

# FINAL REPORT

## ZERO WASTE FEASIBILITY STUDY UPDATE

*Submitted electronically on July 7, 2021*

# ZERØWASTEMARIN

July 7, 2021

Ms. Liz Lewis  
Executive Director, Marin County Hazardous and Solid Waste JPA  
c/o Marin County Department of Public Works  
P.O. Box 4186  
San Rafael, CA 94913

**Subject: Final Report – Zero Waste Feasibility Study Update**

Dear Ms. Lewis,

R3 Consulting Group, Inc. (R3) is pleased to submit the attached final report for the 2021 Zero Waste Feasibility Study Update for Marin County Hazardous and Solid Waste JPA (Zero Waste Marin or ZWM).

The report that follows is structured to present an overview of the current solid waste system in place in Marin, a summary of the 2009 Zero Waste Feasibility Study, a review of the progress made toward Zero Waste in Marin and statewide, and an analysis of potential additional recovery in Marin County. The objective of this report is to provide an update on R3's findings in conducting an update to the 2009 Zero Waste Feasibility Study. The update is intended to provide specific, actionable projects that would provide significant reductions in material going to landfill and increase recovery of waste materials in Marin County. Strategies for consideration by ZWM are included at end of this report.

A draft of this report was shared with and presented to the Zero Waste Marin Board on February 25, 2021. During that meeting the Board indicated general support for the recommended strategies and the Board provided feedback that the Zero Waste goal should be adjusted to be achievement of 75% diversion to be consistent with the State's diversion goal. Additionally, the Board provided feedback that identification of strategies to support compliance with State mandates vs. achievement of Zero Waste leadership be more clearly identified. Finally, the Board requested a more detailed timeline of activities related to recommended strategies. All such feedback has been incorporated into this final report.

The draft report was also shared with and presented to a joint meeting of the Board and the Local Task Force (LTF) on April 22, 2021, which coincided with an open public comment period lasting several months. The draft report was also shared with the primary solid waste operators in Marin County. Public comments received included verbal comments provided by Marin Sanitary Service and Mill Valley Refuse Service and written comments provided by Recology Sonoma Marin and the Marin Biomass Recovery Group (included as attachments to this report). In summary, public comments received included:

- » General overall support for the recommended strategies.
- » Strong support for strategies to divert and recover wood waste, particularly from fire fuel reduction activities, with identification of willing coalition partners.
- » Suggestions that Zero Waste Marin fee assessments by hauler vs. facilities be aligned with strategies affecting waste streams related to each.
- » Suggestions relating to Zero Waste Marin's organizational configurations.

In terms of next steps, R3 recommends that the Zero Waste Marin Board:

- » Adopt the adjusted Zero Waste goal of 75% diversion and accept the strategies included in this report.
- » Adjust the structure of the organization to target the selected strategies and objectives (the subject of the related Organizational Assessment which will be presented to the Board at a later date).

\* \* \* \* \*

We appreciate the opportunity to be of service to Zero Waste Marin. Should you have any questions regarding our report or need any additional information, please don't hesitate to reach out directly.

Sincerely,



Garth Schultz | *Principal*  
**R3 Consulting Group, Inc.**  
510.292.0853 | [gschultz@r3cqi.com](mailto:gschultz@r3cqi.com)



Rose Radford | *Project Manager*  
**R3 Consulting Group, Inc**  
415.347.9536 | [rradford@r3cqi.com](mailto:rradford@r3cqi.com)

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# 1. EXECUTIVE SUMMARY

R3 Consulting Group, Inc. (R3) was engaged to conduct the 2021 Zero Waste Feasibility Study Update for Marin County Hazardous and Solid Waste JPA, Zero Waste Marin. This report provides a summary of the current solid waste system, a summary of the prior 2009 Zero Waste Feasibility Study (2009 Study), an update on the status of implementing the strategies outlined in the 2009 Study, an overview of the status of Zero Waste in Marin and statewide, an analysis of additional recovery potential based upon statewide waste characterization results, and a list of strategy options for Zero Waste Marin's consideration.

Zero Waste Marin has made good progress in implementing the strategies in the 2009 Study. Moreover, the majority of the recommendations from that Study remain viable and should continue, though some are better implemented by member agencies and not ZWM and others are already being partially implemented by either ZWM or haulers and facilities.

