively known as StopWaste.Org (or the Agency), is an integrated agency whose mission is to provide the most environmentally sound waste management program for the people of Alameda County. StopWaste.Org offers a wide range of programs in the areas of waste reduction, public education, Bay Friendly Gardening and Landscaping, Green Building, Business Assistance, Schools Recycling and Education,

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Environmentally Preferable Purchasing, market development, low-interest loans to recycling businesses, and grants to non-profit organizations.

THE 2007 ASSESSMENT

The Program Assessment (Assessment) is a broad overview and evaluation of waste prevention, recycling, and composting programs within Alameda County. The Assessment is one of two components of the periodic "audit" required by Subsection 64.040(C) of Measure D to determine compliance and degree of progress with the recycling policy goals of Measure D. The 2007 Assessment addresses enhancements to the effectiveness of countywide and member agency programs, with a focus on the materials still most prevalent in the disposal stream. The Assessment includes evaluation of a range of topics related to identifying the best means for achieving very high levels of diversion.

The Authority and Recycling Board Ad Hoc Committee process regarding efforts to reach the 75 percent diversion goal by 2010, culminated in the March 2007 adoption by both Boards of key recommendations regarding new initiatives and relative emphasis for existing ones. The action of the Boards provides important context for the Assessment. Among the recommendations were:

- Jurisdictions should formally adopt the 75 percent goal by vote of city council.
- Current programs and recommendations should continue to be pursued, as not all recommended programs and policies have been adopted by all the member agencies.
- Jurisdictions should adopt mandatory recycling ordinances for its residents and businesses.
- The Agency should pursue a regional landfill ban on certain materials, including green waste and cardboard, in conjunction with the nine Bay Area counties through ABAG and San Joaquin County.

Report Organization

The Assessment is organized as follows:

- **Section 2 Summary of Member Agency Programs:** Contains the results of an extensive member agency survey process profiling recycling, organics, and other diversion programs for each member agency, and comparisons with residential programs for six comparable jurisdictions.
- **Section 3 Countywide Programs:** Provides summary descriptions of Agency and County programs by broad program area.
- **Section 4 Mandatory Recycling Programs and Facility Bans:** Addresses the experiences of other communities with mandatory programs and bans, and provides recommendations for member agencies and the Agency regarding steps to prepare for, develop, and implement mandatory programs and bans.
- **Section 5 Additional System Issues:** Addresses several other system issues that relate broadly to achieving high diversion levels, including analysis of self-haul material flows,

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advantages and disadvantages of regional franchising and ability to direct the flow of materials, and experiences in siting and operating four food scrap processing facilities.

- **Section 6 Diversion Service Issues:** Addresses a range of specific topics related to achieving high diversion including rate structuring, status of materials markets, non-exclusive collection, and alternative approaches to recovery of materials.
- **Section 7 Other Countywide Issues:** Examines longer-term alternatives for Agency funding, and alternative means for measurement of diversion programs.
- **Section 8 Program Analysis and Recommendations:** Provides analysis and recommendations for member agency programs.

The Assessment includes the following appendices:

- **Appendix A Review of State Business Waste Audit Data:** Contains analysis of the potential application of recent CIWMB business waste audit data to the work of the StopWaste Partnership. Prepared by Kies Strategies.
- **Appendix B Review of Options for Commercial Packaging Reduction:** A review of selected current work elsewhere regarding commercial packaging waste reduction efforts in support of Agency waste prevention efforts. Prepared by Kies Strategies.
- **Appendix C Mandatory Programs and Disposal Bans - Background Information:** A detailed report prepared by Skumatz Economic Research Associates on mandatory programs and disposal bans, and a basis for Section 4.
- **Appendix D Private Sector Diversion Activity - List of Interview Contacts:** List of individuals contacted by Kies Strategies regarding private sector diversion activity discussed in Section 6.

"Member Agency Program Summaries", detailed versions of the information collected through the member agency survey summarized in Section 2, were prepared as part of the Assessment, and are available separately from the Agency.

The Agency plans to make several background documents developed for the Assessment available electronically on the Agency's website at <http://www.stopwaste.org/docs>.

KEY FINDINGS AND RECOMMENDATIONS

Key findings and recommendations are organized by whether their primary effect is on the Agency (or countywide affecting both the Agency and the member agencies) or on the member agencies. Mandatory program and disposal ban recommendations are provided separately.

Agency and Countywide Issues

FINDINGS

1. As for the 2002 Assessment, in reviewing the Agency's and County's programs we do not find any significant program gaps. We note that as greater effort is focused on reaching higher levels of diversion:

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- Programs are more comprehensive, and gaps within program areas are filled in.
 - There is enhanced focus on shaping and changing behavior.
 - There is a trend away from voluntary efforts and recognition that, in many program areas, mandatory approaches are (or will be) needed.
 - There is increasing attention on sustainable practices, cross-media impacts, and participation in the emerging and rapidly-growing discussion regarding the role of waste management practices in climate change.
2. Incorporation of waste prevention practices by individual businesses has a great potential for long-term sustainable reduction in the disposal stream, but generally requires a longer period of time for planning and implementation than is true for traditional recycling programs.
3. Waste prevention is most effective when focused on application of best practices by type of industry and function. Because of the longer time required to incorporate waste prevention, the focus should be on replicable practices. Excessive focus on quantifying waste prevention is not fruitful.
4. Business inquiries to the StopWaste Partnership regarding supply chain and packaging issues have increased significantly in recent months, reflecting in part increased interest in "greening" efforts.
5. To effectively reach a large segment of the self-haul sector, member agency and Agency tools for directing self-haul tonnage away from disposal should include use of contractual requirements for recycling, ordinances that require waste management plans and use of designated recycling and processing facilities, and disposal bans.
6. There is need for ongoing communication between all parties of the impact of collection practices and processing operations on the quality of materials marketed to end-users. The quality of processed materials directly affects the ability of end users to manufacture quality products for sale.
7. Countywide and member agency programs funded through the Agency rely on three main sources of funding, all of which are disposal-based. Over the medium to longer-term, waste prevention and diversion programs will be increasingly successful in reducing the need for disposal. As this occurs, Agency revenues will decrease and there will be a need to identify alternative means of funding.
8. Most states and communities use one of two main methods for measuring progress in diversion:
- Landfill Diversion. Measures the tonnage disposed at landfills receiving waste generated in the jurisdiction in comparison to a "base" year. A variation of this approach is used in California.
 - Program Diversion. Measures tonnage diverted by each program, expressed as a percent of the year's generation or total diverted and disposed tons. This approach is used by the Agency.

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9. There is recent increasing interest by communities seeking high levels of diversion and increased waste reduction, in exploring new financial incentives to increase waste prevention and diversion, including separate payment for all three services and payment in part based on total volume of service.

RECOMMENDATIONS

1. With regard to market trends and identifying gaps in service, Agency should continue grants and low-interest loans for technology improvements, and for research and development.
2. Once the 2008 Waste Characterization Study is completed, the Agency should analyze more recent self-haul material flow data using correlation analysis similar to that conducted for Section 5.2.
3. Many member agencies use a small number of recycling and organics processors. The Agency should consider developing uniform guidelines for collection and reporting of processing residue data.
4. If more than one member agency is interested in pursuing a wet/dry approach the Agency could conduct a study to better quantify the costs and benefits of converting to two-streams.
5. The Agency should monitor developments in every-other-week collection of solid waste, beginning with review of the results from the pending EPA-funded study.
6. The Agency and member agencies should continue to use the CIWMB calculation methodology as the primary measure of each jurisdiction's achievement of diversion goals.
7. The Agency should regularly add new Agency programs to the sustainability indicator analysis to monitor progress in those areas.
8. The Agency should develop a process and schedule for identifying and phasing-in alternative funding options.
9. The Agency should begin monitoring potential near-term and medium-term funding options.
10. The Agency should monitor implementation of alternatives to the current models for rate setting for residential and commercial solid waste and diversion services.

Member Agency Issues**FINDINGS**

1. Most member agencies have core collection programs in place:
 - All member agencies have single-family recycling programs, as required by Measure D.
 - All member agencies have multi-family recycling programs per Measure D requirements.
 - All member agencies have single-family yard debris programs.

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- Thirteen member agencies now have full organics programs for yard debris and household food scraps; and, as currently planned, two additional member agencies will have full organics programs for single-family residents by 2009.
- Seven member agencies have multi-family yard debris programs.
- All member agencies have some form of commercial recycling collection, whether or not municipally-sponsored.
- All member agencies have some form of commercial organics collection, whether or not municipally-sponsored.
- Thirteen member agencies have adopted C&D debris recycling ordinances, and at least one other is in the planning stage.

2. Based on comparison with the six comparable jurisdictions, member agency residential programs appear to be performing relatively well. However, performance comparisons between communities are more art than science, and many factors influence disposal, recyclables material, and compostable material per-capita figures.

3. The terms "municipally-controlled" and "municipally-sponsored" disposal and diversion are useful concepts for referring to programs that are directly controlled by member agencies through franchises, other contracts, or by the municipality. This concept provides a useful means for examining and comparing the effectiveness of programs, but is limited in that member agencies with open market commercial recycling and/or organics diversion programs, or that do not collect commercial diversion program data, will appear to have less-effective programs than may be the case.

4. Member agencies can productively use the near-term period prior to implementing mandatory programs to review and enhance current programs. Key objectives include:

- Maximizing availability of service.
- Ensuring that current programs are functioning as well as possible.
- Enhancing auxiliary aspects of program management such as program data collection, reporting and monitoring practices, enforcement and staffing.

5. Ensuring good diversion program performance requires strong ordinance, permit, and contract provisions and the ability and willingness to enforce them.

6. With regard to exclusive and non-exclusive systems, clear requirements for provision of service, reasonable compensation for service providers, consistent reporting of data by service providers, consistent monitoring of data by public agency staff, tracking commercial complaints and satisfaction in the same manner they do for residential customers, and consistent enforcement are more important than the type of system.

7. Regional franchising for transfer, coupled with either processing or disposal, could be a useful tool for member agencies in working to reach higher levels of diversion as cost-effectively as possible. Based on current information from the member agency survey:

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- 13 member agencies have the contractual ability to direct organic materials for processing.
- 14 member agencies have the contractual ability to direct recyclable materials for processing.
- 14 member agencies have the contractual ability to direct solid waste for disposal.

8. Residential customers do not appear to be swayed by increasingly steep rate structures, and are more likely to recycle based on belief than for financial reasons. Commercial customer behavior does appear to be influenced by the relative pricing of service.

9. Member agencies vary widely in the staff resources devoted to diversion program management, and in the level of authority of that staff.

10. Wet/dry collection and processing, every-other-week collection of solid waste, and options for recovery of last resort are related concepts for collection and processing of materials in the context of high diversion:

- Wet/dry collection has the potential to offer higher levels of diversion than the current three-stream approach used by the member agencies, but presents a complex and interactive set of advantages and disadvantages compared to a three-stream approach including the availability of facilities to process the appropriate volumes, and the mix of materials contained in the two streams.
- Commercial wet/dry routing is a proven technique for increasing diversion.
- Every-other-week collection of solid waste may be of potential interest as a means for increasing single-family residential participation in food scraps programs.
- Recovery of last resort is a useful umbrella concept for a range of techniques for maximizing recovery by ensuring that, to the extent practicable, materials are processed rather than disposed.

11. Key observations from StopWaste Partnership staff regarding issues that arise in providing diversion and waste prevention services to larger businesses include:

- Working with member agency elected officials and staff is very helpful in approaching and assisting businesses in specific jurisdictions. Member agency staff assistance is helpful in providing accurate and targeted recommendations and implementation resources to individual businesses.
- Member agency commercial recycling and organics service provisions affect the potential for business diversion. Key issues include inconsistency of service provisions between member agencies for businesses operating at multiple locations, access to free or low cost recycling collection services, and ability to obtain customized services.
- Mandatory commercial programs and disposal bans will not have much effect on larger businesses that already recover the materials that are likely to be included in either mandatory programs or disposal bans.

*Program Assessment "Five Year Audit"***RECOMMENDATIONS**

1. The member agencies should review and enhance programs with relation to provision of service, ensuring that:

- Service providers are required to make programs available to all potential customers.
- Service actually is offered.
- Service is convenient and fits reasonable individual customer needs.

2. Key program enhancements and best practices include:

Single-Family Recycling

- Consider adding materials.
- Allow unlimited set-outs of recyclable materials at no added charge and with no added steps.
- Allow for easy change to a larger size recycling cart at no added charge for single-family customers with set-outs that regularly exceed their cart size.

Residential Organics

- Increase food scrap program participation by residents.

Bulky Item Collection

- Maximize diversion from bulky item collections.

Commercial Programs

- Use business waste audits as a tool to identify the best options for each collected stream.
- Require that businesses prepare diversion plans.
- Ensure business access to technical assistance for implementing and maintaining waste reduction, recycling and organics programs.

Construction and Demolition Debris

- Adopt C&D debris recycling ordinances, if not now in place.
- Lower thresholds for applicability of projects under existing ordinances.
- Require collection and reporting of data on materials diverted. Four member agencies with C&D debris recycling ordinances currently do not collect data.
- Enforce all provisions of the ordinance.

*Program Assessment "Five Year Audit"*Data Collection and Reporting

- Collect data for all programs that allows for calculation of total generation, disposal, and diversion tonnages.
- Collect multi-family customer and tonnage data separately from that for single-family residents and for commercial customers.
- Require that service providers collect and report tonnage data for commercial recycling and organics, including residue disposal data resulting from processing.
- Require timely provision of data from contractors.
- Ensure that franchises, permits, and ordinances address the ability to add and/or modify reporting requirements.

Enforcement

- Enforce the provisions of franchises, permits, and ordinances. The strongest contract is of little value if enforcement is lacking.
- In adopting mandatory programs, it will become increasingly important to enforce requirements placed on generators as well as the service provider.

Adequate Staffing

Review current staffing levels and the authority and responsibility granted to staff to develop, implement, and enforce programs.

3. Member agencies can most effectively address recovery of last resort by adopting and enforcing C&D debris recycling ordinances.
4. Member agencies with significant commercial sectors should consider further options for wet/dry routing of collection from the commercial sector.
5. Member agencies and the businesses community should become more active in ensuring that member agency commercial recycling and organics service agreements fully address the needs of the commercial sector.
6. With regard to market trends and identifying gaps in service, local government actions can support and increase recycling and reuse through:
 - Increasing capture rates for materials collected through existing programs.
 - Assistance in local permitting and land-use issues to support siting and purchasing property for salvage, reuse, recycling and resale businesses.
 - Commitment to purchase and use recycled-content products.
7. Any member agency that is interested in pursuing a wet/dry approach should examine the advantages and disadvantages relative to its current programs and other related factors.

Mandatory Programs and Disposal Bans

Following are summaries of the suggested approaches for developing and implementing mandatory programs and disposal bans.

MANDATORY PROGRAMS

The Joint Board action requested that staff provide guidance to the member agencies regarding options for designing and implementing mandatory recycling ordinances. Mandatory programs must be in place relatively soon in order to contribute to reaching the 75 percent diversion goal in 2010. The Agency can provide valuable assistance, but ultimately the responsibility for developing and implementing mandatory programs rests with the individual member agencies.

Two options for program design include:

1. **Generator-Based.** With this approach, the requirement to source separate material is placed on the generator. Enforcement actions are focused on generators, and the contractor may be penalized if it fails to enforce the ordinance. This approach appears to be the more common of the two.
2. **Contractor-Based.** For this approach, the ordinance places responsibility to ensure compliance with the ordinance primarily on the contractor.

The Agency can begin the process by developing a model ordinance, with options, for use by the member agencies. Individual member agencies can:

1. Begin identifying and removing service gaps for the residential and commercial sectors to help smooth later implementation of mandatory programs.
2. Enhance monitoring of program diversion performance by sector.
3. Identify data needs for the residential and commercial sectors.
4. Begin conducting public meetings and/or Council study sessions to provide education and to gather input.

As member agency ordinances are being drafted, member agencies will also need to:

1. Determine whether and how to address multi-family generators.
2. Review enforcement of C&D debris programs.
3. Begin discussions with service providers regarding enforcement responsibilities.
4. Review public education and outreach efforts, and begin to conduct education in advance of the new program.
5. Consider timing of program implementation by sector and/or materials, including any phase-in.

DISPOSAL BANS

Key considerations for the Agency include:

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1. Defining program design options for the initial targeted materials, cardboard and yard debris, including the target sectors for each.
2. Considering use of economic measures to influence self-hauler behavior, in addition to or in lieu of bans.
3. Determining any phasing of the ban(s).
4. Determining availability of alternative options for managing banned materials. In some cases, it may not be necessary (or possible) to have full availability of alternative options prior to developing the ban.
5. Synchronizing bans that require at least partial enforcement at the curb with actions taken by member agencies.
6. Reviewing recent United States Supreme Court decisions regarding flow control issues in terms of applicability to a ban.
7. Considering public ownership of facilities. Implementing and enforcing bans is much simpler with public facility ownership, and the Agency may wish to consider the issue.

ACKNOWLEDGEMENTS

The team included HF&H Consultants, LLC, Kies Strategies, Skumatz Economic Research Associates, and Environmental Planning Consultants.

We wish to thank the following for their assistance with the Assessment:

1. The staff of the 17 member agencies that participated in the survey process and provided detailed information on programs to facilitate our review and analysis. The surveys used to compile the material in Section 2 and the member agency program summaries were extensive in both length and content.
2. Agency staff that provided input on project design, information on countywide programs and review of drafts, and in particular the Agency's project manager.
3. Private sector service staff that provided data for several of the member agencies.
4. Staff of programs from around the country that provided comparative insight.

HF&H's project manager wishes to thank our team members and everyone at HF&H that worked so hard to make the Assessment a reality.

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SECTION 1: INTRODUCTION

1.1 OVERVIEW

The Waste Reduction and Recycling Initiative Charter Amendment

The Waste Reduction and Recycling Initiative Charter Amendment (Measure D) was adopted by the voters in November 1990. Measure D sets forth countywide goals for the reduction and diversion of non-hazardous solid wastes from landfill; creates a framework for comprehensive source reduction and recycling programs; imposes a surcharge (currently \$7.43 and increasing to \$7.67 per ton effective January 1, 2008) on wastes landfilled in the unincorporated county to fund these programs; and, establishes a Source Reduction and Recycling Board (Recycling Board) to oversee the distribution of funds and the conduct of countywide programs. Pursuant to Measure D, the Recycling Board is mandated to establish recycling programs necessary to meet the recycling policy goals set forth in Measure D that parallel and then exceed those mandated by State law.

The Program Assessment

The Program Assessment (Assessment) is a broad overview and evaluation of recycling, source reduction, market development, and public education waste reduction programs within Alameda County. The Assessment is one of two components of the periodic "audit" required by Subsection 64.040(C) of Measure D to determine compliance and degree of progress with the recycling policy goals of Measure D. The second component, a financial audit of Measure D expenditures is not part of this project. An initial "4 Year Measure D Audit" was completed in 1997, covering fiscal years through 1995/1996. A second program review was completed in 2002 for the five-year period through FY 2000/2001 (2002 Review). The Assessment is the third such review under Measure D.

About the Recycling Board

The 11-member Recycling Board is made up of five elected public officials from the Alameda County Waste Management Authority and six professional experts in specified areas of waste reduction, who are appointed by the Alameda County Board of Supervisors. Funding for the Recycling Board is derived from the Measure D per-ton disposal fee. Fifty percent of the landfill surcharge revenues are distributed to participating municipalities for the maintenance and expansion of municipal recycling programs, and 50 percent are budgeted and spent by the Recycling Board in the prescribed areas of grants to non-profit organizations, source reduction, market development, recycled product procurement, and administration.

About the Authority

The Alameda County Waste Management Authority (Authority) operates under an agreement for joint exercise of powers among the County of Alameda, each of the fourteen cities within the County, and two sanitary districts that also provide refuse and recycling collection services. The Authority, established in 1976, is governed by a 17-member board composed of elected officials appointed by each member agency. Primary funding for the Authority is derived from waste

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import mitigation fees and facility fees (AB 939 fees) at the Altamont, Tri-Cities, and Vasco Road landfills.

The Authority is responsible for the preparation of Alameda County's Integrated Waste Management Plan and Hazardous Waste Management Plan and provides support to member agencies in the implementation of those plans. The Authority manages a long-range program for development of solid waste facility capacity and offers a wide variety of other programs in the areas of waste reduction, market development, technical assistance, and public education.

About the Agency

The Alameda County Waste Management Authority and the Alameda County Recycling Board, now collectively known as StopWaste.Org, is an integrated agency whose mission is to provide the most environmentally sound waste management program for the people of Alameda County. StopWaste.Org offers a wide range of programs in the areas of waste reduction, public education, Bay Friendly Gardening and Landscaping, Green Building, Business Assistance, Schools Recycling and Education, Environmentally Preferable Purchasing, market development, low-interest loans to recycling businesses, and grants to non-profit organizations. Although the Assessment is managed by the Recycling Board and mandated by Measure D, many of the programs reviewed in this report are funded through the Authority. Thus, the term "Agency" is used throughout the Assessment to refer collectively to both entities.

1.2 THE 2007 ASSESSMENT

The 2002 Review focused on "forward-looking" opportunities for improved effectiveness and efficiency within and between municipal and regional waste reduction efforts, rather than focusing on documenting past performance. The Board also requested that the 2002 Review draw on comparisons of programs with model programs from other jurisdictions. The 2002 Review was used to provide input for revision of the Source Reduction and Recycling Plan, the Agency's primary mid- and long-term planning document.

The 2007 Assessment is similar to the 2002 Review, in that it continues this approach, with focus on improving and enhancing program effectiveness. The Assessment includes evaluation of several topics related to identifying the best means for achieving very high levels of diversion, and analysis of two specialized topics that are included in the appendices.

Two activities provide added context for the Assessment. First, the Authority and Recycling Board Ad Hoc Committee process regarding efforts to reach the 75 percent diversion goal by 2010, culminated in the March 2007 adoption by both Boards of key recommendations regarding new initiatives and relative emphasis for existing ones. The approved recommendations included:

- Jurisdictions should formally adopt the 75 percent goal by vote of city council.
- Current programs and recommendations should continue to be pursued, as not all recommended programs and policies have been adopted by all the member agencies.
- Agency programs should be augmented, with the priority on projects that divert the highest level of material. These four initial programs to augment are: funding additional

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MRFs; expanding the regional media campaign for residential food waste; enhancing the StopWaste Partnership to increase diversion; and, undertaking a regional media campaign in support of existing curbside recyclables.

- Jurisdictions should adopt mandatory recycling ordinances for its residents and businesses.
- The Agency should pursue a regional landfill ban on certain materials, including green waste and cardboard, in conjunction with the nine Bay Area counties through ABAG and San Joaquin County.

These recommendations are a key focus of the Assessment and in particular the second, fourth and fifth recommendations for enhancing current efforts, and developing mandatory programs and disposal bans.

Second, the pending 2008 Waste Characterization Study is the first County-wide waste characterization conducted by the Agency since the 2000 Waste Characterization, and will be of value for fine-tuning countywide and member agency programs.

1.3 REPORT ORGANIZATION

The Assessment is organized as follows:

- **Executive Summary:** Includes a condensed version of the conclusions and recommendations.
- **Section 2 Summary of Member Agency Programs:** Contains the results of an extensive member agency survey with summary tables and explanatory text profiling recycling, organics, and other diversion programs for each member agency. This section also includes information on residential programs for six comparable jurisdictions from across the country, and comparisons of performance with member agency residential programs.
- **Section 3 Countywide Programs:** Provides summary descriptions of Agency programs in four broad areas of Green Building, Business and Public Agencies, Organics and Schools. Section 3 also includes discussion of the emerging area of Climate Change and its relationship to waste management, in which the Agency is active.
- **Section 4 Mandatory Recycling Programs and Facility Bans:** This section addresses the experiences of other communities with mandatory programs and bans, and provides recommendations for member agencies and the Agency regarding steps to prepare for, develop, and implement mandatory programs and bans.
- **Section 5 Additional System Issues:** Section 5 addresses several other system issues that relate broadly to achieving high diversion levels and in varying degrees to the development of material bans, processing facility capacity and member agency decisions regarding materials processing. The issues include: 1) analysis of the relationship between facility tip fees, the cost of delivery, and relative tonnages of material delivered for self-haul materials originating from the member agencies and delivered to disposal facilities both inside and outside of the County; 2) advantages and disadvantages of

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regional or joint member agency franchising and the related issue of member agency ability to direct the flow of materials; and 3) experiences in siting and operating four food scrap processing facilities in southern California, Washington State, and Canada.

- **Section 6 Diversion Service Issues:** Section 6 addresses a broad range of topics with subsections entitled, "Residential and Commercial Rate Structures and Diversion Behavior", "Private Sector Diversion Activity", "Non-Exclusive Solid Waste Collection", "Wet/Dry Collection and Processing", "Every-Other-Week Collection of Solid Waste" and "Recovery of Last Resort".
- **Section 7 Other Countywide Issues:** Section 7 examines two areas: longer-term alternatives for Agency funding; and, alternative means for measurement of diversion programs.
- **Section 8 Program Analysis and Recommendations:** Section 8 provides analysis and recommendations for member agency programs drawing on material contained in Sections 2, 4, and 6, and focuses on enhancing current programs and preparing for mandatory programs. Section 8 also includes discussion of new emerging options for compensating service providers and for setting customer rates in the context of high diversion.

Appendices

The following is a list of appendices to the Assessment:

- **Appendix A Review of State Business Waste Audit Data:** This appendix contains analysis of the potential application of recent CIWMB business waste audit data to the work of the StopWaste Partnership. This review was prepared by Kies Strategies.
- **Appendix B Review of Options for Commercial Packaging Reduction:** In support of Agency waste prevention efforts, this material is a review of selected current work elsewhere regarding commercial packaging waste reduction efforts and describes possible direction regarding applicability and needs for Alameda County. This review was prepared by Kies Strategies.
- **Appendix C Mandatory Programs and Disposal Bans - Background Information:** Appendix C contains a detailed report prepared by Skumatz Economic Research Associates on mandatory programs and disposal bans, and is a basis for the material in Section 4.
- **Appendix D Private Sector Diversion Activity - List of Interview Contacts:** This appendix contains a list of the individuals contacted by Kies Strategies for the Section 6 discussion of private sector diversion activity.

Member Agency Program Summaries

The Member Agency Program Summaries contain by member agency, detailed versions of the information collected through the member agency survey, as used in Section 2. The Summaries are available separately from the Agency, and are each approximately ten pages in length. They will also be available on the Agency's website as noted below.

Electronic Documents

The Agency plans to make the following documents developed for the Assessment available electronically on the Agency's website at <http://www.stopwaste.org/docs>:

- The Member Agency Program Summaries noted above.
- Section 2.7 Comparative Residential Programs - Skumatz, Lisa A., and David Freeman, "Comparison Communities and Leading Programs", October 5, 2007.
- Section 7.1 Planning for Long-Term Funding - Lisa A. Skumatz, Ph.D., Principal, Skumatz Economic Research Associates, Inc., "Footing the Bill for Diversion Programs: Funding Options" - Final Report, October 25, 2007.
- Section 7.2 Alternative Diversion Measurement Options - Lisa A. Skumatz, Ph.D., Principal and David Juri Freeman, Skumatz Economic Research Associates, Inc., with Delyn Kies, Kies Strategies, "Measuring Success in Diversion...Best Practices: Alternative Measurement of Recycling, Diversion, And Waste Prevention" - Final Report, October 27, 2007.

1.4 ACKNOWLEDGEMENTS

We wish to thank the following people for their assistance with the Assessment:

6. The staff of the 17 member agencies that participated in the survey process and provided detailed information on programs to facilitate our review and analysis. The surveys used to compile the material in Section 2 and the member agency program summaries were extensive in both length and content; therefore, development of the comparative member agency material presented in the main report would not have been possible without their assistance.
7. Agency staff that provided input on project design, information on countywide programs and review of drafts, and in particular the Agency's project manager who spent many hours in consultation as the Assessment took shape.
8. Private sector service staff that provided data for several of the member agencies.
9. Staff of programs from around the country that provided comparative insight.

The team included HF&H Consultants, LLC, Kies Strategies, Skumatz Economic Research Associates, and Environmental Planning Consultants. Thanks to each of our team members that worked so hard to conduct the Review:

- Delyn Kies of Kies Strategies.
- Lisa Skumatz, PhD and Juri Freeman of Skumatz Economic Research Consultants.
- Richard Gertman and Tracie Bills of Environmental Planning Consultants.

Finally, the project manager wishes to thank everyone at HF&H that worked so hard to make the Assessment a reality.

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SECTION 2: SUMMARY OF MEMBER AGENCY PROGRAMS¹

2.1 OVERVIEW

This section contains a set of summary tables regarding member agency programs and program data. The primary source of information for Section 2 was a detailed survey completed between April and August 2007 by member agency and, in some cases, service provider staff. Member agency staff provided most of the information regarding programs through an extensive surveying process, and provided review of the draft program summaries.² Additional information for each member agency was obtained from the Agency's 2006 disposal tonnage reports. The material in this section is presented factually, and then used in Section 2.7 to make comparisons with residential and commercial programs, and in Section 8 to identify best practices.

Note the following regarding treatment of the unincorporated areas of Alameda County:

- Tonnage data shown for the Oro Loma Sanitary District includes tonnages from those portions of Hayward and San Leandro served by District programs. Note that the L2 portion of the District, which is also part of Hayward, is generally served by District programs, except for residential curbside recycling, which is provided under contract by Hayward.
- The unincorporated area of the County that is not geographically part of either the Castro Valley Sanitary District or the Oro Loma Sanitary District is excluded from this analysis due to the relatively small number of residential and commercial accounts in the area.

All data is for calendar 2006 except as otherwise noted. To the extent possible, the tables include significant pending or planned changes in programs through October 2007.

The terms "municipally controlled" and "municipally sponsored" disposal and diversion are used in Section 2 and elsewhere in the Assessment. The terms refer to disposal and diversion programs that are directly controlled by member agencies through franchises or other contracts with private service providers, or that are directly administered by the municipality as is the case for Berkeley. This concept provides a useful means for examining and comparing the effectiveness of programs. However, the concept is limited in that member agencies with open market commercial recycling and/or organics diversion programs, or that do not collect

¹ Portions of this section are revised to reflect changes, as of December 2007, in reported 2006 tonnage data.

² Environmental Planning Consultants assisted with the survey process. Detailed summaries of the program material collected in the Assessment surveys are separately available from the Agency for each of the sixteen member agencies (excluding the unincorporated County areas not included within the two sanitary districts).

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commercial diversion program data, will appear to have less effective programs than may be the case.

Section 2 is organized as follows:

- “2.2 Demographic and Institutional Information,” provides summary demographic and waste and diversion services information for the member agencies in Tables 2-1 through 2-3.
- “2.3 Overview of Diversion Programs,” provides summary information in Tables 2-4 through 2-7 regarding residential and commercial recycling programs.
- “2.4 Disposal and Diversion from Municipally Controlled Waste Streams,” provides summary information regarding the role of disposal and diversion for municipally controlled member agency programs in Tables 2-8, 2-9, and 2-10.
- “2.5 Detailed Diversion Information,” contains Tables 2-11 through 2-13 with detailed data regarding per-capita disposal and diversion rates, non-municipally controlled diversion, and reported and calculated diversion rates.
- “2.6 Customer Service Rate Structures” provides the residential and commercial customer service rates with information regarding the variability or steepness of the rates in Tables 2-14 through 2-17.

In addition, “2.7 Comparative Residential Programs” provides comparison of member agency program performance with that of six other jurisdictions from around the country, including two in California.

2.2 DEMOGRAPHIC AND INSTITUTIONAL INFORMATION

Table 2-1 summarizes demographic information for each member agency, including population, number of single-family houses, multi-family dwellings, and mobile homes, number of businesses, and geographic size. Note that for several member agencies, including Berkeley and Emeryville there is a far higher daytime population.

Table 2-2 lists the contracted or franchise service providers operating within each member agency, and the facilities used for recycling, transfer, and disposal.

Table 2-3 lists the service provider, the materials collected by each service provider, the initial year of execution, and the current expiration date for collection, processing, and disposal agreements for each member agency. As discussed in Section 8, “Program Analysis and Recommendations” of the Assessment, reaching or surpassing the 75-percent diversion goal will require that member agencies maximize the effectiveness of existing programs, and add mandatory diversion programs as adopted by the two Boards in March 2007.

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Table 2-1 2006 Demographic Summary³

Jurisdiction	Population	# SFD	# MFD	Mobile Homes	Area (sq mi)	Number of Businesses	Taxable Sales (000's)
Alameda	74,405	17,122	14,790	300	10.7	1,924	536,486
Albany	16,680	3,981	3,338	6	1.5	510	176,362
Berkeley	105,385	21,909	25,680	59	15	4,270	1,276,011
Dublin	41,907	9,155	5,139	28	8.6	857	1,288,421
Emeryville	8,537	599	4,657	37	1.2	684	692,951
Fremont	210,158	49,470	21,286	756	94	5,479	2,647,214
Hayward*	138,148	27,462	18,100	2,299	62.55	4,201	2,477,710
Livermore	81,443	23,754	5,231	431	19.6	1,842	1,688,249
Newark	43,486	10,445	2,912	59	13	1,165	1,050,621
Oakland	411,755	79,036	82,150	456	56.1	19,720	4,212,737
Piedmont	10,999	3,784	69	8	1.8	233	16,691
Pleasanton	67,876	19,495	5,519	456	16.2	2,750	1,903,874
San Leandro*	48,644	21,462	9,497	904	13.1	1,855	1,978,944
Union City	71,152	15,158	3,942	919	19	1,075	714,523
Castro Valley Sanitary District	55,000	11,301	3,779	n/a	9.3	440	n/a
Oro Loma Sanitary District	139,847	28,820	15,026	1,277	13	1,216	n/a
Total	1,525,422	342,953	221,115	7,995	354.45	48,221	20,660,794

*Hayward and San Leandro populations are not inclusive of customers in each city that are served by the Oro Loma Sanitary District.

³ Population, single-family, multi-family, and mobile home data obtained from the Department of Finance. *City/County Population and Housing Estimates*. 1/1/2006, www.dof.ca.gov/HTML/DEMOGRAPH/ReportsPapers/Estimates/E5/E5-06/documents/E-5A.xls. Square miles, number of businesses, and taxable sales are taken directly from the individual member agency surveys.

Table 2-2 2006 Collection, Processing, and Disposal Arrangements

Jurisdiction	Service Providers	Transfer Station	Recycling Facility	Composting Facility	Landfill
Alameda	ACI	Davis Street, Aladdin Ave	Aladdin Ave	Newby Island	Altamont
Albany	WMAC	Davis Street	Davis Street	Grover	Altamont
Berkeley	City of Berkeley; Ecology Center	Berkeley Transfer Station	Community Conservation Center	Grover	Vasco Road
Dublin	AVI	Pleasanton Transfer Station ⁴	Aladdin Ave	Newby Island	Altamont
Emeryville	WMAC	Davis Street	Davis Street	Grover, Z-Best	Altamont
Fremont	Allied	Fremont Recycling and Transfer Station ⁵	Fremont Recycling and Transfer Station	Newby Island	Tri-Cities
Hayward	WMAC	Davis Street	Tri-CED Recycling Center	Grover	Altamont
Livermore	WMAC	-	Davis Street	Grover	Vasco Road
Newark	WMAC	Fremont Recycling and Transfer Station ⁶	Davis Street	Grover	Tri-Cities
Oakland	WMAC	Davis Street	Davis Street Transfer Station and CWS Facilities	Grover	Altamont
Piedmont	Republic	Golden Bear	West County Integrated Resource Recovery Facility	West Contra Costa Sanitary Landfill	Potrero Hills
Pleasanton	PGS	Pleasanton Transfer Station	Pleasanton Transfer Station	Newby Island	Vasco Road
San Leandro	ACI	Aladdin Ave	Aladdin Ave	Newby Island	Vasco Road
Union City	Allied	Fremont Recycling and Transfer Station ⁷	Tri-CED Recycling Center	Newby Island	Tri-Cities
Castro Valley Sanitary District	WMAC	Davis Street	Davis Street	Grover	Altamont
Oro Loma Sanitary District	WMAC	Davis Street	Davis Street	-	Altamont

⁴ Only recyclable and organic materials are transferred.

⁵ The city is using this facility as of July 1, 2007.

⁶ Ibid

⁷ Ibid

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Table 2-3 Service Provider Contract Information

Jurisdiction	Service Provider	Services	Commencement Date	Expiration Date
Alameda	ACI	Solid Waste, Recycling, Organics	10/1/2002	9/30/2012
Albany	WMAC	Solid Waste, Recycling, Organics	5/1/2004	4/30/2011
Berkeley	City of Berkeley	Solid Waste, Organics	n/a	n/a
	Ecology Center	Recycling		6/30/2008
Dublin	AVI	Solid Waste, Recycling, Organics	7/1/2005	6/30/2012
Emeryville	WMAC	Solid Waste, Recycling, Organics	1/1/2005	12/2/2010
Fremont	Allied	Solid Waste, Recycling, Organics	1/1/2003	6/30/2013
Hayward	WMAC	Solid Waste, Organics	6/1/2007	5/31/2014
	Tri-CED	Recycling	6/1/2007	5/31/2014
Livermore	WMAC	Solid Waste, Recycling, Organics	8/1/2002	6/30/2009
Newark	WMAC	Solid Waste, Recycling, Organics	6/1/2005	5/31/2012
Oakland	WMAC	Solid Waste, Recycling, Organics	1/1/2005	12/31/2012
	CWS	Recycling		
Piedmont	Republic	Solid Waste, Recycling, Organics	7/6/2001	7/5/2008
Pleasanton	PGS	Solid Waste, Recycling, Organics	8/1/1989	7/30/2019
San Leandro	ACI	Solid Waste, Recycling, Organics	2/1/2000	1/31/2010
Union City	Allied	Solid Waste	7/1/2005	6/30/2015
	Tri-CED	Recycling, Organics	5/23/2005	5/31/2015
Castro Valley Sanitary District	WMAC	Solid Waste, Recycling, Organics	5/1/2001	4/30/2009
Oro Loma Sanitary District	WMAC	Solid Waste, Recycling, Organics	9/1/1997	8/31/2012

2.3 OVERVIEW OF DIVERSION PROGRAMS

Tables 2-4 through 2-7 contain information used in Section 8 of the Assessment.

Table 2-4 provides an overview of the residential recycling programs provided by each member agency, including frequency of collection, type of container, method of collection, the recyclables processing facility, types of materials accepted, and collection system.

Table 2-5 describes each member agency's current organics diversion programs including: frequency of collection, collection method, type of container, the organics processing facility, the processing facility, and types of materials accepted.

Table 2-6 describes each member agency's approach to construction and demolition (C&D debris) diversion including whether the member agency has a C&D debris ordinance in place, a financial threshold for construction and demolition projects, the deposit amount, diversion requirements, and the method of regulation.

Table 2-7 summarizes the commercial recycling arrangements for each member agency including: number of businesses in each jurisdiction; tons of commercial solid waste, recyclable material, and organic material collected through municipal programs; and, the diversion rate achieved through municipally-sponsored commercial recycling programs. Note that depending on the member agency, multi-family tonnage may be reported as part of commercial tonnage.

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Table 2-4 Summary of Residential Recycling Programs

Jurisdiction	Service Providers	Frequency	Container Sizes	Additional Materials* ⁸	Collection
Alameda	ACI	Weekly	32-, 64-, and 96-gallon	Plastics 3-7, scrap metal, aseptic containers, aerosol cans, foil, pie tins, wide-mouthed plastics	Single-stream
Albany	WMAC	Weekly	32-, 64-, and 96-gallon	Plastics 3-7, aseptic containers, foil, pie tins	Single-stream
Berkeley	Ecology Center	Weekly	18- gallon	Foil and pie tins	Dual-stream
Dublin	AVI	Weekly	32-, 64-, and 96-gallon	Plastics 3-7, scrap metal, aseptic containers, batteries	Single-stream
Emeryville	WMAC	Weekly	35-gallon	Plastics 3-7, aerosol cans, foil, pie tins	Single-stream
Fremont	Allied	Weekly	32-, 64-, and 96-gallon	Plastics 3-7, aseptic containers, plastic shopping bags, foil, pie tins, styrofoam and foam packing (#6 only)	Single-stream
Hayward	Tri-CED	Weekly	32- and 64-gallon	Plastics 3-7, scrap metal, aseptic containers, styrofoam	Single-stream
Livermore	WMAC	Weekly	64- and 96-gallon	Plastics 3-7, aseptic containers, aerosol cans	Single-stream
Newark	WMAC	Weekly	64- and 96-gallon	Plastics 3-7, aseptic containers, batteries (household, rechargeable, and button)	Single-stream
Oakland	WMAC	Weekly	20-, 32-, 64-, and 96-gallon	Plastics 3-7, aseptic containers, latex paint cans, aerosol cans, foil, pie tins	Single-stream
Piedmont	Republic	Weekly	14- gallon	Plastics 3-7, aseptic containers, aerosol cans	Single-stream
Pleasanton	PGS	Weekly	35- and 90-gallon	Paper, plastic, glass, aluminum, and metal.	Commingled with solid waste/blue bag
San Leandro	ACI	Bi-weekly	20-, 32-, 64-, and 96-gallon	Plastics 3-7, scrap metal, aseptic containers, foil, pie tins	Single-stream
Union City	Tri-CED	Weekly	35- and 64-gallon	Plastics 3-7, scrap metal, aseptic containers, styrofoam, reusable clothing	Single-stream
Castro Valley Sanitary District	WMAC	Weekly	64- and 96-gallon	Plastics 3-7, aerosol cans, wide-mouthed plastics, latex paint cans	Single-stream
Oro Loma Sanitary District ⁹	WMAC	Bi-weekly	32-, 64-, and 96-gallon	Plastics 3-7, aseptic containers, aerosol cans	Single-stream

⁸ All jurisdictions accept: metal containers, plastics 1&2, glass, mixed paper, cardboard, and newspaper.