There are a handful of solid waste disposal, recycling, and organics processing facilities in Marin County, including: one transfer station; one landfill; one C&D processing facility; and four composting facilities (three of which are small scale operations). The vast majority of the waste generated in Marin County flows through these facilities, with some being transferred to an out-of-County landfill. Information gathered from these facilities and analyzed by R3 indicate that the amount of solid waste disposed in landfills has increased in recent years, in a reversal of prior long-term trends towards increasing material recovery. As a result of these increases in landfill disposal, Zero Waste Marin is not on track to meet its ambitious goal of achieving 94% diversion by 2025 (note that diversion and recovery are used interchangeably in this report).

These trends are not unique to Zero Waste Marin – landfill disposal throughout California has been increasing since 2008, with commensurate decreases in calculated diversion rates statewide. Other agencies with ambitious Zero Waste goals are similarly not on track for goal achievement. Many of those agencies have consequently reframed their goals to better align with realistic – yet still ambitious – reductions in landfill disposal and increases in diversion. Zero Waste Marin, likewise, has the option to reframe its goal to better reflect its scope of influence and responsibility. Many similar agencies have reframed their goals and adopted policies similar to those already in place in Marin. More ambitious programs are certainly feasible, and in place at other agencies; however, implementing those programs would require additional resources.

While overall landfill disposal by Zero Waste Marin has increased in recent years, the amount of landfill disposal by franchised haulers operating in Marin County has actually been decreasing since 2014, with corresponding increases in recycling and organics diversion since that time. This means Zero Waste Marin is not on track to meet its goal partly as a result of increases in the amounts of solid waste being disposed of by non-franchised “self-haulers” – individual residents, businesses, and contractors. ZWM should consider and implement strategies to control and reduce “self-haul” disposal attributed to Marin County if it wishes to decrease disposal tons.

That said, all waste generators in Marin County can do more to reduce landfilled waste, with 2/3 of the waste sent to landfills in Marin County being potentially recoverable via recycling, composting, or other methods. The vast majority of the potentially recoverable material is comprised of organic waste (yard trimmings, food scraps, paper, wood and lumber). Recovery of organic waste from landfilled waste streams is needed in order to reduce greenhouse gas (GHG) emissions, achieve climate action plan objectives, and achieve compliance with unfunded state mandates via recent legislation, SB 1383. ZWM and its member agencies should consider strategies that would capture and recycle more organic materials, which may also coincide with the compliance requirements of SB 1383.

## 2. 2021 ZERO WASTE FEASIBILITY STUDY UPDATE

### Background on Zero Waste Marin

Zero Waste Marin consists of the County of Marin and all 11 incorporated cities and towns within Marin (Belvedere, Corte Madera, Fairfax, Larkspur, Mill Valley, Novato, Ross, San Anselmo, San Rafael, Sausalito, and Tiburon, collectively member agencies). In addition to the cities, towns, and County of Marin, twelve special districts also hold franchise agreements for solid waste collection in the County. The JPA Agreement gives Zero Waste Marin the power to adopt ordinances, conduct studies, levy fees, implement programs, and more. ZWM funds a number of key programs in the County, including:

- » Operation of the Household Hazardous Waste (HHW) Program at the facility in San Rafael.
- » Remote collection programs for universal wastes including batteries, fluorescent bulbs, sharps, and pharmaceuticals.
- » A grant program available to all member agencies for funding diversion programs.
- » AB 939 compliance programs, including solid waste planning, reporting to the State of California, and specific programs such as the construction and demolition debris (C&D) recycling program.
- » Outreach and education in schools.
- » A countywide advertising campaign to promote source reduction and recycling.
- » Facilitation of meetings including the “Local Task Force” advisory body.

ZWM assumed its current state via a revised Joint Powers Agreement in July 1996 and was formed to meet the goals mandated by State Public Resources Code (PRC) Sections 40900 through 43000, which were added by Assembly Bill (AB) 939. Those PRC code sections have since been amended by various legislation, most recently AB 341, AB 1826, and Senate Bill (SB) 1383. The laws that succeeded AB 939 have added additional diversion goals and mandates on local agencies.

ZWM’s annual budget is approximately \$4 million, and funding is derived from fee assessments on the franchised haulers active in the County, the transfer station, and the landfill located in the County. ZWM contracts with the Marin County Department of Public Works for staffing, administration, and program implementation. Zero Waste Marin performs several key services for its member agencies that are not explicitly evaluated as a part of this Update, including HHW, state reporting, the schools program, and the Countywide advertising campaign. These programs provide key benefits to ZWM’s member agencies and absent another directive, we have assumed – and recommend – that these programs will remain core functions of the Zero Waste Marin, irrespective of decisions regarding new programs to achieve greater diversion.