⁹ The District provides residential recycling in areas L1 and L3; Hayward provides residential recycling in the area L2.

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Table 2-5 Summary of Current Residential Organics Diversion Programs

Jurisdiction	Service Provider	Frequency	Container Sizes	Destination	Materials Accepted ¹⁰
Alameda	ACI	Weekly	32-, 64-, and 96-gallon	Newby Island	Plant debris, food scraps, food-soiled paper, meat, bone, and dairy.
Albany	WMAC	Weekly	32-, 64-, and 96-gallon	Grover	Plant debris, food scraps, food-soiled paper, meat, and bone.
Berkeley	City of Berkeley	Bi-weekly	32-, 64-, and 96-gallon & 45 gallon paper bags	Grover	Plant debris and unpainted wood scraps. Food scraps and food-soiled paper added as of July 1, 2007.
Dublin	AVI	Weekly	32-, 64-, and 96-gallon	Newby Island	Plant debris food scraps, food-soiled paper, meat, bone, and dairy.
Emeryville	WMAC	Weekly	32-, 64-, and 96-gallon	Grover, Z-Best	Plant debris, food scraps, food-soiled paper, meat, bone, and pet waste.
Fremont	Allied	weekly	64- and 96-gallon	Newby Island	Plant debris, food scraps, food-soiled paper, meat, bone, and dairy.
Hayward	WMAC	Weekly	64- and 96-gallon	Bio-Mass	Plant debris. City has option to require food scraps, food-soiled paper, meat, bone, and dairy by July 2009.
Livermore	WMAC	Weekly	95-gallon	Grover	Plant debris, food scraps, food-soiled paper, meat, and bone.
Newark	WMAC	Weekly.	64-gallon	Grover	Plant debris, food scraps, food-soiled paper, meat, and bone.
Oakland	WMAC	Weekly	64-gallon	Grover	Plant debris, food scraps, food-soiled paper, meat, and bone.
Piedmont	Republic	Weekly or Bi-weekly	32-gallon	West Contra Costa Sanitary Landfill	Plant debris. Food scrap program pending approval in 2008.
Pleasanton	PGS	Weekly	96-gallon	Newby Island	Plant debris, food scraps, food-soiled paper, meat, bone, and dairy.
San Leandro	ACI	Weekly	32-, 64-, and 96-gallon	Newby Island	Plant debris, food scraps, food-soiled paper, meat, bone, and dairy.
Union City	Tri-CED	Weekly	20-, 35-, 64-, and 96-gallon	Newby Island	Plant debris, food scraps, food-soiled paper, meat, bone, and dairy.
Castro Valley Sanitary District	WMAC	Weekly	32-, 64-, and 96-gallon	Grover	Plant debris, food scraps, food-soiled paper, meat, bone, and dairy.
Oro Loma Sanitary District	WMAC	Weekly	32-, 64-, and 96-gallon	Altamont	Plant debris

¹⁰ Berkeley added food scraps and began weekly collection of organics in September 2007. Piedmont and Hayward plan to add food scraps in 2008 and 2009, respectively.

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Table 2-6 Summary of C&D Debris Diversion Programs

Jurisdiction	C&D Debris Recycling Ordinance	Construction Project Threshold	Demolition Project Threshold	Deposit Amount	Diversion Requirement
Alameda	Yes	\$100,000	\$100,000	Bond posted prior to permit issuance	50% of all C&D debris
Albany	Yes	\$75,000	\$25,000	Lesser of 3% of Project Cost or \$10,000	50% of all C&D
Berkeley	Yes	\$100,000	\$50,000	None	100% of concrete & asphalt; 50% of remaining C&D debris
Dublin	Yes	\$100,000	\$100,000	(Square Footage) x (60/2000) x (\$35) + \$2,738	100% of concrete & asphalt; 50% of remaining C&D debris
Emeryville	Pending	N/A	N/A	N/A	N/A
Fremont	No	N/A	N/A	N/A	N/A
Hayward	Yes	\$75,000	\$75,000	None	100% of concrete & asphalt; 50% of remaining C&D debris
Livermore	Yes	\$300,000	\$40,000	Construction over \$1M = 1% of value, not to exceed \$100k. Demolition over threshold = \$10k + 1% of value, not to exceed \$100k.	50% of all C&D debris
Newark	Yes	\$100,000	\$20,000	None	100% of concrete & asphalt; 50% of remaining C&D debris
Oakland	Yes	New construction; additions and alterations over \$50k	Any non-residential or apartment house demolition	None	50% of all C&D debris
Piedmont	Yes	\$50,000	\$50,000		50% of all C&D debris
Pleasanton	No	N/A	N/A	N/A	N/A
San Leandro	Yes	\$100,000	\$100,000	None	100% of asphalt and concrete; 50% of remaining C&D debris
Union City	Yes	\$100,000	\$100,000	Lesser of 3% of Project Cost or \$10,000	50% of all C&D debris
Castro Valley Sanitary District	Yes	\$75,000	\$75,000	None	50% of all C&D debris
Oro Loma Sanitary District	Yes	\$100,000	\$100,000	None	100% of concrete & asphalt; 50% of remaining C&D debris

Table 2-7 Summary of 2006 Municipally-Controlled Commercial Disposal and Reported Diversion

Jurisdiction	Population	Number of Businesses	Commercial Refuse (Tons)	Commercial Recycling (Tons) ¹¹	Reported Municipally-Controlled ¹² Commercial Diversion Rate
Alameda	74,405	1,924	22,483	1,377	6%
Albany	16,680	510	4,000	3,003	43%
Berkeley	105,385	4,270	24,350	8,197	25%
Dublin	41,907	857	13,902	2,081	13%
Emeryville	8,537	684	6,129	2,344	28%
Fremont	210,158	5,479	36,643	10,791	23%
Hayward	138,148	4,201	78,011	781	1%
Livermore	81,443	1,842	9,809	3,712	27%
Newark	43,486	1,165	12,961	702	5%
Oakland	411,755	19,720	156,828	-	0%
Piedmont	10,999	233	909	772	46%
Pleasanton	67,876	2,750	14,452	3,199	18%
San Leandro	48,644	1,855	40,548	5,616	12%
Union City	71,152	1,075	29,617	2,151	7%
Castro Valley Sanitary District	55,000	440	10,538	1,560	13%
Oro Loma Sanitary District	139,847	1,216	34,741	5,886	14%

2.4 DISPOSAL AND DIVERSION FROM MUNICIPALLY-CONTROLLED WASTE STREAMS

The in-county disposal data and member agency diversion data in Tables 2-8, 2-9, and 2-10 provide the basis for calculating per capita disposal and diversion rates and calculating the approximate proportion of disposal and diversion that results from municipal programs.

Table 2-8 summarizes total tons disposed within Alameda County by member agency. Most disposal occurs within the County. Commercial waste is defined as that generated by businesses using franchised front-loader (bin), debris box, and compactor collection service. Many large businesses receive regular solid waste service through roll-off service (debris box or compactors). This disposal data is used in a number of the subsequent tables in Section 2.

¹¹ Consists primarily of paper grades, cans, bottles, and organic materials.

¹² Includes contracted recycling and organics program tonnages. Excludes C&D debris, self-haul, and other special programs. A low percentage indicates that diversion programs are conducted through an open market or non-exclusive franchise and/or that diversion data is not reported to the member agency, and is not indicative of actual performance.

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Note that several member agencies with major solid waste facilities in or nearby the jurisdiction (including Berkeley, Fremont, Livermore, Oakland, and Pleasanton) have higher ratios for disposal of self-haul and roll-off tonnage. This may result from misreporting by generators and misattribution of tonnages to these host communities.

Table 2-9 lists residential and commercial diversion program tonnage information as tracked by each member agency. In general, these are the tonnages diverted from the municipally controlled waste streams through service provider agreements or municipal programs. Nearly all member agencies track residential recycling and organics tonnages. One exception to this is if a member agency has open competition or non-exclusive franchise for collection of a specific material, in which case tonnages may or may not be reported to the member agency.

Table 2-10 provides a breakout of municipally-controlled disposal by sector, diversion by sector, and material or program type.

Table 2-8 2006 Total In-County Disposal Tonnage

Jurisdiction	Total Residential Contracted Disposal (Tons)	Total Commercial Contracted Disposal (Tons) ¹³	Total Municipally Controlled Disposal (Tons)	Self-Haul and Other (Tons)	Total Disposal (Tons)	% of Disposal not Collected Under Contract
Alameda	11,831	22,483	34,314	39,939	74,252	54%
Albany	2,638	4,000	6,638	2,551	9,189	28%
Berkeley ¹⁴	17,888	24,350	42,238	70,512	112,750	63%
Dublin	8,791	13,902	22,694	15,791	38,485	41%
Emeryville	3,665	6,129	9,794	29,813	39,607	75%
Fremont	55,838	36,643	92,481	99,368	191,849	52%
Hayward	29,658	78,011	107,669	56,696	164,365	34%
Livermore	18,168	9,809	27,977	87,124	115,101	76%
Newark	7,895	12,961	20,855	22,401	43,256	52%
Oakland	79,097	156,828	235,925	154,545	390,470	40%
Piedmont	3,207	909	4,116	586	4,702	12%
Pleasanton	21,157	14,452	35,609	78,464	114,073	69%
San Leandro	11,565	40,548	52,113	70,723	122,836	65%
Union City	15,338	29,617	44,955	16,244	61,199	27%
Castro Valley Sanitary District	13,998	10,538	24,536	3,215	27,751	12%
Oro Loma Sanitary District	27,524	34,741	62,265	5,597	67,862	8%

¹³ Includes debris boxes.

¹⁴ City has municipal rather than contract services.

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Table 2-9 2006 Municipally Controlled or Contracted Residential & Commercial Diversion Tonnage

Jurisdiction	Residential Recycling (Tons)	Commercial Recycling (Tons)	Residential Organics (Tons)	Commercial Organics (Tons)	C&D Debris (Tons) ¹⁵	Bulky Item Pickup, City Facility Recycling (Tons)	Municipally Controlled Total Diversion (Tons)
Alameda	12,424	815	6,953	561	3,121	574	24,449
Albany	3,041	2,557	1,739	446	130	16	7,929
Berkeley	8,330	3,574	8,689	4,623	0	6,706	31,922
Dublin	4,469	1,454	3,987	626	14,810	595	25,942
Emeryville	1,180	1,494	336	850	0	50	3,910
Fremont	21,279	10,484	26,087	307	0	0	58,158
Hayward	9,162	0	11,195	781	12,000	1,777	34,915
Livermore	12,732	3,300	15,978	412	14,786	85	47,293
Newark	5,010	702	5,495	0	0	608	11,814
Oakland	39,809	0	31,770	0	121,194	4,387	197,160
Piedmont	2,667	0	1,372	772	136	0	4,947
Pleasanton	5,936	3,199	11,130	0	0	0	20,265
San Leandro	5,852	4,105	7,448	1,511	0	0	18,916
Union City	7,903	1,399	7,261	752	0	0	17,315
Castro Valley Sanitary District	6,978	1,560	7,409	0	1,767	0	17,715
Oro Loma Sanitary District	9,906	5,886	11,416	0	0	210	27,418

¹⁵ Represents tonnages reported to, and by the member agencies.

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Table 2-10 Municipally-Controlled Disposal and Diversion as a Percentage of Total Municipally-Controlled Tons

Jurisdiction	Residential Contracted Disposal (%)	Commercial Contracted Disposal (%)	Municipally Controlled Disposal (%)	Residential Recycling (%)	Residential Organics (%)	Commercial Recycling (%)	Commercial Organics (%)	C&D (%)	Bulky Item Pickup, City Facility Recycling (%)	Municipally Controlled Total Diversion (%)
Alameda	20%	38%	58%	21%	12%	1%	1%	5%	1%	42%
Albany	18%	27%	46%	21%	12%	18%	3%	1%	0%	54%
Berkeley*	24%	33%	57%	11%	12%	5%	6%	0%	9%	43%
Dublin	18%	29%	47%	9%	8%	3%	1%	30%	1%	53%
Emeryville	27%	45%	71%	9%	2%	11%	6%	0%	0%	29%
Fremont	33%	22%	54%	12%	15%	6%	0%	0%	0%	34%
Hayward**	21%	55%	76%	6%	8%	0%	1%	8%	1%	24%
Livermore	24%	13%	37%	17%	21%	4%	1%	20%	0%	63%
Newark	24%	40%	64%	15%	17%	2%	0%	0%	2%	36%
Oakland	22%	44%	66%	11%	9%	0%	0%	34%	1%	55%
Piedmont	35%	10%	45%	29%	15%	0%	9%	2%	0%	55%
Pleasanton	38%	26%	64%	11%	20%	6%	0%	0%	0%	36%
San Leandro**	16%	57%	73%	8%	10%	6%	2%	0%	0%	27%
Union City	25%	48%	72%	13%	12%	2%	1%	0%	0%	28%
Castro Valley Sanitary District	33%	25%	58%	17%	18%	4%	0%	4%	0%	42%
Oro Loma Sanitary District	31%	39%	69%	11%	13%	7%	0%	0%	0%	31%

* Public/Not Contracted

**Hayward and San Leandro tons are not inclusive of tonnage collected in Oro Loma Sanitary District

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2.5 DETAILED DIVERSION INFORMATION

Tables 2-11 through 2-13 contain more detailed information regarding diversion for each member agency.

Table 2-11 provides the residential and total disposal and residential diversion rates for each member agency, expressed in pounds per day per person.

Residential disposal rates range from 0.9 to 2.4 pounds per person per day. The wide variation in total disposal per capita is largely a reflection of variation between member agencies in daily in-flux of employees that work in, but do not live in a given member agency. Residential recycling and organic rates range from 0.4 to 1.3 pounds per person per day. Low disposal rates and high diversion rates could indicate the robustness of the residential diversion program. However, this analysis does not take into account diversion through source reduction or non-municipally sponsored residential diversion activities such as the use of buy-back or drop-off facilities. Variations in how "single-family" is defined can also be a factor; for instance, Berkeley has a large multi-family dwelling population receiving single-family service. For other communities, multi-family tonnage is reported as part of commercial tonnage.

Table 2-12 lists the 2005 diversion rate as reported to the California Integrated Waste Management Board (CIWMB).

Table 2-13 uses the diversion rates reported by each member agency to calculate total tons diverted in 2006. These diversion percentages are presented only as a means of understanding in broad terms the relative role of municipally-sponsored diversion, given the imprecise nature of the State formula for estimating generation and diversion.

Recycling pounds per person per day will be artificially low for member agencies experiencing a relatively high level of scavenging from curbside set-outs. This diversion will instead be credited to buyback programs.

The calculation of total tons diverted is based on the equation:

$$\text{Generation} = \text{Disposal} + \text{Diversion}$$

The Castro Valley and Oro Loma Sanitary Districts do not estimate their diversion rates separate from Unincorporated Alameda County; therefore, the Assessment uses the unincorporated area default diversion rate for both of those agencies. The calculation gives an approximation of the tons represented by the diversion rate. The CIWMB diversion rates are calculated using adjustment factors (such as employment, population, taxable sales, and CPI), and thus these tons represent an approximation of actual tons diverted. Table 2-13 also includes a calculation of the percent of total diversion that is not municipally controlled. Except for the jurisdictions that are primarily residential, the municipally controlled tons typically represent less than 20 percent of total diversion.

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Table 2-11 Disposal and Diversion Rates by Member Agency¹⁶

Jurisdiction	Population	Residential Solid Waste (Lbs/ Person/ Day)	Total Disposal (Lbs/ Person/ Day) ¹⁷	Residential Recyclables (Lbs/ Person/ Day)	Residential Organics (Lbs/ Person/ Day)
Alameda	74,405	0.9	5.5	0.9	0.5
Albany	16,680	0.9	3.0	1.0	0.6
Berkeley	105,385	0.9	5.9	0.4	0.5
Dublin	41,907	1.1	5.0	0.6	0.5
Emeryville	8,537	2.4	25.4	0.8	0.2
Fremont	210,158	1.5	5.0	0.6	0.7
Hayward	138,148	1.2	6.5	0.3	0.4
Livermore	81,443	1.2	7.7	0.9	1.1
Newark	43,486	1.0	5.5	0.6	0.7
Oakland	411,755	1.0	5.2	0.5	0.4
Piedmont	10,999	1.6	2.3	1.3	0.7
Pleasanton	67,876	1.7	9.2	0.5	0.9
San Leandro	48,644	1.3	11.6	0.7	0.8
Union City	71,152	1.2	4.7	0.6	0.6
Castro Valley Sanitary District	55,000	1.4	2.8	0.7	0.7
Oro Loma Sanitary District	139,847	1.1	2.7	0.4	0.4

¹⁶ Calculations use total population and will be artificially low in direct relation to the amount of the population that is served through multi-family programs.

¹⁷ Residential and commercial tonnages.

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Table 2-12 Historical AB 939 Diversion Rates

Jurisdiction	2000	2001	2002	2003	2004	2005
Alameda	65%	62%	64%	64%	68%	68%
Albany	62%	67%	66%	63%	70%	70%
Berkeley	49%	52%	47%	52%	57%	59%
Dublin	54%	55%	51%	50%	50%	55%
Emeryville	48%	55%	54%	61%	66%	64%
Fremont	62%	63%	63%	62%	66%	63%
Hayward	52%	50%	49%	51%	60%	62%
Livermore	50%	59%	55%	63%	65%	63%
Newark	53%	52%	50%	56%	61%	62%
Oakland	52%	52%	50%	53%	55%	58%
Piedmont	63%	68%	63%	64%	65%	64%
Pleasanton	48%	47%	48%	48%	52%	53%
San Leandro	51%	64%	55%	62%	60%	59%
Union City	61%	52%	61%	57%	58%	62%
Unincorporated Alameda County ¹⁸	65%	60%	63%	57%	60%	60%

¹⁸ Alameda County unincorporated area includes the Castro Valley Sanitary District and the Oro Loma Sanitary District.

Table 2-13 Calculated 2005 Diversion Tonnages¹⁹

Jurisdiction	CIWMB Diversion Rate (2005)	Total Disposal Tons	Estimated Reporting Year Generation Tons	Total Calculated Diversion Tons	Municipally Controlled Diversion Tons	Percent of Diversion Not Municipally Controlled
Alameda	68%	49,962	155,346	105,384	23,875	77%
Albany	70%	9,575	31,450	21,875	7,929	64%
Berkeley	59%	105,784	258,564	152,780	25,216	83%
Dublin	55%	41,779	92,582	50,803	25,942	49%
Emeryville	64%	17,571	48,936	31,365	3,867	88%
Fremont	63%	192,600	523,184	330,584	58,158	82%
Hayward	62%	144,139	383,730	239,591	21,328	91%
Livermore	63%	116,043	244,667	128,624	47,293	63%
Newark	62%	45,760	119,274	73,514	11,814	84%
Oakland	58%	409,291	908,433	499,142	197,160	61%
Piedmont	64%	6,204	17,080	10,876	4,811	56%
Pleasanton	53%	121,034	259,132	138,098	20,265	85%
San Leandro	59%	110,127	270,215	160,088	18,916	88%
Union City	62%	63,287	168,149	104,862	17,315	83%
Unincorporated Alameda County*	60%	102,206	257,427	155,221	43,365	72%
Countywide Total	59%	1,535,362	3,738,169	2,202,807	406,059	82%

2.6 CUSTOMER SERVICE RATE STRUCTURES

Rate structures can be used as a tool to influence disposal and diversion behavior. Tables 2-14 through 2-17 provide information on residential and commercial rates. The impact of rates on customer behavior is discussed in Section 6.2 of the Assessment.

Table 2-14 summarizes the residential rates listed for each member agency on the Agency's Web site. All jurisdictions offer variable can rates, with 12 jurisdictions offering mini-cans (20 gallons per week) and three jurisdictions offering micro-cans (10-13 gallons per week).

Table 2-15 presents the incline of the residential rate relative to the 32-gallon service rate. This table illustrates that the rates are not directly related to the volume of service. Variable rate structures are designed to encourage generators to reduce waste and divert more. As an approximate measure of steepness of rates to influence diversion:

- Ten member agencies have steeply inclined residential rates, with 96-gallon rates that are more than 2.5 times the 32-gallon rate.

¹⁹ CIWMB diversion and total disposal data is for 2005.

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- Four member agencies have moderately steep residential rates, with 96-gallon rates that are two to 2.5 times the 32-gallon rate.
- Only two member agencies have relatively flat residential rates, with 96-gallon rates that are less than two times the 32-gallon rate.

Finally, note that the relative 20-gallon rate varies widely, from 60 percent to 98 percent of the 32-gallon rate.

Table 2-16 summarizes the commercial rates for each member agency as listed on the Agency's Web site.

Table 2-17 describes the relative incline rate of the commercial bin rates based on the cost of one cubic yard serviced one time per week. As with residential rates, some jurisdictions have fairly steeply inclined rates. However, most member agencies have relatively flat or discounted rates. These member agencies may wish to consider reconfiguring the flat or discounted rates to encourage recycling and source reduction.

Table 2-14 Residential Rates by Solid Waste Container Size

Jurisdiction	10-13 Gallon	20 Gallon	30-35 Gallon	60-64 Gallon	90-96 Gallon	Rates current as of
Alameda	N/A	\$16.52	\$26.01	\$43.41	\$60.64	7/1/2007
Albany	\$10.49	\$20.97	\$23.47	\$40.58	\$57.69	5/1/2007
Berkeley						
District 1	\$9.00	\$13.85	\$22.11	\$44.24	\$66.36	7/1/2006
District 2	\$9.19	\$14.12	\$22.58	\$45.14	\$67.69	7/1/2006
District 3	\$9.75	\$14.96	\$24.00	\$48.02	\$72.00	7/1/2006
Dublin	N/A	N/A	\$12.84	\$23.58	\$34.33	7/1/2006
Emeryville	\$4.38	\$6.63	\$10.98	\$21.96	\$32.95	1/1/2007
Fremont	N/A	\$21.87	\$22.36	\$24.49	\$36.05	5/1/2006
Hayward	N/A	\$15.93	\$23.28	\$41.53	\$59.74	6/1/2007
Livermore	N/A	\$8.91	\$14.86	\$32.68	\$54.22	7/1/2007
Newark	N/A	\$17.79	\$19.77	\$35.02	\$50.25	7/1/2007
Oakland	N/A	\$19.26	\$25.84	\$56.33	\$86.79	7/1/2007
Piedmont*	N/A	\$21.33	\$28.70	\$51.85	\$75.00	9/1/2006
Pleasanton	N/A	N/A	\$22.50	N/A	\$25.04	8/7/2007
San Leandro	N/A	\$15.71	\$19.58	\$32.58	\$45.58	7/1/2007
Union City	N/A	\$25.93	\$30.53	\$61.07	\$91.60	7/1/2007
Castro Valley Sanitary District	N/A	\$12.19	\$18.89	\$32.81	\$46.74	3/1/2007
Oro Loma Sanitary District	N/A	N/A	\$10.92	\$21.84	\$32.76	9/1/2006

* Rates include recycling and bi-weekly subscription to green waste service.

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Table 2-15 Relative Incline of Residential Rates

Jurisdiction	10-13 Gallon	20 Gallon	30-35 Gallon	60-64 Gallon	90-96 Gallon
Alameda	N/A	0.64	1.00	1.67	2.33
Albany	0.45	0.89	1.00	1.73	2.46
Berkeley	-	-	-	-	-
District 1	0.41	0.63	1.00	2.00	3.00
District 2	0.41	0.63	1.00	2.00	3.00
District 3	0.41	0.62	1.00	2.00	3.00
Dublin	N/A	N/A	1.00	1.84	2.67
Emeryville	0.40	0.60	1.00	2.00	3.00
Fremont	N/A	0.98	1.00	1.10	1.61
Hayward	N/A	0.68	1.00	1.78	2.57
Livermore	N/A	0.60	1.00	2.20	3.65
Newark	N/A	0.90	1.00	1.77	2.54
Oakland	N/A	0.75	1.00	2.18	3.36
Piedmont	N/A	0.74	1.00	1.80	2.61
Pleasanton	N/A	N/A	1.00	N/A	1.11
San Leandro	N/A	0.80	1.00	1.66	2.33
Union City	N/A	0.85	1.00	2.00	3.00
Castro Valley Sanitary District	N/A	0.65	1.00	1.74	2.47
Oro Loma Sanitary District	N/A	N/A	1.00	2.00	3.00

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Table 2-16 Commercial Rates by Container Size

Jurisdiction	1 Cubic Yard 1 x Week	1 Cubic Yard 3 x Week	3 Cubic Yards 1 x Week	3 Cubic Yards 3 x Week	14-15 Cubic Yard Box Per Pull	30-40 Cubic Yard Box Per Pull
Alameda	\$ 98.48	\$301.36	\$295.45	\$904.08	\$ 593.69	\$1,187.39
Albany	\$163.03	\$489.10	\$489.09	\$1,467.29	\$ 394.84	\$ 753.56
Berkeley	\$ 92.44	\$291.19	\$277.31	\$873.55	\$ 386.61	\$ 597.46
Dublin	\$ 54.96	\$192.24	\$164.88	\$522.00	\$ 231.14	\$ 495.30
Emeryville	\$ 64.74	\$194.22	\$194.23	\$582.68	\$ 368.77	\$ 694.51
Fremont	\$ 63.90	\$183.85	\$143.66	\$423.09	\$ 267.94	\$ 390.64
Hayward	\$ 72.95	\$203.59	\$193.26	\$539.33	\$ 219.05	\$ 564.93
Livermore	\$ 69.83	\$217.87	\$209.49	\$653.61	N/A	\$ 508.50
Newark	\$ 77.52	\$214.13	\$205.10	\$559.37	\$ 221.54	\$ 474.75
Oakland	\$121.28	\$385.98	\$317.97	\$1,002.27	\$ 505.45	\$ 758.21
Piedmont	\$114.75	\$316.18	\$344.24	\$948.53	\$ 386.12	\$ 762.60
Pleasanton	\$ 76.51	\$229.53	\$229.53	\$688.60	\$ 265.05	\$ 530.10
San Leandro	\$ 85.83	\$259.49	\$259.49	\$778.48	\$ 211.18	\$ 309.72
Union City	\$106.25	\$293.44	\$278.42	\$758.76	\$ 373.98	\$ 711.86
Castro Valley Sanitary District	\$ 79.61	\$222.87	\$212.01	\$593.84	\$ 205.62	\$ 440.61
Oro Loma Sanitary District	\$ 71.99	\$187.10	\$191.74	\$537.08	\$ 218.68	\$ 624.80

Table 2-17 Relative Incline of Commercial Rates

Jurisdiction	1 Cubic Yard 1 x Week	1 Cubic Yard 3 x Week	3 Cubic Yards 1 x Week	3 Cubic Yards 3 x Week
Alameda	1.00	3.06	3.00	9.18
Albany	1.00	3.00	3.00	9.00
Berkeley	1.00	2.10	3.00	9.45
Dublin	1.00	3.50	3.00	9.50
Emeryville	1.00	3.00	3.00	9.00
Fremont	1.00	2.88	2.25	6.62
Hayward	1.00	2.79	2.65	7.39
Livermore	1.00	3.12	3.00	9.36
Newark	1.00	2.76	2.65	7.22
Oakland	1.00	3.18	2.62	8.26
Piedmont	1.00	2.76	3.00	8.27
Pleasanton	1.00	3.00	3.00	9.00
San Leandro	1.00	3.02	3.02	9.07
Union City	1.00	2.76	2.62	7.14
Castro Valley Sanitary District	1.00	2.80	2.66	7.46
Oro Loma Sanitary District	1.00	2.60	2.66	7.46

2.7 COMPARATIVE RESIDENTIAL PROGRAMS²⁰

Overview

This portion of Section 2 addresses comparison of member agency residential disposal data, and recycling and organic materials program performance data as contained in Table 2-11 (and repeated below as Table 2-20), with similar data for six model residential programs from across the country. Comparisons are based on per-capita volumes for each of the three streams. The following material addresses:

1. Grouping of the member agencies based on demographic and economic data for purposes of selecting comparison jurisdictions.
2. Selection of the comparison jurisdictions.
3. Profiles of the comparable jurisdictions.
4. Results of the comparisons.

The information for the comparative jurisdictions is useful in two ways. First, it is useful in terms of the quantitative comparisons presented in this section as an inexact means of

²⁰ Information for five of the six comparison cities was developed for the Assessment by Skumatz Economic Research Associates, Inc (SERA). For added detail see, Skumatz, Lisa A., and David Freeman, Comparison Communities and Leading Programs, October 5, 2007. This report will be available electronically on the Agency's website.

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evaluating program performance. Second, and perhaps more importantly, they are useful in providing examples of mandatory programs and bans (see Section 4) and of best practices for member agency programs (see Section 8).

Grouping Member Agencies

The first step is to develop a means for combining the sixteen member agencies into a small number of groups with several like characteristics reflecting other factors that may influence program performance.²¹ Note that there is no "correct" way to do such an analysis, and the selected criteria and their relative weights (low, medium and high) are just one method. The selected criteria include:

1. Relative population (low, medium or high).
2. The relative ratio of single-family housing to multi-family housing (low, high).
3. The ratio of taxable sales (in dollars) to population (low, medium or high) as a measure of relative size of the commercial sector.
4. Relatively large generation of yard debris in Dublin, Livermore, Piedmont and Pleasanton due to climate and/or large lots.

Although income may seem a good relative measure, it is not used for this analysis. Income provides a variable measure because:

- Income is generally a measure of consumption, and one can tend to expect higher total generation of materials in affluent communities. But since much of the "extra" generation may be plastics the additional weight may not be much greater.
- Less affluent communities with relatively high concentrations of multi-family housing also often tend to have relatively higher total generation.

SERA staff state that "median housing value" would also be a useful means for comparison that avoids the pitfalls of using income.

With regard to commercial activity, number of businesses is an obvious but flawed measure given the huge range in size of businesses, and was not used for this analysis.

The goal is to combine these characteristics in a manner that allows for grouping the sixteen member agencies in four to six groups. Thus, a hypothetical member agency might have: 1) high population, high single-family concentration, and a medium ratio of commercial sales to population; or 2) medium population, medium single-family concentration, and a high ratio of commercial sales to population, etc. However, due to the wide range of characteristics among the member agencies, the result was six groupings of two member agencies each, and four individual member agencies that did not fit into a group. The results are shown in Table 2-18, with demographic data based on Table 2-1.

²¹ As discussed on page 1 of Section 2, excludes the portion of unincorporated Alameda County not contained in either sanitary district.

Table 2-18 Comparative Demographic, Economic and Program Data for Member Agencies

Member Agency	Population			SF to MF Ratio		Commercial Sector			Yard Waste Generation	
	Low	Medium	High	Low	High	Small	Medium	Large	Typical	High
Alameda		X			X	X			X	
Albany	X				X	X			X	
Berkeley			X	X			X		X	
Dublin	X				X			X		X
Emeryville	X			X				X	X	
Fremont			X		X		X		X	
Hayward			X		X			X	X	
Livermore		X			X		X			X
Newark	X				X			X	X	
Oakland			X	X			X		X	
Piedmont	X				X	X				X
Pleasanton		X			X			X		X
San Leandro		X			X		X		X	
Union City		X			X		X		X	
Castro Valley Sanitary District		X			X	X			X	
Oro Loma Sanitary District			X		X		X		X	

With regard to Table 2-18:

1. Population ranges are defined as follows: Low is less than 50,000; Medium is 50,000 - 100,000; and, High is over 100,000.
2. The single-family to multi-family unit ratio is as follows: Low is less than 1.0; and, High is 1.0 and above. In general, there is a significant gap in the single-family to multi-family ratio between Berkeley, Emeryville and Oakland, and the other member agencies.
3. The relative commercial sector size is defined as follows based on the ratio of taxable sales to population: Low is a ratio of less than 12; Medium is a ratio of 12 to 22; and, High is a ratio of over 22. The ranges for each ratio were selected to result in three similar-sized groups. The ratios are a relative measure within communities, and are by no means an absolute measure of commercial activity between communities.

Selecting Comparable Jurisdictions

The consultant team, in consultation with Agency staff, used the member agency information described above to select an initial pool of eleven comparable jurisdictions from SERA's database, and from which five of the final six jurisdictions were selected. The initial pool, as well as the selected group of six jurisdictions, represents a broad range of population,

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geographic diversity, comparability of programs, and relative leadership roles in seeking high diversion. The selected jurisdictions include:

1. Boulder, Colorado
2. Chapel Hill, North Carolina
3. Chula Vista, California
4. Madison, Wisconsin
5. Palo Alto, California
6. Portland, Oregon

Detailed interviews were conducted with the six comparison cities by SERA and HF&H staff. Brief profiles of the six comparison cities are provided below, with a focus on the three residential collection programs. More detailed information on each can be found in the Skumatz Economic Research Associates (SERA) report referenced at the beginning of this subsection. The SERA report provides information on the full range of programs offered by the cities, including other residential programs, non-residential programs, the use of facilities, and use of rate structures with relation to incentives for diversion.

With regard to the following profiles, note:

- Data is generally for 2005 or 2006.
- Inclusion of two California cities; Palo Alto recognized nationally as a leader in solid waste management and Chula Vista in San Diego County. The summary for Palo Alto is more detailed due to its proximity to Alameda County.
- Listed data for each jurisdiction includes population, and single-family and multi-family units. Other data is provided as readily available for the given community, including diversion rates by stream or sector. Tons of disposed and diverted material are not listed, but are used for calculating per-capita material in Table 2-20, and are available in the SERA report.
- Diversion figures are provided on a city-wide basis, unless otherwise indicated. Diversion rates for Chula Vista and Palo Alto are based on the State's diversion calculation method and are relatively comparable to State diversion figures for the member agencies. We have not documented the basis for calculation of diversion rates for the four cities located outside of California, and one should not assume direct comparability with member agency diversion data.

Information regarding the comparable cities also appears in Section 4 and Section 8 of the Assessment. Five of the six jurisdictions have, or are considering use of mandatory programs and/or bans and several are profiled as part of the Section 4 discussion of mandatory program and bans. Several of the cities have model programs in areas such as C&D debris and commercial recycling, and are noted in Section 8 as sources for best practices for member agency programs.

Profiles of Comparable Jurisdictions

BOULDER, COLORADO

Population: 83,432
Single Family Units: 18,812
Multi Family Units: 22,706
Total Diversion: 42 percent
Total Residential Diversion: 52.3 percent

Residential solid waste collection is provided by multiple franchised haulers with one primary hauler serving a majority of customers, and with unregulated rates. Recycling collection is provided by multiple collectors in a regulated context. Boulder is currently in the process of switching to single stream recycling from a dual stream system. The city does not have curbside yard debris collection at this time, but residents can use a free drop-off site, and the city also provides free seasonal clean-ups twice a year. The city plans to implement a yard debris collection program by 2008, and hopes to include food scraps. The recent appearance of bears inside the city limits may affect the design of the food scraps program.

CHAPEL HILL, NORTH CAROLINA

Population: 51,519
Single Family Units: 7,976
Multi Family Units: 11,108
Total Diversion: 37 percent

The Town of Chapel Hill provides municipal solid waste collection for the city and surrounding rural unincorporated areas. The Orange County Solid Waste Management Department is responsible for collecting curbside recycling, operating the landfill, waste reduction programs, and composting. Recycling collection is dual stream for single-family and duplexes. The multi-family program is voluntary, but the Department estimates that over 95 percent of multi-family units receive recycling service. The city provides weekly curbside collection of yard debris on a different day than the collection of recyclables and garbage. Yard waste service does not include the collection of food scraps.

Orange County has been a national leader in C&D debris programs, and in the use of mandatory programs and bans, as discussed in Section 4.

CHULA VISTA, CALIFORNIA

Population: 212,954
Single Family Units: 38,879
Multi Family Units: 36,843
Total Diversion: 47 percent

Residential solid waste is collected by one franchised hauler. Recycling collection for single-family and multi-family units is single stream. The city switched to single stream in 2003 and observed an 89 percent increase in recyclables generation, an 11percent decrease in solid waste generation, and a 2 percent increase in yard debris generation. Single family set-outs increased

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by a factor of two and multi family set-outs increased by a factor of about 2.5. Multi-family property owners must provide recycling carts for residents. Contamination levels for the single stream system range from 6 to 9 percent. Yard debris is collected weekly, and excludes food scraps.

Chula Vista's multi-family and commercial recycling programs are further discussed in Section 8 with relation to best practices for the member agencies.

MADISON, WISCONSIN

Population: 203,704

Single Family Units: 42,234

Multi Family Units: 58,564

Total Diversion: 57 percent

The city collects residential solid waste through the property tax, and there is no limit on the amount that residents may dispose of. Madison uses automated collection of wheeled single stream carts for mandatory collection of recyclables (see Section 4 also). City staff reports that it is hard to determine the level of additional diversion resulting from the switch to single-stream due to a concurrent addition of mixed paper to the recycling stream; however, city staff estimates single stream may have led to an increase of about 30 percent in recycling tonnage. The city provides a year round drop-off area for yard debris. The city is considering adding household organics including food scraps to the current seasonal leaf collection and making organics collection year-round.

PALO ALTO, CALIFORNIA

Population: 61,400

Single Family Units: 16,587

Multi Family Units: 11,180

Total Diversion: 62 percent (2004)

Residential collection services are provided by a Waste Management affiliate. Palo Alto utilizes a variable rate structure which is charged to customers based on their subscription level for garbage service. The cost of recycling and yard waste service is included in the rates charged to customers for solid waste service. Municipal solid waste is delivered to the SMaRT Station in Sunnyvale for transfer to the Kirby Canyon Landfill. The SMaRT Station is owned by Sunnyvale and also serves Palo Alto and Mountain View. Single stream recycling is available to both single- and multi-family customers. Collected materials include cardboard, newspaper, mixed paper, glass, aluminum, steel, and bi-metal cans, and plastics #1 through #7. Single-stream recyclable materials are delivered to PASCO's affiliate facility, Waste Management's Davis Street Transfer Station in San Leandro, for processing. Multi-family recycling service featured a universal roll-out of containers. Yard debris is collected weekly, but does not currently include food scraps. Yard debris is delivered to the city's landfill for composting.

The city recently adopted a Zero Waste Policy and a Zero Waste Operational Plan, with the goal of diverting 73 percent of solid waste by 2011 and to strive for zero waste by eliminating Palo Alto's material sent to the landfill by the end of 2021. The Plan specifies program options to reach the 73% diversion goal and zero waste, including the programs, policies, incentives and

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facilities necessary for achieving the City's goals. Palo Alto is currently procuring a new service agreement with added services that may include some or all of the following: provision of commercial recycling to all businesses (most now have it), mandatory recycling for all sectors, collection of residential and commercial food scraps, diversion of all C&D debris, and expansion of the list of collected recyclable materials.

PORTLAND, OREGON

Population: 513,627

Single Family Units: 151,484

Multi Family Units: 93,786

Total Diversion: 55 percent

Portland has non-exclusive franchises with 29 private hauling companies to collect residential solid waste in specific geographic areas. The haulers must provide collection of recyclables in two yellow bins, bi-weekly yard waste collection, and glass collection in a separate rigid container. The city gathers service and cost data from each service provider and determines a universal rate for service.

Table 2-19 summarizes key demographic data using the same measures as for the member agencies in Table 2-18. Note the following:

1. There are not many high performing cities with populations of less than 50,000, and hence the comparative cities are all above 50,000 in population. Chapel Hill and Palo Alto, however, are not significantly over 50,000 in population.
2. Every state has a different tax system, and the term "taxable sales" is not a comparable measure from state to state. Thus Table 2-19 includes the ratio of taxable sales to population as a relative measure of commercial activity for Chula Vista and Palo Alto, but excludes it for the four other jurisdictions.

Table 2-19 Comparative Demographic Data for Comparable Cities

Jurisdiction	Population			SF to MF Ratio ²²		Commercial Sector	
	Low	Medium	High	Low	High	Small	Large
Boulder, CO		X		X			
Chapel Hill, NC		X		X			
Chula Vista, CA			X		X	X	
Madison, WI			X	X			
Palo Alto, CA		X			X		X
Portland, OR			X		X		

²² A low ratio means a relatively high proportion of multi-family to single-family housing.

Comparisons with Member Agencies

DEMOGRAPHIC COMPARISONS

The diversity of member agencies and the comparable cities do not lend themselves to easy comparisons. However, in comparing the information in Tables 2-18 and 2-19:

- Dublin, Newark, and Pleasanton have relatively small populations but can probably be compared to Chapel Hill and Palo Alto which are in the lower end of the medium range for population.
- Berkeley and Oakland are similar to Madison in that the three have large populations and a relatively low ratio of single-family to multi-family housing units.
- Fremont and the Oro Loma Sanitary District are similar to Chula Vista.
- Emeryville is similar to Chapel Hill with regard to population and housing, but probably has a significantly larger commercial sector.

PERFORMANCE COMPARISONS

Table 2-20 is similar to Table 2-11 Disposal and Diversion Rates by Member Agency and provides data for the member agencies for disposal, recyclables, and organics collection, expressed in pounds-per-day per-capita, with similar data for the comparative jurisdictions.

We note the following regarding Table 2-20:

Disposal: The figure for Chapel Hill is quite high, and likely reflects inclusion of unincorporated areas immediately surrounding the city. Figures for the other comparable jurisdictions are relatively closely clustered, and twelve of the member agencies are in a similar range to that for the comparable jurisdictions.

Recyclable Materials: Five of the six comparable jurisdictions have essentially the same capture rate, and most of the member agencies have a similar or higher capture rate. Not surprisingly, several member agencies with low single family to multi-family ratios have relatively low per-capita figures for recyclable materials.

Organic Materials: None of the six comparable jurisdictions have a history of collecting food scraps as part of organics collection. Boulder is currently implementing food scraps as part of organics collection, but does not yet have program data. Palo Alto plans to add residential food scraps to its curbside organics program in mid-2009.

SERA notes that Halifax, a Canadian regional municipality with a population of about 370,000 has food scraps collection and reports a diversion rate for the program of about 0.7 pounds per-person per-day. Markham, a Canadian city with a population of about 280,000 that also has a food scraps program reports a diversion rate for the program of about 1.2 pounds per-person per-day. Based on its analysis of programs from across North America, SERA considers 0.5 to 0.8 pounds per-person per-day to be a reasonable range for high performing residential food scraps programs.

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Table 2-20 Disposal & Diversion Rates for Member Agencies & Comparable Cities

Jurisdiction	Population	Residential Solid Waste (Lbs/ Person/ Day)	Residential Recyclables (Lbs/ Person/ Day)	Residential Organics (Lbs/ Person/ Day)
Member Agencies				
Alameda	74,405	0.9	0.9	0.5
Albany	16,680	0.9	1.0	0.6
Berkeley	105,385	0.9	0.4	0.5
Dublin	41,907	1.1	0.6	0.5
Emeryville	8,537	2.4	0.8	0.2
Fremont	210,158	1.5	0.6	0.7
Hayward	138,148	1.2	0.3	0.4
Livermore	81,443	1.2	0.9	1.1
Newark	43,486	1.0	0.6	0.7
Oakland	411,755	1.0	0.5	0.4
Piedmont	10,999	1.6	1.3	0.7
Pleasanton	67,876	1.7	0.5	0.9
San Leandro	48,644	1.3	0.7	0.8
Union City	71,152	1.2	0.6	0.6
Castro Valley Sanitary District	55,000	1.4	0.7	0.7
Oro Loma Sanitary District	139,847	1.1	0.4	0.4
Comparative Jurisdictions				
Boulder, CO	83,432	0.8	0.6	0.0
Chapel Hill, NC	51,519	2.6	0.5	0.3
Chula Vista, CA	211,513	1.1	0.5	0.6
Madison, WI	203,704	1.3	0.5	0.6
Palo Alto, CA	61,400	1.0	0.9	1.2
Portland, OR	513,627	1.2	0.5	0.3

Most of the member agency programs that include food scraps compare well with this figure, even though food scrap participation rates are not high. This may be due to relatively high participation rates and capture rates for yard debris. Differences in capture rates for the member agencies could reflect variations in participation rates, although there is no obvious connection between the participation rates identified by Agency food scrap program field audits (discussed in Section 8) and the data in Table 2-20 (which includes food scraps and yard debris).

FINDINGS

1. Based on comparison with the six comparable jurisdictions, member agency residential programs appear to be performing relatively well.
2. Performance comparisons between communities are more art than science, and many factors influence disposal, recyclables material, and compostable material per-capita figures.

SECTION 3: COUNTYWIDE PROGRAMS

This section reviews countywide programs serving Alameda County residents, businesses and public institutions, addressing both the Agency's programs and other countywide programs directly administered by Alameda County. The purpose of this aspect of the Assessment is to review programs from a broad level to identify any major gaps or omissions. Thus, the section is summary in nature, focusing on program descriptions, broad program goals, recent key accomplishments, and key core objectives. Programs are discussed in more detail in the annual budgets and the Agency's Recycling Plan.

3.1 AGENCY PROGRAMS

Introduction

The majority of the countywide programs serving Alameda County are administered by the Agency. The development and implementation of the Agency's programs through this decade has been shaped by a primary consideration: increasing diversion from land disposal by targeting the specific materials that are still most prevalent in the disposal stream. This focus began with the 1995 Waste Characterization and reinforced with the 2000 Waste Characterization Study (2000 Study), each of which identified the top remaining materials in the disposal stream. Figure 3-1 lists the top material disposal streams by tonnage, as identified in the 2000 Study, and the roles of the member agencies, the Agency, or both in targeting them.²³

The Agency's guiding policy document is the Alameda County Source Reduction and Recycling Plan Vision 2010: 75% and Beyond (Recycling Plan), adopted in January of 2003 and reviewed and amended in January 2006. The Recycling Plan builds on data from the 2000 Study, as well as the results of several other major studies from the early portion of this decade to identify and define Agency and member agency programs and program objectives. The Agency's annual budget process is based on implementation of the Plan. This section focuses on programs conducted by Agency staff; discussion of member agency efforts that result from Agency programs and referenced in this section, such as construction and demolition debris ordinances can be found in Sections 2 and 8.

The Agency's four key program areas are identified below; each area contains two or more distinct programs. In addition, Climate Change is a new and emerging area that is addressed at the end of this section.

- Green Building
- Business and Public Agencies
- Organics
- Schools

²³ Figure 3-1 is contained in the Recycling Plan as Table 1: Top Materials Disposed in Alameda County, pg 18. The Agency will be conducting an updated, year-long waste characterization beginning in Spring 2008. The results will help fine-tune the focus for each Agency and member agency program.

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Figure 3-1 Top Disposal Steams and Program Targets (tons)

Rank	Material Categories	Single-Family	Multi-Family	Commercial	Roll-Off	Self-Haul	Total (in Tons)
1	Food waste	78,274	25,708	57,429	21,708	1,612	184,717
2	Wood – unpainted	2,970	2,443	22,624	70,232	38,465	136,741
3	Other paper	48,447	16,277	39,979	15,298	2,495	122,485
4	Plant debris ²⁴	16,939	8,558	14,806	11,388	57,692	109,393
5	Wood – painted	2,853	1,587	14,134	30,335	36,442	85,357
6	Uncoated corrugated cardboard	8,737	4,384	24,827	29,412	9,249	76,602
7	Composite bulky items	1,394	1,564	5,258	32,915	34,396	75,538
8	Mixed plastics	12,569	4,461	20,453	25,216	10,599	73,294
9	Film plastics	21,378	7,086	21,276	14,894	2,124	66,753
10	Other ferrous metals	3,484	2,177	12,589	29,711	18,274	66,238
11	Crushable inerts	2,289	752	7,847	20,160	25,449	56,503
12	Mixed paper	17,414	5,556	12,970	14,820	3,210	53,969
13	Newspaper	19,417	6,846	10,776	3,705	1,446	42,189




	Agency Target
	Member Agency Target
	Agency and Member Agency Target

Figure 3-2 shows the roles of the first three program areas listed above in targeting specific waste streams generated by specific sectors.

²⁴ Plant debris is a composite of three material categories: leaves and grass, branches and stumps, and pruning and trimmings.

Figure 3-2 Target Materials and Programs

Program	Material	Sectors
Green Building	Unpainted Wood Inerts Cardboard	Roll-Off Self Haul
Business	Mixed Paper Cardboard Food Waste Film Plastics	Commercial Roll-Off Self Haul
Organics	Food Waste Yard Waste Other Paper	Residential Commercial Roll-Off Self Haul

During the recent process of reviewing and amending the Recycling Plan ending in January 2006, Agency staff concluded that despite the success of the Agency's aggressive programs, the 75 percent countywide diversion goal would not be achieved by 2010. The Recycling Board and Authority Board convened an Ad Hoc Committee in March of 2006 to discuss additional means to divert an estimated 150,000 tons of new diversion to accomplish the 75 percent goal. A set of recommendations were approved by both the Recycling Board and the Authority Board as an amendment to the Recycling Plan at the joint meeting held on March 28, 2007, and these include:

- Augmenting Agency programs with priority on projects that divert the highest level of material. These four initial programs to augment include (with program area in brackets): funding additional MRFs (Green Building, Organics, and Business and Public Agencies) expanding the regional media campaign for residential food waste (Organics); enhancing the StopWaste Partnership to increase diversion (Business); and undertaking a regional media campaign in support of existing curbside recycling programs.
- Agency pursuit of a regional landfill ban on certain materials, including green waste and cardboard. Landfill bans are discussed in Section 4.

The FY 07-08 budget provides increased funding of media campaigns in support of residential food scrap programs and other curbside recycling, and added funding for subsidies to cities and businesses for commercial food scrap collection in order to increase participation in the commercial sector.

Program Areas

GREEN BUILDING

The Green Building Program area includes two complementary efforts that together target the 21% of total landfilled waste (as of 2000) contributed by construction and demolition (C&D) activities:

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1. Green building promotion to prevent and reduce waste generation, enhance use of recycled materials, and enhance sustainability, and
2. C&D debris recovery to address generated materials for which there are alternatives to disposal.

Green Building Program

The Green Building Program reaches building industry professionals, member agency staff and policy makers, and Alameda County residents. Green building efforts focus on the efficient use of resources, such as reducing the amount of materials used in construction; using more durable products and recycled content building materials; improving energy efficiency and water efficiency; and improving indoor air quality in buildings.

In the short term, Agency staff will continue to provide education on a comprehensive basis to all those involved in designing, constructing and buying buildings. The Agency will continue to work collaboratively with local, regional, and state organizations in promoting green building. In the medium term, the Agency will initiate a comprehensive marketing campaign to proactively influence the definition of green building and drive demand for green homes and materials.

As with C&D debris recycling promotion, The Agency is shifting from a voluntary approach toward encouraging member agencies to adopt mandatory green building policies and ordinances for civic buildings. The Agency is pursuing an integrated approach to sustainability and has modified the Civic Green Building Model Ordinance to include Bay Friendly Landscaping (see Organics Programs). Such a policy or ordinance requires Green Building and Bay Friendly Landscaping practices to be incorporated into city-owned and funded buildings, traditional public works projects, and public/private partnership projects. Staff recommends that these efforts be coordinated with Cities with environmentally preferable purchasing (EPP) practices, for those member agencies that have adopted EPP. The Assessment's survey of member agencies found that as of July 2007, 11 jurisdictions have adopted a civic green building ordinance.²⁵

Green building for private construction will continue to be encouraged through a voluntary, market-driven approach. The Agency has adopted a model resolution, encouraging all of the cities in Alameda County to adopt the Alameda County Residential Green Building Guidelines as a city reference document. LEED™ reference guides are recommended as the reference document for commercial buildings.

In the long term, once green building practices become more common the Agency will narrow its focus to waste prevention, recycling and buy recycled messages, and ongoing efforts to advocate changes in the state building code to support green building practices.

Construction and Demolition Debris

C&D efforts promote use of existing recovery facilities by contractors and builders, and development of new processing facilities for managing these waste streams. While on-site

²⁵ See Section 2 for an overview of the survey process.

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source separation of C&D debris is always promoted as the most preferable option, space and other constraints often result in generation of mixed debris at job sites. The short term strategy has been to provide subsidies for use of mixed C&D debris processing facilities, while at the same time continuing to encourage in-county facility development. Because of success in introducing C&D debris generators and collectors to processing options both in and out-of-county, the Agency is ending a \$10 per ton subsidy that has been in place for several years. The Agency is continuing to work with private transfer and disposal facility owners to add C&D debris processing capacity for underserved areas of the county. However, if the increased capacity at existing transfer stations and landfills is not adequate, the Agency will encourage development of a new C&D debris facility.

As the program has evolved, the Agency has focused on encouraging member agencies to mandate by ordinance C&D debris recycling for projects over a specified size. The Agency's model ordinance was recently updated to require 100% diversion of all Portland cement concrete and asphalt concrete and an average of at least 50% of all remaining C&D debris from construction, demolition, and renovation projects. The Assessment's survey of member agencies found that as of July 2007, 13 jurisdictions have adopted C&D ordinances and 3 are in the planning stages to do so.

Recent Key Accomplishments

- Assisting seven member agencies in the development and/or implementation of civic/commercial green building policies.
- Organizing training of member agency staff regarding green building residential projects and building code issues.
- Assisting with the promotion of the GreenPoint rated program for new homes and expanding it to remodeled homes.
- Providing rebates for diversion of 16,290 tons of mixed C&D debris in FY 06-07.

Key Objectives

- Sustainable building concepts are well known and commonly used in the residential, commercial and public sectors.
- Environmentally sound and financially viable materials management practices, including reuse and waste prevention are commonly used by all participants in the building and deconstruction processes, and increased consumer awareness of green building stimulates greater demand for green homes.
- Adequate infrastructure exists for sorting and recycling mixed construction and demolition debris materials in-county.
- Member agencies' franchise agreements allow for maximum diversion of construction and demolition materials.
- All member agencies will have adopted and successfully implemented a construction and demolition debris ordinance or policy by 2008.

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- All member agencies will have adopted the Alameda County Residential Green Building Guidelines and the LEED™ as a city Reference Document for residential construction projects by 2008.
- All member agencies will have adopted and successfully implemented a civic green building ordinance or policy by 2010.
- The percentage of C&D debris identified in the 2000 Waste Characterization Study is reduced from 21 percent in 2000 to 12 percent in 2010.
- 8,000 tons of new waste is diverted annually.

BUSINESS AND PUBLIC AGENCIES

The Business Assistance Program focuses on the non-residential sector, in which the majority of waste is still generated. This sector consists of businesses, public agencies and institutions and includes commercial, industrial and office environments. The Program recognizes that providing assistance to larger and smaller businesses requires fundamentally different approaches. Programs are designed to prevent waste, boost resource efficiency and materials recovery, and enhance markets for recyclable materials.

Key programs in this area include:

1. StopWaste Partnership which targets large and medium-sized businesses and public agencies.
2. Direct assistance to MRF facilities.
3. Assistance to smaller businesses and multifamily program efforts through aspects of the Franchise & Ordinance assistance project, and the Green Business Program.
4. Development of markets to benefit all generators of recyclables through the Revolving Loan Fund (RLF), and other financial and technical assistance to businesses.
5. Expanded emphasis on waste prevention in the commercial sector, with focus on packaging and paper use reduction.

The StopWaste Partnership

The StopWaste Partnership (SWP) targets large and medium-sized commercial, industrial and institutional waste generators for assistance, providing comprehensive environmental assessments and technical assistance to prevent and reduce waste. The SWP is a collaborative effort between the Agency, the East Bay Economic Development Alliance, East Bay Municipal Utility District, Pacific Gas & Electric and the member agencies. The Partnership works with businesses county-wide, but also focuses on specific industries (such as heavy manufacturing and food processing), specific disposal streams (such as clean wood), and specific projects such as waste prevention through reusable packaging. The Partnership also provides customized strategic planning assistance to interested member agencies to together enhance local commercial/industrial recycling and waste prevention. Member agency staffs work closely with the Partnership to help target and promote the Agency's services to businesses.

*Program Assessment "5-Year Audit"***Direct Assistance to MRF facilities**

While the SWP assists waste generators in segregating recyclables from refuse, the MRF Assistance Project works to expand processing capacity for businesses and for self-haulers. The result is targeting of recyclables-rich loads of commercial, self-haul and debris box garbage for mechanical sorting at upgraded transfer stations, such as the Davis Street Materials Recovery Facility.

Small Business and Multi-Family Recycling

Small business recycling is addressed through several different projects of the Agency and its member agencies. The Franchise and Ordinance Assistance project provides member agencies with model contract language to maximize diversion and ensure service providers provide a minimum level of free or low-cost recycling for all businesses. The Agency encourages franchise language to promote non-exclusive collection of commercial recyclables. Additionally, the Agency provides \$1 million of funding each year to member agencies for non-residential programs, and some member agencies use some of these funds to support small business recycling programs.

The Green Business Program is administered by the Association of Bay Area Governments with financial and technical support from the Agency. The Green Business Program offers resource efficiency services to smaller, consumer-oriented businesses such as printers, restaurants and auto body repair shops. The Agency's Recycling Information Services (RIS) provides businesses of all sizes with technical assistance and referrals to reuse and recycling vendors or drop-off sites via the Recycling Hotline, recycling guides, and a comprehensive online recycling information website and database²⁶. Small businesses receive expert advice and resources that help them with their recycling needs.

Just as the delivery of effective, efficient recycling services to small businesses is a nearly universal challenge, so too is the servicing of multi-family dwellings. The StopWaste.Org multi-family recycling effort assists member agencies with outreach to multi-family building owners, property managers and residents. It is very difficult to develop and sustain multi-family recycling programs due to a wide variety of factors and the Agency is in the process of conducting a study to help identify practices with the best opportunity for success.

Market Development

The Agency identifies opportunities in emerging markets and provides technical and limited grant assistance. Through the Revolving Loan Fund, the Agency provides low-cost financial assistance to companies to expand diversion and consumption of recycled materials or improve product quality. The StopWaste Partnership identifies material market needs of in-county businesses and works with the Agency's RIS staff to find markets for these materials. Plastic film has been a recent focus for market development activities.

The Agency also provides expanded resources for both businesses and public agencies in the area of recycled product and Environmentally Preferable Purchasing (EPP). The Agency's Recycled Product Central and GSA Liaison projects, in particular, offer in-depth purchasing assistance to member agencies and the County of Alameda General Services Agency to help

²⁶ See Media and Outreach Programs section.

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them lead by example in the EPP arena. The Assessment's survey of member agencies found that as of July 2007, six jurisdictions have adopted an Environmentally Preferable Purchasing policy and three are in the planning stages to do so. The StopWaste Partnership also offers EPP assistance to institutions and large businesses.

Waste Prevention

Waste prevention is an increasing focus area for the Agency's business outreach efforts. The Agency's Waste Production Measurement Study, completed in 2003, and its Waste Prevention Estimator Tool (developed in 2005) have identified commercial and industrial activities or functions that should be most amenable to a focus on waste prevention. The Agency has begun and will continue to offer incentives for behavioral changes in the area of waste prevention and recycling. Follow-up studies and surveys and direction from the Recycling Board have led to the integration of waste prevention services into the StopWaste Partnership and include the following:

- Identification and marketing of best practices to specific industries and business types, starting with the "Use Reusables" campaign that was launched in July 2007.
- Technical assistance including training and financial incentives for implementing waste prevention best practices.
- Documentation of the linkages between waste prevention and economic benefits including cost savings.

Recent Key Accomplishments

- Assisting in the certification of 49 new "green businesses" in FY 06-07 for a total of 272 certified Alameda County green businesses.
- Continuing to monitor and evaluate performance of the Davis Street MRF through its fifth year of full scale operation (with an annual diversion of over 55,000 tons).
- Exceeding the annual tonnage goal of 7,500 tons for the StopWaste Partnership.
- Providing 28 SWP clients with funding assistance for their waste prevention and recycling programs in FY 05/06 and FY 06/07.
- Completing Phase I development of the Sustainable Business Achievement Ratings (S-BAR) project.
- Completing a strategy and marketing plan for the "Use Reusables" campaign, and conducting the initial two workshops to educate SWP clients and other businesses about reusable transport packaging.
- Establishing a partnership with the Reusable Pallet and Container Coalition.
- Modifying Eco-Park funding guidelines to designate the entire county as eligible for Market Development funding.
- Funding three new loans through the Revolving Loan Fund (RLF) in FY 06-07.

*Program Assessment "5-Year Audit"***Key Objectives**

- Adoption of recycling and waste prevention best practices businesses and public agencies.
- Partner with local and regional business, trade and economic development organizations to promote waste prevention and recycling, reduce waste and enhance market development.
- 50% (1500) of employers with 50 employees or more have been offered or received recycling services.
- 25% (750) of employers with 50 employees or more have been offered or received waste prevention services.
- Member agency practices provide for recycling services to be available to all businesses.
- All transfer stations have appropriate and cost-effective infrastructure for maximizing diversion of commercial waste.
- Public agencies and businesses are offered recycled content and environmentally preferable purchasing resources.
- Markets for target materials such as plastic film and fiber are stimulated due to market development assistance.
- Annual diversion by the SWP of 5,000 new tons of waste with monitoring of diversion from ongoing waste reduction programs.
- The Environmental Domain tool of the first Sustainable Business Rating System will be developed and piloted in Alameda County with the use of a multi-stakeholder input process.

ORGANICS

Of the 40 categories of material that constitute the disposal stream, food is the single largest category representing 12 percent of the total disposed tonnage. Adding contaminated paper and plant debris brings the compostable portion of the waste stream to 27 percent of all landfilled materials. Agency staff considers composting to be the preferred method of handling organic materials, compared to conversion technologies or bioreactor landfills, because it is a cost-effective, proven and environmentally beneficial technology.

The Organics Program consists of two complimentary efforts;

6. A sustainable landscaping and gardening program that focuses on waste prevention and resource conservation and use of recycled content products in the landscape, as well as on-site management of organics through composting, mulching and grasscycling.
7. Centralized collection and processing of food scraps, plant debris and contaminated paper.

*Program Assessment "5-Year Audit"***Sustainable Landscaping & Gardening**

The Bay-Friendly Landscaping and Gardening program builds on the success of the Agency's long-standing home composting program, but has a broader approach and targets a broader audience of landscape professionals, home gardeners and member agencies

Bay-Friendly Gardening (BFG) targets home gardeners and continues to sell home compost bins at a discount as well as educate residents on reducing green waste at home through proper plant selection, healthy soils, home composting, grasscycling, mulching and more. Over 20 percent of single family households countywide now practice home composting and in some communities the participation is nearly 50 percent. The program's new popular programs include the annual Bay-Friendly Garden Tour and the Bay-Friendly Workshop Series, and the companion Bay-Friendly Gardening Guide on design and day-to-day maintenance. In addition the program has eight nurseries in Alameda County that label plants as Bay-Friendly and it Registers home gardens as "Bay-Friendly" if they meet a minimum standard.

The Bay-Friendly Landscaping (BFL) program targets landscape professionals. Of the 110,000 tons of plant debris still being disposed, approximately 60 percent is disposed of by landscape professionals. The program has two core tools. The first tool is the Bay-Friendly Landscape Guidelines which define seven principles to sustainable landscaping and over 55 practices, and was one of the first comprehensive publications to define sustainable landscaping. The second tool is a rating system that takes the practices defined in the Guidelines and assigns points to create a Bay-Friendly Landscape Scorecard. The BFL program hosts workshops for public and private landscape design professionals, promotes Bay-Friendly Landscaping at industry events, and has developed a unique multi-day training and qualification program for landscape maintenance professionals that qualifies them as a "Bay-Friendly Qualified Landscaper".

Bay-Friendly Landscaping for Member Agencies (BFLMA) offers free technical assistance to member agencies developing new civic landscapes. Member agency projects with a minimum score on the BFL Scorecard may qualify for grant funding. BFLMA has developed model landscape specification language to use in landscape design and construction bid documents, and in maintenance contracts, and works with member agencies to "green" their landscape ordinances and policies. The program has a model policy for civic landscapes and for private sector landscapes that references the Bay-Friendly Landscape Guidelines and Scorecard. The model policy promotes mandatory compliance for civic landscapes, and voluntary compliance for the private sector.

Organics Technical Assistance

The Organics Technical Assistance (OTA) Program provides funding and technical assistance for member agency residential food scrap collection programs, and provides direct technical assistance to businesses and institutions. As part of the Ad Hoc Committee recommendations acted on by the two Boards in late March of 2007, additional funding has been approved to expand the commercial food waste collection programs and to re-label residential green waste carts to promote and expand use of the food scrap recycling programs. A bio-degradable bag pilot program will also be tested to determine if it increases customer participation in residential programs. The OTA program launched and will expand a regional advertising campaign to support programs in all the member agencies that offer residential food waste

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collection. The Assessment's survey of member agencies found that residential food scraps programs are now available in 13 jurisdictions. OTA program staff estimate that over 310,000 single family households are now provided this service and the program will be assisting two additional member agencies launch food scrap programs over the next year or two. On-the-ground technical assistance is provided to cities to start and expand their commercial food waste collection programs. Assistance includes restaurant staff training, business recruitment and follow-up.

Organics Processing Development

The Agency is working to develop low-cost, long-term, high-quality compost processing capacity in Alameda County. The Authority is currently evaluating proposals and options to provide new organics processing capacity for Alameda County. In-county composting will help close the loop on organics diversion and provide value-added products back to the community, including residents and landscape professionals, as well as securing long-term ability to divert this material. Market development for compost products will be a future area of focus as more organics are diverted.

Recent Key Accomplishments

Sustainable Landscaping and Gardening

- Nearly 2,000 people have attended BFG workshop series, and 4,000 have attended the Bay-Friendly Garden Tour, over 150 home gardens are registered as Bay-Friendly over the last three years and over 65,000 discount compost bins have been sold.
- Since 2004, more than 280 landscape design and construction professionals and member agency staff have attended Bay-Friendly Landscape trainings.
- In the first year of the Bay-Friendly Landscaper Qualification and Training program, 55 landscape professionals were qualified.
- Bay-Friendly Landscaping policies have been integrated with Green Building into a unified approach for cities. Two Member Agencies have adopted mandatory civic Bay-Friendly Landscape policies and four have adopted Bay-Friendly policies for the private sector.
- Bay-Friendly Landscaping and Gardening hosted the first meeting of a regional coalition representing twenty-five public agencies from all the nine Bay Area counties.

Organics Technical Assistance and Processing Development

- Thirteen member agencies have begun food scrap recycling programs in the last 6 years.
- Agency staff assisted Berkeley with roll-out of the city's food scrap collection program.
- Countywide media campaign to promote food scrap recycling began in 2005.
- Assisted the cities of Dublin, Livermore and Fremont with the inception and expansion of their commercial food waste collection programs.
- Pursuing provision of processing capacity to serve both the eastern and western portions of the county.

*Program Assessment "5-Year Audit"***Key Objectives**

- Bay-Friendly Landscaping and Gardening principles and practices will be well known and commonly used in the residential, commercial and public sectors.
- Continued education and outreach to residents, as well as technical assistance to member agencies, will increase participation in the food scrap recycling programs.
- Ensure long term, low cost, high quality, high volume composting facility in Alameda County with adequate capacity for, and commitments from, member agencies.
- 180,000 tons of organics will be processed annually through the organics processing facility by the end of 2010.
- All member agencies have residential and commercial food scraps collection service in their jurisdictions with 50% participation rate in the residential sector and targeting a minimum of 50% of food scrap generating businesses.
- A significant percentage of Alameda County residents, professional landscapers and turf managers will use Bay-Friendly practices.
- Each member agency will adopt specific Bay-Friendly practices for its public landscapes.
- At least one new public or private landscape will be designed and constructed in each of the member agencies using Bay-Friendly principles and practices.
- Bay-Friendly Landscaping and Gardening will serve as a basis for partnerships with at least five other key agencies in Alameda County
- Continuing promotion of backyard composting and provide resources and/or access to low-cost bins.

SCHOOLS

The Agency's Schools Program provides a variety of services targeted toward Alameda County's public schools, with key program areas of infrastructure and education and outreach. The two areas together provide Alameda County students with waste reduction education (awareness, knowledge, attitude and skills) and the opportunity to practice what they are learning.

Public schools are the priority as they offer the opportunity to leverage Agency resources through coordination with unified school districts and member agencies. The Schools Program links waste reduction education with the opportunity to practice recycling behavior at school. Reducing the 4 percent of the total county disposal stream generated by public schools may not seem significant in meeting the Agency's 75 percent diversion goal, but providing recycling opportunities and academic education to K-12 schools begins a pattern of responsible waste reduction practices that will influence behavior in the decades to come.

The Schools Infrastructure project focuses on getting recycling collection and composting programs into schools. The Schools Education and Outreach and K-12 Curriculum projects provide access to 4Rs – Reduce, Reuse, Recycle, and Rot (composting) environmental education for youth in the county. These programs help increase knowledge of waste reduction issues and increase the skills of students to practice and apply 4Rs behavior at school and in everyday life.

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The Agency goal is to have the services that are delivered to teachers or students connected to academic state content standards, thus adding validity to the waste reduction message while assisting schools in meeting the core mission of academic achievement.

The Schools Program infrastructure project provides technical assistance and expertise in the area of waste reduction, recycling, composting, and procurement to school districts that commit to district-wide recycling. The first step of engagement with a district is a recycling bin-in-every-classroom program and developing a system to support it. A program is considered self-sustaining when it is integrated into the district organizational structure and continues from year to year. There are three phases to technical assistance: design and development, implementation, and self-sustaining.

The K-12 Curriculum (Educational Partnerships) project provided student assemblies, outdoor environmental education experiences, waste reduction and clean campus service learning projects, and worm bin presentations at the irecycle@school education center at the Davis Street Transfer station.

Ongoing program evaluation is also important. It is important to measure the 4Rs services both qualitatively and quantitatively. Quantitative measurement, such as the number of students or teachers served, provides feedback on cost effectiveness and equity. Qualitative measurement provides information on topics such as what do students know, believe, or practice.

Recent Key Accomplishments

- As of May 2007, 13 school districts have made the commitment to provide a recycling bin in every classroom, representing 80% of schools in Alameda County.
- The K-12 Curriculum (Educational Partnerships) project provided assemblies to elementary and middle school students, and outdoor environmental education experiences through Camp Arroyo.
- Ten high schools and 38 teachers participated in waste reduction and clean campus service learning projects.
- Trained 200 teachers, and hosted 6,770 students at the irecycle@school education center at the Davis Street Transfer station.

Key Objectives

- Partner with a minimum of two school districts per year
- Provide partner districts technical assistance to design and implement a "bin-in-every-classroom" recycling program
- Provide partner districts technical assistance to build organizational capacity to sustain their district-wide recycling program
- Publish best practices and case studies to share district's experience throughout Alameda County
- Provide low or no cost 4Rs academic services and resources to public schools in districts committed to district-wide recycling.

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- Provide grade specific programs and activities, teacher tested curriculum and resources
- Students will know the 4Rs hierarchy (reduce, reuse, recycle, rot) and related concepts, can track the amount of materials they dispose over a finite period and identify means for reducing, reusing, recycling, and composting them, and believe their actions can reduce waste going to local landfills.

Other Agency Efforts

Two other areas of effort for the Agency include media and outreach, that serves all of the program areas discussed above and the emerging area of climate change.

MEDIA AND OUTREACH

Recognizing that long term solutions to waste management challenges depend on changing public attitudes and behaviors, the Agency targets numerous media and outreach efforts to a wide audience of residents, businesses, member agencies, schools, and public agencies and public policy makers at every level of government. In coordination with the individual member agencies, media and outreach programs promote participation and help increase diversion rates for new and existing recycling programs. Agency staff seeks opportunities to leverage partnerships with local and regional agencies to reach a broader audience. As described above, programs in each program area work with the Media and Outreach staff to target specific audiences and to build program recognition.

The Agency uses a wide range of media to transmit its message, including print media, broadcast media of television and radio commercials produced by the Agency, and "live" telephone operators in the Recycling Information Services Program. The Recycling Information Services Program includes the countywide Recycling Hotline (1-877-STOPWASTE) and the Compost Information "Rotline" (510-444-SOIL).

The electronic media center on the Agency website at www.StopWaste.Org, offers a comprehensive overview of Agency programs, jurisdiction-specific recycling information, reports and studies, press releases and special events. The Agency recently revised its website to be a more versatile and robust tool for information dissemination to the general public, member agencies, and professionals in the field. The public outreach project will continue to work on regional campaigns, such as the Used Oil Recycling Campaign and the Bay Area Recycling Outreach Coalition (BayROC), and promotion of curbside and food scrap recycling programs.

CLIMATE CHANGE

Climate change is a new and emerging area of focus for the Agency. The Agency goal is for climate change issues to be a consideration in design and implementation of programs in each of the other program areas, with metrics for measurement of the effectiveness of each program in terms of climate change impact. Available data indicates that 42 percent of the remaining Alameda County disposal stream consists of five types of organic material (food, food contaminated paper, recyclable paper, cardboard and yard debris) that generate greenhouse gases when disposed.

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The Agency is currently active in two projects directly related to climate change. These two projects are motivated by Agency interest in playing a leadership role in the emerging climate change debate by:

1. Helping to shape the debate in Sacramento regarding implementation of California's AB 32, the country's signature climate change legislation, to ensure that recycling and composting are appropriately viewed as climate change mitigation measures.
2. Raising the profile of the Agency's waste reduction programs and their role in reducing greenhouse gas (GHG) emissions.
3. Ensuring that recycling and composting are included in member agency climate action plans.
4. Ensuring that landfill methane emissions are accurately accounted for in inventorying GHGs.

The first project is Agency facilitation of the Alameda County Climate Action Project with ICLEI – Local Governments for Sustainability to provide member agencies with the tools to develop climate action plans that address the relative benefits of waste reduction and recovery. This project involves developing baseline greenhouse gas (GHG) inventories for the 14 cities and the County, drafting a model action plan for member agency use, and quantifying the role of Agency programs in reducing emissions of GHG's.

The second project is work with Californians against Waste (CAW) to help shape the actions of the California Air Resources Board and the California Integrated Waste Management Board in implementing AB 32, and specifically in developing accurate, scientifically-based accounting for the relative role of various waste management strategies in contributing to, or alleviating, GHG emissions.

Accomplishments include the completion of baseline inventories for ten cities and the County, with four more cities to be completed in early 2008; the completion of a climate action plan template posted on the Agency website; and a quantification of the CO₂ emission reduction potential for many of the Agency's programs.

Findings

As for the 2002 Assessment, in reviewing the Agency's programs we do not find any significant program gaps. Relative to 2002, we note several program trends. As greater effort is focused on reaching higher levels of diversion:

- Programs are more comprehensive, and gaps within program areas are filled in.
- There is enhanced focus on shaping and changing behavior.
- There is a trend away from voluntary efforts and recognition that, in many program areas, mandatory approaches are (or will be) needed.
- There is increasing attention on sustainable practices, cross-media impacts, and participation in the emerging and rapidly-growing discussion regarding the role of waste management practices in climate change.

3.2 OTHER COUNTYWIDE PROGRAMS

The Alameda County General Services Agency (GSA) administers several countywide programs that are funded through Measure D monies. These include programs addressing C&D debris, environmentally preferable purchasing, green building, and climate change.

As noted above in discussion of the Agency's Business and Public Agency Program, the Agency also provides expanded resources for both businesses and public agencies in the area of recycled product and Environmentally Preferable Purchasing (EPP). The Agency's Recycled Product Central and GSA Liaison project offers in-depth purchasing assistance to the County of Alameda General Services Agency.

Green Building and Construction and Demolition Debris

The Alameda County Green Building Ordinance requires that all County projects initiated on or after July 1, 2003, except "traditional public works projects", must meet a minimum U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) silver rating for new construction, or a County approved equivalent. Traditional public works projects are subject to the County Public Works finding suitable mechanisms for applying green building practices to traditional public works projects. The GSA has developed regulations for implementing the program.

The Alameda County Green Building Ordinance also requires that construction and demolition (C&D) debris generated by County projects shall be diverted from landfill as follows. County projects, with the exception of traditional public works projects, that have a total estimated cost of construction of \$100,000 or greater and consist primarily of demolition with a total estimated cost of \$25,000 or greater must divert at least 50 percent of the total debris generated by the project.

Traditional public works projects with a total estimated cost of construction of \$100,000 or greater should meet three diversion requirements, including: at least 75 percent of the asphalt, concrete, and earth debris generated by the project is diverted; at least 50 percent of the total of all other debris generated by the project is diverted, and; debris consisting of hazardous waste, contaminated earth or soil, and materials without any use or market value even after re-manufacturing are exempted from the foregoing diversion requirements.

RECENT KEY ACCOMPLISHMENTS

- The Alameda County Juvenile Justice Center was awarded LEED Gold, Sept 2007.
- 93 percent diversion of construction & demolition debris for the Juvenile Justice Center (JJC) Project.
- Use of 215 tons of fly ash in concrete for the JJC Project
- 70 percent average diversion rate for construction projects to date

KEY OBJECTIVES

- Ensure the reuse and recycling of materials from construction and demolition projects.

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- Set project diversion goals at 70 percent or greater, exceeding the requirements of the ordinance.
- Require mixed C&D diversion for on small projects below the ordinance threshold.

Environmentally Preferable Purchasing Practices

In order to support development of the recycled materials market, the County has implemented a program to maximize the amount of recycled products purchased by the County. The GSA requests that County agencies and other tenants of buildings operated by the County purchase products that are made from recyclables if they are comparable in function and cost to products manufactured from virgin materials. The County has also modified its purchasing forms and procedures to ensure that information as to the recycled content, including both post-consumer discards and secondary discards, of all supplies and materials purchased by the County is available and taken into account during the purchasing process. This information is to be provided for the supplies and materials portions of all public works contract bids that are received by the County.

The Recycling Board may establish a price preference which is greater than ten percent (10%) for certain recycled product categories, if it is demonstrated that the manufacturing costs for said recycled product categories are higher than the manufacturing costs for similar products produced with virgin materials such that a ten percent (10%) preference is insufficient for said recycled products to be competitive.

The County may set minimum amounts of recycled products, both by quantity and by category, to be utilized in the execution of all public works contracts made by the County.

RECENT KEY ACCOMPLISHMENTS

- 137,000 reams of purchased paper containing either 30 or 100% recycled content
- All janitorial papers purchased by the GSA for 6 million square feet of facility space meet the minimum EPA CPG standard for recycled content.
- All janitorial liners purchased by the GSA for 6 million square feet of facilities meet the minimum state standard for recycled content.

KEY OBJECTIVES

- To leverage the County's large buying power to create markets for recycled-content and environmentally preferable products.
- To reduce the overall environmental impact of the County's purchasing and operations.
- To create awareness of sustainability in our employees by assisting them in greening the purchasing process.

Climate Change

ICLEI – CLIMATE CHANGE BASELINE STUDY

Alameda County completed an emissions inventory in partnership with StopWaste.Org and ICLEI. This inventory utilizes the ICLEI emissions baseline methodology and was conducted for County-operated facilities as well as the unincorporated area residential and commercial sectors. Per StopWaste.Org's recommendation, the County will not consider methane sequestration at landfills as a carbon sink.

CLIMATE ACTION PLAN

The County is in the process of developing a climate action plan. The County will utilize the draft StopWaste.Org climate action plan with other resources to develop a comprehensive climate action plan. In particular, the County will tie the mitigation measures to StopWaste.Org programs including: green building, waste reduction, Bay friendly landscaping, environmentally friendly purchasing, etc.

RECENT KEY ACCOMPLISHMENTS

- The County passed a Climate Change Resolution in June of 2006.
- The County completed its first climate-change emissions inventory in October of 2007.
- The County is one of 12 counties nationwide to become a Charter Signatory of the Cool Counties Declaration, committing the County to 80 percent reduction in green house gasses below current levels by the year 2050. Additionally, we have influenced six other counties to sign on in California and continue to recruit all counties in California.

KEY OBJECTIVES

- Address climate change in an aggressive and comprehensive manner.
- Ensure that waste issues receive equal focus with energy and water conservation in our own climate plan as well as at the state and federal levels.
- Be nationally recognized as a leading county in addressing climate change.

SECTION 4: MANDATORY RECYCLING PROGRAMS AND FACILITY BANS

4.1 OVERVIEW

This section addresses the experiences of other communities with mandatory programs and bans, and provides recommendations for member agencies and the Agency regarding steps to prepare for, develop, and implement mandatory programs and bans. Skumatz Economic Research Associates (SERA) and Kies Strategies provided research for the Assessment on mandatory programs and bans.

In March 2007, the Recycling Board and Authority Board approved five recommendations resulting from the Ad Hoc Committee process for reaching the 75 percent diversion goal. These recommendations include two items that are the focus of this section:

- Jurisdictions should adopt mandatory recycling ordinances for their residents and businesses.
- The Agency should pursue landfill bans on certain materials, including green waste and cardboard.

The Joint Board action requested that staff provide guidance to the member agencies regarding options for designing and implementing mandatory recycling ordinances. The Assessment is an early opportunity to provide information and recommendations to the Boards regarding both mandatory programs and bans.²⁷ The increased diversion resulting from implementation of mandatory programs may be relatively lower for Alameda County jurisdictions given the relatively high current level of diversion, and the public and private sector infrastructure currently in-place.

Mandatory recycling ordinances and material bans are similar in that both require specific practices with the common goal of minimizing or eliminating disposal of specific materials. As used in the Assessment, "mandatory programs" refers to requirements and/or prohibitions regarding recyclables or other materials that are applied at the point-of-collection, often with some form of verification at the facility receiving the stream(s) addressed in the ordinance. Thus, mandatory recycling or organics ordinances may require that: recyclables or organics be placed in the correct container and/or may require that recyclables or organics not be placed in the solid waste container; and may require that solid waste not be placed in the recycling or organics container. In this context, the term "mandatory" places requirements on the generator of materials, and is an extension of the requirement that service providers provide the opportunity to recycle (sometimes referred to as "mandatory provision of service").

²⁷ This section draws in part on two overview pieces developed for the assessment: Skumatz Economic Research Associates, Inc. and Kies Strategies, *Material Bans And Mandatory Recycling Programs: U.S. Experience And Lessons*, October 2007; and, Skumatz Economic Research Associates, Inc., *Comparison Communities And Leading Program Initiatives*, October 2007. The first of these reports can be found in Appendix C, while the second will be available on the Agency's website.

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The term "ban" as used in the Assessment focuses on the point of delivery to a facility, and applies to prohibition on transfer and/or disposal facility acceptance of specific streams with the intention of disposing of them. The term "ban" is also sometimes used to denote a "ban at the point of collection", but is not used in this manner in the Assessment. In addition, this section includes discussion of the use of economic incentives or disincentives, increased or decreased fees or surcharges on materials to influence the flow of a material in lieu of a ban, and of the potential need to involve other counties in developing effective bans. This section does not address product bans.

Mandatory programs at the point of collection and material bans have complementary effects. For instance, if the goal of a material ban is to ensure there is no cardboard in the disposal stream collected by franchised service providers, then programs must also be in place at the point of collection.

Figure 4-1 details the largest components of the disposal stream by sector, as quantified in the 2000 Waste Characterization Study, and the roles of the member agencies, the Agency, or both in targeting them.²⁸ The results of the 2008 Waste Characterization Study may have some bearing on the design of mandatory recycling ordinances and programs by specific member agencies. This may be true especially for residential programs, in which understanding how much recyclable material is still in the disposal stream could influence decisions about the degree and timing of enforcement efforts. However, the results of the 2008 Study are unlikely to affect the need for mandatory efforts to approach or surpass the 75 percent diversion goal, and the process of designing programs should begin prior to completion of the 2008 Study.