### 2009 Zero Waste Feasibility Study

In 2009, ZWM considered a goal to increase the diversion of materials from the landfill to meet an 80% diversion goal by 2012 and 94% diversion by 2025. It also received and filed the 2009 Study to meet that goal which included numerous strategies targeting the following key outcomes:

- » Establishment of programs and policies to strengthen Countywide programs for meeting the Zero Waste goal; and
- » Guidance on implementation of specific programs and policies by member agencies.

The 2009 Study presented eighteen recommendations, split up into the functional groups presented above, and was intended to provide a summary of findings and analysis related to the evaluation of current solid waste and household hazardous waste programs, program improvements, and new

programs. The disposal reduction associated with implementing the strategies described in the plan was estimated at 180,000 tons, and the theoretical achievement of 94% diversion.

While aspirational goals are common in Zero Waste plans developed in the past, the last few years have shifted the paradigm in solid waste management for the foreseeable future. Resource recovery, including recycling and diverting organics from landfill, is no longer considered only for diversion and resource conservation value, but also as important means of greenhouse gas (GHG) emission reduction.

Although Marin County as a whole has access to some of the best diversion programs in the state, Zero Waste Marin did not meet its 80% diversion by 2012 goal and will not meet its 2025 goal of 94% diversion. Current (2019) diversion as measured by the State of California for ZWM is 67%, which compares favorably to other agencies throughout the state, and is an indicator of relatively high diversion achievement. ZWM's and its member agencies have made significant progress in implementing programs from the 2009 Study, including adding food waste to residential and commercial organics collection programs, directing a portion of clean food to anaerobic digestion, complying CALGreen C&D and other state recycling laws, conducting outreach, educating schoolchildren and the public, and improving opportunities for proper disposal of household hazardous and universal wastes, such as batteries.

### Changes in Approach to Diversion

In the past decade, many jurisdictions and waste related JPAs, including Zero Waste Marin, have gone beyond AB 939's diversion requirements and adopted a Zero Waste goal and plan. Zero waste, however, cannot be achieved by recycling and composting programs alone.

Zero waste goes beyond diverting materials from landfill and means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. Because Zero Waste goes beyond "diverting" waste, and because CalRecycle, in 2014, changed the methodology for demonstrating compliance with AB 939 from a diversion percentage to a "pounds of disposal per person" goal, many jurisdictions stopped tracking and reporting diversion rates, and are instead tracking disposal pounds per person (which factors in waste prevention efforts), and recycling and organics pounds collected per person.

Regardless of the methodology used for tracking progress toward higher diversion and Zero Waste, achieving Zero Waste goals have always been partially dependent on factors that go beyond local collection and processing programs, such as markets and value for scrap material, and the elimination or reduction of problematic packaging (such as certain types of single use or biodegradable plastic and multi-material packaging that can't be recycled, composted or recovered). Working collectively with other agencies - including the state - to address those larger issues, in addition to improving diversion and waste prevention programs, has been a key part of most jurisdictions' Zero Waste plans.

Zero waste goals, as well as the increasing focus on organics, have also recently been more closely tied to greenhouse gas emission and sequestration efforts underway locally and statewide.

### Changes in Recycling Markets

In January 2018, the People's Republic of China reduced the maximum contamination on all incoming recycled material shipments levels from a previous 10% to 0.5% effective March 1, 2018. Such contamination is monitored at the port upon arrival of incoming recycled material shipments and is subject to return to its shipment source if higher levels are determined to be found. The policy has been said by some leading industry experts to be "virtually impossible" to attain.

This policy, known as the National Sword, nearly eliminated the end destination market for most of California's recyclables. While other countries including Vietnam, India, Malaysia, and Turkey have previously accepted recyclable materials for processing before China's National Sword Policy, they continue to be overwhelmed with material diverted from China's market. This policy has led to changes in Marin County including Mill Valley Refuse Service's decision to switch from single stream recycling to

dual stream recycling for residents, stricter contamination standards for customers, and increased rates to cover the costs of additional sorting needed at material recovery facilities.

## Marin County Diversion Outcomes and Trends

Despite the successful efforts outlined in the 2009 Study, the Countywide recycling rate as measured by CalRecycle is declining as disposal increases more quickly than population. This trend is shown in Figure 1.