Mandatory programs and bans are quite different in terms of stakeholder involvement and the process for design and implementation. Mandatory programs will ultimately be the responsibility of individual member agencies, which will need to negotiate with their service providers regarding potential additional contractor responsibilities and their associated costs. The Agency can assist member agencies in this effort in a variety of ways, including providing model ordinance and franchise language, options for program design, associated costs, and information regarding administrative features such as enforcement. By contrast, development of material bans at facilities will primarily involve Agency staff and the Boards in interaction with other counties and facility operators.




The Agency can also sponsor public forums to provide for efficient discussion of the issues by all interested and affected parties. We suggest the Agency use public workshops to develop strategies for each issue. The workshops can be framed in part in terms of the growing dialogue regarding the climate benefits of reduced disposal and enhanced recovery, augmenting the need to reach or surpass the 75 percent diversion goal. In addition, consideration of mandatory ordinances gives each member agency and the Agency a new opportunity to emphasize public education for waste prevention in the residential sector.

²⁸ Figure 4-1 is contained in the *Alameda County Source Reduction and Recycling Plan* (StopWaste.Org, revised January 2006) as Table 1: Top Materials Disposed in Alameda County, pg 18.

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Figure 4-1 Top Disposal Streams and Program Targets (Tons)

Rank	Material Categories	Single-Family	Multi-Family	Commercial	Roll-Off	Self-Haul	Total (in Tons)
1	Food waste	78,274	25,708	57,429	21,708	1,612	184,717
2	Wood – unpainted	2,970	2,443	22,624	70,232	38,465	136,741
3	Other paper	48,447	16,277	39,979	15,298	2,495	122,485
4	Plant debris ²⁹	16,939	8,558	14,806	11,388	57,692	109,393
5	Wood – painted	2,853	1,587	14,134	30,335	36,442	85,357
6	Uncoated corrugated cardboard	8,737	4,384	24,827	29,412	9,249	76,602
7	Composite bulky items	1,394	1,564	5,258	32,915	34,396	75,538
8	Mixed plastics	12,569	4,461	20,453	25,216	10,599	73,294
9	Film plastics	21,378	7,086	21,276	14,894	2,124	66,753
10	Other ferrous metals	3,484	2,177	12,589	29,711	18,274	66,238
11	Crushable inerts	2,289	752	7,847	20,160	25,449	56,503
12	Mixed paper	17,414	5,556	12,970	14,820	3,210	53,969
13	Newspaper	19,417	6,846	10,776	3,705	1,446	42,189

	Agency Target
	Member Agency Target
	Agency and Member Agency Target

There may be concern that mandatory programs and bans will have negative economic impact on businesses. We are not aware of any specific studies of this impact, but note that mandatory programs and bans are in effect in a number of states, and that:

1. In general, waste management costs are a very small percentage of operating costs for businesses, and are a far lower cost than other utilities such as energy. Solid waste management costs provide a relatively insignificant price signal that, by itself, may not provide an adequate incentive to recycle.

²⁹ Plant debris is a composite of three material categories: leaves and grass, branches and stumps, and pruning and trimmings.

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2. The relative competitive impacts of any higher costs are shared by businesses that compete primarily with other businesses in this region.
3. Effective diversion programs may be no more expensive, and may reduce costs for commercial generators if they can migrate to a reduced level of solid waste service as a result of increasing diversion. This would most likely apply to commercial generators that may now be doing little recycling.
4. For commercial generators that are now actively recycling, any incremental impact should not generally be substantial with the addition of mandatory programs or bans. To the extent that mandatory programs and bans spur private sector development of additional processing infrastructure or expanded market opportunities for recovered materials, reduced processing costs could result in a reduction in cost for these generators.
5. For organic materials in particular, developing closer or in-county processing options that reduce the need to transport materials long distances can help reduce overall organics recovery costs and decrease the current cost differential with disposal.

This section is organized as follows:

- Section 4.2 provides an overview of programs in both California and out-of-state.
- Section 4.3 contains discussion of the design and implementation of mandatory programs.
- Section 4.4 contains discussion of the design and implementation of disposal bans.

4.2. PROGRAMS IN CALIFORNIA AND OUT-OF-STATE

Mandatory Programs in California

The type of mandatory recycling programs and landfill bans under consideration by the member agencies and the Agency are relatively new concepts in California. Mandatory recycling provisions are becoming more common, often as part of a high diversion or zero waste strategy. Figure 4-2 summarizes California communities that have, or have had mandatory recycling and/or ban programs in place, or are considering such a program.

Figure 4-2 Mandatory Programs and Bans in California

Community	Mandatory	Ban
Santa Cruz County	X	X
Sacramento Regional SWA	X	
City of San Diego	X	
City of Palo Alto	X	
San Luis Obispo IWMA		X
Sonoma County		X
San Diego County		X

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As discussed in the text, the City of San Diego ordinance has just been adopted, and the Palo Alto measure is under consideration. The San Diego County restrictions were in effect in the early 1990's.

California mandatory programs currently in force include the following.

SANTA CRUZ COUNTY

Santa Cruz County implemented a mandatory recyclables source-separation requirement at the point of collection, effective January 1, 2006. The County is unusual in that a number of customers subscribe to recycling or organics collection service, but either self-haul or do not generate solid waste. The franchised collector may not collect containers with more than five percent recyclable materials. Customer carts are collected but tagged as a first warning, and subsequently are not collected. As noted below, the County also implemented a landfill ban for materials collected through the recycling and organics programs as well as other materials, also effective January 1, 2006.

SACRAMENTO REGIONAL SOLID WASTE AUTHORITY

The Sacramento Regional Solid Waste Authority adopted a commercial recycling ordinance requiring businesses in the City of Sacramento and unincorporated area of Sacramento County generating over four cubic yards of solid waste per week have recycling programs, and to keep cardboard, office paper and beverage containers separate from solid waste. Enforcement will be phased-in with initial emphasis on inventorying commercial generators, ensuring recycling programs are in-place, and intensive education. The program will then expand to include site inspections for compliance.

Communities that have just adopted, or that are considering mandatory programs include the following.

CITY OF SAN DIEGO

The City Council of the City of San Diego in November 2007 adopted a mandatory ordinance requiring that all residential properties and all multi-family and commercial properties generating over six cubic yards of solid waste per week have, and use recycling services. The mayor would have the discretion, following 90 day notice, to reduce the threshold. Business and multi-family customers will be phased-in based on size, and can receive temporary exemptions for up to one year due to space limitations or other constraints. Recycling is provided by the City and by a number of franchised collectors. The latter are required by the ordinance to submit annual reports listing all customers and their service levels, and must report tonnages collected. The impetus for the program includes increased diversion and extending the life of the local landfill.

Ordinance requirements will begin to take effect early in 2008 for residential customers, and will be phased-in multi-family and commercial customers as follows:

- Multi-family facilities will be phased-in by facility size, with three groupings: equal to or over 100 units, 50 to 100 units, and below 50 units.

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- Commercial facilities will be phased-in by facility size, with three groupings: equal to or over 20,000 square feet, 10,000 to 20,000 square feet, and below 10,000 square feet.

All phase-ins will be completed by January 1, 2010.

The City anticipates the need for four new staff positions related to managing the program, including providing public education and enforcement.

CITY OF PALO ALTO

Palo Alto recently adopted a Zero Waste Implementation Plan that requires the City to consider passage of mandatory recycling ordinances for each sector (potentially including single-family, multi-family and commercial). Among the options now under consideration is implementing mandatory recycling for a specific sector if voluntary program results for that sector fall below a defined threshold(s). The thresholds could include one or more performance measures such as the percentage of customers participating voluntarily, trends in annual tonnage collected, and/or periodic waste sorts to determine what recyclables are still present in the disposal stream. Should a mandatory program be adopted for one or more sectors, it will likely have a phased approach to enforcement similar to that discussed below for Seattle and that is incorporated in San Diego's new ordinance.

Disposal Bans in California

California uses regulatory measures to ban a number of materials from disposal as refuse, including whole tires, appliances, and universal wastes. But the state does not ban from disposal common recoverable materials such as cardboard and yard debris, or other non-hazardous materials such as clean wood. In the absence of a statewide disposal ban for a particular material, such as cardboard or yard debris it is difficult to develop and enforce a ban at a local or regional level unless facilities are publicly-owned. Not surprisingly, facility bans in California tend to involve facilities owned by counties or solid waste joint powers authorities.

Public facilities more commonly use economic measures such as sharp pricing differentials, rather than regulatory bans to encourage self-haulers to recycle or compost material. Economic measures alone are less likely to provide effective incentives for franchised service providers to voluntarily engage in efforts to enforce mandatory generator separation of banned materials from municipal solid waste.

The following are several current examples of California bans and economic measures intended to minimize disposal of targeted materials, as well as the example of San Diego County that is no longer in effect.

SANTA CRUZ COUNTY

As noted above, Santa Cruz County implemented a disposal ban at its publicly-owned landfill effective January 1, 2006. The ban includes all materials collected through the County's subscription recycling and organics collection programs (as listed above), as well as other materials. The ban applies whether recyclable materials are brought to the landfill mixed with, or separated from municipal solid waste.

The list of banned materials is extensive and includes newspaper, cardboard, office paper, mixed waste paper (including junk mail, catalogues, paperboard, egg cartons, phone books,

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brown paper, paper grocery bags, colored paper, construction paper, envelopes, writing pad backings, shoe boxes, cereal and similar food boxes), computer paper, magazines, aseptic packaging, milk and juice cartons, container glass, aluminum cans, trays and foil, tin cans, steel cans, scrap metal (including white goods and appliances), rigid plastic containers marked # 1 through 7, used motor oil and oil filters, household and auto batteries, yard waste and wood waste, tires, mattresses, electronic waste (including monitors, televisions), concrete, asphalt, tile and porcelain, and gypsum board.

SONOMA COUNTY

Sonoma County combines economic incentives with disposal bans for self-haul loads delivered to the County's publicly-owned Central Transfer Station and Landfill. The facility offers free re-use and recycling for a wide range of materials just inside the facility gate, and the rate for clean yard debris is about one-third of that for municipal solid waste disposal. In addition, the County bans disposal of separated yard debris, wood waste, scrap metal and cardboard. Public staff directs these recoverable materials away from disposal.

SAN LUIS OBISPO COUNTY INTEGRATED WASTE MANAGEMENT AUTHORITY

The San Luis Obispo County Integrated Waste Management Authority owns a recycling and disposal facility at which users pay a flat fee to enter the gate. Facility users can then either utilize the re-use and recycling drop-off options at no added charge or pay an added fee to enter the disposal area. While not a regulatory ban, this is an economic approach with much the same result.

SAN DIEGO COUNTY

In the early 1990's, San Diego County's landfills were publicly-owned and the County used high surcharges for delivery of municipal solid waste loads containing recyclables. This approach was a means to effectively force implementation of curbside collection of recyclables by contract collectors. This example is also interesting in that unlike most economic measures that target self-haulers, this measure targeted contract collectors of municipal solid waste.

Mandatory and Ban Programs in Other North American Communities

SERA and Kies Strategies conducted a detailed analysis of mandatory programs and bans in other North American communities. Mandatory recycling ordinances and/or bans have been in effect for many years in other parts of the country in which disposal options are distant and expensive, or in which communities wish to preserve publicly-owned landfill capacity, as summarized in Figure 4-3. Programs tend to follow one of two models, as reflected in Figure 4-3 and in the text. The first model is a statewide ban with local enforcement. The second model is an entirely local or regional measure. There are a number of more recent ordinances coming into effect, such as that in Seattle. Public objectives for the bans include preserving disposal capacity, increasing overall diversion levels in states with relatively low recycling rates, and developing progressive policies for reaching substantially higher levels of diversion. The following is a sampling of a range of communities across the United States and Canada with mandatory and/or ban programs.³⁰ If a ban involves enforcement at the curb and the landfill it

³⁰ For more detail, see Skumatz Economic Research Associates, Inc. and Kies Strategies, *Material Bans and Mandatory Recycling Programs: US Experience and Lessons*, October 2007.

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is listed below as both a mandatory program and a ban. To the extent that some of these programs have been in effect for a long period, their experiences can provide useful guidance for the member agencies.

Figure 4-3 Mandatory and Ban Programs in Other North American Communities

Community	Mandatory	Ban
Madison, Wisconsin	X	X
Chelmsford, Massachusetts	X	X
Seattle, Washington	X	
Marshall County, Iowa	X	X
Chapel Hill and Orange County, North Carolina	X	X
Capital Regional District, Canada	X	X
Gainesville, Florida	X	
Addison County SWMD, Vermont	X	X

STATEWIDE BANS WITH LOCAL ENFORCEMENT

Madison, Wisconsin - Mandatory Recycling and Local Enforcement of Statewide Ban

Madison is one of the comparable jurisdictions discussed in Section 2. Madison has a mandatory residential recycling program. The opportunity to levy a fine exists but has never been used. Mandatory recycling is viewed primarily as an educational tool to increase overall awareness of recycling, and Madison has a participation rate of nearly 95 percent for its curbside recycling program. For single-family residences, the ordinance is only enforced on an "on-call" basis. However, for multi-family properties, the city conducts inspections to ensure that recycling is occurring. The city provides recycling carts and collection at no additional cost to multi-family units, so generally it is just necessary to inform the property owner of the available options.

Chelmsford, Massachusetts - Local Enforcement of Statewide Landfill Ban

This town of 33,000 in January 2006 enacted an ordinance enforcing a statewide disposal ban that includes cans, bottles, paper, mixed, cardboard, plastics 1 and 2, construction and demolition debris, and yard waste. The results include a ten percent reduction in disposal tonnage and a 25 percent increase in diversion tonnage.

The town enforces the ban, in effect a mandatory program for generators, as follows. Collectors enforce at the curb, placing a bright orange sticker on the solid waste can if there are visible recyclable materials, and leaving it uncollected. The town found it difficult to ensure that collectors were reliably doing this, so the town is now monitoring the collectors' enforcement of the ordinance. The town conducted six months of enforcement during which staff did spot checks of collected solid waste loads and "stings" in which they placed recyclables in uncollected solid waste to see what the given collector would do. After a series of warnings, the town fined the collectors at fault, a penalty that is provided for in the town's collection contracts.

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Enforcement has required 0.5 FTE (full-time equivalent staff), and other substantial costs have included \$15,000 for additional recycling containers and \$1,000 for public education mailers.

LOCAL OR REGIONAL MANDATORY PROGRAMS AND/OR BANS

Seattle, Washington - Mandatory Recycling with Enforcement

Seattle has a population of about 540,000 and began mandatory recycling for single-family, multi-family and commercial generators on January 1, 2006. Residential materials include paper, cardboard, aluminum, glass, and plastic. Commercial materials include paper, cardboard, and yard waste. Overall diversion increased from 38 percent prior to the program to 44 percent after.

Seattle has focused on education first and enforcement second, spending about \$400,000 annually for education for two years prior to commencing the program. The rate of compliance has been high. Compliance is measured as solid waste that contains no more than ten percent recyclables. The city's phased approach has become a model for enforcement by other communities. Enforcement is done by city employees as follows:

- Single-family residences are not fined. Containers are tagged, telling residents to remove the recyclables and set out the container again the following week for collection.
- For businesses, the enforcement team has inspected about 2,500 of 10,000 accounts. Only about 1.5% of businesses were in violation last year. Containers are tagged, and on the third tag a fine of \$50 is levied.
- For multi-family, the enforcement team has inspected about 50 percent of 10,000 accounts and found very few violations. About 97 percent of the city's multi-family units are recycling, with the other 3 percent granted exemptions due to lack of space.

Residential tags totaled 227 for the first month of the program and dropped to 133 in the second month. Commercial and multi-family tags totaled 115 in the first month of enforcement and then dropped to a monthly average of 33. The enforcement effort consists of 6 part time employees, a total of 3 FTEs.

Marshall County, Iowa - Local Landfill Ban with Curbside and Facility Enforcement

Marshall County has 16 towns with a total population of about 40,000. In 1995 the County adopted an ordinance banning disposal of compostable materials (yard debris) and recyclables including paper, containers, and aluminum at the publicly-owned Marshall County Landfill. The ordinance is enforced by the collectors at the curb and public agency staff at the landfill. Landfill staff inspect every load for banned materials and if they observe "too much" recyclables they will speak to the particular collector about the problem. In general, very little time or budget is spent on enforcement.

Chapel Hill and Orange County, North Carolina - Local Material Bans with Enforcement

Chapel Hill is one of the comparable jurisdictions discussed in Section 2. Chapel Hill has a population of about 49,000. In 1996, the city adopted an ordinance banning disposal of non-residential cardboard. Any business using the local publicly-owned landfill must source-separate cardboard (using a separate dumpster). In 2002, the county added an ordinance

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requiring that all cardboard, scrap metal, and clean wood be taken to a certified recycling facility. When the banned materials began to be exported out-of-county for disposal, the ordinance was revised to prohibit collectors from disposing of any of the regulated materials in any landfill.

Cardboard was 20 percent by weight of the commercial disposal stream prior to the 1996 ban and now is about 3 percent. Enforcement is conducted both at the curb and at the landfill. City staff conducts two types of enforcement at the curb, inspections of loads and "dumpster diving" with tagging of dumpsters. Enforcement at the landfill is assisted by the tipping fee structure; \$40 per ton for municipal solid waste, \$15 per ton for clean wood waste, and no tipping fee for metal or OCC. However, inspections at the landfill result in sequential fines of double tip fee, \$25, \$50, \$100, \$500, and one year loss of drivers' license. Enforcement staffing is 1 FTE.

Capital Regional District, Canada - Regional Landfill Bans with Local Enforcement

The District has a population of 360,000 with 16 towns. The District has enacted a series of facility bans beginning in 1991. The individual towns have subscription curbside recycling, but the District owns the landfill. Banned materials include drywall, cardboard, e-waste, scrap metals, paper, and most recently yard debris.

Diversion rates for the District generally range between 34 percent and 40 percent. The onus for enforcement falls on the collectors since there are no other viable disposal options, and they use a variety of techniques. The District has a full time officer at the landfill that is on duty most of the time the landfill is open. The officer randomly checks loads and tickets collector's drivers who are in violation. A driver who dumps a "bad" load will try and determine where the load originated and speak to the generator. Nearly all of the tickets are issued to collectors even though there is residential drop-off at the landfill.

Tickets are \$200, and the total annual amount of tickets is an average of \$30,000 to \$35,000. Tickets are issued to drivers, but collection companies pay the fines. District staff works with the collectors to identify generators of bad loads and provides education to residents.

Gainesville, Florida - Mandatory Commercial Recycling with Required Materials and "Complaint-based" Enforcement

Gainesville has a population of 150,000, and mandatory recycling for all commercial properties, including both businesses and multi-family. The city is the collector and the materials differ by customer type; commercial materials include cardboard and office paper and multi-family materials include newspaper and metal cans. Commercial business enforcement occurs only at the curb, and is largely on a "complaint basis". Multi-family recycling is enforced through rare inspections. Business enforcement is very "friendly". City staff first talks with the violator, and then if the violation is repeated staff sends them a letter. Few letters are sent out and it has not been necessary to take further steps. The program is considered "quite effective" and it is estimated there are about ten citizen complaints per week about multi-family complexes or businesses. Enforcement is done with 0.25 FTE.

Addison County Solid Waste Management District, Vermont - Mandatory Residential and Commercial Recycling with Load Inspections

The District has a population of about 36,000 and in the early 1990's implemented mandatory ordinances for both residential and commercial generators. Licensed service providers must offer recycling and rates must be competitive with those for trash. The current diversion rate is 34 percent.

Enforcement is done at the transfer station which is owned and operated by the District. The District has the option to check bags curbside but has not used it. Collection drivers know that they have to reject trash with lots of recyclables or they will be fined at the transfer station, so it is easiest for them to tag the bag curbside for non-collection. Transfer station staff inspects every fortieth incoming load, and complaints are received from private citizens. Fines for licensed collectors are, per successive violation, \$100, \$200, \$300, \$500, but they have not been levied. Instead, the District contacts the collector or generator and reminds them to recycle.

4.3 DESIGN AND IMPLEMENTATION OF MANDATORY PROGRAMS

Key Aspects of Program Design and Implementation

Following are key aspects of developing and implementing mandatory programs, drawing on the programs described above.

PUBLIC SECTOR ROLE

The mandatory programs described above tend to be within a context of municipal collection programs, or municipal or private sector collection coupled with bans at publicly-owned facilities. None of the reported instances involve both private contracted collection services and privately-owned and operated facilities.

PROGRAM DESIGN

There are two options for overall program design:

1. Generator-Based. With this approach, the ordinance places the requirement to source separate material on the generator. Jurisdictions such as Seattle and Chelmsford, Massachusetts use public agency staff, or direct the service provider to use their staff to place warnings or non-collection notices on containers that contain material(s) they should not contain. Enforcement actions are focused on generators, and the contractor may be penalized if it fails to enforce the ordinance. This approach appears to be the more common of the two.
2. Contractor-Based. For this approach, the ordinance places the requirements primarily on the contractor to ensure compliance with the ordinance, as in Marshall County, Iowa. Generators may also be penalized but the contractor is the primary focus for municipal enforcement of the ordinance.

The approach could also vary within a single jurisdiction by sector, such as a generator-based approach for the commercial sector and a contractor-based approach for the residential sector.

*Program Assessment "5-Year Audit"***TARGETED MATERIALS**

Targeted materials by sector for the above jurisdictions include:

- Residential (single-family and multi-family): Paper, cardboard, metal containers, aluminum, glass, various plastics, and yard debris.
- Commercial: Cardboard, paper, beverage containers, yard debris, and clean wood.
- Construction and Demolition: Clean wood.

Skumatz Economic Research Associates, Inc. (SERA, see first footnote in this section) notes that mandatory programs in other parts of the country often start with cardboard and later add other materials.

TARGETED SECTORS

Targeted sectors include single-family, multi-family, and commercial. Some locally enforced statewide facility bans target a range of recyclables and organics, without reference to sector of origin. Ordinances include mandatory provision of service, unless already in place since generators must have service in order to recycle.

THRESHOLDS

Thresholds are a defining feature of multi-family and commercial ordinances. For example, the Sacramento area ordinance applies to commercial customers generating over four cubic yards of solid waste per week, while the San Diego ordinance applies to commercial properties (including multi-family) generating over six cubic yards of solid waste per week and includes administrative provisions for lowering that threshold.

OTHER EXEMPTIONS

Exemptions may apply to multi-family and commercial customers. For multi-family service, container space limitations may be a basis for a temporary or permanent exemption. For commercial service, exemptions may be based on the weekly volume of solid waste service, or space limitations as discussed above. In addition, a broad exemption might be applied to an entire sector if target levels for high performance are maintained.

PROGRAM PHASE-IN

Programs may be phased-in based on type of materials, size of business, and the ending of temporary exemptions due to space limitations. One aspect of program phase-in can be to require that businesses develop diversion plans prior to implementation of mandatory programs.

ENFORCEMENT

With regard to enforcement:

- Approaches range from voluntary compliance, to containers tagged for non-collection, to moderate fines.
- The strongest programs involve extensive public education prior to enforcement.
- Punitive measures may be phased-in over-time.

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- Compliance thresholds vary from zero tolerance, to no more than 10 percent recyclables in solid waste containers based on visual check of relative volume, to non-quantitative measures such as "not too much" recyclable material in the solid waste cart.
- There is wide variation in who does the enforcement. A strong facility material ban can provide adequate incentive for private service providers to enforce mandatory provisions at the curb, but much enforcement is done by public agency staff. In some cases public enforcement staff cooperatively assists private service providers, and in others public agency staff work to ensure that private service providers do the required enforcement.
- Private service provider enforcement is done by drivers on route. The level of public agency enforcement staffing varies from 0.25 full time equivalent staff (FTE) to 3 FTE for Seattle.

DIVERSION

Diversion results are generally substantial for those programs that tracked the difference between diversion prior to, and after implementation. SERA found that there is some increased diversion without enforcement, and about 15 to 50 percent increases in diversion with enforcement.³¹ Diversion percentage increases for member agencies may be lower since the base level of diversion is already relatively high.

Next Steps in Alameda County

Mandatory programs must be in place relatively soon in order to contribute to reaching the 75 percent diversion goal in 2010. The Agency can provide valuable assistance, but ultimately the responsibility for developing and implementing mandatory programs rests with the individual member agencies.

KEY STAKEHOLDERS

Key stakeholders in developing ordinances and programs, other than the given member agency and the Agency will include:

- The franchised collection companies that, with the exception of Berkeley serve residential customers.
- The franchised collection companies that serve commercial customers, including debris boxes and compactors. For cities with open or nonexclusive commercial recycling, other companies engaged in recyclables collection should also be engaged.
- Transfer and processing facility operators, particularly to the degree mandatory programs include compliance verification when loads are delivered.
- Single-family residents and businesses affected by ordinances.
- Property managers at commercial properties.
- Property managers at multi-family residential complexes.

³¹ Lisa Skumatz, personal communication with Peter Deibler, May 1, 2007.

PROCESS FOR DEVELOPING MANDATORY ORDINANCES

Based on part from the experience of other communities both in California and out-of-state, HF&H suggests the following activities as an approach to developing and implementing mandatory programs.

The Agency can begin the process by developing a model ordinance with options for use by the member agencies, such as sample language for several approaches to enforcement. As with the C&D debris ordinances, uniformity of approach will reduce complexity for all parties and enhance ability to analyze and compare results. The Agency can also assist the process by beginning discussions with haulers, and soliciting relevant in-county experiences such as Alameda's universal roll-out of commercial recycling service, as well as their experiences from other jurisdictions.

While the model ordinance language is being developed, individual member agencies can:

1. Begin identifying and removing service gaps for the residential and commercial sectors that will help smooth later implementation of mandatory programs. Key among these is mandatory provision of recycling service to multi-family and commercial sectors, with recycling service provided as part of the basic service package. Steps to close service gaps and other program enhancements are discussed further in Section 8 of the Assessment.
2. Examine effectiveness of specific programs based on current data reporting, noting the following potential targets for mandatory programs based on the data in Figure 4-1:
 - a. The single-family disposal stream: paper, newspaper, plant debris, and cardboard.
 - b. The multi-family disposal stream: newspaper, mixed plastics, and plant debris.
 - c. The commercial disposal stream: paper and cardboard.
 - d. The roll-off disposal stream: paper, cardboard, and other ferrous categories.
3. Enhance monitoring of program diversion performance by sector. For instance, for the residential sector member agencies could use the "Franchised Diversion Rate", a metric used by Agency staff that equals: Residential Recycling Tons (net of processing residue) + Residential Organics Tons (net of processing residue) + Bulky Item diversion tons + E-scrap recycling tons divided by the sum of the above diversion + Franchised Residential Disposal Tons (net of self-haul).
4. Identify data needs for the residential and commercial sectors as addressed in Section 8, including segregated multi-family tonnage data, commercial recycling diversion data, and data regarding recycling and organics processing residues.
5. Direct service providers to begin collecting and providing baseline curbside recycling participation data. The Agency could assist in this process by providing multi-agency grants, possibly by hauler, for collecting certain types of baseline data.

During this period, member agencies can begin conducting public meetings and/or Council study sessions to provide education and to gather input. Early workshops, with affected parties such as business owners, property managers, and interested residents, can do much to alleviate potential concerns in advance of program commencement. Agency staff can be available to assist with workshops as requested.

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As member agency ordinances are being drafted, member agencies will also need to:

1. Determine whether and how to address multi-family generators, given the relative difficulties of developing and maintaining multi-family programs. For member agencies with a relatively large proportion of multi-family housing, it is important to consider including multi-family in mandatory programs, if not initially.
2. Review enforcement of C&D debris programs and consider whether this sector should be part of a mandatory approach. Options for enhancing C&D debris programs are discussed further in Section 8.
3. Begin discussions with service providers regarding service provider enforcement responsibilities. Key issues include providing incentives for route drivers to be aware of, and to tag contaminated containers, and the potential impact on collection efficiency for automated recycling and/or solid waste collection programs. For instance, with regard to minimizing solid waste in recycling carts, San Jose has required service provider supervisors to visually inspect loads arriving at the recycling processing facility and to challenge the driver to provide a number of tags for notice of improper set-out commensurate with the amount of contamination in the load.
4. Review public education and outreach efforts, and begin to conduct education in advance of the new program. The Agency could assist by providing model approaches and materials for public education and outreach, building on existing materials.
5. Consider timing of program implementation by sector and/or materials, including any phase-in.

The Agency can also assist by providing a concise "how-to" paper for negotiating a change in scope for adding mandatory programs with ongoing service providers, including roles and responsibilities for each party, timelines for implementation, possible changes in customer choice of service levels and impact on rate revenue³², types of added or reduced capital and/or operating costs that might be anticipated (including the avoided cost of disposal), etc. The result could be a change in rates.

As member agencies begin to adopt ordinances, the Agency can assist the process by encouraging staggering of implementation schedules to minimize the need for service providers to roll-out programs simultaneously in multiple jurisdictions. The Agency could also help coordinate development and implementation of compliance verification procedures at facilities to ensure cost-effective and consistent approaches, with comparability of results.

Once ordinances are adopted, the Agency could assist member agencies with collecting comparison data that can help fine-tune programs, such as identifying specific collection routes that are under-performing and for which added education or enforcement is needed. The Agency could assist this process by developing consistent methodologies for participation surveys (such as the number of households setting out particular types of containers) and for

³² The customer decision to change service levels due to program or rate changes is often referred to as "migration".

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"lid-tipping", or estimating the amount of a specific material or materials set-out in a particular container (such as the volume of food scraps in an organics cart.)³³

The Agency can assist member agencies longer-term by identifying useful refinements for mandatory programs such as protocols for monitoring processing facility residue levels for facilities that are used by multiple member agencies, and potentially tailoring commercial mandatory programs to target specific materials for specific industries.

4.4. DESIGN AND IMPLEMENTATION OF DISPOSAL BANS

Key Aspects of Program Design and Implementation

KEY CHARACTERISTICS

The material bans described above in Section 4.2 tend to have one or more of the following characteristics:

1. Bans are usually statewide.
2. Local or regional bans often involve publicly-owned facilities.
3. There does not appear to be a clear template for developing a regional ban in the absence of public facility ownership. As noted with regard to mandatory programs, we did not identify a ban effort parallel to that proposed by the Agency that involved privately-owned facilities, or governmental units larger than a county or smaller than a state.

ENFORCEMENT

Enforcement approaches are generally similar to those for mandatory programs, except conducted at facilities. An early step is requiring that facilities develop a plan for initial and ongoing implementing of the ban. Given the potential for conflict of interest at privately-owned facilities, there is probably some role for public agency staff in conducting inspections on at least a random, spot basis.

DIVERSION

See discussion above of diversion from mandatory programs.

Next Steps in Alameda County

KEY STAKEHOLDERS

Development of material bans at facilities will involve:

1. Agency staff and the Boards in interaction with facility operators, franchised collectors, and potentially other counties.
2. Companies that self-haul materials to the affected facilities, if changes in practice affect pricing, convenience in using the facility, or the ability to use a specific facility.

³³ As discussed in Section 8, the Agency's organics program has done periodic lid-tipping.

3. Self-haulers, including residents using facilities.

PROCESS FOR DEVELOPING MATERIAL BANS

Key Considerations

Key general considerations for the Agency in developing bans, with further discussion below:

1. Define program design options for the initial targeted materials, cardboard and yard debris, including the target sectors for each.
2. Consider use of economic measures to influence self-hauler behavior, in addition to or in lieu of bans.
3. Determine any phasing of the ban(s).
4. Determine availability of alternatives.
5. Synchronize bans that require at least partial enforcement at the curb with actions taken by member agencies. Thus, enforcement of a ban on disposal of cardboard will be greatly simplified by universal adoption of mandatory programs that require recycling of cardboard.
6. Review recent United States Supreme Court decisions regarding flow control issues in terms of applicability to a ban.
7. Consider public ownership of facilities.
8. Determine whether additional materials and/or sectors should be targeted.

Program Design Options

A ban on disposal of yard debris might be directed at self-haul and roll-off customers at transfer stations and landfills, while a ban on cardboard might affect either just self-haul, debris boxes and compactors, or all sectors and require enforcement both at the curb and at the facilities. Thus, for materials such as non-municipally controlled organic material and possibly non-municipally controlled cardboard, a ban on disposal could be implemented independent of, and prior to, implementation of mandatory programs.

With regard to yard debris, it is the Agency's intention to ban disposal of the material, whether for beneficial landfill uses such as alternative daily cover (ADC), alternative intermediate cover (AIC), slope stabilization, soil building, etc.

For municipally controlled streams, the Agency could assume that mandatory program education and enforcement efforts will be adequate to redirect divertible materials at the point of collection, and focus primarily on the self-haul and debris box streams. A comprehensive approach would be to also ban municipally-controlled streams that are covered by mandatory programs. A third approach is a hybrid in which bans focus primarily on self-haul streams, and are extended to include materials delivered as part of municipally controlled streams only if enforcement at the point of collection proves inadequate.

With regard to self-haul material, the ban could address larger deliveries first with later phase-in of the ban for smaller loads delivered from the commercial and residential sectors.

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With regard to municipally controlled streams, member agencies can assist with implementation of bans by incorporating provisions into collection and/or disposal contracts providing that the service provider will not export the material out-of-county to avoid the ban. The Agency can develop model language for this purpose. As part of the Assessment survey of sixteen member agencies discussed in Section 2:

- 14 member agencies reported having contract language allowing them to designate disposal facilities. Five of these member agencies contract for disposal independently of collection.
- One of the two member agencies that cannot designate disposal facilities report that they can require in-lieu payment of Measure D fees for the use of out-of-county facilities. The requirement to pay the fees in addition to the cost of longer transport could be a strong disincentive to deliver materials to out-of-county transfer stations (for disposal) or disposal facilities (see discussion below of Economic Measures).

Economic Measures

The Agency could consider use of additional fees for disposal of certain materials, such as organic materials. For instance, the need for enforcement would be greatly reduced if the total gate fee charged at privately-owned facilities for disposal of organics included a substantial Agency fee that would not be paid if the material is composted. In this case, an economic incentive to avoid disposal could be used in lieu of a ban, again assuming that, as necessary, out-of-county disposal sites have some form of restriction so that materials do not simply flow out-of-county. As noted earlier in this section, the San Luis Obispo County Integrated Waste Management Authority uses pricing to discourage disposal and Sonoma County has a similar approach at its Central Landfill.

Phasing of Bans

Phasing of bans could ease implementation, and the relative need to involve other counties may be a key aspect of the phasing. For instance, if the Agency provides organics capacity in-county, facility proximity and tip fee may be such that a ban on disposal of self-haul organics can be enforced without the participation of other counties, or with participation from a limited number of other counties.

Availability of Alternatives

Despite the cry of "no ban without a plan", for some materials it may not be necessary (or possible) to have full availability of alternative options prior to developing the ban. Private sector processing or market development activities can be driven by strong regulatory signals that the historical option will no longer be available after a date certain. There are successful models for this approach to banning materials, such as the use of C&D debris recycling ordinances requiring that a minimum percentage of material be processed, and that have resulted in development of new processing capacity. Another example is the state's banning of the land disposal of hazardous wastes in the early 1980's, which was predicated on putting new, more expensive but clean alternative technologies in place.³⁴ Banning the disposal of clean

³⁴ The program is administered by the California Department of Health Services, Toxics Substances Control Division.

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wood may be an example of regulatory action driving development of alternatives, in that there are no significant technical barriers, and the key current impediments are the availability of relatively inexpensive disposal and the need to provide for cost-effective collection of material.

Effect of Bans on Material Flows

The State disposal reporting system provides tracking of organic materials separate from municipal solid waste, but does not do so for cardboard. Thus the Agency can develop an accurate sense of which facilities are now used for disposal of organic materials, which allows for some degree of prediction about the effect of a ban with regard to out-of-county flow of material and thus need to involve other counties. Section 5 of the Assessment includes a more detailed discussion regarding flows of materials within and outside of the county, tip fees at in-county and out-of-county facilities, travel distances to the facilities, and the effect of cost on facility use decisions. Review of the State's disposal reporting system data for material generated by the member agencies and transported to disposal facilities either in or out-of-county indicates that for the period of July 1, 2005 to June 30th, 2006³⁵:

- 64 percent of municipal solid waste was disposed in-county.
- 76 percent of yard debris was disposed in-county.
- Nearly 100 percent of C&D debris was disposed in-county.

We recommend the Agency develop an interactive Excel model to identify the likely or possible impacts of different bans given current material flows, facility locations (in and out-of-county), transport costs, and tip fees. The model can build on the material developed for the Assessment and discussed in Section 5, and ideally would be sophisticated enough to look at the impact at the regional or member agency level, and not just at the county level. This type of model could be useful for examining a variety of questions related to consideration of a specific ban such as:

- How many other counties need to be involved to have an effective ban?
- What would be the likely impact if an out-of-county landfill reduced its tip fee by specific amounts to attract material avoiding the ban? From what portions of the county would the facility draw material, and in what amounts?
- What is the maximum amount that a specific out-of-county landfill could accept given its permitted daily maximum disposal limits?
- What impact do other counties' actions such as import restrictions have on the possible out-of-county flow of material?
- What impact might an approved facility expansion at an out-of-county landfill have on out-of-county flows?
- What would be the likely impact if the Agency developed a disposal surcharge to discourage disposal of a material at in-county facilities, and what level of surcharge would be necessary?

³⁵ See discussion in Section 5.2.

*Program Assessment "5-Year Audit"***Legal Constraints**

The Agency will need to address whether there any state or federal legal constraints to banning materials either at facilities within the county, or to banning disposal of materials received at transfer stations located within the county that could transport them to out-of-county disposal facilities.

Public Ownership

The Agency may wish to revisit consideration of public facility ownership, whether with public or private contract operation. Implementing and enforcing bans is much simpler with public ownership and the ability to transfer materials has other benefits such as the ability to transport organic materials to selected out-of-county facilities.

Defining Additional Target Materials

The results of the 2008 Waste Characterization may provide a clear indication of which materials and sectors should be considered for disposal bans following bans of cardboard and yard debris. Should there be a need to define additional target materials and/or sectors in a more analytical manner, the Agency could use a selection process based on criteria such as:

1. Diversion potential.
2. Availability of alternatives to disposal.
3. Member agency ability to direct flow of materials such as organics, as applicable.
4. Relative likelihood of "leakage" of banned materials out-of-county to avoid a ban, and thus the need to involve other nearby counties.
5. Relative effort required for program administration and compliance.

If necessary, the Agency could consider using these and perhaps other criteria to develop either a qualitative or a ranked quantitative assessment of the options. In the latter case, the criteria could be given weights to arrive at a total quantified score.

SECTION 5: ADDITIONAL SYSTEM ISSUES

5.1 OVERVIEW

Section 5 addresses several other system issues that relate broadly to achieving high diversion levels and, in varying degrees, to the development of material bans, processing facility capacity, and member agency decisions regarding materials processing. The three issues are:

1. An analysis of the flow of self-haul materials originating from the member agencies and delivered to disposal facilities both inside and outside of the County. The analysis examines the relationship between facility tip fees, the cost of delivery of materials (both transport and tip fees), and the relative tonnages of material delivered.
2. Regional or joint franchising by two or more member agencies is an approach that can be applied to collection, transfer, processing and/or disposal services. This material addresses key issues related to regional franchising, and the value of the ability to direct materials to achieve similar results.
3. The third topic addresses the siting and municipal use of four food scrap processing facilities in southern California, Washington State, and Canada, with assistance from Skumatz Economic Research Associates (SERA). The goal of the review is to better understand whether municipal programs or facilities tend to be developed first; key facility siting issues; the distance of processing facilities from municipalities using them; and, the relative role of competition with disposal options, as applicable.

5.2 THE EFFECT OF TIP FEES AND DISTANCE ON SELF-HAUL MATERIAL FLOWS

Overview

An ongoing question for the Agency and for member agencies is how to best increase diversion for the large volumes of self-haul material, with a focus on commercial self-haul and non-franchised debris boxes that are recoverable yet are still contained in the disposal stream. The approach to this task has two components. First, the following analysis attempts to determine to what degree self-haul facility customers respond to price signals and to what extent other factors may apply. Second, based on consulting team members' experience with private sector demolition activities, and interviews with several large volume construction and demolition debris (C&D debris) generators and a former facility manager, we draw conclusions regarding why self-haul materials flow as they do, and distinctions between larger and smaller self-haul customers, and in particular for C&D debris. The results have implications for the development of material disposal bans, as discussed in Section 4.

Analysis

The analysis of data identifies whether there is any correlation for self-haul flows of materials by member agency of origin, between the cost of delivery for specific facilities (including cost of transport and tip fees), and the tonnage delivered to that facility. Data used for the analysis includes:

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1. Tip fees for twelve Bay Area transfer stations and landfills located within and outside of Alameda County that received significant quantities of self-haul material originating in Alameda County between July 2005 and June 2006. Alameda facilities and tip fees are listed in Figure 5-1. Facility tip fee data was collected from HF&H project files and databases, and updated as necessary. The facilities represent a combination of privately-owned and operated facilities, and publicly-owned facilities operated under contract with a range of public sector control over facility pricing. Data is believed to be current as of mid-2007. Tip fees at transfer stations may not include the cost of transport.
2. Tonnage data for the period July 2005 to June 2006, as compiled by Agency staff for the CIWMB's Disposal Reporting System (System). The System reports disposal data by member agency of origin and facility of receipt for municipal solid waste (MSW), green waste, and C&D debris. The analysis includes all loads delivered from each given member agency to each facility, unless the total flow of material was less than 100 tons for the year. Figure 5-1 indicates the specific material and related tip fee for each facility based on material received.³⁶

Of the self-haul materials reviewed in this analysis:

- 64 percent of solid waste was disposed in-county.
- 76 percent of green waste was disposed in-county.
- Almost 100 percent of C&D debris was disposed in-county.

³⁶ Facilities taking materials for disposal from Alameda County charge three types of fees or rates: 1) tip fees negotiated by member agencies for delivery of solid waste collected under contract or directly by the member agency, 2) posted rates for use of facilities by most self-haulers, often based on volume (cubic yards) and/or flat rates for certain types of vehicles, and 3) special rates negotiated by larger self-haulers such as demolition contractors. Publicly negotiated tip fee data is publicly available and is the basis for this analysis. Posted gate rates generally represent the highest rates paid by facility users, but comparisons between facilities and between disposal streams are difficult because of the use of volume-based rates. Privately negotiated rates are not generally public information. To the extent that facility users delivering material included in this survey are paying lower, privately negotiated rates rather than tip fees that are higher, this would strengthen the finding that cost of transport is more of a determinant of facility choice than tip fees. Based on interviews conducted as part of the discussion of private sector diversion activity in Section 6.3, individual negotiation of rates by demolition contractors used to be more common but it is now typical for all contractors to pay uniform amounts based on volumes and material types, but less than the gate rates.

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Figure 5-1 Facility Tip Fees by Material

Facility	County	Municipal Solid Waste - Tip Fee	Plant Debris - Tip Fee	Construction & Demolition Debris - Tip Fee
Altamont Landfill	Alameda		\$14.69	
Berkeley Transfer Station	Alameda	\$96.00	\$54.00	
Davis Street Transfer Station	Alameda	\$64.68	\$30.50	\$50.00
Fremont Recycling and Transfer Station	Alameda	\$59.37		
Pleasanton Transfer Station	Alameda		\$20.00	\$85.00
Tri-Cities Recycling and Disposal Facility	Alameda	\$24.72		
Vasco Road Landfill	Alameda	\$29.89		
Golden Bear Transfer Station ³⁷	Contra Costa	\$25.29	\$14.30	\$30.00
Keller Canyon Landfill	Contra Costa	\$22.08	\$13.16	
Redwood Landfill	Marin	\$36.87		
Ox Mountain Landfill	San Mateo	\$32.41	\$26.00	
Guadalupe Landfill	Santa Clara	\$39.45		
Kirby Canyon Landfill	Santa Clara	\$53.15		
Newby Island Landfill	Santa Clara	\$39.80	\$20.07 \$30.26 ³⁸	
SMaRT Station	Santa Clara	\$78.09	\$78.09	
Zanker Road Landfill	Santa Clara			\$47.50

³⁷ Figures reflected negotiated arrangements, and the MSW and C&D debris figures include tip fees but not the cost of transport to the disposal site in Solano County.

³⁸ Includes food scraps.

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Note that:

1. Alameda County facilities include all transfer stations and landfills in the county, with the exception of the Aladdin Street Transfer Station and MRF in San Leandro, which does not accept self-haul materials.
2. Tip fees represent the full cost of delivery at the gate and are inclusive of pass-through fees. Facilities used in the analysis were selected, in part, for the wide range of tip fees.
3. The period of the analysis represents one of transition, in that all materials were reported together as MSW prior to January 2006, and MSW, green waste and C&D debris were reported as separate parts of the disposal stream after January 2006. In addition, WMAC changed data reporting systems for the Davis Street Recycling and Transfer Station during this period, which led to possible data inconsistencies. For the 12 months, the majority of material by weight was MSW.
4. The System is limited in that other materials, appearing in relatively large volumes from self-haul and roll-off, most notably cardboard are not separately tracked.
5. The analysis does not account for intra- or inter-company decisions by facility owners regarding material flows. For instance, WMAC has at times directed material to its affiliate, Redwood Landfill in Marin County.

Using the collected data, HF&H mapped the tonnages of each material stream delivered to these facilities from each member agency of origin. Self-haul material arrives at facilities in a variety of types of vehicles, and transportation costs are assumed to range between \$50 and \$100 per hour inclusive of all labor, fuel, and equipment costs. Based on this information, HF&H analyzed the correlation between the distances traveled to deliver material to the facilities and the tonnages delivered.

Findings

Key findings from the analysis, with discussion include:

1. The cost of transportation, measured largely in terms of time is a stronger determinant for choosing facilities than tip fees. Given the range of tipping fees (depending on the material type and facility), and load ranging from approximately 0.2 to 5 tons, we conclude that for most of the loads delivered to these facilities, transportation costs are a significantly greater portion of the total cost of delivery than tipping fees.
2. The data analysis indicates an insignificant correlation between the full cost of delivering materials (transport costs and tip fee) to a facility and the number of tons delivered to that facility.
3. The data analysis showed no correlation between tipping fees alone, and the number of tons delivered to a facility.
4. Based on industry knowledge and the interviews, less than five percent of customers (primarily demolition contractors) engage in negotiations with facilities to pay less than the posted gate rates. Based on anecdotal information for one major in-county transfer

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station, we estimate that these customers deliver a significant amount by weight of the total self-haul stream, perhaps as much as 40 percent.

In summary, with regard to the findings, many "typical" self-haulers are either not aware of the options available to them, or choose a facility on factors other than the cost of delivery or the tip fee. As an example, a construction contractor located in Oakland has a job in Dublin; instead of disposing of materials at Vasco Road, which is much closer to the job site and offers lower tipping fees, that contractor delivers the materials to Davis Street. In this instance, the contractor may know of Vasco Road and simply choose to pay a higher tipping fee to avoid additional driving. Alternatively, the self-hauler may not be aware of Vasco Road and may go to Davis Street from habit. For most commercial self-haulers that conduct business at these facilities, tipping fees are a very small portion of their overall costs.

Finding 4 further substantiates the other evidence suggesting that self-haulers are not particularly motivated by pricing signals due to the relatively small portion of their overall costs that represent their disposal expenses. However, this finding also suggests that large volume generators are attuned to the disposal market because of the associated costs with high volume disposal and can potentially be influenced by pricing strategies.

Additional observations about contractors and self-haulers are noted below:

- For larger volume demolition contractors, the cost of disposal is a very significant portion of the total cost of demolition projects.
- Individual contractors make decisions about sorting and where to take debris based on a variety of factors and depending on each particular job. The only constants for sorting and recycling appear to be concrete, asphalt, and metals.
- Pricing affects all decisions regarding how contractors bid and operate. This includes not only disposal fees, but trucking time and distances and schedule requirements. Anecdotally, savvy demolition contractors take lighter material to the Davis Street Transfer Station (which charge by weight) and heavier materials to the Redwood Landfill in Marin County (which charges by volume).
- State law provides an inexpensive alternative to composting, recycling, and reuse of demolition materials through use as alternative daily cover (ADC) and alternative intermediate cover (AIC). State law defines beneficial reuse as diversion rather than disposal. Since it is considered diversion, fees do not apply and thus it is an inexpensive alternative.
- Demolition contractors are more aware of, and likely to use reuse and recycling options than are new construction contractors.

Conclusions and Recommendations

In broad terms, self-haulers of both green waste and C&D debris include many small facility users that pay the posted gate rates, and a small number of entities that pay lower, privately negotiated rates. Thus, pricing strategies may be effective in incentivizing large volume generators to recycle rather than dispose of their materials, but this strategy will be largely ineffective for controlling smaller volume tonnage from self-haulers that do not pay privately

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negotiated rates. Thus, to effectively reach a large segment of the self-haul sector, member agency and Agency tools for directing self-haul tonnage away from disposal should include use of contractual requirements for recycling, ordinances that require waste management plans and use of designated recycling and processing facilities, and material bans.

As noted above, the manner of reporting data changed in January 2006 to provide for separate reporting of green waste (used as ADC, AIC, and other beneficial uses) and C&D debris disposal. We recommend that once the 2008 Waste Characterization Study (Study) is complete, the Agency use this type of correlation analysis to review more recent data reflecting a full year or more of the three streams in coordination with the results from the Study.

5.3 REGIONAL FRANCHISING OPTIONS

Regional or joint franchising is an approach that can be applied to collection, transfer, processing and/or disposal. As used here, the term refers to two or more member agencies jointly contracting for services. The following pages provide several examples of regional franchising in the Bay Area, discuss key issues for regional franchising, and discuss the related use of the ability to direct materials to achieve many of the same results.

Bay Area Regional Solid Waste Franchising Agencies

There are a number of solid waste management and diversion joint powers authorities in the Bay Area that use regional franchising. Following are some examples:

- The West Contra Costa Integrated Waste Management Authority contracts jointly with Republic for processing, transfer, and disposal for a group of cities. The cities contract for collection individually with several companies.
- The Central Contra Costa County Waste Management Authority (CCCSWA) jointly contracts for collection, processing, transfer, and disposal. Regional franchising consists of three contracts, one with Allied for collection, transfer, processing, and disposal of solid waste and yard debris, one with Waste Management for collection and processing of recyclable materials, and one with Pacific Rim for recyclables processing. One group of cities uses Waste Management for recyclables processing and one group uses Pacific Rim, based on relative proximity. The CCCSWA uses a permitting system for commercial recycling, with Waste Management as the recycler of last resort.
- The South Bayside Waste Management Authority (SBWMA) is a group of San Mateo County cities that contract jointly for collection, processing, transfer, and disposal of solid waste, recyclable materials and organic materials. The SBWMA financed a transfer station developed and owned by BFI. The SBWMA purchased the facility and contracts for its operation separately from collection services. The SBWMA has a third contract (with BFI) for disposal at the Ox Mountain Landfill.

Key Issues for Regional Franchising

COLLECTION FRANCHISING

The decision to enter into regional franchising is generally based on recognition by two or more jurisdictions of a joint interest that can best be served by contracting together for services. Often that joint interest is the need or desire to finance a facility and to achieve economies of scale with multiple users. Facility development was the motivating force for two of the three Bay Area agencies noted above, and the Joint Refuse Rate Review Committee (JRRRC) was founded by a group of Alameda County cities to provide bonding for Waste Management of Alameda County's (WMAC, formerly Oakland Scavenger's) Davis Street Recycling and Transfer Station. The cities already used Oakland Scavenger for collection and as the local landfills surrounding the Bay began to close, needed to develop a facility for transfer of solid waste to the Altamont Landfill. The JRRRC continued for a number of years, primarily through conducting joint rate reviews for the member cities but has since been dissolved.

Regional franchising of collection service is almost always coupled with joint facility use, and much of the cost savings comes with guaranteed delivery of relatively large volumes of material for transfer, processing, and/or disposal. However, there is a relatively competitive marketplace for collection services in the Bay Area, with a number of regional and local companies, and consortiums in addition to the three major multi-nationals. It has been argued that an ongoing process of competitive procurement by individual cities is the best way to maintain that competitive environment and the reduced costs that come with it.

The most difficult aspect of initiating joint franchising for collection would be arranging for current contract dates to terminate at the same time. Even with interest in doing so, it might be necessary for interested parties to wait through one or two cycles of contracting (often seven to ten years each) to arrange for joint franchising in a manner that would not disadvantage any of the jurisdictions. Any jurisdiction ending its contract earlier than otherwise planned may incur added costs, especially if equipment is not fully depreciated or is depreciated rapidly in order to speed the termination of a contract. As shown in Figure 2-3 of Section 2, there is wide variation in the end dates for current member agency contracts.

Regional collection franchising also requires extensive coordination, and recording and reporting of data on an individual as well as joint basis. While programs may be quite similar, each jurisdiction has differences in how services are defined and delivered. In addition, there may be economies of scale related to having collection routes that cross jurisdictional lines, but there is also the need to keep data separate for each agency. A key requirement for successful joint franchising is clear and shared expectations regarding the level of service and cost. In general, there will be much more variation among jurisdictions for collection services than for facility services. Regional franchising, in particular for collection, requires a clear and credible process for allocating costs between the member agencies. Depending on the degree of uniformity of approach, the development and implementation of mandatory collection programs, as addressed in Section 4, may add to the challenges of inter-agency coordination.

*Program Assessment "5-Year Audit"***FACILITY FRANCHISING AND THE ABILITY TO DIRECT FLOW**

Regional franchising for transfer, coupled with either processing or disposal, could be a useful tool for member agencies in working to reach higher levels of diversion as cost-effectively as possible. Having the ability to direct materials is generally necessary for entering into regional franchising during an existing contract. However, in some cases the ability to direct could be sufficient by itself. At present, based on the member agency survey conducted for the Assessment:

- 13 member agencies have the contractual ability to direct organic materials for processing.
- 14 member agencies have the contractual ability to direct recyclable materials for processing.
- 14 member agencies have the contractual ability to direct solid waste for disposal.

The following are several examples, not necessarily mutually exclusive of how these tools could be used by the member agencies and Agency:

- If the Agency is successful in developing a composting facility to manage the full spectrum of organic materials now collected through member agency programs, member agencies with the ability to direct organic materials will quickly be able to utilize the facility, realizing potential cost savings with use of a closer facility as well as lower per-unit costs as more member agencies participate.
- The ability of many member agencies to redirect solid waste for disposal or to use regional franchising could be a valuable means to leverage the development of material bans at landfills in lieu of having multi-county agreements for regional bans. The threat of redirection of solid waste to facilities that will voluntarily comply with a ban on a specific material could be a powerful inducement for voluntary compliance with bans at a number of facilities. Redirecting the flow of material could result in rate increases, depending on the differentials in tip fees and transport costs.
- As discussed in Sections 4 and 8, increased collection and reporting of data will be important for implementing and monitoring mandatory programs, and for other aspects of reaching higher levels of diversion. Processing residue is a key example of this, since the true diversion for a recycling or organics program should be measured net of the disposal residue left after processing of materials. The results of the member agency survey conducted for the Assessment indicate that most member agencies do not receive data regarding processing residue. Ability to get accurate data regarding processing residue will be enhanced through direct contracting for these services, rather than in combination with collection or through regional franchising.
- Should the Agency be unable to develop a closer and more attractive alternative, regional franchising of organics transfer and processing could be used to deliver high volumes of material to one or more out-of-county facilities, with potential cost savings for participating member agencies.
- The availability of Bay Area disposal capacity is tightening and there is no expectation that new landfills will be built in the core Bay Area counties. Member agencies could

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consider using regional franchising to negotiate for long-term, affordable disposal capacity.

5.4 FOOD SCRAPS PROCESSING FACILITIES

The following pages address the siting and municipal use of four food scrap processing facilities in southern California, Washington state, and Canada.³⁹ The goal of the review is to better understand which tends to be developed first: municipal programs or facilities; the relative remoteness of processing facilities from municipalities using them; and, the relative role of competition from disposal facilities. The four facilities all process yard debris and food scraps delivered from municipal collection programs.

Southern California Facilities

California Bio-Mass, Inc., founded in 1990, operates composting facilities in Victorville and Thermal. The Victorville facility began operating in the early 1990's prior to development of most municipal yard debris programs, and the Thermal facility began operating in 2000 prior to the addition of food scraps to most municipal collection programs. Both facilities were sited and permitted prior to the development of more rigorous state permitting requirements, and are located in the relatively sparsely populated high desert to the north of Los Angeles. Distances from municipalities using each facility range from 6 to 39 miles and transfer stations and landfills in this area of southern California are also often located at some distance. Fees at both facilities are \$28.00 per ton for most materials, with reduced fees for high volume users.

VICTOR VALLEY REGIONAL COMPOSTING FACILITY – VICTORVILLE, CALIFORNIA

The Victorville facility accepts plant debris, food scraps, wood, and drywall for processing. Material is delivered from the Cities of Adelanto, Apple Valley, Barstow, Hesperia, and Victorville. The facility processes an average of 300 tons per day. The facility uses open windrows and receiving is not done under cover. The facility is not located near residential areas and has not received complaints of odor or noise. Figure 5-2 provides the populations and distances from the facility for the key municipal users of the facility.

Figure 5-2 Distance of California Biomass' Victorville Facility from Municipal Users

City	Population	Distance in Miles
Adelanto	23,419	7
Apple Valley	71,985	12
Barstow	35,433	38
Hesperia	84,500	20
Victorville	102,538	8

³⁹ The Washington and Canadian case studies, including Figures 5-4 and 5-5, are drawn from research and material developed by Skumatz Economic Research Associates, Inc. The text contains brief summaries of the four facilities; additional information has been provided to Agency staff under separate cover.

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CALIFORNIA BIO-MASS – THERMAL, CALIFORNIA

The Thermal facility accepts plant debris, food scraps, wood, drywall, manure, and liquids for processing. Unlike the Victorville facility, the Thermal facility does not accept loads of C&D debris. Material is delivered from various areas of Riverside and San Bernardino counties, and specifically the high desert cities. The facility receives an average of 100-150 tons per day and employs an open air, windrow system. Materials are received in the open rather than using a building.

The facility is not located near residential areas and has not received complaints of odor or noise. The facility uses misting systems and organic odor neutralizers for odor control. When the facility first opened, it did not accept food scraps. With increased municipal demand for food scrap recycling from multiple jurisdictions, the facility began accepting the stream. Figure 5-3 provides the populations and distances from the facility for the key municipal users of the facility.

Figure 5-3 Distance of California Biomass' Thermal Facility from Municipal Users

City	Population	Distance in Miles
Cathedral City	53,281	30
Coachella	38,486	6
Desert Hot Springs	16,582	39
Indio	59,100	10
La Quinta	41,416	13
Palm Desert	42,350	21
Palm Springs	45,731	35

Washington State Facility

The Cedar Grove Composting Facility is a privately-owned and operated facility located in Maple Valley, Washington, to the southeast of metropolitan Seattle in unincorporated King County. The facility site includes a landfill. The composting facility accepts food scraps (including food soiled paper), leaf, and plant debris. Cedar Grove began composting plant debris in 1989 with windrows; processing has evolved to a Gore cover system using positive aeration and computerized controls and monitoring. The total process takes slightly over eight weeks. The facility can process about 650 tons per day of raw materials.

The facility is used by a variety of municipalities in the Puget Sound region, and its development was encouraged by public agencies interested in the provision of composting capacity. Figure 5-4 lists the larger cities in King and Snohomish counties and their populations that have residential food scrap collection programs and that deliver material to Cedar Grove. The average distance to the facility for the cities shown in Figure 5-4 is about 20 miles.

Figure 5-4 Distance of Cedar Grove Composting Facility from Municipal Users

City	Distance to Facility	Population
Bellevue	18	119,678
Bothell	30	30,150
Issaquah	8	11,121
Kirkland	24	45,054
Redmond	26	45,256
Sammamish	16	34,104
Seattle	24	563,374

The Cedar Grove Composting facility contracts directly with Seattle. For the other cities, Cedar Grove contracts with the service providers delivering material. In Seattle, yard waste and organics collection are optional. The service requires a one-year minimum commitment and households are billed \$5.00 per month. A 96-gallon wheeled cart is provided.

Cedar Grove began waste management operations in 1938, and yard and leaf composting in 1989. It is located in an unincorporated, industrial-zoned area of King County surrounded by residential developments. Cedar Grove began operations with an open windrow system but converted to a Gore cover system that includes forced aeration after a period of odor complaints and a class action lawsuit. Material is now received under cover and grinding and screening are done in the open air. Curing is covered and under negative aeration. In 2002, Cedar Grove and King County began a pilot residential food collection program. The original program collected food waste from 1,700 households in four communities and lasted for two years. The pilot was a success and the program was expanded to include the cities listed above, among others.

There are no other composting facilities located in King County. However, there are three other composting facilities located to the north in Snohomish County. The average distance of travel for the various haulers is estimated to be slightly over 20 miles one-way. Two competing landfills are located over 200 miles away. The transfer and processing fee for organics at King County's transfer stations is \$82.50 while the gate fee for transfer and landfill disposal is \$95.00. The Cedar Grove facility tip fee is \$42.00 for plant debris and clean wood, and \$47.50 for food scraps.

Canadian Facility

Hamilton, Ontario is located northwest of Buffalo, New York and 20 miles south of Toronto on the southwest corner of Lake Ontario. In 2001, the city and its five surrounding municipalities merged to form the new City of Hamilton with a total population of about 500,000. The city is a mix of urban, suburban, and rural areas but the majority of the residents live within urban boundaries. Hamilton is an industrial center and nearly one quarter of residents are foreign born.

In 2006, the city completed the Centralized Composting Facility (CCF) to manage household organics including food scraps, leaf, and yard debris. The city has set a waste diversion goal of 65 percent for 2008, and estimates that the CCF will divert 35-40% of the total waste stream. All major city solid waste and diversion services are provided municipally or under contract. The

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CCF is located on 20 acres in the city's industrial area, and uses a Dutch three-stage aerobic, in-vessel forced air twenty-four day cycle composting process, with two phases for processing and curing. The facility is completely enclosed and air is processed through bio-filters. The facility is owned by the city and privately operated. The contractor is paid a per-ton rate that decreases as throughput increases.

The CCF can process about 200 tons per day with a peak processing capability of about 300 tons per day. During the first six months of operating experience in 2006, the CCF processed about 147 tons per day. Overall diversion from 2005 to 2006 increased from 30 percent to 40 percent with 975 tons of organics collected in 2005 and 25,144 tons collected in 2006.

The CCF was developed using a siting process with public input. The site selection process began in 2003 and after selecting several city-owned sites, a short list of sites was identified that met the specifications. This short list was subjected to public consultation and the final site was chosen. The selected site is adjacent to the city MRF. The City seeks to make the site aesthetically pleasing and odor control was a major consideration during the operational design of the facility. The facility uses computerized odor management and dust is minimized by screening the compost in an enclosed area. Figure 5-5 shows the six cities that joined to form Hamilton and their relative distances to the CCF.

Figure 5-5 Distance of Hamilton's Central Composting Facility from Municipal Users

City	Distance
Hamilton	6
Ancaster	11
Dundas	18
Flamborough	20
Glanbrook	14
Stoney Creek	8

Findings

With regard to the four facilities:

1. All four facilities accept material collected through municipally-sponsored programs for delivery for composting.
2. Municipalities contract directly with the facilities or direct private haulers to use them.
3. Three of the four facilities are privately-owned, and one is municipally-owned.
4. The three private facilities are relatively remote from populated areas, and two of them were built over 15 years ago.
5. The one public facility is built in an industrial area adjacent to other existing solid waste management facilities and uses an enclosed composting system. Municipal users range in distance from approximately six to 40 miles from the facilities.
6. Of the three private facilities, the two California facilities were built in anticipation of (but prior to) implementation of municipal organics programs, and the Washington state

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facility was developed as municipal organics programs first came on line and with the support of public agencies interested in capacity development.

7. The public facility was built as part of a larger planning process and developed in concert with municipal collection programs.

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SECTION 6: DIVERSION SERVICE ISSUES

6.1 OVERVIEW

Section 6 addresses a range of issues that together fit within the broad context of maximizing diversion. The section begins with:

- "6.2 Residential and Commercial Rate Structures and Diversion Behavior." This discussion addresses the relationship of rate structure and diversion. To what extent to which residential and commercial generators respond to rates as a price signal?
- "6.3 Private Sector Diversion Activity." The material provides research and evaluation of general trends in private sector recycling, composting and waste prevention activity, identifying perceived "gaps" or areas in which public sector action might effectively increase levels of diversion through governmental action. The discussion focuses on construction and demolition (C&D) debris management practices and market trends for specific materials.

This section then addresses a structural question: four issues related, primarily for the commercial sector. The first topic is:

- "6.4 Non-Exclusive Solid Waste Collection." With the exception of Berkeley, all member agencies have exclusive commercial solid waste collection. What are the key advantages and disadvantages of non-exclusive solid waste collection and does this approach have a positive impact for commercial recycling and organics collection programs? What are the advantages and disadvantages of non-exclusive service for commercial recycling and organics?

The three remaining topics are related to varying degrees and involve options for maximizing program effectiveness while striving for high diversion. These topics are treated together in Section 6.5 Additional Options for High Diversion:

- Wet/Dry Collection and Processing. There are a range of possible options for collecting and processing various combinations of wet and dry materials. What does this technique have to offer member agencies with regard to residential and/or commercial programs?
- Every-Other-Week Collection of Solid Waste. Addresses the question of whether, and under what circumstances it may be feasible for member agencies to consider reducing the frequency of collection of solid waste.
- Recovery of Last Resort. What are the best means for ensuring the recovery of materials that are not otherwise captured through member agency programs?

All members of the consulting team contributed to Section 6. In particular, Kies Strategies conducted the interviews for Section 6.3 Private Sector Diversion Activity, and Skumatz Economic Research Associates and Environmental Planning Consultants developed material used in Section 6.5 Additional Options for High Diversion.

6.2 RESIDENTIAL AND COMMERCIAL RATE STRUCTURES AND DIVERSION BEHAVIOR

Analysis

The consulting team collected the single-family residential and commercial rates (current as of July 1, 2007) and the 2006 residential and commercial solid waste tonnages for each member agency. Based on the information in the Section 2 Tables 2-14 through 2-17:

- Nine member agencies have regressive residential rate structures, for which the rate multiplier for 90-96 gallon containers is less than three times the 30-35 gallon rate.
- Two member agencies have uniform residential rate structures, for which the rate multiplier for 90-96 gallon containers is three times the 30-35 gallon rate.
- Five member agencies have progressive residential rate structures, for which the rate multiplier for 90-96 gallon containers is more than three times the 30-35 gallon rate.
- Nine member agencies have regressive commercial rate structures, for which the rate multiplier for 3 cubic yards of service is less than three times the 1 cubic yard rate.⁴⁰
- Four member agencies have uniform commercial rate structures, for which the rate multiplier for 3 cubic yards of service is three times the 1 cubic yard rate).
- Three member agencies have progressive commercial rate structures, for which the rate multiplier for 3 cubic yards of service is more than three times the 1 cubic yard rate.

HF&H then analyzed the following variables in an effort to understand the relationship between rate structuring (regressive, uniform, or progressive) and diversion activity:⁴¹

1. Effect of the single-family residential rate structure on reducing per capita residential disposal.
2. Effect of commercial rate structuring on reducing per business commercial disposal.
3. Effect of commercial rate structuring on reducing commercial disposal per million dollars of taxable sales.

⁴⁰ Commercial service levels address both container size and frequency of collection. The term "regressive" is used from the perspective of customers that need a total volume of service per week, e.g. whether one cubic yard collected three times per-week or three cubic yards collected one time per-week. From a cost of service perspective, we note that collecting a larger volume once per week is much less expensive than collecting smaller volumes multiple times per week.

⁴¹ To identify each of these effects, the rate multipliers for each of the member agencies were plotted on a graph against the member agencies' per capita residential disposal; per business commercial disposal; and commercial disposal per million dollars of taxable sales. Once the points were plotted on the graph, a trend line and formula (using a $y=mx+b$ formula) were inserted to determine the level of correlation (slope of the line) between the rate structure and the resulting disposal measurement. Slopes (m values) with an absolute value of one or greater are typically considered significant, while slopes with an absolute value of less than one are considered inconclusive.

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Because there are certain weaknesses associated with each of the commercial analyses performed (e.g. some cities may have a large number of small businesses, some businesses may have high taxable sales but low waste generation, etc) it was determined that both commercial analyses should be performed to verify results.

Findings

RESIDENTIAL RATES

Increasingly progressive single-family residential rates have a very weak correlation with reducing per capita residential disposal. Member agency diversion programs are relatively mature and customers are generally accustomed to either separating materials for diversion, or not participating for whatever reason. As such, residential customers generally subscribe to the level of service that they have always subscribed to and rarely adjust container sizes, other than for exogenous factors such as a new service provider, new programs, or a move to a new residence. Residents typically only change service levels when reminded of the opportunity by their city or collection company. Additionally, customers may not pay much attention to their refuse bill when they are also paying energy, cable, telephone, and water bills, each of which may be substantially higher than the refuse bill.

COMMERCIAL RATES

Increasingly progressive commercial rates have a strong correlation to reducing both per-business and per-taxable sales disposal. Many Alameda County businesses do not have mandatory provision of service with universal roll-out of containers as residential customers do. Businesses must make a decision to recycle. As the cost of service increases with generation, large generators may look for opportunities to reduce the cost and, as a result, reduce generation. This correlation may be further compounded by the general policy in Alameda County jurisdictions of providing steeply discounted commercial recycling rates. Despite this strong correlation, as noted later in Section 6 with regard to the experiences of StopWaste Partnership in assisting larger businesses, the relative price signal is still small compared to other costs and some of the Partnership's clients and potential clients fail to make specific decisions to divert materials or prevent waste generation due to a lack of price motivation.

Conclusion

Residential customers do not appear to be swayed by an increasingly steep rate structure. Residential customers are likely to recycle more from an environmental belief or ethic than for financial reasons. Steeper residential rate structures can also have unintended consequences such as providing an incentive to customers to subscribe to a smaller level of solid waste service than they need, and then contaminating the recycling and/or organics streams with the extra disposal material.

Commercial customers do appear to be influenced by the pricing strategies used in uniform and progressive rate structures. As such, it may be advantageous to make use of such rate structures, to the extent feasible, and to discount recycling and organics services. Once this infrastructure is in place, as it already is for most member agencies, these programs should be advertised frequently in terms of businesses experiencing unnecessary additional costs that can be avoided by recycling.

6.3 PRIVATE SECTOR DIVERSION ACTIVITY

The objective of this task of the Assessment is to research and evaluate general levels and trends in private sector recycling, composting and waste prevention activity, identifying any perceived "gaps" or areas in which municipal or county agencies might effectively increase levels of diversion through governmental action. The task focused in particular on construction and demolition (C&D) debris management practices since these materials continue to represent a significant proportion of the remaining disposal stream, as well as market trends for a broad range of recoverable materials.

Delyn Kies of Kies Strategies, a member of the consulting team, conducted interviews on selected topics with contacts suggested by Agency staff.⁴² The goal was to interview individuals knowledgeable with current and likely future Bay Area, California, and Pacific Rim trends for each of the diversion materials identified below. A more detailed version of this material has been separately provided to Agency staff.

The following material summarizes the highlights and key points for each interview, supplemented with additional, current and readily available research. In addition, the subsection reflects experiences of the StopWaste Partnership staff and consulting technical assistance team in working with businesses, recyclable material collectors and processors and member agencies.

Construction and Demolition Debris Recycling and Reuse

Sources were asked the following questions regarding construction and demolition debris (C&D debris):

1. What are the trends in your business/industry that are helping or hindering reuse and recycling of C&D debris?
2. What current activities or actions by StopWaste.Org or other agencies in Alameda County are providing helpful incentives or programs?
3. What government actions currently in-place present barriers, or are otherwise not helpful in your marketplace?
4. Based on these trends, do you have suggestions for actions that StopWaste.Org, or other County agencies, could take?

FINDINGS

Key findings include:

- The decision-making process is the same for all contractors, e.g. doing what is the most cost-effective for each job. But the resulting decisions about whether or not to sort and where to take material are not uniform. Thus any financial incentive, such as rebates or lower tip fees will not necessarily result in the material going to a recycling facility.

⁴² Appendix D provides a list of the individuals and organizations interviewed for the discussion in Section 6.3 Private Sector Diversion Activity.

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However, regulatory requirements (i.e., ordinances requiring recycling plans and/or delivery of debris to authorized recycling facilities) will result in recycling since it becomes a level playing field for all contractors, and is no longer a pricing variable.

- Effective local government actions have included compilation and distribution of the comprehensive Recycling Guide and the availability of grants and low-interest loans.
- Suggested local government actions to support and increase recycling and reuse include:
 - Continued availability of grant funding and low-interest loans.
 - Assistance in local permitting and land-use issues to support siting and purchasing property for salvage, reuse, recycling and resale businesses.
 - Commitment to purchase and use recycled-content products.
 - Establish and enforce C&D debris ordinances that require waste management plans and use of authorized recycling facilities for mixed debris loads.

Market Trends

The following are summary observations by material type or end-use.

C&D DEBRIS/WOOD/COMPOST

- Metals: The market will remain strong as long as China's demand stays high.
- Gypsum: The agricultural market continues to look strong as long as the material competes with mined materials, since new mines are not being developed.
- Roadbase: More projects are recycling on-site. Local governments need to buy recycled roadbase.
- Wood: The market remains steady, but opportunities for treated wood are declining.
- Dirt: Prices are increasing substantially for storage of dirt for later use, due primarily to shortage of land. If prices for storage exceed those for disposal, there will likely be a substantial increase in the amount of dirt sent for disposal.
- Plastics: The market is steady, particularly as oil and gas prices increase.
- Compost: The market is continuing steady, but is not as strong. A key need for growth in this market is to eliminate the use of potentially compostable materials for beneficial reuse at landfills. A ban on disposal of organics would support market development and pricing.
- Co-generation: A steady market with no foreseen problems.

METALS

The metals market has been unpredictable yet sustaining for 160 years. High demand is currently exceeding supply world-wide, resulting in better pricing and more recycling.

PAPER

With regard to the paper market:

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- Production is up, consumption is up, and recovery of paper is up but not enough to meet demand.
- One-third of easily recovered paper produced is not collected or recycled.
- Domestic mills are closing, leaving export of collected material as the primary market.

PLASTICS

With regard to the plastics market:

- Domestic PET and HDPE bottle reclamation capacity continues to exceed supply and export demand is strong.
- For domestic recycled PET end uses:
 - Polyester fiber, carpet and strapping demand are strong.
 - There is little growth in beverage bottles demand.
 - Sheet applications are growing due to sustainable packaging issues and enforcement of content laws.
- For domestic recycled HDPE end uses:
 - N-HDPE – Primarily used in bottle applications.
 - C-HDPE – Pipe & other profile extrusions remain a strong end-use market.
- Domestic plastic film demand exceeds supply:
 - The logistics of collection remains the main obstacle.
 - The primary domestic end market for commercial scrap plastic film is composite lumber. Demand had been growing rapidly, but with the current downturn in the housing market, there is reduced demand.
- Export to Asia is the current best market option for mixed resin bales; prices are at a historic high. However, it is risky to rely solely on the export market for the longer-term.
- There is no demand for very small or non-container items like straws, lids, and cutlery.

BEVERAGE CONTAINER RECYCLING

- The California Department of Conservation (DOC) is encouraging development of products made from recycled beverage containers.
- Markets for recycled beverage container materials in California are dynamic, complex and influenced by:
 - The interactions between recycling rates in California and elsewhere;
 - National and global commodity production and prices;
 - Domestic and international transportation costs;
 - Local government permitting and siting issues;

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- The California business climate; and
- Consumer consumption patterns.
- The State is addressing product stewardship and recycling sustainability as well as the following material-specific market trends and opportunities:

Aluminum

- Aluminum sales and recycling have declined significantly over the last several years.
- The key market issue for aluminum is increasing the supply of recycled aluminum.
- Solutions include identifying creative initiatives to:
 - Increase the volume of aluminum recycled at buy-back centers.
 - "Mine" trash cans and landfills for the millions of aluminum cans that have been disposed.

Glass

- Single stream recycling has resulted in a sharp deterioration in the quality of almost one-half of the glass recycling stream in California.
- There are two areas of market development focus:
 - Finding alternatives for Southern California glass that is being shipped out-of-state by:
 - Increasing use of recycled glass by Northern California glass and fiberglass manufacturers.
 - Developing new end-use markets for glass in concrete products, as well as high-end, but low-volume products such as tiles.
 - Identifying new ways to utilize glass fines that provide an opportunity for improving recycled glass markets and avoiding disposal of glass fines by:
 - Capturing more small glass for use by the glass container and fiberglass industries.
 - Finding new, high value uses for glass fines.

PET

- California's recycled PET market continues to be strongly influenced by exports, with as much as 80 percent of the material transported to China.
- There is a projected shortfall of raw material supplies for PET reclaimers, which will be exacerbated by Chinese demand for California recycled PET.
- There are serious long-term implications for both PET and HDPE recycling due to growing use of chemical additives, differential barrier layers, and bio-resins in plastic containers that increase recycling costs and create technical challenges for recyclers, processors, and end-users.

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- Among the solutions is expanding end-use capability for clean recycled PET flake. Higher-value end-uses, such as food-grade PET flake and bottle-grade PET resins, could provide the greatest value-added.
- While California reclaimers cannot compete with China in terms of materials sorting and other lower-value end-uses, California reclaimers are able to produce higher quality material, and to deliver that material to end-users more rapidly.
- Funding by state and local governments for innovative and long-term research and development to help address the technical issues of plastic resin coding, additives, bio-resins, and multi-layer containers could be an important contribution to the future of plastic recycling in California and the nation.

HDPE

- Similar to aluminum, the key market issue for HDPE is lack of supply.
- With increased demand for recycled HDPE by China, and strong domestic demand from HDPE reclaimers in the Southeast, the available supply of recycled HDPE is insufficient. Furthermore, the lack of supply has led to inflated prices and reduced quality for bales of recycled HDPE.
- HDPE recycling activities are also threatened by the use of additives and multi-layered containers.
- The Association of Postconsumer Plastic Recyclers (APR) is working to educate recyclers and container manufacturers on the problems that result from this relatively new practice. The APR program includes:
 - Design for Recycling Guidelines
 - Critical Issues and Criteria for Testing
 - Testing Method Protocols
 - Critical Guidance Document Testing
 - Innovation Recognition Program
- Supporting R&D on plastic resin issues will be important to the long-term success of HDPE recycling.

FINDINGS

With regard to market trends and identifying gaps in service and useful public sector actions for consideration by the Agency and/or member agencies:

- Member agencies should work to increase capture rates from existing programs.
- Member agencies should establish policies for ongoing, predictable purchase of recycled products, such as roadbase.
- All member agencies should adopt and enforce C&D debris recycling ordinances.
- The Agency should continue grants and low-interest loans for technology improvements, and for research and development.

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- There is a broad need for ongoing communication between all parties of the impact of collection practices and processing operations on the quality of materials marketed to end-users. The quality of processed materials directly affects ability of end users to manufacture quality products for sale.

Experience of the StopWaste Partnership

The following are summary observations and recommendations from an August 2007 roundtable discussion between Agency and technical support staff for the StopWaste Partnership (Partnership) regarding issues that arise in providing diversion and waste prevention services to larger businesses in Alameda County.

1. Working with member agency elected officials and staff is very helpful in approaching and assisting businesses in specific jurisdictions. Member agency staff assistance is helpful in providing accurate and targeted recommendations and implementation resources to individual businesses.
2. Member agency commercial recycling and organics service provisions contained in ordinances, franchises and permits affect the potential for business diversion in the following ways:
 - a. Inconsistency of service provisions between member agencies makes diversion planning more complex for firms operating at multiple locations in Alameda County.
 - b. Access to free or low cost recycling collection services, whether through the franchise (and paid for in the solid waste rates) or the open market, make it easier for businesses to increase diversion.
 - c. The inability of businesses to obtain customized services such as added pickups or collection within facilities, or to do so in a timely manner, makes it more difficult to implement programs at client businesses. In practice, this is particularly true for member agencies with exclusive service providers.
3. Member agencies and the businesses community should become more active in ensuring that member agency commercial recycling and organics service agreements more fully address the needs of the commercial sector.
4. Mandatory commercial programs and disposal bans will not have much effect on larger businesses that already recover the materials that are likely to be included in either mandatory programs or disposal bans. Education regarding mandatory programs or disposal bans will be needed in order to reach medium and smaller generators in the business community.
5. Incorporation of waste prevention practices by individual businesses has a great potential for long-term sustainable reduction in the disposal stream, but generally requires a longer period of time for planning and implementation than is true for traditional recycling programs.
6. Waste prevention is most effective when focused on application of best practices by type of industry and function. Because of the longer implementation time to incorporate

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waste prevention practices, the focus should be on replicable practices. Excessive focus on quantifying waste prevention is not fruitful.

7. There is often inadequate information regarding recovery options for specialty materials, an area of increasing demand from many of the Partnerships' client businesses. The Agency can help facilitate the collection and flow of this information.
8. Inquires to the Partnership regarding supply chain and packaging issues have increased significantly in recent months, as have referrals from the Bay Area Green Business Program. This increased interest often stems from "greening" efforts, the new Wal-Mart packaging requirements, and the Partnership's Use Recyclables Campaign, as much as from cost considerations. Larger businesses are also interested in receiving public acknowledgment for their efforts.

6.4 NON-EXCLUSIVE SOLID WASTE COLLECTION

Overview

The discussion below addresses the following two questions. First, what in general are the advantages and disadvantages of non-exclusive solid waste collection compared to exclusive solid waste collection? Second, what are the specific advantages and disadvantages of non-exclusive solid waste collection compared to exclusive solid waste collection with regard to providing commercial recycling and/or organic materials collection opportunities for generators?

With two exceptions, all member agencies have exclusive commercial solid waste and C&D debris collection in which one service provider collects all materials as part of its franchise with the member agency. The exceptions are Berkeley and Dublin. Berkeley provides municipal commercial solid waste and organics collection and debris box solid waste and recycling services. Berkeley provides dry rubbish and commercial recycling collection within a non-exclusive, franchised system with six private service providers. Dublin has a non-exclusive system for C&D debris collection and transport.

Non-exclusive collection is defined here as two or more entities providing collection services, either through franchises or other contracts, a permit system, or unregulated open competition. In practice, a non-exclusive solid waste collection system would presumably also provide for non-exclusive diversion services, while an exclusive solid waste collection system could provide for exclusive, non-exclusive franchised, or open market diversion services.

As reported by member agency staff through the survey process discussed in Section 2:

- Nine member agencies provide commercial recycling on a non-exclusive or open market basis.
- Seven member agencies provide commercial recycling service on an exclusive (or relatively exclusive) basis.
- Eight member agencies provide commercial organic materials service on a non-exclusive or open market basis.

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- Eight member agencies provide exclusive commercial organic materials service.

As provided by state law, any generator may sell or donate materials, regardless of franchise provisions.

Key Issues

The following are key issues to consider for exclusive and non-exclusive commercial solid waste collection, relating to trade-offs in costs and rates, availability and quality of service, administrative complexity and environmental factors.