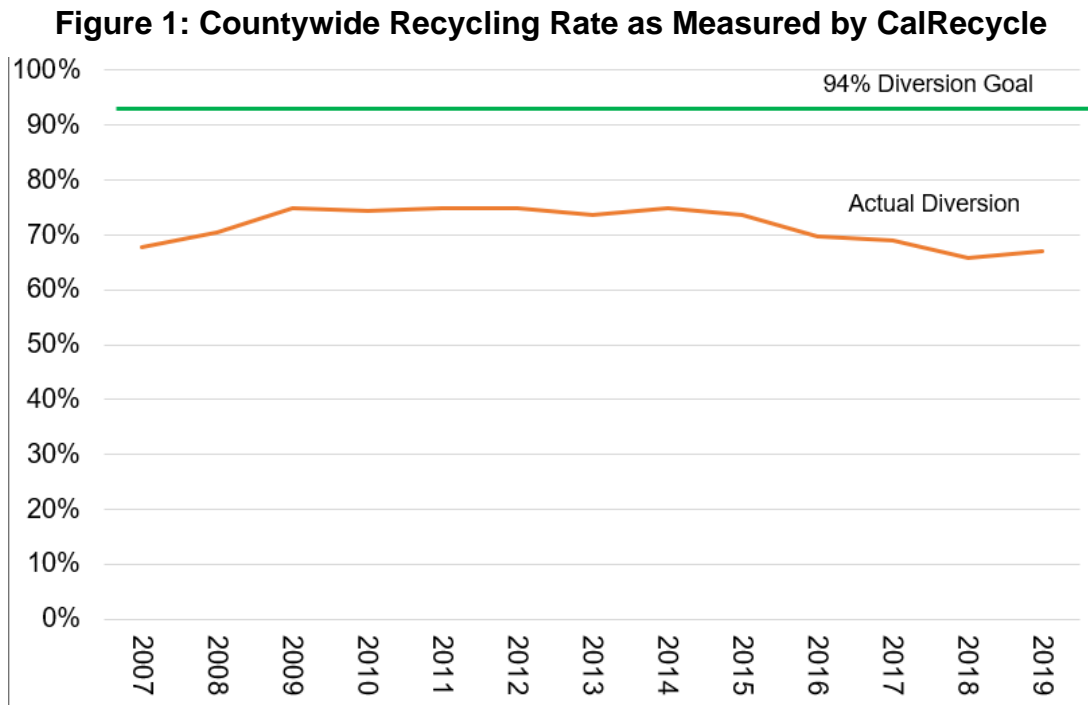


Figure 2 (next page) shows the disposal and diversion data over time since 2014. This data was collected through ZWM’s role in reporting disposal to the state; this role was transferred to CalRecycle as of the third quarter of 2019, and similar data is no longer being collected.

## Statewide Diversion Trends

Despite the ambitious legislation the state has passed, and increasingly stringent enforcement of that legislation on local agencies, statewide disposal has been steadily increasing, and the state’s calculation of its recycling rate has been decreasing. Figure 2 (next page) shows CalRecycle’s calculated statewide recycling rate through 2018.



**Figure 2: California’s Statewide Recycling Rate Since 2010<sup>1</sup>**

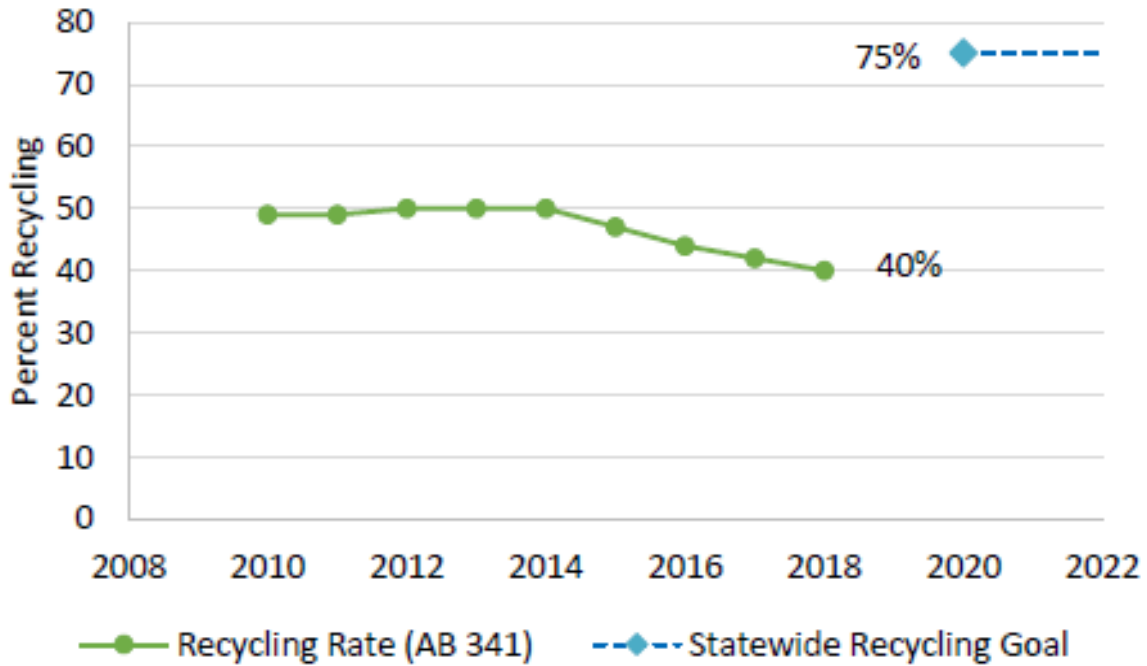
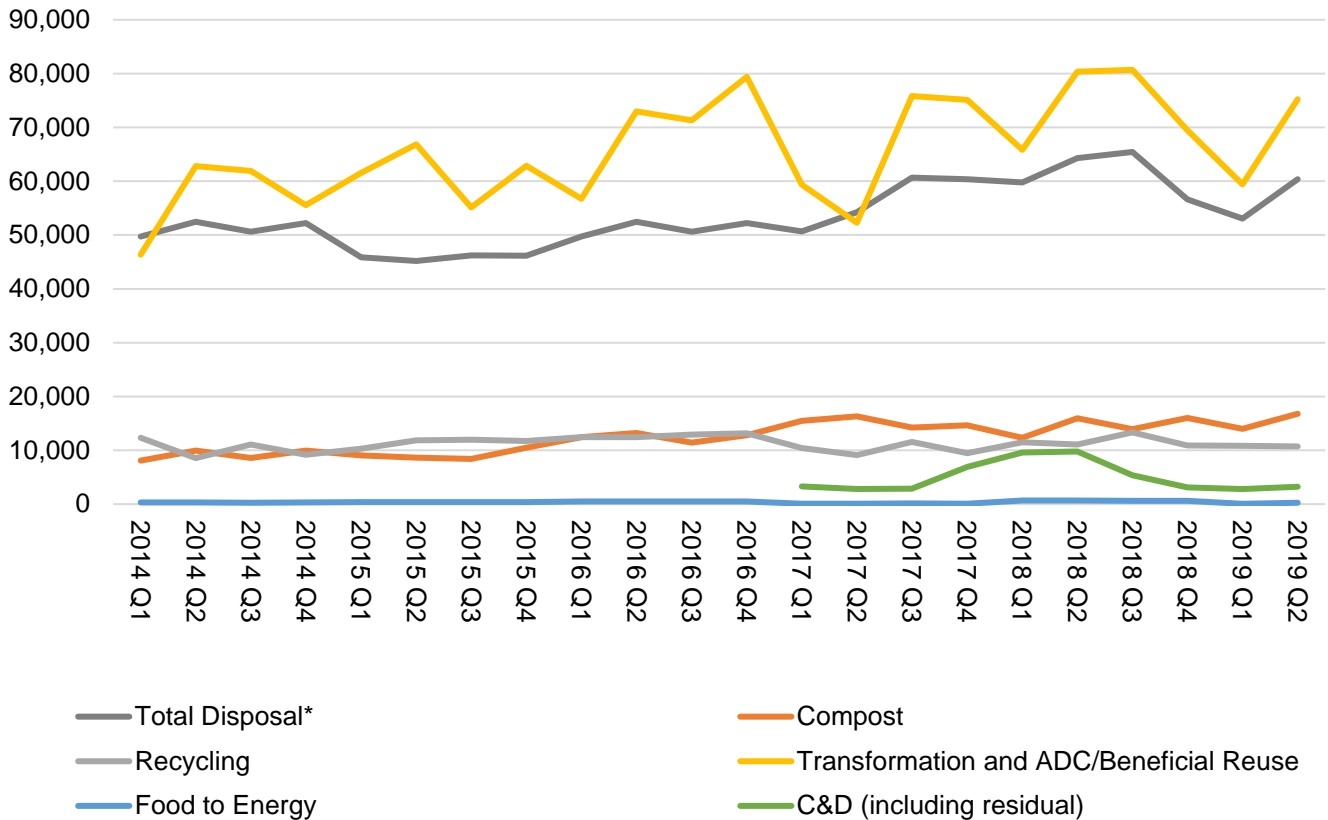