COST OF SERVICE AND RATES

- Exclusive collection provides service providers with relatively predictable revenue, reducing their risks. Reduced risk should reduce the overall cost of franchise services.
- Exclusive collection for a set period of time provides a basis for financing of capital improvements.
- Exclusive collection may provide relatively lower rates for residential services since commercial rates typically subsidize residential rates.
- Non-exclusive collection provides competition for service and potentially lower rates for commercial customers. Rates in a non-exclusive system can be completely unregulated or partially regulated. However, if rates are unregulated, larger customers may be offered relatively lower unit rates than smaller customers, leading to rate inequity. Thus, non-exclusive systems may have minimum rates, maximum rates, or use a "band" with specified minimum and maximum rates. Stockton, for instance has two non-exclusive franchised commercial solid waste collectors with set maximum rates, and the two companies compete by providing lower rates and/or better service.
- A completely unregulated market may result in relatively high rates for heavy putrescible bins (such as from restaurants), or in refusal to provide service. The city of Sacramento formerly provided commercial solid waste collection in competition with private service providers required to charge no more than maximum rates. The city found itself having to provide putrescibles service because the private service providers "cherry-picked" the economically attractive accounts.

AVAILABILITY AND QUALITY OF SERVICE

- Commercial recycling provided through an exclusive system should be designed to meet customers and community needs, by at a minimum:
 - Limiting exclusivity to a specified set of "traditional recyclables".
 - Allowing generators to select third party service providers for collection of specialty materials.
 - Fostering limited competition, such as allowing exclusive service for single-stream recycling, but non-exclusive for source separated materials.
- Non-exclusive solid waste collection may automatically result in service provider offers of better service to generators due to competition. Jurisdiction can also ensure good

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service through exclusive solid waste service using strong contract provisions, such as requiring maintenance of minimum inventories of containers and stipulating maximum time for delivery of requested containers. But ensuring that these standards are met in an exclusive system will require relatively more contract enforcement.

- Non-exclusive commercial diversion services collection may also result in better service due to competition, including specialized services like pickup of materials by floor or at the point of generation, and document destruction. These types of ancillary diversion services are relatively customer-specific and difficult to stipulate in an exclusive contract.
- Non-exclusive collection programs make the most sense in denser areas near major transit arteries in which a relatively large number of collectors provides a competitive environment.
- Service providers that own landfills and provide exclusive commercial services may favor disposal over diversion at a regional or corporate level, even if staff at the local level have agreed to connect compensation with diversion.

PROGRAM ADMINISTRATION

- Administrative aspects of data collection, reporting and tracking, and the comparability of the resulting data are generally simpler for exclusive systems since there is only one service provider. Likewise, these activities are relatively simpler for non-exclusive franchise systems than for permit systems since a contract can provide much more specificity, and hence control than a permit.
- Compliance with a requirement for mandatory provision of service (see discussions in Sections 4 and 8) will be simpler to administer through an exclusive system since recycling and organics service can be offered as part of a package with solid waste collection.
- With an exclusive system the collector can be contractually required to provide service to any generator requesting it (known as recycler of last resort), ensuring that no generator goes without service. This issue can also be addressed in a non-exclusive system but compliance will be more difficult to enforce.
- Ordinances requiring mandatory use by generators of commercial recycling or organic materials collection services (see Section 4) will be simpler to administer through an exclusive system, or a non-exclusive franchise system. However, with non-exclusive systems, it will be necessary to monitor multiple service providers, and possibly also require that individual generators prepare and comply with diversion plans since they may be purchasing diversion services separately from solid waste collection.
- Municipal staff frustration with either exclusive or non-exclusive systems often stems from excessive expectations for service providers. For instance, staff may request that a company provide additional diversion-related services without any increase in compensation, assuming that the revenues from additional collected materials will cover any additional costs, but this may not be the case.

ENVIRONMENTAL

Exclusive systems result in fewer vehicles on the street and fewer total vehicle miles.

Findings and Recommendations

Based on the above list of trade-offs, we have the following findings and recommendations:

1. Each approach has its advantages and disadvantages, and neither appears clearly superior to the other. It often seems that whichever system a city has, it wants to try a different approach. Communities with exclusive collection often come to believe that non-exclusive collection will solve the problems of trying to get the franchised service provider to provide the desired level of service. Conversely, San Jose has had a non-exclusive commercial franchise recycling system for a number of years and is now considering making it at least partially exclusive.
2. It is difficult to test the prior conclusion since there are few cases of cities going from one system to the other. To the extent there are, the results will be anecdotal and likely say more about the specific circumstances than about the two concepts.
3. While much attention is paid to whether exclusive or non-exclusive collection of recoverable materials is preferable, diversion results are not likely to be inherently better with one system or the other. In our experience diversion program performance is largely a function of several related factors:
 - a. The corporate attitude of the given service provider.
 - b. The attitude of the local manager.
 - c. The degree to which the service provider and city forge a cooperative relationship after the agreement is signed.
 - d. Fair compensation for service provided.
4. Ensuring good diversion program performance requires strong ordinance, permit, and contract provisions and the ability and willingness to enforce them. Clear requirements for provision of service, reasonable compensation for service providers, consistent reporting of data by service providers, consistent monitoring of data by public agency staff, tracking commercial complaints and satisfaction in the same manner they do for residential customers, and consistent enforcement are more important than the type of system. In general, jurisdictions should include in their exclusive and non-exclusive franchises as much specificity about the services expected for commercial customers as are specified for residential customers.

6.5 ADDITIONAL OPTIONS FOR HIGH DIVERSION

The following three topics are related and involve different ways of thinking about collection and processing in the context of high diversion. Wet/dry collection and processing is a further extension of the step taken by most member agencies in establishing residential and commercial food scraps programs. These programs seek to shift food scraps and related materials from garbage collection and disposal, to compostable materials collection and processing. If a member agency is successful in encouraging residents and/or businesses to shift the

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putrescibles from the disposal to the compostable stream, the result could be either continuation of a three-stream system or a wet/dry system in which the remaining dry material still being collected as "garbage" is placed in the recycling container. Should member agencies utilize a wet/dry, or two-stream system?

With regard to every-other-week collection of solid waste, since food scraps are removed from the garbage stream, then the disposal stream does not need be collected weekly due to health and safety concerns. This concept generally assumes that communities continue with collection of three streams. As discussed below, there are trade-offs in retaining three streams versus switching to just two streams. Recovery of last resort addresses how to maximize recovery of all remaining, potentially recoverable materials, whether a community continues with three-stream collection or switches to two-stream collection,

SERA and Environmental Planning Consultants developed material used in the following discussion.

Findings and recommendations are presented together for the three topics.

Wet/Dry Collection and Processing

OVERVIEW

The term "wet/dry" refers to various ways of segregating the wet and dry fractions of discarded material generated by residential, multi-family or commercial customers. Wet/dry approaches have the potential to maximize diversion in that highly recyclable materials such as paper, newspaper, and cardboard remain dry and thus recoverable. The wet (or putrescible) fraction is composed of compostable organic materials including plant trimmings, clean wood, food scraps of all kinds, coated and soiled paper products. The compostable fraction can also include dog droppings and disposable diapers if the composting process is properly operated, and these wastes are sterilized by high temperatures.

The non-compostable materials (also referred to as the dry stream) can include all other discards, such as cans, bottles, paper, plastics, textiles, household items, toys, and small scrap metal items. Larger and heavier items would continue to be collected separately in a bulky item collection program.

Fifteen member agencies have, or plan to add food scraps to the compostable materials. Wet/dry collection and processing is a further extension of food scrap collection and composting. If member agencies are successful in encouraging residents and/or businesses to shift food scraps and related materials from garbage collection and disposal to compostable materials collection and processing, a next step could be a wet/dry system in which the remaining dry material still being collected as "garbage" is instead placed in the recycling container. Does it make sense for member agencies to convert now to a wet/dry, or two-stream system?

The key advantages of the wet/dry approach include:

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- High potential recovery rate. The only materials that are disposed are the residues from processing; there is no direct disposal of unprocessed material.
- Reduced costs for collection. Collection involves just two streams, compostable materials and recyclables instead of the current three streams. Some of what would have been collected as garbage is collected with the recyclables, and the rest is collected with the compostable materials, with reduced vehicle and labor requirements, and fewer vehicle miles driven.

The key disadvantages of the wet/dry approach include:

- Limited experience. Very few communities have yet implemented a full wet/dry approach.
- Uses for the compost product. The compost product generally may be sold into the landscape and nursery markets for landscaping applications, but is not appropriate for use in food production. The product will generally be of lower-quality than that currently produced from member agency food scrap collection programs, and long-term uses are potentially more limited.
- Public education needs. Successfully adding food scraps to compostable collection while retaining the garbage cart represents an incremental step that is a significant shift in practice for customers. But a wet/dry system is a more thorough shift and requires added public education and a new understanding of discard services.

Other disadvantages include:

- Higher relative costs for processing. The higher processing costs result from having to sort recyclables from all mixed dry materials.
- Contamination of the dry stream. More contaminants must be removed from both the compostable and non-compostable fractions since some putrescible material will inevitably be placed in the dry stream.
- Glass and other breakable materials that will be hard to screen out of the finished compost.
- Problem materials. Household hazardous waste (HHW) and Universal wastes should not be disposed but often are. See further discussion below.

EXPERIENCE WITH WET/DRY COLLECTION

Very few communities have yet implemented a full wet/dry approach to collection and processing. Portola Valley and Woodside are two Bay Area communities that are using the approach, and began to do so in July 2002. Diversion rates for Portola Valley and Woodside are estimated to be 79 percent of the waste stream collected by the franchised hauler. The wet fraction equals 75 percent of the total discards collected, and 75 percent of these materials are recovered resulting in diversion equal to 56 percent of the two collected streams. Dry materials are 25 percent of total discards collected, and over 90 percent of the dry stream is recovered and marketed, representing diversion of 23 percent of the total of the two collected streams. The cost

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of service for this program is lower than the cost of service for Portola Valley and Woodside under their prior three-stream system, even though the service level is higher.

Guelph, Ontario began using a wet-dry collection system in the late 1990's, and experimented with several variants. The results of a pilot study indicated that the two stream wet-dry system achieved higher diversion than a three-stream approach. But Guelph ultimately returned to a three-stream collection program because they did not feel that it was appropriate to have residents put non-recyclable materials in the recycling containers, and did not want to receive household hazardous wastes at their MRF as part of the "recycling" stream.

COLLECTION ISSUES

As noted above, with a wet/dry system collection costs will decrease. Both categories of materials can be collected with one two-compartment truck. Generally, fewer split-body trucks are required to provide service to an equal number of homes when compared with two single compartment trucks, and many communities now use the split-body trucks for the collection of garbage and recyclables in a single pass.

However, split-body trucks have their drawbacks:

- Materials can unintentionally be dumped up in the wrong compartment.
- The two compartments do not fill at the same rate, and drivers may purposefully dump the materials into the wrong compartment to increase the number of pick-ups before driving off-route to unload.
- If the two compartments are not unloaded at the same location, there is some risk of an accident caused by the truck being heavily loaded on only one side after the first material type (garbage) has been unloaded, while the truck is on route to unload the second material type (recyclables).

Alternately, the two streams can be collected using two single-compartment vehicles. The two separate single-compartment trucks are likely to provide cleaner feedstock materials to the processors than one two-compartment vehicle. Therefore, separate collection may be preferable, even if more costly than co-collection.

MATERIAL PROCESSING AND PRODUCT

With regard to processing and recovery of specific materials collected through a wet/dry system:

- Almost no plastic bottles or aluminum cans are disposed. If they are shipped to the compost site, they are screened from the composted materials and can be returned to the recyclables processing facility for shipment with other recyclables.
- Virtually no paper is disposed. If it is not recovered as fiber for recycling, it is shipped to the composting facility and is composted.
- All plant trimmings are composted. If this material is mistakenly placed in the dry container it can be shipped from the recycling processor to the compost processor.

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Some of the materials delivered to the compost site will also be disposed of as residue. The residue is comprised of organic materials that do not decompose during the composting, such as waxed cardboard and poly-coated paperboard milk cartons, and non-compostable materials that are inadvertently sent to the compost site. Some woody materials do not break down and are screened from the final compost. These materials are returned for further composting, used as biomass, or disposed as residue.

The residue will also contain a high percentage of film plastics, and especially bags that are screened from the final compost. To insure high-quality compost, it is essential to coarse-grind rather than fine-grind the incoming compost feedstock, and to then screen out those materials that do not completely break down during the composting process.

Proper handling of HHW and other problem materials is important, but if they are put in with the dry recyclables, the recyclables can be sorted at a MRF. However, the cost to separate and properly dispose of these materials is prohibitive. Regardless of the approach, but particularly with wet/dry collection it will become increasingly important for the Agency and the member agencies to support and promote development of national and state EPR approaches as an integral part of the overall effort to reach very high levels of diversion.

The market value of the recovered materials is primarily a reflection of the quality of the processing that occurs. It is possible to sort the mix of all dry materials back out into high value commodities. However, there is a higher cost to process mixed dry materials than there is for processing source separated recyclables. The community must be committed to paying this higher cost, or the processor is not likely to produce quality feedstock for reuse.

Current single stream and multi-stream recycling collection programs are capable of producing high quality feedstock materials, but they often do not because the economic incentives are not properly delineated in the collection contract. Processing mixed dry recyclables is subject to the same considerations. There will be a higher residue rate because more non-recyclable materials are being delivered to the processing facility, but the sorted materials can be of equal quality to that of facilities that process only clean recyclables.

It is certainly possible to make a high value compost product out of the mix of compostable materials. It is important to find the appropriate market for the mixed material compost.

The key to the success of the wet-dry collection system is in having a compost facility that is permitted to accept and process the mixed organics stream (not just plant trimmings); and a MRF that can manage the large number of material types (not just fiber and containers) that comprise the dry stream.

MULTI-FAMILY AND COMMERCIAL WET/DRY COLLECTION

As with any diversion effort, the multi-family residential sector is the most difficult-to-serve, and this would certainly be no less true in terms of shifting to a wet/dry system. On the one hand, unless a wet/dry approach becomes common there will be the need for increased and ongoing communication with tenants regarding how the system works. Conversely, with a simplified system in which there are no long lists of recyclable and non-recyclable materials it may be more convenient for residents to participate.

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The wet-dry approach can be applied to commercial collection programs. Businesses can be provided with two bins; one for compostable materials and one for recyclables. The bin for compostable materials is used for items such as food scraps, food and other soiled paper (like paper plates), and paper towels from restrooms. The dry waste recyclables bin is used for all clean paper, cardboard boxes, discarded office supplies and equipment, beverage containers, and any other dry items. Businesses are asked to sort their wastes into these two categories to facilitate recovery of the maximum amount of materials. This system is used in Portola Valley and Woodside.

COMMERCIAL WET/DRY COLLECTION ROUTING

A limited commercial wet-dry system can be achieved by implementing selective routing and collection, and can be done without the knowledge or involvement of generators. To some extent, commercial collectors do this on their own in order to increase revenues from the sale of recovered materials. For this approach, bins with different materials are collected by separate front-load trucks or with the same truck after it unloads the other route material type, so that each load will have a high concentration of the target material. For example, by routing restaurants separately from retail shops, food waste does not degrade cardboard from the stores. Conversely, a compostable materials route might collect wastes only at bars and restaurants, florists, markets and food service businesses. Oakland's non-exclusive commercial organics program achieves the same result with collection concentrated along corridors that are dense in restaurants. Commercial dry waste collection routes can easily be established since over 90 percent of the wastes from most offices and many retail businesses are fiber materials. Since they generate relatively little in the way of putrescible wastes, the entire waste stream can be taken to a processing facility at which contaminants can be removed from the fiber. Berkeley's system of non-exclusive collection of dry commercial waste promotes this type of recovery. With city direction, Hayward's exclusive contractor uses selective routing to separately collect dry loads for recovery.

The keys to effective selective routing system are:

- Collecting a full truck load of a target material in a cost effective manner. This requires geographic concentration of the target accounts.
- Availability of processing capacity for each stream, and particularly of MRF capacity to so the dry fraction heavy in paper.

In Portola Valley and Woodside all commercial businesses are serviced by the wet-dry system. However, because there are so few businesses in the two communities, each material is collected on a different day in one load. If more than one load a day were required, the hauler could collect the compostable materials and deliver them to a composting facility, and then collect the recyclables.

Every-Other-Week Collection of Solid Waste

OVERVIEW

California State law states that the owner, operator and/or occupant of any house, business or other premise is responsible for the safe and sanitary storage of all solid waste accumulated at

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that location, and forbids property owners and occupants from leaving refuse on their property for more than a week for health and safety reasons.⁴³ Issues regarding this language arise periodically, most recently in the context of several private service providers operating in Alameda County and citing this language to argue that commercial customers needed to take weekly service. The issue also arises with regard to compostable material collection programs. If member agency food scrap programs are successful in removing putrescible materials from the disposal stream, can the remaining "garbage", which is dry debris, be collected on a less than every week basis?

Advantages of such an approach include:

- A higher food scrap recovery rate than for communities with food scrap programs and continued weekly garbage collection.
- Reduced collection costs.

Disadvantages include:

- Inconvenience to the generator in remembering which containers to set out when.
- To the extent that single-family and commercial refuse cart customers are served by the same routes, commercial customers may also need to have every-other-week collection. Skumatz Economic Research Associates (SERA) suggests use of stickers to denote the carts that are in the minority (whether collected every week or every other week) and use of alternately short and long routes as necessary to accommodate this type of imbalance.

The key to the success of this approach is ensuring that residents do not put putrescible wastes in containers that will not be collected weekly. Presumably, due to odor concerns, residents are likely to learn fairly quickly on their own to not do so.

This type of collection system could have two or three streams. The three-stream program would collect compostable materials (including all putrescibles, but also including yard debris and soiled paper), recyclables and rubbish. The compostable materials would be collected weekly, but the other materials could be collected less often; possibly every-other-week, twice a month, or even monthly. The three-stream system lowers the contamination of the recyclables stream by providing for the separate collection of non-recyclable materials – a key distinction from the two-stream system. The two-stream collection alternative is essentially the equivalent of the wet-dry system, except that the dry stream is collected less than weekly to further reduce collection costs.

EXPERIENCE WITH EVERY-OTHER-WEEK COLLECTION

SERA conducted a detailed review of its database of 700 communities to identify examples, trends, and results regarding options for every-other-week collection of solid waste.⁴⁴ SERA

⁴³ Sections 17311 and 17331, respectively, of Title 14 of the California Code of Regulations.

⁴⁴ Some of these results are contained in Skumatz, Lisa A., Ph.D. and Juri Freeman, "Alternating Weeks: Options and Opportunities for Garbage and Recycling", *Resource Recycling*, September 2007

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concluded that every-other-week solid waste collection is uncommon in North America and is currently available in less than one percent of surveyed communities. However, this total may be expected to increase over the next decade, with the expansion of automated collection and physical incompatibility with collection of small containers of less than 30 or 32 gallons. Every-other-week collection of a standard container can be an effective substitute for a small container collected weekly. The system is compatible with wet/dry collection options. Quantitative research indicates that decreasing the frequency of trash collection leads to higher recycling rates and decreased costs, with about nine to 15 percent increase in recycling tonnages,⁴⁵ and very significant savings -- perhaps as much as 35-percent to 40-percent -- in collection costs.⁴⁶

Concerns that every other week garbage service will lead to odor and health issues seem exaggerated; none of the cities SERA have interviewed indicated significant problems with this issue. However, communities with these systems, such as Olympia, Washington and Markham, Ontario tend to be located in colder, more northern areas.

An EPA-funded study of best practices for food scrap collection and processing is now nearing completion.⁴⁷ The study found that in the Bay Area, participation rates for food scrap programs range from 20 to 40 percent of eligible households that are eligible to participate, but that the participation rates in Toronto and the UK range from 60 to 80 percent. The authors attribute this difference to the use in Toronto and the UK of every-other-week collection for the dry or "rubbish" stream that remains once food scraps are composted. The organics or composting cart in effect becomes the "garbage" stream, with weekly collection and there is no issue of compliance with the law. One author notes that several Bay Area cities have expressed preliminary interest in conducting every-other-week pilot programs.

Recovery of Last Resort

OVERVIEW

The concept of a "recovery of last resort" program is that even in communities with very effective residential collection programs, recyclable materials are still disposed. To reduce the disposal of recyclable materials, a community could direct the collector to process all materials at a MRF. "Dirty" MRFs process garbage, particularly from residences and from commercial front-end bin collection routes. "Dusty" MRFs recover material from commercial and industrial debris boxes with a focus on selective routing of commercial loads and C&D debris. This

⁴⁵ Skumatz, Lisa A., Ph.D., "Nationwide Diversion Rate Study", Skumatz Economic Research Associates, Superior, CO 1996, and Skumatz, "Achieving 50% In California: Analysis Of Recycling, Diversion, and Cost-Effectiveness", Prepared for California Chapters of SWANA, Skumatz Economic Research Associates, Inc. Superior, CO, and Skumatz in AF&PA "Single Stream Recycling - Total Cost Analysis", prepared by Jakko Poyry and Skumatz Economic Research Associates, 2002.

⁴⁶ Skumatz, "Achieving 50% In California: Analysis Of Recycling, Diversion, and Cost-Effectiveness", Prepared for California Chapters of SWANA, Skumatz Economic Research Associates, Inc. Superior, CO, and Skumatz in AF&PA "Single Stream Recycling - Total Cost Analysis", prepared by Jakko Poyry and Skumatz Economic Research Associates, 2002.

⁴⁷ New Found Lands Institute, Next Steps to Zero Waste: Model Expanded Organics Programs and Demonstration, unpublished report funded by EPA Region 9. Telephone communication with Gary Liss, study co-author, November 8, 2007.

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approach can also provide for recovery of recyclables from multi-family residents and small businesses that may not be able to fully participate in the existing recycling programs in their community.

The Sunnyvale Materials Recovery and Transfer Station, or SMaRT Station is a dirty MRF that receives materials from Mountain View, Palo Alto and Sunnyvale, and processes materials remaining in the disposal stream after residents have source separated recyclables for separate collection. Each of the three communities using the SMaRT Station has a different curbside recycling program. All three communities separately collect plant trimmings, but none of them currently collects food scraps. Palo Alto has single stream recycling, while Mountain View and Sunnyvale collect recyclables in split 64-gallon carts. Mountain View collects plastic containers, aluminum cans, and glass food and beverage containers in one side of the cart, and all mixed paper in the other side of the cart. Sunnyvale collects the same container mix as Mountain View, but only collects clean newspaper; Sunnyvale's mixed paper is recovered from the disposal stream at the MRF. The SMaRT Station is the processor of last resort for the three cities using it.

Pleasanton Garbage Service (PGS) has operated a dirty MRF for a number of years. PGS sorts recyclables from Pleasanton's residential solid waste and from blue bags collected with the residential solid waste. This program is in lieu of a curbside recycling program.

The core of the wet-dry system discussed above is that all materials are processed, so it is in effect the equivalent of a recovery of last resort system. The wet-dry system has a higher processing cost because it targets all discarded materials, but three-stream or four-stream collection systems will have higher collection costs.

MULTI-FAMILY DWELLINGS

Given the difficulties of developing and maintaining multi-family diversion programs, a MRF of last resort could be used to recover materials that would otherwise be disposed. GreenTeam of San Jose is processing mixed garbage from apartments in the city at the Z-Best Compost Facility. The GreenTeam contract provides for an incentive payment of 35 percent if the generated wastes are diverted. Currently only about 30 percent of the wastes are recovered through their extensive recycling program, so GreenTeam hauls a sufficient quantity of garbage to Z-Best to insure that an additional 5 percent is diverted. Incentive payments can also be used to promote additional diversion in other locations. Z-Best is permitted to receive and compost municipal solid waste. Materials are composted using an Ag-Bag system and the product is then cured in windrows.

MIXED USE FACILITIES

As housing density increases in our communities, there will be a greater number of mixed use buildings with commercial on the ground floor and residential housing above it. Management of discards from these structures will require a different form of recycling because more materials will be mixed. MRFs will likely play a larger role in recycling from mixed use facilities.

*Program Assessment "5-Year Audit"***CONSTRUCTION AND DEMOLITION DEBRIS**

Clean materials are often generated sequentially at a construction site. Even when mixed, these materials are mostly recyclable because there are relatively few components and there are few putrescibles in the stream. Extensive equipment is needed to properly sort mixed materials from a demolition site for recycling. The Davis Street Transfer Station (San Leandro) and the Zanker Road Materials Processing Facility (San Jose) are designed to process this "dusty" material into marketable commodities. Most of the other facilities in Santa Clara County and elsewhere in the Bay Area can recover some of these materials, but do not have the financial incentives to sort it as completely.

NON-FRANCHISED AND SELF-HAUL MATERIAL

The 2000 Waste Composition Study found that half of the remaining disposal stream is from roll-off and non-franchised self-haul. Through adoption of C&D debris recycling ordinances, most member agencies now have control over the generation and management of the large portion of non-franchised and self-haul materials that are C&D debris. If ordinances are properly designed and enforced, C&D debris can be directed to an appropriate processing facility.

The Authority currently offers a \$10 per ton subsidy to contractors for mixed C&D debris from projects located in jurisdictions that have C&D debris recycling ordinances, and that is shipped to an approved facility for processing. This subsidy has increased the flow of C&D debris to processing facilities and helped spur development of new MRF capacity such as the Davis Street Transfer Station C&D processing line. The subsidy has served its purpose in introducing contractors to mixed C&D recycling facilities, and will be terminated at the end of 2007.

With regard to yard debris, the other key component of the non-franchised and self-haul streams, the Agency will consider regulatory measures that ban disposal of yard debris, as discussed in Section 4.

Additionally, communities and private properties that are seeking to meet or to be certified for LEED New Construction and Major Renovation or Existing Building Efficiency Certification, must recycle, and provide appropriate supporting documentation. When the impact of certification is applied in communities with C&D ordinances, there may be a cumulative impact that will result in higher diversion than with either one alone. Additionally, green building practices that are utilized today may reduce the amount of waste generated years from now, when buildings built using non-standard practices become obsolete. Communities can work with contractors to develop programs that will promote green building and encourage them to make maximum use of resources, while encouraging increased recycling of the C&D debris that is still generated.

Findings and Recommendations

1. Wet/dry collection has the potential to offer higher levels of diversion than the current three-stream approach used by the member agencies.
2. Wet/dry collection presents a complex and interactive set of advantages and disadvantages compared to a three-stream approach. A pre-requisite for implementing

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wet/dry collection is the availability of facilities to process the appropriate volumes and mix of materials contained in the two streams.

3. Commercial wet/dry routing is a proven technique for increasing diversion from this sector.
4. Every-other-week collection of solid waste may be of potential interest as a means for increasing single-family residential participation in food scraps programs.
5. Recovery of last resort is a useful umbrella concept for a range of techniques for maximizing recovery by ensuring that, to the extent practicable, materials not otherwise collected in recycling and organics programs are processed rather than disposed.

We recommend that:

1. Any member agency that is seriously interested in pursuing a wet/dry approach should examine the advantages and disadvantages relative to its current programs, the composition of its residential and commercial sectors and other related factors including but not limited to options for enhancing the performance of existing programs.
2. If more than one member agency is interested in pursuing a wet/dry approach the Agency could conduct a study to better quantify the costs and benefits of converting to two-streams.
3. Member agencies with significant commercial bases should consider further options for wet/dry routing of collection from the commercial sector.
4. The Agency should monitor developments in every-other-week collection of solid waste, beginning with review of the results from the pending EPA-funded study discussed above.
5. Member agencies can most effectively address recovery of last resort by adopting C&D debris recycling ordinances requiring processing of collected material, and by fully-enforcing these provisions.

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SECTION 7: OTHER COUNTYWIDE ISSUES

7.1 OVERVIEW

This section examines two areas related to countywide issues. The first issue is alternatives for Agency funding. As diversion programs are increasingly successful, funding mechanisms based on disposal will generate decreasing amounts of revenue. The second issue is alternative means for measurement of diversion programs, with the goal of identifying any useful metrics other than that used by the Agency or by the CIWMB. With regard to treatment of these the two issues for the Assessment, Skumatz Economic Research Associates (SERA) prepared a report on funding, and SERA and Kies Strategies prepared a report on measurement options.⁴⁸

7.2 PLANNING FOR LONG-TERM FUNDING

Overview

Countywide programs and member agency programs funded through the Agency rely on three main sources of funding. The Measure D Fee, Import Mitigation Fee, and other facility fees are all disposal-based, per-ton payments. Over the medium to longer-term, waste prevention and diversion programs will be increasingly successful in reducing the need for disposal. As this occurs, Agency revenues will decrease.

The purpose of the following discussion is to begin the process of thinking about longer-term, sustainable means for funding countywide programs and member agency programs (as now funded through the Agency). This subsection identifies a broad framework for making these decisions, identifies initial options for the near-term (less than five years), medium term (five to fifteen years) and the longer-term (greater than fifteen years), and includes a brief discussion of the role of Proposition 218.

SERA developed background material used in Section 7.2, cited in the footnote below.

Key Goals and Timeframes

A first step is to identify several key goals for framing consideration of funding options. For example, goals might include:

1. Sustainability. The potential longevity of the funding source.
2. Consistency. Consistency with the Agency's broad policies and objectives.
3. Diversification. Broadening the number of key sources of funding.

⁴⁸ Lisa A. Skumatz, Ph.D., Principal, Skumatz Economic Research Associates, Inc., Footing the Bill for Diversion Programs: Funding Options - Final Report, October 25, 2007; and, Lisa A. Skumatz, Ph.D., Principal and David Juri Freeman, Skumatz Economic Research Associates, Inc., with Delyn Kies, Kies Strategies, Measuring Success in Diversion... "Best Practices": Alternative Measurement of Recycling, Diversion, And Waste Prevention - Final Report, October 27, 2007. These reports will be available on the Agency's website.

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We suggest thinking of the medium-term as a period of transition in which current sources of funding are augmented with new ones. During the longer-term period, current sources of funding will begin to be replaced by new sources.

Criteria for Evaluating Funding Options

A second step is to identify relevant criteria for evaluating the efficacy of specific funding options. Funding options should be assessed on the basis of criteria that represent the most important considerations for the Agency.

Such criteria, in no specific order, could include:

- Ability of Agency to Directly Influence. The Agency will not have direct control over, and can not predict revenues (or reduced costs) from, important medium-term and long-term funding options such as deposits and fees based on state or federal requirements for extended producer responsibility.
- Revenue Adequacy. The generation of sufficient revenues to fund the cost of the solid waste system.
- Equity. Charges to users of the system are directly related to the benefits received.
- Incentives. Maintaining or increasing the incentive to maximize waste prevention and diversion, and to reduce disposal.
- Economic Impacts. Any likely direct and/or indirect macroeconomic impacts on job growth, business retention, etc.
- Waste Reduction. The rate structure provides incentives to encourage waste reduction, reuse, and recycling.
- Affordability. The ability of those paying for the program to bear the costs for which they will be responsible.
- Implementation. The relative costs and efforts of implementing and administering the funding mechanism.
- Credit Rating Impacts. The effect of bonding measures on the Agency's credit rating.
- Authority to Implement. The legal ability of the Agency to implement the mechanism.
- Predictability. Degree to which the revenues are predictable.

In general, fee-based funding mechanisms should be equitable, simple, and economically neutral. They should generate sufficient revenue to finance desired services over time, and be administratively simple.

Key issues in developing sound fees or rates include:

- Efficiency. Efficiency such that the fee or rate discourages wasteful use of resources and reflects all present and future private and social costs and benefits.

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- Fairness. Fairness in apportioning total costs among ratepayers, and lack of arbitrariness. The fee or rate structure contains horizontal equity in which equals are treated equally and vertical equity that addresses ability to pay.
- Nondiscriminatory and Free of Subsidies.
- Flexible. Dynamic efficiency in promoting innovation and responding to changing demands and supply patterns.

These criteria may be mutually exclusive, and thus judgment must be exercised in balancing priorities and objectives in order to tailor an appropriate set of revenue sources.

Funding Options

NEAR- AND MEDIUM-TERM FUNDING OPTIONS

During the near-term (the next five years) it is unlikely that current revenue sources coupled with reserves will significantly decrease. However, as the 75 percent diversion goal is met and exceeded, it will be prudent to begin exploring alternative funding mechanisms. Revenue sources are currently available (grant funding) or becoming available (carbon emissions credits). The Agency can explore these sources to ensure the availability of easily obtainable revenue. Following is a brief summary of several near- and medium-term funding sources that should be reviewed and considered by the Agency.

- Grants. Grants are awarded to local governments for many purposes from state and federal government sources and from private foundations. Grant monies, when available, are an excellent way to finance local government projects. The Agency and the member agencies are savvy about obtaining grant funding, but it is useful to monitor potential sources on an on-going basis.
- Facility Fees. Charges for new public diversion facilities such as an Agency-sponsored composting or a C&D debris recycling facility, or charges for private sector facilities, could incorporate fees to help fund waste prevention and diversion activities. This approach is similar to that for disposal, but recognizes that over-time, diversion services will need to pay their share. This mechanism provides a direct parallel to hazardous waste regulation. In the early 1980's the State, followed by the federal government, banned the land disposal of many hazardous wastes. State regulatory programs had been funded based on per-ton disposal fees but shifted over-time to a variety of fees at each type of new hazardous waste treatment facility.
- Permit or Business License Fees. Permit fees for commercial facilities and/or businesses can be established or existing fees may be increased. Fees can be structured as per-business fees, per truck, per-square foot, etc. Revenues are usually limited to recovering administrative or direct costs of oversight.
- Carbon Emissions Credits. Diversion, reuse, and waste prevention programs can lead to significant reductions in green house gases. New markets are becoming available for buying and selling carbon equivalents, such as the Chicago Climate Exchange. Carbon credits could be a significant source of revenue, by rewarding reductions in emissions. Such an approach would require coordination and cooperation between service

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providers, member agencies, and the Agency to maximize potential returns and prevent double-counting. The Agency could act on behalf of the member agencies as a broker for these emissions credits, returning revenues from the sale of credits to each member agency. Alternatively, member agencies could create contract or permit requirements for service providers requiring that they sell emissions credits with proceeds used to defray program costs.

LONGER-TERM FUNDING OPTIONS

As the Agency begins to prepare for longer-term funding of countywide programs, the current funding strategies (based largely on disposal facility taxes and host fees) will no longer be sufficient to provide the operating income needed by the Agency. Sustainable long-term funding strategies typically focus on user fees and generator- and/or producer-based charges. Below is a brief description of several longer-term funding strategies that may be appropriate for the Agency.

- Extended Producer Responsibility Charges. Product-based disposal charges are levied on manufacturers based on the materials and packaging used in the products. This kind of disposal charge is most effective at the federal or state level and helps embed life-cycle cost into product prices.
- Material Revenues. Revenues from the sale of recyclable materials are another source of income, but one that fluctuates with market pricing. However, over the long-term, both the volume and value of recyclable materials should improve and become more stable as the commodity markets mature further and recycled content (as opposed to virgin) becomes the norm.
- Energy Sales. The Agency currently receives revenue from the sale of wind power. The Agency could also explore means for receiving a share of revenue from the sale of energy produced from landfill gas generated by landfills in the County.

PROPOSITION 218

Proposition 218 requires, among other things, local governments to ensure that all taxes and fees levied as property-related fees are based on the real direct and indirect costs associated with the programs those fees are intended to pay for. Additionally, Proposition 218 requires that the public is given the opportunity to vote for (or protest against) these property-related fees. While recent California Supreme Court and Appeals Court decisions have held that water and sewer fees are subject to the requirements of Proposition 218, there is less agreement among attorneys specializing in Proposition 218 law regarding the impact of Proposition 218 on solid waste fees and charges. However, there are currently a number of pending court cases that may further clarify judicial interpretation of Proposition 218 relative to solid waste fees. In beginning to examine funding options, the Agency should monitor interoperation of Proposition 218 and related ballot measures.

RECOMMENDATIONS

Our recommendations include:

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1. The Agency should develop a process and schedule for identifying and phasing-in alternative funding options.
2. The Agency should begin monitoring potential near-term and medium-term funding options.

7.3 ALTERNATIVE DIVERSION MEASUREMENT OPTIONS

Overview

Based on surveys of hundreds of jurisdictions, most communities and states around the country use one of two main methods for measuring progress in diversion:

- Landfill Diversion. This method measures the tonnage disposed at landfills receiving waste generated in the jurisdiction in comparison to a "base" year. A variation of this approach is used in California.
- Program Diversion. This method measures the tonnage diverted by each program, expressed as a percent compared to the year's generation or total diverted and disposed tons. This approach is used by the Agency.

One other measurement method used in many communities is a per-capita approach, as used in Section 2.7 of the Assessment:

- Per Capita and other "Normalized" Methods. With this method, tons are divided by population or employment in the jurisdiction. This method can be applied to disposal and diversion programs. The method is based on the premise that with diversion programs in place, tons per capita disposed will decrease (or increase more slowly) than would otherwise be the case, and that recycling per capita will increase. The approach has the advantage of "normalizing" data in a simple and clear manner that facilitates comparison.

SERA and Kies Strategies developed background material used in Section 7.2, and it is cited at the beginning of Section 7.

California Diversion Measurement

The AB 939 reporting process has evolved since 1989, but continues to be based on the same general diversion formula:

$$\text{DIVERSION} = \text{GENERATION} - \text{DISPOSAL}$$

The method for calculating diversion for the base year is somewhat different than for subsequent years.

- Disposal. Initially and subsequently, disposal is based on actual facility records, and includes both disposed and exported material. The robustness of this figure depends on the availability, reliability, and completeness of facility records.
- Generation. Base year generation is generally based on a combination of reported and modeled data. After the base year, the generation rate is adjusted annually using

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changes in population, employment, and inflation-adjusted taxable sales growth. This rate can also be adjusted for unusual events, such as major disasters, and for imports.

- **Diversion.** Diversion is the difference between generation and disposal. Once generation and disposal tons are determined, diversion can also be expressed as a percentage. For instance, the State diversion rate for 2004 was 100 percent – 52 percent = 48 percent.

Over time, California's method has proven more accurate for large jurisdictions than for small. Rural and small jurisdictions are more sensitive to changes in the waste stream.

EPA DIVERSION MEASUREMENT

The U.S. EPA developed and released a recycling measurement tool in 1997 that "ensures fair comparison of recycling rates among jurisdictions, produces useful information for planning and decision-making, provides accurate, up-to-date numbers for market development, and allows for easy data collection from the private sector."⁴⁹ It includes a guidance document; worksheets; sample survey forms for recycling collectors, processors, disposal facilities, and end users; planning checklists; and volume-to-weight conversion factors. Pennsylvania, Washington, the Northeast Recycling Council⁵⁰, and others have used this measurement tool.

The recycling rate is based on tons recycled as follows:

$$\text{RECYCLING RATE (\%)} = \text{MSW RECYCLED} \times 100 / \text{TOTAL MSW GENERATED}$$

This method relies on distributing survey forms to solicit data about the quantities of materials collected, processed, disposed, and recycled.

The method also relies on "traditional" definitions of municipal solid waste (MSW) and recycling. The definition of MSW does not include, for example, C&D debris and sewage sludge. The definition of recycling includes, for example, off-site composting but not backyard composting. Data for these materials can be collected and analyzed separately using the same basic methodology.

OREGON DIVERSION MEASUREMENT

The State of Oregon's Department of Environmental Quality (DEQ) calculates a statewide "Annual Recovery Rate" each year. The DEQ process is unique and elaborate. The DEQ has been calculating the State's Annual Recovery Rate since the early 1990's, and now uses a sophisticated software program for the calculations. The data is based on mandatory reports submitted by haulers, some large generators, and recyclers (scrap metal dealers are exempted). The reports include how much was recycled and to whom it was sold. DEQ tracks the materials to their endpoints, and then balances what is bought and sold. The resulting information is reported back to each county and jurisdiction.

⁴⁹ Quoted from EPA literature. The tool is available on the EPA's website at www.epa.gov/recycle.measure/index.htm.

⁵⁰ See www.nerc.org.

FINDINGS & RECOMMENDATIONS

Findings include:

1. For the purposes of calculating overall diversion system performance, some form of landfill diversion tracking approach (similar to that used by California) is necessary. While this method of calculation, its attribution rules, and the volatility of the adjustment factors have inherent drawbacks, the California diversion calculation methodology is most likely to provide a comparable measurement strategy when comparing cross-jurisdictional system performance.
2. For the purposes of assessing individual program performance to determine effectiveness and value, normalized or per-capita measurements are more appropriate. These measurements will allow jurisdictions to look at their specific performance over time as well as to benchmark their performance, on a normalized basis, to other jurisdictions. The Agency currently uses this type of measurement method in the sustainability indicator analysis that is performed annually. Additionally, each member agency collects this type of information as part of their contractual reporting requirements for municipally sponsored programs.

Recommendations include:

1. The Agency and member agencies should continue to use the CIWMB calculation methodology as the primary measure of each jurisdiction's achievement of diversion goals.
2. The Agency and each member agency should include normalized, program-specific reporting requirements in their program plans and in service contracts.
3. The Agency should regularly add new Agency programs to the sustainability indicator analysis to monitor progress in those areas.

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SECTION 8: PROGRAM ANALYSIS AND RECOMMENDATIONS

8.1 OVERVIEW

Section 8 has two components. The first component addresses analysis and recommendations for member agency programs, drawing on:

- The Section 2 review of member agency programs.⁵¹
- Data from the member agency surveys and the member agency program summaries, as described in Section 2.⁵²
- Section 2 discussion of programs from comparable jurisdictions.
- The mandatory program design and implementation recommendations in Section 4.
- Sections 6.3 Private Sector Diversion Activity and 6.4 Non-Exclusive Solid Waste Collection.
- Generally accepted best practices for diversion program design and implementation.

The discussion is not intended to be exhaustive, and is limited to identifying key areas for enhancement. The discussion also references source documents that provide more detail in certain areas. As a final note, the discussion focuses on efforts to divert generated materials with less emphasis on the important role of waste prevention.

The second portion of Section 8 provides findings and recommendations for one additional area not discussed in the previous sections, future options for compensating service providers and for setting customer rates. This discussion has a parallel to the funding alternatives discussion of Section 7.