Figure 3 shows seasonal fluctuation in disposal tonnages, with franchised and non-franchised materials combined, and significant tonnages of material used as alternative daily cover (ADC) and beneficial reuse at landfill (for erosion control, road maintenance, and other functions). The data shows an increase in disposal over the period, and smaller but consistent increases in recycling and composting-bound materials. Materials delivered as C&D debris for recycling is reported separately from C&D delivered for disposal (reported as disposal), with data available from 2017 onward.

<sup>1</sup> Source: State of Recycling and Disposal Report for Calendar Year 2018, CalRecycle, available at the following web address: <https://www2.calrecycle.ca.gov/Publications/Download/1453>

**Figure 3: Tonnage Trends, Marin 2014-2019**



\* Sum of Potrero Hills, Redwood, and Keller Landfills as reported to CalRecycle.

The vast majority of the increases in disposal have been in non-franchised materials hauled by residents and businesses directly to the transfer station and landfill, and not the materials collected by franchised haulers from permanent collection containers. In 2014, franchised disposal was about 105,000 tons; by 2018 franchised disposal had reduced to 97,000 tons, an impressive reduction. The best available data on non-franchised disposal shows that it is primarily from construction and demolition (C&D) activity, making the Countywide C&D diversion program particularly important as a focus area moving forward – however, options for processing all delivered solid waste tonnages for recovery will also support increased diversion.

Figure 4 shows the tonnage data with franchised disposal displayed in dark blue and subtracted from total disposal. This figure shows a steady decrease in franchised disposal and a corresponding increase (circled in red) in recycling and organics tonnages over the period, with non-franchised disposal in dark gray increasing over the entire period.