Note that the pending 2008 Waste Characterization (2008 Study) will result in summary data and data by member agency that is similar to the 2000 Waste Characterization summary data shown in Sections 3 and 4 of the Assessment presenting the absolute amounts and relative order of the key materials left in the disposal stream. As noted in Section 4, while the 2008 Study may provide some changes in the relative order of the top materials disposed, as well as changes in the total tonnages for each stream, the results of the 2008 Study are unlikely to materially affect the need to pursue mandatory programs and disposal bans, and should not result in delay in planning for them.

⁵¹ As in Section 2, the material in this section excludes, or does not explicitly include the unincorporated area of Alameda County that is not otherwise included within the service area of the two sanitary districts.

⁵² The sixteen member agency summaries are available electronically on the Stopwaste.Org website.

8.2 MEMBER AGENCY PROGRAMS

The key premise of the following analysis and recommendations is that member agencies can productively use the near-term period to review and enhance current programs prior to implementing mandatory programs. The following are several key objectives for improving current programs in order to maximize the success of future mandatory programs:

1. Maximizing availability of service.
2. Ensuring that current programs are functioning as well as possible.
3. Enhancing auxiliary aspects of program management such as program data collection, reporting and monitoring practices, enforcement and staffing.

Making program enhancements now also provides member agencies the opportunity to re-focus public attention on recycling programs in general, maximize customer participation, and create good generator habits prior to implementing mandatory ordinances.

The following material addresses these objectives, with discussion of:

- Program availability.
- Provision of service.
- Collection program enhancements.
- Construction and demolition debris.
- Materials processing.
- End use markets.
- Program monitoring.
- Data collection and reporting.
- Enforcement of franchises.
- Adequacy of staffing.

Program Availability

The first step is, of course, to have programs in-place. Based on the material contained in Section 2 and the surveys of member agency staff, most member agencies have the core collection programs in place:

- All member agencies have single-family recycling programs, as required by Measure D.
- All member agencies have multi-family recycling programs per Measure D requirements.
- All member agencies have single-family yard debris programs.
- Thirteen member agencies now have full organics programs for yard debris and household food scraps and as currently planned two additional member agencies will have full organics programs for single-family residents by 2009.

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- All member agencies have multi-family recycling programs.
- Seven member agencies have multi-family yard debris programs.
- All member agencies have some form of commercial recycling collection, whether or not municipally-sponsored.
- All member agencies have some form of commercial organics collection, whether or not municipally-sponsored.
- Of the three member agencies with relatively high concentrations of multi-family housing, one provides organics collection (including food scraps) to multi-family units.

In addition:

- Thirteen member agencies have adopted construction and demolition debris (C&D debris) recycling ordinances, and at least one other is in the planning stage.

As a result of the recent Authority Board action regarding distribution of import mitigation funds, it is likely that by July 2009 most or all member agencies will: initiate programs for residential food scraps; formally adopt the 75 percent goal; and, formally adopt ordinances for C&D debris recycling applicable to both private and civic projects, civic green building, and civic Bay Friendly Landscaping.

Provision of Service

Provision of service is an issue pertaining to commercial and multi-family recycling and organics programs, with reference to the following questions:

- Are service providers required to make programs available to all potential customers?
- Is service actually offered?
- Is service convenient and does it fit reasonable individual customer needs.

As noted in the Section 4 discussion of design and implementation of mandatory programs by member agencies, having mandatory provision of service in-place prior to implementing mandatory programs will ease the transition to full mandatory.

Broad issues of service availability are addressed here with a focus on commercial programs, and with further specifics provided by service type in the following Collection Program Enhancements and Materials Processing subsections.

With regard to commercial recycling and organics collection, and multi-family organics collection (assuming that service is generally available) the following are pertinent issues.

GENERAL AVAILABILITY

Is the service only offered upon customer request, or is it universally available as part of the basic service package? Is service offered with the same range of containers and at the same frequency as for solid waste?

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A number of member agencies require contractors to provide service if requested, but few have implemented service on a universal basis. Several examples of universal provision of service include:

- The city of Alameda provided universal roll-out of commercial service for both recycling and organics.
- Palo Alto, one of the comparative jurisdictions discussed in Section 2.7, conducted a universal roll-out of multi-family recycling service.
- Chula Vista (San Diego County), another of the comparative jurisdictions, requires that all commercial properties (including multi-family) contract for collection of recyclable materials and provide a recycling enclosure that can hold both trash bins and recycling bins or carts.

Ultimately, in order to reach high overall diversion levels, diversion services will need to be thought of as the base service, and collection for disposal as the alternative service.

CONTAINER SIZES

Are a full range of container sizes available?

Service provider contract provisions may or may not specify that service must be offered in all of the same size containers for which solid waste service is available. Smaller businesses will have service if service must be offered to all customers and smaller containers are available.

FREQUENCY

Is service available at the necessary frequency?

Service provider contract provisions may or may not specify that service must be offered at the same range of frequencies that solid waste service is available. This is important for commercial recycling service, and crucial for commercial organics service. For instance, if a restaurant can only obtain organics collection two or three times per week, it may well opt to keep its current five-day-a-week solid waste collection service to avoid possible health and safety concerns, or space constraints due to the need for a larger container.

CONVENIENCE

In addition to the issues addressed above, is service available in a manner that meets customer needs regarding the logistics of collection such as location of pick-ups?

As noted in the Section 6 discussion regarding non-exclusive collection, exclusive commercial recycling or organics collection service providers generally will not provide these types of added services unless specifically required to by their municipal contracts. With regard to multi-family recycling, Chula Vista can require that a multi-family property owner install two chutes for recycling next to the trash chute if recycling performance is poor.

Collection Program Enhancements

Other key program enhancements are presented below by program type.

*Program Assessment "5-Year Audit"***RESIDENTIAL PROGRAMS**

The following are key enhancements to consider. See Section 2.7 for discussion of the comparative performance of single-family recycling programs.

Single-Family Recycling⁵³

Table 2-4 of Section 2 details the range of materials now collected by each member agency's residential recycling program. Several member agencies are leaders in collecting a relatively full range of recyclables, including materials such as aseptic containers, foil, pie tins, aerosol cans, and Styrofoam. Palo Alto is considering adding a number of additional materials.

Other enhancements specific to single-family recycling include:

- Allowing unlimited set-outs of recyclable materials at no added charge and with no added steps such as obtaining special tags.
- Ensuring that cardboard can be easily set-out for collection.
- Allowing for easy change to a larger size recycling cart at no added charge for single-family customers with set-outs that regularly exceed their cart size.

Residential Organics

Table 2-5 of Section 2 details the range of materials now collected by each member agency's residential organics program. Of the 13 member agencies now collecting food scraps, most collect a range of similar materials.

Increasing food scrap program participation by residents should be a key focus. The Agency has sponsored ongoing collection of field data for member agencies that have food scrap programs.⁵⁴ The results indicates that participation rates (defined as number of carts with food scraps divided by all houses setting out at least one cart) range from about 12 percent to 390 percent, with an average of 19 percent.

Multi-Family Recycling

We acknowledge that it is famously difficult to develop and maintain multi-family recycling programs. The Agency currently has a study in-progress to identify best practices for multi-family programs.

Bulky Item Collection

There are two key issues with relation to bulky item collection and maximizing diversion. One is whether service is provided on-call to individual residents when needed, or on a scheduled, community-wide basis. There is general agreement that the former is preferable for reducing

⁵³ Most member agency programs have single-stream recycling. For additional detail regarding single-stream program enhancements (both collection and processing) see Susan Kinsella and Richard Gertman, *Single-Stream Recycling Best Practices Manual and Implementation Guide*, February 2007. This project was supported in part through funding from the Authority.

⁵⁴ Environmental Science Associates, *Participation in Residential Food Scrap Programs, Audit Result Averages - Alameda County Jurisdictions, 2007*, available from the Agency.

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disposal. The second issue is whether or not there is significant diversion from the program and whether or not diversion tonnages are reported.

COMMERCIAL PROGRAMS⁵⁵

The following practices are generally applicable to both commercial recycling and organics programs.

Waste Audits

Is the service provider(s) required to provide generators with free waste audits to help determine the best options for recycling?

To enhance the independence of recommendations, franchise language can stipulate the use of third parties to provide audits. Audits raise awareness on the part of generators, can enhance participation in advance of adoption of mandatory programs, and are particularly of value if the mandatory program will place the primary requirement to recycle on the generator. Franchises for Dublin, Livermore, and Union City all provide for contractor provision of audits for recycling and organics.

Diversion Plans

Are commercial generators required to prepare diversion plans?

Requiring businesses to develop and follow diversion plans is another useful step to take prior to implementation of mandatory programs. As with audits, this activity is particularly useful for member agencies that will place the mandatory requirement on the generator.

Technical Assistance

Do generators have access to technical assistance in implementing and maintaining programs? The Agency has assistance available through the StopWaste Partnership and the Organics Technical Assistance programs. The South Bayside Waste Management Authority in San Mateo County contracts jointly for collection services for its member agencies, but contracts directly for commercial organics technical assistance that the service provider must utilize as it works to meet specific targets for program performance.

Exclusive and Nonexclusive Programs

Section 6.4 contains a detailed discussion of considerations with regard to exclusive and nonexclusive programs. A key conclusion of that discussion is that regardless of the type of approach, ensuring good diversion program performance requires strong contract provisions. The following are suggested enhancements for both types of approaches.

Several member agencies currently provide for non-exclusive collection of commercial recyclables, either through non-exclusive franchises or permits. We encourage these member agencies to ensure that the franchised service provider is the "recycler of last resort", required to provide recycling service for a specified list of traditional recyclables at no more than a pre-set rate regardless of market pricing for specific commodities.

⁵⁵ See above reference to *Single-Stream Recycling Best Practices Manual and Implementation Guide*.

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Several member agencies currently have exclusive franchises for recycling, in which either a core group of recyclables (paper, cardboard, etc), or possibly all potential recyclables, are considered to be exclusively part of the service provided by the franchised service provider. For member agencies that elect this approach, best practices include:

- Restricting the exclusive portion of the franchise to commingled "traditional recyclables" such as cardboard, and ensuring that businesses can use any service provider for source separated recyclables (including cardboard), or at a minimum for specialty recyclables.
- Providing full and independent information to businesses regarding their options. Use public agency staff or independent contractors for this function to ensure that all service providers are operating on a level field.
- Provide recycling services for traditional commingled materials at a sharp discount from rates for the comparable level of refuse service. Most member agencies currently provide for a maximum rate that represents a significant discount from the comparable solid waste rate.

Other Issues

In Chula Vista, landscapers working under contract with businesses must recycle or compost 100 percent of the organic material. The business is responsible for gathering receipts from the landscaper proving that they have diverted all of the organic waste and must provide those receipts to the city if requested.

Construction and Demolition Debris

We recommend that member agencies:

1. Adopt C&D debris recycling ordinances, if they have not already done so.
2. Lower thresholds for applicability of projects under existing ordinances.
3. Require collection and reporting of data on materials diverted. Based on the member agency survey data from Table 2-9 in Section 2, four member agencies with C&D debris recycling ordinances currently do not collect data.
4. Enforce all provisions of the ordinance.

Materials Processing

Based on the results of the detailed survey of member agency staff, most agencies do not receive information regarding the rate of contamination for either their recycling processing or organics processing facilities. The residue from processing must be disposed at a landfill and should be a debit against each member agency's reported diversion rates. Collection agreements often do not direct the contractor regarding the landfill to be used for residue, or more importantly, do not require that residue disposal figures be reported back to the specific jurisdiction.

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In general, contamination ranges of five to ten percent are often reported for single-stream recyclables processing.⁵⁶ Contamination rates for organics processing are more variable due to the range of incoming materials and of processing techniques. Higher rates of contamination point to excess contamination of set-outs by customers and/or poor processing practices. The first problem can be detected through member agency ability to require the collector to monitor contamination by route, and to require the facility operator to provide agency-specific data regarding diversion based on visual inspection or periodic load audits. The problem can be remedied with improved education or enforcement. High contamination of recyclables can result in recovered materials that are not diverted because end users cannot use them. Thus paper mills experience high levels of residue from recycled feedstock shipped from single-stream processors.

With regard to the second issue, for facilities taking material from a number of jurisdictions, it may be far easier to obtain accurate residue data for a larger community because materials can periodically be stockpiled and separately processed. This is more difficult for facilities to do for smaller jurisdictions. In addition, for many of the member agencies the recyclables processor is an affiliate or subcontractor of the collection contractor. In this situation it can be difficult to obtain compliance on the part of the processor with franchise provisions requiring periodic sorts and other data reporting related to processing residues. Member agencies should have strong franchise provisions, such as substantial liquidated damages for this type of situation, and be willing to levy them.

End Use Markets

In addition to increasing processing residue that must be disposed, contamination and poor processing practices negatively impact the quality of materials marketed to end users. This affects the economics of the collection/processing/marketing system as well as the ability of end users to manufacture quality products for sale.

A key factor to a successful and sustainable recycling collection and processing system is end use markets. To the extent possible, member agencies need to commit to purchase and use recycled-content products. This ranges from post-consumer recycled content copy paper to roadbase, mulch, compost and other products that meet clear performance specifications. Through Recycled Product Central, the Agency offers member agencies technical assistance and funding for increased purchases of eligible recycled content products.

Program Monitoring

As discussed in Section 4, with regard to mandatory programs, member agencies should monitor program performance on an ongoing basis, and many do. One useful metric discussed in Section 4 is the concept of "franchised residential diversion". If member agencies begin collecting data for commercial diversion programs on a more consistent basis as discussed below, it will become possible to develop and use a "reported commercial diversion" metric to monitor individual programs and to compare performance across jurisdictions.

⁵⁶ See reference above to *Single-Stream Recycling Best Practices Manual and Implementation Guide*. Page 74 of the *Implementation Guide*.

Data Collection and Reporting

Data collection and reporting, and the ability to segregate data by source and stream are steadily more important as programs become more comprehensive and sophisticated. General enhancements include:

- Collecting data for all programs that allow for calculation of total generation, disposal, and diversion tonnages.
- Collecting multi-family customer and tonnage data separately from that for single-family residents and for commercial customers.
- Requiring that service providers collect and report tonnage data for commercial recycling. 13 member agencies currently collect data on commercial recycling, whether it is occurring within or outside of the franchise.
- Requiring that service providers collect and report tonnage data for commercial organics. 11 member agencies currently collect data regarding collection of commercial organics.
- Requiring that service providers collect and report residue disposal data resulting from commercial recycling and organics processing.
- Requiring timely provision of data (such as by the 15th of the month) following the end of the reporting month or period for ongoing reporting requirements, and response within three or five business days for special requests from member agency staff.
- Ensuring franchises, permits, and ordinances address the ability to add and/or modify reporting requirements.
- In procuring new services, requests for proposals can state that in submitting a proposal, potential service providers are stipulating that they have, or will have, the necessary data management systems in place to segregate data as required in the draft franchise agreement.

Recommendations for the Agency include:

- Many member agencies use a small number of recycling and organics processors. The Agency should consider developing uniform reporting guidelines for collection and reporting of processing residue data, including possible adoption of uniform County requirements by ordinance.
- Consider developing a single or "model" guideline for defining single-family and multi-family service (based on number of units) so that to the degree practicable for individual member agencies, data can be collected in a consistent and comparable format.

Enforcement

Enforcement has two aspects:

- Enforcing the provisions of franchises, permits, and ordinances. The strongest contract can be of little value if enforcement is lacking.

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- In adopting mandatory programs, it will become increasingly important to enforce requirements placed on generators as well as the service provider.

Enforcement of franchise provisions is crucial with regard to all the issues discussed in this section. As discussed in Section 4 regarding developing mandatory programs, member agencies should consider new or increased roles for public agency staff in enforcement of service provider and generator requirements.

Adequate Staffing

Member agencies vary widely in the staff resources devoted to diversion and waste program management, and in the level of authority of that staff. We recommend member agency review of current staffing levels and the authority and responsibility granted to staff to develop, implement, and enforce programs. All member agencies should have sufficient dedicated staffing with clear authority in place prior to implementing mandatory ordinances, including responsibilities for code enforcement staff.

8.3 COMPENSATION AND PRICING OF SERVICE

The following topic was not directly part of the scope of the Assessment, but does address the broad role of the Assessment in identifying future issues. There has recently been increased interest on the part of communities seeking high levels of diversion in exploring new financial incentives for residential and commercial customers, and for service providers to divert increased amounts of material. For residential service, high diversion advocates suggest re-thinking the now-traditional approach in which customers pay for a certain level of solid waste service and receive recycling and organics collection at no extra charge. Considerations include (perhaps non-intuitively) that residents should pay for all three services, and that the total charge should be based in part on the total volume of service.

The thinking behind this concept is that 1) customers place more value on a service that they pay for than one that is free, 2) that recycling and organics services should be provided with a clear discount from solid waste service to encourage diversion (as often done now for commercial diversion services), and 3) that charging residents, in part, based on a total volume charge coupled with reduced rates for recyclables and organics services will encourage waste prevention and reduce the total generation volume. It can be argued that "free" recycling undervalues the service, contributing to the need to remind residential customers about the efficacy of recycling, and to contamination of recyclables by placing solid waste in recycling containers. The reasoning is similar with regard to commercial services, with a focus on creating incentives to migrate from solid waste service to recycling and organics service, and to reduce the total volume of service. Service providers would be compensated in a parallel manner so that the incentives for both generators and service providers are consistent and work toward the same ends.

The concept is consistent with the Section 6 findings regarding the price signals that current member agency rate structures send to both residential and commercial generators. This type of service pricing also has a parallel to the funding alternatives discussion of Section 7 of the Assessment, in that both address moving from a past based on disposal to a future based on diversion.

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In addition, the approach outlined above will likely result in pricing that is much more reflective of the true cost of service, and will thus be in concert with a key intent of Proposition 218.

We recommend that the Agency:

- Monitor implementation of alternatives to the current models for rate setting for residential and commercial solid waste and diversion services including, but not limited to, that outlined above, and provide guidance to interested member agencies regarding the advantages and disadvantages of changing approaches for the residential and/or commercial sectors, and the best means for doing so.
- Provide member agencies assistance in rate setting and structuring as requested, and as provided by Measure D.

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APPENDIX A

REVIEW OF STATE BUSINESS WASTE AUDIT DATA

Scope

The scope of work for this task included the following steps:

1. Reviewed California Integrated Waste Management Board (CIWMB) report, *Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups*, June 2006.
2. Summarized methodology and key findings.
3. Discussed initial summary and observations with Rory Bakke and Justin Lehrer to identify questions and determine direction on applicability and priority needs for Alameda County.
4. Drafted report evaluating applicability for StopWaste.Org in predicting diversion opportunities (recycling, reuse and waste prevention) by industry types and by materials.

Objective

The objective for this task is to determine the applicability of the results and findings of the CIWMB report, *Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups* (June 2006) for the needs of Alameda County. Priority issues identified at the onset are:

- Determine if there is a way to translate material types to packaging types (i.e., to help see how to measure packaging going into County landfills).
- Determine if there are any significant differences between the San Francisco Bay Region and the other 3 metro regions surveyed in the CIWMB report (if sufficient detail is included in the final report).
- Evaluate applicability for StopWaste.Org in predicting diversion opportunities (recycling, reuse and waste prevention) by industry types and by materials.

Methodology and Key Findings

See attached a summary of the approach and findings of the CIWMB report, *Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups* (June 2006). The full CIWMB report is available at <http://www.ciwmb.ca.gov/Publications/Disposal/34106006.pdf>.

Highlights from review of the methodology include the following:

- 14 different types of businesses were targeted including fast food restaurants, full-service restaurants, food stores, durable wholesale distributors, non-durable wholesale distributors, large hotels, building material & gardening/big box stores, building material & gardening/other stores, retail/big box stores, other retail stores, public venues and events, shopping malls, anchor stores at shopping malls, and large office buildings.
- Business sites were recruited in 4 heavily urbanized areas including Los Angeles, Sacramento, San Diego, and San Francisco.

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- 378 sites participated in the study within the 14 industry groups (378/14 = 27 per industry group / 4 geographic areas = 6.75 per industry group and geographical area).
- Table 1 (Page 8 of the CIWMB report) shows the number of participating sites for each industry.
- Diversion was documented through interviews with employees at the businesses and inspection of recycling and diversion systems during on-site visits.
- Disposal was quantified through measurements of waste accumulation in dumpsters or through interviews and examination of waste disposal records.
- Disposed waste was characterized by obtaining one or more 200-pound samples from each site and hand-sorting it into 74 material categories.

Highlights from review of the findings include the following:

- Table 2 (Page 12 of the CIWMB report) shows each industry group and provides disposal, diversion, waste generation, and diversion rate per employee. This information is based on gathered data from approximately 22-33 participating sites per industry group in four different locations.
- Industry groups with the highest diversion in the study include food stores (71%), retail/big box stores (64%), non-durable wholesale distributors (59%), and retail/other stores (54%).
- Industry groups with the lowest diversion in the study include other building material & gardening/other stores (24%), large hotels (23%), shopping malls (19%), and large office buildings (7%).
- Table ES-1 (Pages 3-5 of the Executive Summary of the CIWMB report) shows key opportunities for additional diversion.
- Cardboard is the significant material currently being recycled, although paper (including cardboard) also makes up a large portion of disposed material for many industry groups, as do food and plastics.
- The study concludes that compostable materials, recyclable papers and lumber present the greatest opportunities for increased diversion.

Key Questions and Issues

The key questions raised by staff and the consultant are listed below with answers resulting from research and analysis of the study methodology and findings and follow-up discussion with Nancy Carr, CIWMB staff responsible for waste characterization studies (ncarr@ciwmb.ca.gov, 916/341-6216).

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1. Is there a way to translate material types to packaging types in order to measure packaging being disposed?

No, there is no breakdown by packaging type. The main packaging material in the Paper Category is Cardboard. In the Plastic Category, Plastic Film is separated into the following material types: plastic trash bags, plastic grocery & other merchandise bags, non-bag commercial & industrial packaging film, film products and other film.

2. Are there any significant differences between the San Francisco Bay Region and the other 3 metropolitan regions surveyed in the CIWMB report (if sufficient detail is included in the final report)? Are there differences within industry groups by metropolitan region?

No detail on regional differences was included in the report or analyzed from the raw data, nor was the tonnage and diversion detail for each industry group broken out by regional category. Only the numbers of locations surveyed in each region are noted. Given the sample size, it would not be statistically significant to just look at the Bay Area samples with confidence.

3. How confident can we be about extrapolating information from all regions for application to the Bay Area? One concern might be the overabundance of agricultural and food processing businesses in the Sacramento region. Another is that the Bay Area disposal site was Tri-Cities Landfill in Fremont, and the samples were taken from generator sites within a 15 mile radius of Fremont. Checking mileage, this would not have included the Cities of Oakland and San Francisco.

Given the results (i.e., large hotels, large venues, shopping malls and office buildings for example, present some of the greatest opportunities for increased diversion), it seems the study provides a good overview by business type that reflects Alameda County.

The study did not specifically target agricultural companies and the report describes excluding several businesses that would skew the data. For example, companies were excluded if one or two material types would impact the average of the rest of the businesses in that industry group or material category.

In speaking with Nancy Carr about this issue, she noted they did some sampling in Oakland, San Francisco and the South Bay, particularly for data more representative of large office buildings and large venues. She reviewed the raw data and noted that samples were taken from Oakland Coliseum; the Cow Palace, Monster Park and Exploratorium in San Francisco; the HP Pavilion and a flea market in San Jose; and a movie theatre and fair in San Mateo County, for example.

4. For Large Hotels, can we determine what portion of the 49% organics remaining in the waste stream is food waste?

All of it.

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5. What's excluded from recyclable papers for hotels, or other industries?

Currently Diverted Recyclable Papers from Large Hotels include:

- Uncoated Corrugated Cardboard
- Newspaper
- White Ledger

All Papers in the Paper Category Included in the Study and Noted as Also Disposed by Large Hotels include:

- Uncoated Corrugated Cardboard
- Paper Bags/Kraft
- Newspaper
- White Ledger
- Other Office Paper & Colored Ledger Paper
- Computer Paper
- Magazines & Catalogs
- Phone Books & Directories
- Other Miscellaneous Paper
- Remainder/Composite Paper

6. Are wood pallet programs addressed? Or any distinguishable part of the Lumber Category? Is only clean wood included in the Lumber Category?

Pallets are not separately classified but are included under Lumber in the Construction & Demolition Category. This is the only category for wood. Treated Wood Waste is separately categorized from Lumber in the Lumber & Treated Wood Waste subcategory. References in the CIWMB report to wood pallet programs (i.e., non-durable goods wholesale distributors on average divert 59 percent of waste materials that is mainly achieved through cardboard recycling and through the reuse of wood shipping pallets) result from onsite observations and interviews at the business sites, according to Nancy Carr.

7. For Retail, the remaining %'s of recyclable papers in the waste stream in Table ES-1 (Pages 3-5 of the Executive Summary of the CIWMB report) seems low. Why might this be?

Retail/Big Box Stores have a total of 21.7% of paper disposed, including cardboard (6.0%). Retail/Other Stores have a total of 31.8% paper disposed, including cardboard (7.9%). Other significant percentages of waste disposed include plastic, organics, and C&D material types. Table ES-1 shows percentages of additional easily diverted Recyclable Papers such as newspaper and office paper. Percentages of additional easily diverted cardboard are noted separately in Table ES-1.

8. Are volume numbers available, i.e. for plastic film?

No, all quantities are calculated by weight.

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9. For Large Office Buildings, can we tell if the remaining organics is mostly food?

Yes. Food represents 18.3% of the waste disposed from Large Office Buildings. The total Organics disposed is 24.4%. No Organics were diverted from office buildings in this study.

10. Given the statement in the CIWMB report that the diversion rate for large office buildings does not take into account any diversion that might be done by tenants of the office buildings independently of the buildings' management and custodial services, how much would factors like e-waste, furniture, tenant improvements, shredding services and other such tenant-independent programs make the data not support this industry group as a target for additional diversion?

Other than a small amount of lumber, the study only shows paper being diverted from Large Office Buildings. The study shows paper, bottles & cans, plastic trash bags, lumber and organics being disposed. While it is correct that the study does not address the full spectrum of the Large Office Building waste stream, and consequently the calculations of quantities generated, diverted and disposed may not be fully accurate, the interviews and observations in the study support the overall ranking of office buildings and their potential for diversion.

11. Are paper towels part of compostable paper?

According to Nancy Carr, paper towels would be included as part of the Remainder/Composite Paper subcategory in the Paper Category, not in the Remainder/Composite Organics subcategory in the Organics Category.

12. Does the CIWMB plan to update the 1999 Waste Characterization Study with this new data? Not at this time. Nancy Carr said the data is not easily updated accurately. The 1999 Study did generator-based studies of all business groups, and the 2006 study only targeted selected industry groups. She has not quite figured out how to do it correctly and accurately.

The State's Solid Waste Characterization Studies can be accessed at:

<http://www.ciwmb.ca.gov/WasteChar/WasteStudies.htm#Overview> They include the following:

- Overview
- 2006 Characterization and Quantification of Residuals from Materials Recovery Facilities (MRF)
- 2006 Detailed Characterization of Commercial Self-Haul and Drop-Box Waste (S/H)
- 2006 Detailed Characterization of Construction and Demolition Waste (C&D)
- 2006 Waste Disposal and Diversion Findings for Selected Industry Groups
- 2004 Statewide Waste Characterization Study
- 1999 Statewide Waste Characterization Study

APPENDIX A

REVIEW OF STATE BUSINESS WASTE AUDIT DATA

Conclusions

Based on the limited review and evaluation of data and findings scoped for this task, the CIWMB report, *Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups* (June 2006), provides baseline data by employee and by business sector that offers value and insight to similar businesses in similar circumstances. The study is comprehensive, providing data and analysis for what is generated, disposed, and recycled from each type of industry group. A strong methodology was used to achieve an understanding of disposal quantities, disposal composition, and diversion by selected industry sector and per employee.

The applicability for StopWaste.Org in predicting diversion opportunities (recycling, reuse and waste prevention) by industry types and by materials is in comparisons of the data and use of generation, diversion and disposed weights per employee as a factor to apply to other situations.

The study confirms the industry groups currently targeted by the StopWaste Partnership, and does not identify any missing material types or business sectors. The findings show clear opportunities for increased diversion from more complex commercial sources like large hotels, malls, large office buildings and retail stores. The findings also support promotion of new StopWaste.Org resources like the Special Event Best Practices Guide and continued work with member agencies to expand food scraps collection services.

Suggested Recommendations

Recommendations resulting from the consultant review of the CIWMB report, discussions with StopWaste.Org staff and StopWaste Partnership team leaders include the following:

- Consider using similar material categories for the next StopWaste.Org Waste Characterization Study for comparison purposes.
- Consider using data from a real example (i.e., StopWaste Partnership client hotel, office building or mall) to compare with the weights, numbers and square footages of the CIWMB report data to provide support or adjustments for extrapolation purposes.
- Consider preparing a table of pounds per employee by each material category, similar to Table 2 (Page 12 of the CIWMB report) showing pounds per employee by industry group.
- Consider preparing tables showing percentages disposed, diverted and generated for each industry group by material category. Examples for the Paper Category are illustrated in the following 3 tables:

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REVIEW OF STATE BUSINESS WASTE AUDIT DATA

Table 1. Percentage of Paper/Cardboard Disposed by Industry Group	
Business Sector	% Disposed that is Paper/Cardboard
Fast-Food Restaurants	33%
Full-Service Restaurants	17.3%
Food Stores	18.5%
Durable Wholesale Distributors	26.3%
Non-Durable Wholesale Distributors	26.5%
Large Hotels	32.3%
Building Material & Gardening/Big Box Stores	12.2%
Building Material & Gardening/Other Stores	13.4%
Retail/Big Box Stores	21.7%
Retail/Other Stores	31.8%
Anchor Stores at Shopping Malls	37.9%
Shopping Malls	32.7%
Public Venues & Events	42%
Large Office Buildings	50.3%

Table 2. Percentage of Paper/Cardboard Diverted by Industry Group	
Business Sector	% Diverted that is Paper/Cardboard
Fast-Food Restaurants	78.9%
Full-Service Restaurants	71.6%
Food Stores	78.5%
Durable Wholesale Distributors	18%
Non-Durable Wholesale Distributors	49.8%
Large Hotels	36%
Building Material & Gardening/Big Box Stores	74.4%
Building Material & Gardening/Other Stores	24.4%
Retail/Big Box Stores	93.8%
Retail/Other Stores	91%
Anchor Stores at Shopping Malls	57.8%
Shopping Malls	83.8%
Public Venues & Events	31.6%
Large Office Buildings	99%

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Table 3. Percentage of Paper/Cardboard Material Generated by Industry Group	
Business Sector	% Generated that is Paper/Cardboard
Fast-Food Restaurants	49%
Full-Service Restaurants	34.4%
Food Stores	61.3%
Durable Wholesale Distributors	22.3%
Non-Durable Wholesale Distributors	40.1%
Large Hotels	33.2%
Building Material & Gardening/Big Box Stores	30.7%
Building Material & Gardening/Other Stores	16.1%
Retail/Big Box Stores	67.3%
Retail/Other Stores	63.6%
Anchor Stores at Shopping Malls	45.9%
Shopping Malls	42.8%
Public Venues & Events	38.9%
Large Office Buildings	53.5%

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REVIEW OF STATE BUSINESS WASTE AUDIT DATA

**Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion
Findings for Selected Industry Groups
Summary of Methodology and Findings**

The *Targeted Statewide Waste Characterization Study: Waste Disposal and Diversion Findings for Selected Industry Groups* was commissioned by the California Integrated Waste Management Board (CIWMB) and published in June 2006. This study analyzes the disposal and diversion of 14 different types of businesses. Those businesses include fast food restaurants, full-service restaurants, food stores, durable wholesale distributors, non-durable wholesale distributors, large hotels and BMG/big box stores, retail stores, public venues and events, etc. (A complete listing of businesses is noted below and the full report is submitted with this summary and available at <http://www.ciwmb.ca.gov/Publications/Disposal/34106006.pdf>.)

The results show the average tons disposed and diverted per employee of a specific industry. The CIWMB says that the study should help jurisdictions choose the best commercial diversion programs for their area, as the study provides a great tool for predicting where to maximize diversion.

The following is an excerpt from the Executive Summary of the study:

Summary of Approach

A total of 371 commercial sites belonging to 14 industry groups participated in the study. Sites were recruited in the heavily urbanized areas of Los Angeles, Sacramento, San Diego, and San Francisco. In general, data was gathered from each participating site to confirm its industry group and size (in terms of numbers of employees, numbers of hotel rooms, numbers of visitors, or square footage), to quantify and characterize the materials that are diverted, and to quantify and characterize the materials that are disposed.

The study addressed the following 14 industry groups:

- Fast-food restaurants
- Full-service restaurants
- Food stores
- Durable wholesale goods distributors (e.g., warehouses and distributors of non-perishable items)
- Non-durable wholesale goods distributors (e.g., food warehouses and distributors)
- Large hotels
- Building material and garden stores belonging to certain "big box" chains
- Other building material and garden stores
- Retail stores belonging to certain "big box" chains
- Other retail stores
- Shopping malls
- Anchor stores at shopping malls
- Public venues and events
- Large office buildings

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Diversification was documented through interviews with employees at the businesses and inspection of recycling and diversion systems during on-site visits. Disposal was quantified through measurements of waste accumulation in dumpsters or through interviews and examination of waste disposal records. Disposed waste was characterized by obtaining one or more 200-pound samples from each site and hand-sorting it into 74 material categories. Both disposal and diversion rates were determined, either on a per-employee basis (pounds per employee per year), or per room, per thousand square feet, or per visitor, as appropriate to the nature of the business.

Summary of Findings

The industry groups addressed by this study that achieve the highest diversion rates do so mainly by implementing effective programs to recycle corrugated cardboard boxes and other cardboard packaging. Of the groups addressed in this study, food stores have the highest diversion rate, with an average of 71 percent of all waste material (mostly cardboard) being diverted. They are followed by retail big-box stores, with an estimated 64 percent diversion rate (again, mostly cardboard). Non-durable goods wholesale distributors on average divert 59 percent of waste materials (mainly achieved through cardboard recycling and through the reuse of wood shipping pallets). The group with the fourth-highest diversion rate is other retail stores at 54 percent, which mostly reflects cardboard recycling.

Four of the industry groups addressed in this study divert less than a quarter of their solid waste. Other building material and garden stores divert an average of 24 percent of their waste, and large hotels divert approximately 23 percent. Public venues and events were found to divert about 11 percent of their waste. The diversion rate for large office buildings is estimated to be about 7 percent, although the estimate does not take into account any diversion (e.g., recycling of computer equipment, furniture, etc.) that might be done by tenants of the office buildings independently of the buildings' management and custodial services.

Based on the findings of the study, key opportunities for additional diversion are presented in Table ES-1 of the Executive Summary (see attached report). For each industry sector, groups of divertible materials are listed starting with those that are most prevalent in the disposed waste by that industry sector, and proceeding in rank order.

In general, compostable materials such as food, leaves and grass, and lower grade compostable papers present opportunity to greatly increase diversion for most of the industry groups. Recyclable papers such as cardboard, newspaper, and other recyclable types also show significant potential for further recycling, as does lumber, for several industry groups.

APPENDIX B

REVIEW OF OPTIONS FOR COMMERCIAL PACKAGING REDUCTION

Scope

1. Interviewed Rory Bakke and Justin Lehrer regarding StopWaste Partnership past experience / future potential and current reusable transport packaging campaign projections and primary packaging project potential.
2. Determined key areas to research for additional information.
3. Drafted report summarizing new information and applicability for evaluating feasibility of commercial packaging reduction efforts for Alameda County.

Objective

The objective for this task is to review selected current work elsewhere regarding commercial packaging waste reduction efforts and describe possible direction on applicability and needs for Alameda County.

Findings

Many interesting and informative actions in commercial packaging reduction efforts have taken place since the StopWaste.Org *Waste Prevention Business Adoption Strategy* was completed in April 2006. Two relevant studies include:

1. **Portland Metro's Business Waste Prevention Market Assessment: Shipping and Packaging Wastes completed in July 2006.** Telephone surveys and in-depth interviews were conducted to determine if significant untapped potential exists within the business community in the Metro region for specific practices to reduce shipping and packaging waste, and what the potential benefits and barriers are to more widespread adoption of these practices. Based on the findings, an assessment of the market potential for the targeted waste prevention practices was made. Short-term and long-term action strategies were identified taking into consideration current and likely rates of adoption and resources required to implement. Many of the shipping and packaging waste prevention practices and business sectors evaluated are similar to those evaluated by StopWaste.Org.
2. **Environmental Packaging International's (EPI) Packaging Project with StopWaste.Org.** During the first phase of the project, a spreadsheet was developed to translate material types to packaging types in order to evaluate packaging currently being landfilled or diverted in Alameda County. Material categories drawn from data from StopWaste.Org's Waste Characterization Study were aligned with various packaging components. Where it was possible, landfill disposal rates were linked with the specific materials. Information on whether or not the various materials are accepted for recycling or composting in local programs was also included.

The second phase of the packaging project will focus on the benefits and impacts of decisions related to primary packaging. This may take the form of educational workshops or other means of outreach aimed towards packaging designers and engineers.

Most importantly, StopWaste.Org launched the **Use Reusables Campaign** in Spring 2007. The StopWaste Partnership is teaming up with the Washington, D.C.-based Reusable Pallet & Container Coalition (RPCC) to bring reusable transport packaging to Alameda County

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businesses. Reusables basics, cost comparisons, case studies and information on upcoming events and workshops are located on the campaign's website, www.usereusables.com.

Finally, the State of Oregon Department of Environmental Quality (DEQ) is developing a **Statewide Waste Prevention Strategy**. One of four focus areas is Business Practices, with a short-term focus on packaging. A summary of the process of developing the Strategy and current activities follows. The source of this information is interviews with David Allaway, Waste Prevention Coordinator, Oregon Department of Environmental Quality and review of the various reports and presentations.

- Recycling is up in Oregon, but so is waste generation. Between 1992 – 2005:
 - Disposed waste increased from 4.2 to 4.6 pounds per person per day.
 - Recovered waste increased from 1.5 to 3.8 pounds per person per day.
 - Generated waste increased from 5.7 to 8.4 pounds per person per day.

- Statutory Generation Reduction Goals:
 - No increase in per-capita waste generation in 2005 and subsequent years.
 - No increase in total waste generation in 2009 and subsequent years.

- Waste Prevention Guidance is provided by:
 - Statutes and Policies
 - State Solid Waste Management Plan (Environmental Quality Commission)
 - Waste Policy Leadership Group
 - Governor's Advisory Group on Global Warming

- Projection of Greenhouse Gas (GHG) Emissions with Waste Prevention Goals:
 - "Business as Usual" and "50% Recovery Goal" keep pace with each other in steadily and significantly increasing GHG Emissions from 2003 to 2025.
 - Meeting the Waste Generation Goals only slightly increases GHG Emissions from 2003 to 2025.

- Major DEQ Waste Prevention Activities have included:
 - Grants
 - Recovery rate incentive program
 - Special projects:
 - Resource Efficiency Program (1996 – 2000)
 - Northwest Materialsmart (2002)
 - Packaging Waste Prevention Project (2002 – 2005)
 - Technical assistance, outreach and web presence

- Significant effort undertaken by DEQ to develop a Waste Prevention Strategy since late 2005:
 - Proposes priorities for DEQ's work in waste prevention for the next 10 years.
 - Developed by DEQ staff in consultation with a Steering Committee, external stakeholders and management feedback.

- Waste Prevention Strategy researched:

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- Waste generation: changes and causes of change
- Environmental considerations
- State of Oregon experience
- Local government experience
- Non-governmental infrastructure, green building
- Waste prevention in businesses
- Programs outside of Oregon
- Product stewardship/extended producer responsibility

All documents are available at:

www.deq.state.or.us/lq/sw/wasteprevention/wpstrategy.htm

- Sources of Increasing Per-Capita Generation include:
 - Wood
 - Scrap metal
 - “Other inorganics” (brick, rock, rubble, wallboard)
 - Roofing
 - Carpets/rugs
 - Yard debris
 - Plastics
 - Clothing and footwear
 - Commercial printing
 - Small appliances/consumer electronics

- Draft Waste Prevention Strategy - Four Proposed Focus Areas:
 1. Design, construction, remodeling and demolition of buildings
 2. Business waste (short-term focus on packaging)
 3. Consumer education
 4. “Foundation” research and analysis

- Focus Area Two - Business Practices:
 - Proposed short-term focus on packaging.
 - Implementation planning in consultation with industry.
 - Assistance to organizations conducting outreach.
 - Case studies, demonstration projects, targeted outreach campaigns.
 - Technical assistance and/or grants.
 - Additional target sectors, materials, products, practices (TBD).

Four packaging projects have been selected in the process and are summarized below:

Project 1: Implementation Planning for Packaging Waste Prevention

DEQ’s recently completed packaging waste prevention pilot project, co-funded by Metro, produced several positive results. Evaluation of the pilot project identified several possible next steps that DEQ might pursue. These include:

- Promotion of existing (web-based) information resources to Oregon businesses.

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REVIEW OF OPTIONS FOR COMMERCIAL PACKAGING REDUCTION

- Promotion of specific best practices or provision of support (technical assistance and/or funding) to an organization(s) that would conduct this promotion (such as Metro).
- Provide ongoing technical assistance to businesses interested in evaluating their packaging for waste prevention potential.
- Target outreach to large generators of packaging waste (such as Amazon.com).
- Develop additional information tools.
- Conduct additional life cycle analysis.

Since the DEQ/Metro pilot project was completed, several national packaging organizations have expressed an interest in DEQ's packaging work, raising the possibility of partnership opportunities that could leverage DEQ's resources into even greater environmental results. Design decisions regarding packaging that ends up as waste in Oregon often occur out of state. Possible partnership opportunities include the Sustainable Packaging Coalition, Institute of Packaging Professionals, Flexible Packaging Association, and Wal-Mart, which recently launched a significant environmental packaging initiative.

DEQ will develop an implementation plan that describes future work in the area of packaging waste prevention. The implementation plan will be developed in consultation with interested and potential partners. The plan will include projects, tasks, partners, other resources required, evaluation activities, and schedule.

Project 2: Implementation for Packaging Waste Prevention

Upon completion of the Implementation Plan, DEQ will conduct additional work in the area of packaging waste prevention. Details cannot be described further as they have not yet been determined.

Project 3: Assistance to Organizations Conducting Business Outreach

DEQ will devote some resources to assisting organizations that are actively engaged in conducting outreach to businesses on waste prevention. Examples include Metro-area local governments, reSource's "Work Smart" program in Central Oregon, and the Oregon Natural Step Network. Typically, this assistance will include a variety of waste prevention practices for businesses (not limited to packaging).

Assistance may include support for developing case studies and demonstration projects, support for targeted outreach campaigns, provision of educational materials for distribution, and/or staff training. Assistance could take the form of DEQ staff time and/or financial assistance. DEQ will begin this project by conducting a needs assessment of potential partners. As with other projects, an implementation plan detailing projects, tasks, partners, other resources required, evaluation activities, and schedule will be developed in consultation with interested and potential partners.

DEQ will also update the Commercial Waste Reduction Clearinghouse, an on-line information source that was created in the late 1990s, which is now badly out of date.

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Project 4: Additional Sectors, Materials, Products, or Practices

Packaging is only one category of waste that businesses generate and/or produce. Once the projects described above are well underway, DEQ will initiate new work involving other sectors, materials, products, or practices. This project will begin with a screening process to narrow the list of sectors, materials, products, and/or practices for consideration. As with other projects, consultation with stakeholders and strategic review of barriers and benefits will be used to define actual projects and develop implementation plans for them.

DEQ is currently preparing a 3-year Work Plan and the second draft of the Strategy which incorporates comments from extensive public and stakeholder comments received earlier in 2007. These documents are expected to be approved before the end of 2007. Resources for implementation include an additional 2.0 FTE in staffing (1.5 FTE for the Waste Prevention Strategy Work Plan and .5 FTE for household hazardous waste prevention) and funding on the order of \$350,000 - \$400,000 for contracted services over the Work Plan's 3-year time frame.

Key to the process has been communications with interested and affected parties and connections with climate change programs, particularly the Western Climate Initiative involving several western states (including California) and Canadian provinces. One issue has been that energy conservation and materials conservation are treated differently in calculating greenhouse gas (GHG) emissions. Participation in the Initiative has allowed discussions and inclusion of waste prevention, recycling and composting in regional GHG reduction goals.

Recommendations

Recommendations resulting from the consultant review of the selected studies and programs and discussions with StopWaste.Org staff include the following:

- Continue review and comparison of results from relevant studies of business shipping and packaging practices.
- Request data on packaging materials from StopWaste.Org's current Waste Characterization Study.
- Continue to screen StopWaste Partnership businesses for packaging waste prevention opportunities.
- Consider and target opportunities based on industry group, and not only opportunities based on shipping and packaging practices.
- Continue evaluating results from the Use Reusables Campaign.
- Continue participation in Sustainable Packaging Coalition.
- Investigate links and measurement of greenhouse gas (GHG) emissions resulting from commercial packaging reduction efforts.
- Renew participation in the Western Climate Initiative for what StopWaste.Org can offer to businesses.
- Consider evaluating impact of trend in Bay Area towards biodegradable and recyclable food service ware and packaging.
- Consider approach to formalizing a systematic waste prevention strategy in coordination with the State of Oregon and the California Integrated Waste Management Board to increase opportunities and maximize resources.

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- Consider increasing staffing and funding resources for commercial packaging reduction efforts and other StopWaste.Org waste prevention programs.

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BACKGROUND INFORMATION

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***MATERIAL BANS AND MANDATORY
RECYCLING PROGRAMS:
US EXPERIENCE AND LESSONS***

-- FINAL REPORT --

***PREPARED AS PART OF ALAMEDA COUNTY SOURCE REDUCTION AND RECYCLING
BOARD / 2006 MEASURE D "FIVE YEAR AUDIT" PROGRAM ASSESSMENT***

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Sections adapted from SERA research paper 2006-1, "Bans, Mandates, and
Other Policy Options: Results from 50 States and the 100 Largest Cities" © SERA

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

Skumatz Economic Research Associates, Inc. (SERA) conducted a review of communities that had implemented either material bans or mandatory recycling – policies that are closely related – with attention to:

- Which materials are banned, and at which point they are banned;
- The manner in which recycling is mandated, with particular attention paid to options for mandatory commercial recycling;
- The manner in which either or both programs are enforced;
- Effects and suggested approaches; and
- Summary of recommendations and possible approaches based on the findings.

SERA conducted a review of its proprietary in-house database to identify various communities with these policies, and conducted several follow-up interviews for programs that seemed particularly interesting in order to gather additional information on the manner of enforcement and other issues. We analyzed the information from more than 40 communities to examine the variation in the ways in which the policies are designed, defined, in place, or implemented across the US. Bans are addressed first, followed by mandatory recycling.

1.1 Material Bans: Summary and Recommendations / Best Practices

Program Design: Bans can be successful and can increase diversion and increase attention on key materials. Key materials should include at least cardboard and “standard” recyclables, and yard waste. Bans from each sector – residential, commercial, and potentially multifamily dwellings - provide a consistent message. Some areas have also banned certain polystyrenes and take-out containers, or other materials. Thresholds may provide a practical alternative to zero tolerance messages; smaller thresholds may be appropriate for materials that are generated “separately” (e.g. yard waste), and 5% - 10% thresholds may work for other materials, particularly when they are generated in combination with other materials. Thresholds can be decreased over time as compliance improves and alternatives “take hold”.

Enforcement: Bans seem especially effective if accompanied by a serious degree of enforcement. Enforcement can take place successfully at (either or both of) two locations – the curb or the transfer station / landfill. Periodic spot inspections of set-outs at the curb work well for residential household enforcement. Seattle’s successful experience advertising the ban made households aware; violations fell during early weeks of the program. Others requested communities within the region to develop enforcement plans, providing guidance on threshold enforcement levels, an option that may be effective within Alameda County as well. Dumpster diving as a practice for enforcing bans and mandates for the commercial sector can help identify the presence of key recyclables; this enforcement can be augmented with periodic inspections of loads at the landfill or transfer station. Bans can be especially effective (and more easily enforced) if the community has a role in the facilities because inspections can be integrated into operations and be conducted efficiently at any time of day (e.g. every 15th truck throughout the

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day, etc.). Fines and penalties – including aggressive elements for persistent violators – should be established. However, evidence seems to indicate that public education, a few visible enforcements, and large, colorful, hard-to-miss “no pick-up” tags may be effective deterrents. Fines must be large enough to cause pain to haulers; if large fines aren’t possible (or effective), some communities force unloading, sorting of materials, and then reloading, and time is a very effective deterrent to haulers. If haulers can be enlisted in helping in enforcement, that is ideal; however, although some communities use them in enforcing bans, their assistance may be best suited to enforcing mandatory recycling (especially in areas where this aligns with their business interests).

1.2 Mandatory Recycling Service: Summary and Recommendations / Best Practices

A combination of both mandatory recycling and bans may be the most effective, keeping all options covered, assuring access to programs (a “must” with bans), and getting the best of all enforcement opportunities.

Program Design: The program should require recycling to be offered for residential and commercial customers (and potentially multifamily). Mandatory recycling may not be required for all businesses, but perhaps for those that exceed a certain size recycling container or possibly employees (if the information is readily available from City business license forms). If possible, the cost of the recycling program should be required to be embedded in the garbage fee. While this is common for residential programs, it has less commonly been implemented in the commercial sector because of the reluctance to “interfere” in the private sector. If a system with “no separate fee” cannot be implemented (for commercial), consider the following options:

- Every business is assessed a fee equal to the cost of recycling equal to at least X% of their garbage service, or at least a 1 cubic yard container once a week of recycling.
- Non-collection of containers with significant recycling in the container – with visible violation stickers
- Other options.

Note that haulers prefer mandatory programs to bans, as it represents a business opportunity for them. Mandatory programs can help reduce cost because stops occur at all generator locations. In addition, if mandatory service is required, haulers can be fairly effective partners in enforcement. However, note that mandatory participation does not make it certain that high levels of materials will be diverted.

Enforcement: While mandatory participation in recycling cannot reasonably be required, payment for the access to the service can be. Residential access and payment is fairly straightforward. Having the haulers help enforce recycling for commercial buildings may be a practical option, given their business interest in making sure recycling service is delivered. This is made more complex under a situation where recycling haulers are distinct from trash haulers, or where trash haulers are not interested in recycling service; however, that is not common in California. Non-compliance could result in fines equal to or above the cost of recycling service, presumably levied by the City or agency. The city or agency should also conduct periodic curbside checks and also check loads at the transfer station and / or landfill.

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2.0 SUMMARY OF FINDINGS ON MATERIAL BANS

2.1 Program Design Elements

Bans have been implemented since the 1980s and before, including actions by cities, states, and landfill districts. The materials that have been banned include:

- A host of itemized recyclables, “separated recyclables”, or subsets of standard recyclables (which is where the overlap with mandatory recycling programs occur);
- Compost
- Wood waste
- “Universal” waste
- Inerts
- Polystyrene / takeout containers
- Yard waste
- Pallets,
- Tires, oil, etc. and
- Other materials.

Tables of statewide landfill bans gathered from SERA databases are presented in Table 2.1 and Table 2.2.⁵⁷ A wide variety of bans have also been established at the local (community) or regional level (counties, districts, etc.).

Table 2.1. Table of State-Level Material Bans – Recycling-Related Bans (Source: Skumatz Economic Research Associates, Inc. / SERA)

Material	CA	IL	MA	ME	MI	MN	MO	NC	ND	NE	NJ	OH	PA	VT	WI
Source Separated Materials						X									
Locally Designated Recyclables											X				
Aluminum Cans								X							
Aluminum Beverage Containers															X
Beverage Containers					X										
Glass Containers			X												X
Metal Containers			X												
Plastic Containers (narrow-neck)			X												
Plastic Bottles								X							
Plastic Beverage Containers															X
Steel Containers															X
Corrugated Cardboard															X
Magazines															X

⁵⁷ Tables 2.1 and 2.2 from Skumatz and Freeman, “Bans, Mandates, and Other Policy Options: Results from 50 States and the 100 Largest Cities”, Research Paper 2006-1, Skumatz Economic Research Associates, Inc., Superior, CO.

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Material	CA	IL	MA	ME	MI	MN	MO	NC	ND	NE	NJ	OH	PA	VT	WI
Newspaper															X
Office Paper															X
Recyclable Paper			X												
Telephone Directories						X									
Leaf Waste (truckloads > 50%)													X		
Leaves										X					
Leaves and Yard Wastes			X												
Source Separated Yard Waste												X			
Yard Trimmings					X	X									X
Yard Waste		X					X								

Table 2.2. Table of State-Level Material Bans – Non-Recycling-Related Bans (Source: Skumatz Economic Research Associates, Inc. / SERA)

Material	CA	IL	MA	ME	MI	MN	MO	NC	ND	NE	NJ	OH	PA	VT	WI
Household Appliances										X					
Major Appliances							X								
Metal			X												
Scrap Metals									X						
White Goods		X	X	X		X		X	X					X	X
White Goods w/Freon					X										
Asbestos					X										
Asphalt Pavement, Brick, Concrete			X												
Oil-based Paint														X	
Wood			X												
Wood Pallets								X							
Cathode Ray Tubes			X	X		X									X
Electronics	X														
Fluorescent Tubes	X														
Lead-Acid Batteries		X	X	X	X	X	X	X	X	X		X	X	X	X
Oil Filters								X							
Used Oil	X	X			X	X	X	X	X	X				X	X
Waste Tires		X								X		X			
Whole Tires	X		X	X	X	X	X	X					X	X	
Whole and Shredded Tires												X			
"General Batteries"														X	
Hazardous Waste					X										
Liquid Waste					X										
Low-level Radioactive Waste					X										
PCBs					X										
Sewage					X										

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Material	CA	IL	MA	ME	MI	MN	MO	NC	ND	NE	NJ	OH	PA	VT	WI
Medical Waste					X										
Untreated Infectious Waste (landfills)													X		
Oyster Shells								X							

State level material bans are common but for the purposes of this report smaller town wide ordinances and bans were also investigated. The statewide bans are listed above in Tables 2.1 and 2.2. The following table lists the communities or landfills included in this report with local or regional bans or mandatory ordinances in place.

Table 2.3. Table of Communities with Local / Regional State-Level Material Bans (Source: Skumatz Economic Research Associates, Inc. / SERA)

Location	What
Seattle	Residential- paper, cardboard, aluminum, glass, plastic Commercial- paper, cardboard, yard waste
Marshall County, IA	1995 City ordinance banning materials at the landfill
Central Vermont SWM District	Local ordinance for mandatory recycling
Gainesville, FL	1997 enacted local mandatory commercial recycling
Concord, CA	Mandatory C/S recycling for SF homes
Chapel Hill, NC	County wide ban passed in 1995-96
Addison County SWMD, VT	Mandatory recycling for residential and commercial accounts

Some communities started with cardboard bans, and later expanded the list. In some cases, the bans are on any amount of the material (zero tolerance; often zero visible tolerance); in other cases specific numeric thresholds are set, noting that no more than 10% of a load can be a particular banned material, for instance.

2.2 Enforcement, Penalties, Costs, and Impacts

Some programs ban from the landfill; others ban materials from collection. We found examples of enforcement that had happened at either location. We also found that, regardless of whether the requirement is officially a landfill or collection ban, many of the bans are enforced at the curb, often enlisting the aid of the haulers (a technique that is especially effective in enforcing mandatory programs). Mandatory recycling and bans can be enforced at any level ranging from a local landfill ban, affecting the communities hauling to the landfill, mandatory recycling that applies to only a certain type of business in a city, to enforceable state wide bans.

Enforcement at the landfill: Examples of the ways in which these bans are enforced at the landfill include:

- Using statewide inspectors. In one case, these inspections are just one of their responsibilities; in most cases, on-site landfill workers were responsible for checking loads.
- Random load inspections. Frequency of load inspections varied from inspecting every load (at small communities) to random inspections of every 40th load, or other frequencies.

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- Inspection plans. One state requires specified plans for enforcement at each facility, with statewide guidance on the frequency of inspection based on size, throughput of facility, and other parameters
- Stings. Some communities conducted “stings” or visible, infrequent inspections with media attention for the results to encourage compliance.

Enforcement at the curb: We found considerable variation in the manner of enforcement, with examples and elements including:

- Dumpster diving / inspection. Some communities used sanitation staff to do “dumpster diving” or container inspections; in other cases, haulers were responsible for checking to see if there were visible infractions, and the city “spot checked” hauler loads.
- Inspections with “tagging”. In some communities, inspectors indicate non-compliance by placing tags giving the owner 24-72 hours to re-sort the material, or tagging and collecting “the next week”, or putting stickers saying “no pickup”. Some communities have the ability to levy fines
- Compliant basis. In some areas, sanitation inspectors work in response to complaints only; others conduct “cold” inspections
- Thresholds of non-compliance. Some areas are “zero tolerance” and inspectors look for any amount of offending material in the container; others are inspecting for violations defined as materials beyond a specified threshold percent of material in the container.

Official penalties vary, and examples include:

- Non-monetary: In this case, penalties include “...talking with the haulers”, stickers for no collection or delayed collection, stings, or public humiliation.
- Financial: Depending on the community, tickets may be associated with fines from \$20 /\$50 / \$100 / \$500 per infraction, or 50% surcharge on the offending load, or double or triple the load tip fee
- More aggressive: Officially, haulers can lose licenses in several areas.

In most cases, aggressive penalties had not yet been used.

The costs to enforce these programs varied from 0.2-0.4 full time equivalent (FTE) staff in small to medium communities, to “half time” FTE in a community of half million without major enforcement, to one 1 FTE for a regional authority of more than a dozen towns, to a maximum of 3 staff at a city of a half million with fairly substantial enforcement efforts. Some communities also spent significant budget dollars on outreach about the program.

The separate effects due to the ban had rarely been measured separately. Many said, anecdotally, that it “helped” or “increased diversion”. A few had conducted some measurements. What numeric information we were able to glean from communities included:

- Diversion increased from 38% to 44% (Seattle) when papers and containers were enforced for residential and commercial collection (and Seattle pays attention to measurement)
- An increase of 25% in recycling, and landfilled tonnage decreased 10% (Chelmsford)
- One examined the share of cardboard in the commercial stream before vs. after the ban, and found a decrease from 20% to 3%
- One area with 16 towns indicates they have diverted 600,000 tons as a result of bans since 1990, saving 4 years of landfill space; another saved one year of space; another estimates they saved almost \$100,000 in tip fees.

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SERA's statistical studies have identified some impacts from bans. We conducted several studies examining the impacts of program design variations – “holding constant” variations in programs, community demographics, and other features. These studies have indicated yard waste bans increased yard waste diversion by about 4-6 percentage points above and beyond impacts from variations in programs and community demographics.⁵⁸ Mandatory recycling programs did not seem to add significant tonnage, but were related to lower costs for the delivery of recycling programs (perhaps 15-25% less expensive per household).⁵⁹ We were unable to find other statistical work on the subject of bans or mandatory programs.

2.3 Comments, Suggestions and Recommendations

Based on review of the approaches, and interviews with some of the communities, we list the following suggestions regarding the implementation of material bans.

- Enforcement is the weak link in these policies; communities that enforce seem to see stronger effects. Weak enforcement is quickly “known around town” and leads to lax compliance.
- Enlisting the haulers as assistants in enforcement can make the job easier at the community level.
- Overall, communities note that without flow control or facility (landfill or transfer station) ownership / control, enforcement of landfill bans is more difficult.
- One community made a five-step suggestion: 1) do not ban unless there are viable alternatives (programs); 2) go to haulers with the reasons for the ban; 3) publicize the ban widely; 4) have meetings with stakeholders to discuss the ban; and 5) have a phase-in or grace period before stringent enforcement begins.
- Talk to haulers and drivers (at meetings with “free food” according to one community) – haulers are the most effective enforcers.
- Local bans can be as effective (and in some cases “better” according to some communities) than statewide or broader bans.
- Enforcement must be all hours of the day (with potentially random inspections), because otherwise haulers radio each other when the inspectors have left for the day or shift.

A summary of results and best practices is included in the executive summary.

⁵⁸ Skumatz, Lisa A., Ph.D., “Nationwide Diversion Rate Study – Quantitative Effects of Program Choices on Recycling and Green Waste Diversion: Beyond Case Studies”, Skumatz Economic Research Associates, Superior, CO, and Skumatz, Lisa A. Ph.D., “Achieving 50% in California: Analysis of Recycling, Diversion, and Cost-Effectiveness”, prepared for California Chapters of SWANA, Skumatz Economic Research Associates, Inc., Superior, CO.

⁵⁹ Skumatz, Lisa A., Ph.D., “Nationwide Diversion Rate Study – Quantitative Effects of Program Choices on Recycling and Green Waste Diversion: Beyond Case Studies”, Skumatz Economic Research Associates, Superior, CO, and Skumatz, Lisa A. Ph.D., “Achieving 50% in California: Analysis of Recycling, Diversion, and Cost-Effectiveness”, prepared for California Chapters of SWANA, Skumatz Economic Research Associates, Inc., Superior, CO.

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3.0 SUMMARY OF FINDINGS ON MANDATORY RECYCLING

3.1 Program Design Elements

We investigated communities with “mandatory” recycling within SERA’s database, with a focus on policies affecting the commercial sector. These programs have been in place statewide in some areas as early as 1989. The range for sectoral coverage for the programs included:

- Residential, commercial, multifamily, churches, schools, or “every trash producer”,
- Subsets of businesses, defined by business type, employee thresholds, or square footage of the facility,
- All towns greater than a certain size (more than 10,000 population in one specific example), or
- Variations of “mandatory” including requiring recycling plans for buildings, requiring recycling in the lease, required to offer recycling, or financial incentives.

The materials that were “mandatory” for recycling in at least one community among the ones we investigated in the database or via interviews are listed in Table 3.1.

Table 3.1. Mandatory Recycling Materials Required

Residential	Commercial	Multifamily
<ul style="list-style-type: none"> • “7 normal recyclables” • Pick from a list • Recyclables list and yard waste • Newspaper, mixed paper, containers 	<ul style="list-style-type: none"> • Cardboard and office paper • Choose 2 from a list • Cardboard and containers (from bars) • Cardboard, paper, aluminum, and newspaper (from offices) • Newspaper, mixed paper, and containers • E-waste • Construction and demolition 	<ul style="list-style-type: none"> • Newspaper and cans • Choose 4 from a list

The variations in the manner in which these “mandatory” programs were defined as mandatory are listed below:

- Must provide recycling to get a hauler license; required as part of the hauler franchise agreement,
- All commercial properties must have recycling containers at least one half the size of the garbage bins (moving to 75%)
- Every trash producer must have recycling, or the hauler must provide this service “if asked”, or the property owner must provide recycling.

Some also defined limitations on how the program may be charged (to help encourage actual use). This is especially important if the program is defined as “must be available”. A few included:

- Commercial recycling can’t cost more than 50% of trash price, residential must be no extra fee / embedded in the trash rates; or
- Recycling fees must be “competitive with trash”.

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3.2 Enforcement, Penalties, Costs, and Impacts

For the communities we investigated, about half were enforced at the landfill or transfer station, and about half at the curb. Other individual communities conducted enforcement through billing records (those requiring minimal sizes of recycling containers) or through hauler volume reports. Enforcement methods are listed in Table 3.2.

Table 3.2: Mandatory Recycling Enforcement Methods

Enforcement at the landfill / transfer station ("Up" the chain)	Enforcement at the curb	Other Enforcement Methods
<ul style="list-style-type: none"> • Every 40th load at the landfill • 100% load check at the landfill • 10% tolerance in loads / some items 0 (zero) tolerance • Random spot checks at the transfer station / landfill 	<ul style="list-style-type: none"> • Drive streets to check "participation" • Curb checks (look in) • Dumpster diving 	<ul style="list-style-type: none"> • None • Complaint basis / letter complaints • Volume reports from haulers • Billing reports • Mandatory FEE only – no participation / volume enforcement • Newsletter asking to "rat" others out (they report this is effective) • Haulers tell which businesses aren't recycling (with a bounty) • Part of franchise agreement when set up – plus rate requirements also part of the agreement

Penalties "on the books" for infractions ranged from:

- Written notice, citation / ticket, trips to court (few).
- Fines – with residential fines ranging from \$10-\$100, and commercial or hauler fines ramping up from \$100-\$250, \$100-\$500, \$100 or 30 days in jail, \$250 or 60 days, \$500-\$1,000 or 90 days.
- Fines of 20% of the trash fee, or charging double for the load.
- Fines equal to the cost of the recycling service they are not getting.
- Loss of hauler license.
- Loss of business license for the firm.

Again, the more aggressive penalties have rarely been invoked (see case studies in Section 4 for specifics, where available). The cost for these enforcement activities varied from about a tenth of an FTE to other communities that dedicated a quarter to half FTE, and others dedicating 1-2 FTE. One community mentioned \$600-\$900K in grants to provide follow-up enforcement and local technical assistance.

The diversion effects from the imposition of mandatory recycling are not documented in most communities, although they are usually perceived as effective. The few reports of monitored effects included:⁶⁰

- Residential: trash decreased 10%, recycling increased 10-15%, recycling increased 50%.

⁶⁰ SERA has not found significant results thus far on statistical studies of mandatory recycling, likely because of enforcement variations.

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- Commercial: “Big effect” from communities that are well enforced, or have “ratting” programs) to “not much effect” from communities that enforce by looking at hauler volume reports for their enforcement mechanism.

3.3 Comments, Suggestions and Recommendations

Community interviews led to a number of suggestions, including:

- Mandatory recycling needs enforcement and constant policing to be effective (and fair).
- If the program is or ban is mandatory and you allow even a 10% tolerance you are still achieving 90% of the effect and this makes a strong program; one community is moving down to 1-5% tolerance.
- Set more attainable goals than “zero waste”.
- Recommendation to involve actors all up and down the chain.
- Small towns can check the most / best.
- Public education is an important tool.
- “Ratting out” worked very well.
- Community suggests doing outreach, identifying barriers, and working with businesses for success.
- One community suggests making sure drivers are involved. They suggest making it easier for them to tag the bags and not collect garbage containing recyclables than to collect it and potentially be fined.
- Don’t define the eligible businesses by employment or square footage, as it is too hard to enforce from the street, or if the City doesn’t provide service. They suggest perhaps defining programs based on dumpster size ratio as potentially more enforceable (e.g. recycling containers must equal trash, or be half the volume or other ratio).
- Enforcement should include / be looked at jointly as education.
- Haulers prefer mandatory programs to bans because it represents a business opportunity for them. They may also be in a better position to help enforce mandatory service.

A summary of results and best practices is included in the executive summary.

4.0 COMMUNITY EXAMPLES / CASE STUDIES

The following examples, derived from a combination of SERA’s database and some interviews, address several key topics:

- Type / description of program
- Diversion impacts,
- Enforcement, and
- Advice on programs.

As mentioned, there is wide variation in the design and implementation of these programs around the country. Rather than any clear “winners” around the country, these examples provide elements of the approaches described in our analysis in sections 2.0 and 3.0. Abbreviations for this section include C&D (commercial and demolition), MFU for multifamily

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units, SF for single family, TS for transfer station, PAYT for Pay as you Throw residential trash rates, and FTE for full-time equivalent employees.

4.1 Community Examples: Material Bans

4.1.1 MILWAUKEE, WI – STATEWIDE LANDFILL BAN WITH DEADLINE FOR ENFORCEMENT PLANS

Population: 556,948

Type of Program:

Milwaukee operates under a statewide landfill ban on recyclables for residential / MFU / commercial generators. In August of 2006 the Department of Natural Resources passed a deadline for the individual communities in the state to make compliance enforcement plans.

Diversion:

Interviewees suggest that the program has definitely increased diversion but can't say how much is due to the landfill ban.

Enforcement:

This is reportedly the weak link in the program. Milwaukee indicates they just don't have the budget to enforce the bans adequately.

- For commercial and MFU - they give a written warning, give the offender time to fix the problem, re-inspect the site, give a final warning, give more time to comply, and then give a fine. They have used fines but very sparingly. For MFU the main enforcement occurs on a "complaint basis"-tenants who want to recycle but for whom service doesn't seem to be available in their building.
- For residential the hauler will tag the offender's garbage with a bright orange sticker and the city sanitation inspector writes it up. The offender is then given 24-72 hours to comply and sort correctly, and if the household doesn't do so they fine the homeowner. Last year they issued about 1,000 household fines.

With a higher enforcement budget Milwaukee believes they could increase attention on enforcement and force compliance but the sanitation inspector has many roles, not just enforcement and there is only one full time recycling employee for the City.

4.1.2 CHELMSFORD, MA – MATERIAL BANS WITH ENFORCEMENT

Population: 33,000

Type of Program:

Chelmsford enacted a city-wide ordinance enforcing the statewide legislation concerning waste bans in January 2006. The ban includes cans, bottles, paper, mixed, occ, plastics 1, 2, C&D, yard waste, CRTs.

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Diversion:

- Trash tonnage is down 10%
- Diversion is up by 25%
- Have saved \$99,300 in reduced tipping fees.

Enforcement:

- Enforced by the hauler at the curb
- If the hauler sees recyclable materials in the trash they will put a bright orange sticker on the can and not pick it up
- It was difficult to get the haulers to do this, they are used to just picking up everything regardless of content so the town did its own enforcement on the haulers
- The city conducted 6 months of enforcement on the haulers with spot checks of loads and they also did "stings" - put recyclables in the trash and then watched to see what the haulers would do
- They gave lots of warning (not sure how many) and then fined the company if infractions continued. Luckily, this was built into the hauler contract with the town so it was easy to levy the fines.

Enforcement Cost - 0.5 FTE. The recycling coordinator for the town handles the enforcement but only works half time. One of the largest costs for Chelmsford was giving away more recycling bins (which cost them \$15K) and they spent \$1K on mail-out education materials.

Advice:

- Town staff feel that bans are a "no-brainer", as they increase diversion and state support for bans was already in place in MA
- It is important to bring in the haulers early. Make sure to not just tell the company executives, but also involve the drivers so they know what's going on. Suggests hosting some early morning breakfasts for all the drivers to educate them.

4.1.3 MARSHALL COUNTY LANDFILL, IA -- LANDFILL BANS WITH ENFORCEMENT

Population: 39,311 16 towns

Type of Program:

In 1995, Marshall County adopted an ordinance that all member communities and cities have a landfill ban on compostables and recyclables - paper, containers, and aluminum.

Enforcement:

- It is enforced by both the haulers at the curb and by the landfill on site
- At the landfill they inspect every load for banned materials and if they observe too much contamination of recyclables they will speak to the haulers
- Each individual town licenses their haulers and as part of the license requirement curbside collection must be provided - the maximum charge for recycling service is \$3 per month
- Marshall County has never had to issue a ticket; they also have the option to revoke a license but have never done so

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- Overall, very little time or budget is spent on enforcement.

Advice:

- The program works well in Marshall County because of the economics. Tipping fees at the landfill are \$52/ton but to drop off recyclables at the MRF it is free so there is an economic incentive in place for the haulers to encourage collection. There is still some contamination, but it is relatively low.
- If you want to implement a ban give the haulers 18 months to get ready for it and bring them on board early on in the process. If you want the ban to be effective, hauler cooperation is key.

4.1.4 CHAPEL HILL, NC – MATERIAL BANS WITH ENFORCEMENT

Population: 48,715

Type of program:

- In 1995-96, Chapel Hill passed an ordinance that banned non-residential OCC. Everyone who used the landfill had to get a separate OCC dumpster or go elsewhere.
- In 2002 they passed a regulated recycling ordinance banning OCC, scrap metal, and clean wood from going anywhere other than a certified recycling facility.

Diversion:

Chapel Hill estimates they have experienced a gain of one year of landfill space from OCC diversion. Cardboard was 20% by weight of commercial stream pre-ban and now it is around 3%.

Enforcement:

- Completed at the curb and landfill
- Two types of enforcement at curb, inspections of loads and "dumpster diving"
- Dumpster diving results in tagging the dumpsters
- Inspections at the landfill result in fines. Fines occur in the following order: Double tip fee, \$25, \$50, \$100, \$500, lose license for a year
- Tipping cost for clean wood waste is \$15/ton v \$40/ton for trash. No tipping fee for metal or OCC.

Enforcement Cost: 1 FTE

4.1.5 CAPITAL REGIONAL DISTRICT, CANADA – LANDFILL BANS WITH ENFORCEMENT

Population: 360,000 16 towns

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Type of Program:

- Capital Regional District (CRD) has enacted multiple landfill bans over the last 16 years, starting in 1991.
- Banned materials include: drywall, cardboard, e-waste, scrap metals, paper, and most recently yard waste.
- The individual towns within the CRD have voluntary curbside recycling.
- CRD is unique because they own the landfill, this allows them to enforce the materials ban even though there are 16 individual towns each with their own local governments. CRD has no control over the individual cities.

Diversion:

The diversion rates for CRD range from 34%-40% over the last 15 years and varies somewhat depending on the year. CRD estimates there are more than 600,000 tons diverted through the bans since 1990, saving an estimated 4 years of landfill space.

Enforcement:

- The onus of enforcement falls on the haulers. Although it is the district enacting the bans, it is the haulers at the curb who make it happen. The techniques the haulers use to enforce vary throughout the district.
- The CRD has a full time officer at the landfill who is on duty 75-80% of the time the landfill is open.
- The officer randomly checks loads and tickets the drivers who are in violation. The driver who dumps the "bad" load will then try and track down where the load originated and speak to the generator.
- About 99% of the tickets issued are for haulers even though there is residential drop-off at the landfill.
- Tickets are \$200, the annual amount of tickets issued is on average \$30-\$35K, tickets are issued to drivers and the companies pay the fines.
- The CRD provides education to residents to stop the bad loads and works with the hauler to identify the generators.

Enforcement cost: 1 FTE subcontracted by law officer

Advice:

- Never ban a material unless there are a number of viable alternatives available for disposal.
- When you do decide to ban, make sure you can present the haulers with a good reason to enact the ban to get them on board.
- Public consultation and outreach is helpful.
- Have a grace period after the ban starts and before you start enforcing the ban. They usually have about a 6 month lag between implementation and enforcement.

4.1.6 SEATTLE WA – BANS WITH ENFORCEMENT

Population: 536,946

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Type of Program:

Starting January 1, 2006 recyclables are banned from Seattle's household, business, and apartment garbage.

- Business bans: paper, cardboard, yard waste
- Household: paper, cardboard, aluminum, glass, plastic

Increased diversion:

Seattle reports that the overall diversion rate increased from 38% before ban to 44% after the ban.

Enforcement:

- For businesses, if they find over 10% of garbage is recyclable they tag it, and on the 3rd tag they fine \$50. There are about 10,000 accounts and they examine about 25% of them. Only about 1.5% of businesses were in violation last year.
- For MFUs the enforcement team inspected about 50% of their 10,000 accounts. There were very few violations. About 97% of the city's MFUs are recycling. The 3% that are not received an exemption. Exemptions can be granted on a case-by-case basis if there is not enough room on the property to recycle.
- Seattle violations have fallen from 115 tags for commercial and MFUs in the first month of the program to 33 a month average now.
- Households are not fined. Inspectors leave a tag, ask households to sort the materials to remove recyclables, and note the materials will be picked up the next week. In the first month of the program a total of 227 enforcement tags were issued; in the second month they issued only 133.
- Cost - There is no real enforcement budget so no number was provided. However, there are 6 inspectors that work on the program and they go out every day to inspect. Seattle reports spending quite a bit on education to inform the public of the ban (about \$400,000 a year for the 2 years before they rolled out the program to educate the public).

Enforcement cost:

There is no specific budget for enforcement alone as it is lumped in with the total budget. The inspection crew consists of 6 part time employees, consisting of about 3 FTE total.

4.2 Community Examples: Mandatory Recycling

4.2.1 CONCORD, CA – MANDATORY RECYCLING, NO ENFORCEMENT

Population:121,780

Program type:

In 1991, Concord started requiring mandatory curbside collection of recyclables and yard waste by haulers for SF homes.

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Enforcement:

- There is no enforcement reported for the program.
- People pay for the service because recycling fee is embedded in hauler charges but they don't have to use it.

4.2.2 FORT COLLINS, COLORADO – MANDATORY RECYCLING THROUGH ORDINANCE WITHOUT STRONG ENFORCEMENT

Population:122,297

Type of Program:

Recycling in Fort Collins is not really mandatory, in that there is no enforcement to see if residents are actually recycling, but per a 1995 ordinance all haulers must provide recycling to residents at no extra cost. All residents are paying for recycling even if they don't use it. There is no mandatory recycling ordinance (or program) currently in place for commercial, as this sector is strictly free market; businesses can recycle if they choose to pay for it.

Diversions:

There was no base line measurement of diversion pre-1995 so the City is not sure exactly how much the ordinance increased diversion but it is estimated to have resulted in about a 50% increase in the residential rate. The ordinance has been very effective for residential recycling.

Enforcement:

- The only enforcement is on a "complaint basis".
- If a residential hauler is not providing the services, the only way the city will find out is if the resident calls and complains.
- The cost to the hauler for not providing residential service is a loss of license.
- The instances of haulers not providing service are very low.
- The cost of this type of enforcement is minimal.

4.2.3 TOWN OF CONWAY, NH – MANDATORY RECYCLING WITH ENFORCEMENT AT TRANSFER STATION

Population: 8,000

Type of Program: Beginning June 2004 the town began enforcing its mandatory recycling provision of its solid waste ordinance. All users of the transfer station, including the town's two haulers, must sort recyclables and place them in designated receptacles. The Town established a goal to increase recycling from 18% to 40%.

Diversions:

- Has resulted in increase in diversion
- HH trash tonnage down 10%
- Recycling is up 10-15%

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Education:

- Educational programming on local TV
- Distribution of brochures at the Transfer Station
- Recycling resource center on the town's website

Enforcement:

- No curbside recycling, it is all at the transfer station.
- Transfer station is open Tuesday-Sunday and the town budget includes a Recycling Enforcement Officer.
- Households must throw their recycling in separated bins; if enforcement officer sees trash households are told, and their trash is thrown in a different area. Residents can sneak recyclables in trash with black bags if they really want to.
- Haulers weigh trash and then drop off in a separate area, enforcement officer checks the load and issues citation if need arises.
- Citations – Household fines range from \$10 to \$100; hauler fines range from \$100-250. So far in 2007 4 citations issued, two residential, two hauler.
- C&D is banned too. When residential construction is underway, builders get a building permit, the landfill is notified to expect more C&D, and inspectors and the landfill watch the trash more closely.

Enforcement cost:

1 FTE working Tuesday-Sunday.

Advice:

- They are lucky that they are a small town because they can check almost all of the trash coming in. There are only two smaller haulers operating in the whole town.

4.2.4 CENTRAL VERMONT SWM DISTRICT – MANDATORY OPPORTUNITY FOR RECYCLING WITH “SOFT” ENFORCEMENT

Population: 60,000 22 towns

Type of Program:

The Central Vermont SWM District's 1990 ordinance addresses recycling in a couple of ways:

- Mandatory hauler licensing/private free market - in order for a hauler to get a license they must provide curbside (c/s) recycling.
- Property owners must provide recycling and trash.
- Recycling cost can be up to 50% of trash cost maximum, so if trash collection is \$3 than recycling is \$1.50.
- No listing of what the mandatory recycling items are.

Enforcement:

- This is the biggest challenge for the SWMD
- They take a very "soft" approach, they educate first and foremost; they have the power to ticket and take people to traffic court but have never done so

APPENDIX C
MANDATORY PROGRAMS AND DISPOSAL BANS
BACKGROUND INFORMATION

- They can do spot checks of haulers at the Transfer Station or spot check tenants and properties but rarely do either due to lack of budget and labor
- The bans are mostly voluntarily enforced
- "Complaint basis" is used for MFUs, for SF the ordinance basically functions only as an outreach/education tool because it is not enforced
- Lots of residents use self haul and there is a PAYT system at the Transfer Station

Advice:

- Thinks it does have a positive effect even without the enforcement by guaranteeing recyclables and stabilizing the market.
- It also helps if people are really refusing to recycle.

4.2.5 GAINESVILLE, FL – MANDATORY COMMERCIAL RECYCLING WITH REQUIRED MATERIALS AND “COMPLAINT-BASED” ENFORCEMENT

Population: 150,000

Type of Program:

Gainesville instituted mandatory recycling for all commercial properties including churches, schools, businesses, MFUs. The city collects recyclables, and they collect different materials for different entities:

- MFUs - Newspaper and metal cans
- Business - OCC and office paper
- All c&d generators must recycle

Enforcement:

- Takes place at the curb only
- The majority of the enforcement is on a "complaint basis", MFUs are enforced by inspections but that rarely happens
- For businesses, the enforcement is very "friendly". For the first offense they talk to the violator; for the second offense they write a letter. There are very few letters sent out and it has never gone further than this.
- The program is reportedly "quite effective" and it is estimated that there are 10-12 citizen complaints per week about MFUs or businesses

Enforcement cost:

0.25 FTE - The person in charge of the program spends about one-quarter time on enforcement.

4.2.6 ADDISON COUNTY SOLID WASTE MANAGEMENT DISTRICT (ACSWMD) VT – MANDATORY RESIDENTIAL AND COMMERCIAL RECYCLING WITH LOAD INSPECTIONS

Population: 35,974

APPENDIX C
MANDATORY PROGRAMS AND DISPOSAL BANS
BACKGROUND INFORMATION

Type of Program:

- Ordinances implemented around 1993
- Mandatory recycling for both residential and commercial
- Licensed haulers must offer recycling and rates must be competitive with trash
- Trash must be PAYT

Diversion:

The district reports the current diversion rate is 34%.

Enforcement:

- Enforcement is carried out at the transfer station, not at the landfill.
- The District also has the option to check bags curbside but the authority is not exercised. The drivers know that they have to reject trash with lots of recyclables or they will be fined, so it is easier for them to just "tag" the bag curbside with a sticker than to collect and get in trouble at the transfer station.
- The ACSWMD owns and operates the transfer station.
- As part of the normal operation at the transfer station they audit and inspect every 40th load that comes in.
- The District requires municipalities and the hauler to send recycling reports.
- They have never fined anyone.
- Fines for licensed haulers are: \$100, \$200, \$300, \$500.
- Enforcement usually occurs along the lines of "complaints" and then the SWMD contacts the hauler or generator and reminds them to recycle.

Advice:

- The ordinances banning recycling work well for a number of reasons - 1) they are enforceable, 2) it can be done by following simple procedures, 3) there is no ambiguity in the ordinance, and 4) it doesn't cost that much to do.

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APPENDIX D
PRIVATE SECTOR DIVERSION ACTIVITY
LIST OF INTERVIEW CONTACTS

The following is a list of third party contacts interviewed with regard to private sector diversion activity:

Brian Eychner, Project Manager, Thomas D. Eychner Co., Inc. – Demolition Contractor

Pete Grogan, Manager of Market Development, Weyerhaeuser, Containerboard, Packaging and Recycling

Michael Gross, Marketing Manager, Zanker Road Landfill and Recycling Facility and Z-Best Composting Facility

Dan Knapp, Urban Ore, Inc. – Salvage, Recycling and Resale

Kenny Luong, President, Ming’s Recycling Corporation, Sacramento, CA

Mark Madden, Schnitzer Steel Industries

Terry McDonald, Executive Director, Society of St. Vincent de Paul

Patty Moore, Moore Recycling Associates, consultant to the American Chemistry Council and the National Association for PET Container Resources (NAPCOR)

Pat Neal, R&B Equipment, Inc. – Demolition Contractor