**Figure 4: Tonnage Trends w/ Franchised Disposal Extrapolated, Marin 2014-2019**

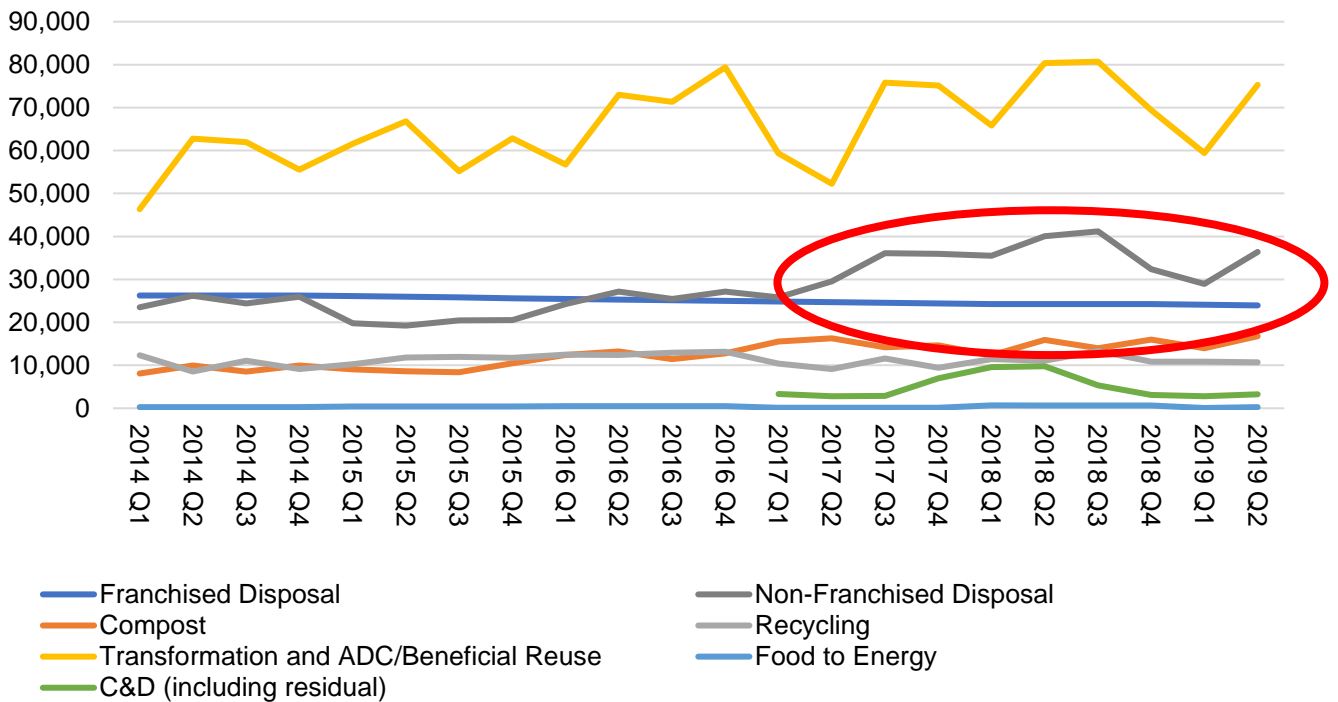
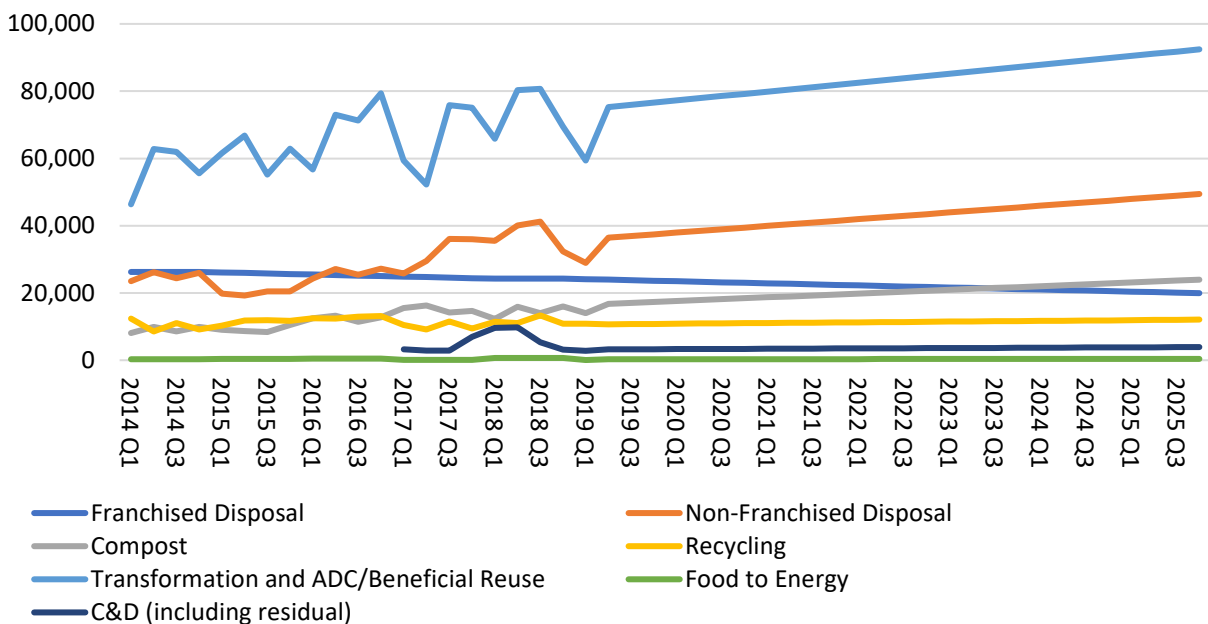


Figure 5 shows a projection of tonnages using current trends through 2025. Zero Waste Marin did not meet its goal of 80% diversion from landfill in 2012 and is not on track to meet the Zero Waste goal by 2025 given that disposal is increasing. If current trends are maintained, diversion will go from 67% in 2018 to 66% in 2025 (measured as recycled tons over total tons, with all categories but disposal counted as recycled).

**Figure 5: Tonnage Projection Through 2025**



## Remaining Recoverable Materials

In order to identify the most viable strategies for increasing diversion, R3 identified the proportion of materials by broad material type that is available in the landfilled material, and by sector (residential, commercial, and self-haul). The composition of each sector’s disposed waste stream was applied to the total tonnages by sector, estimated on a hauler-by-hauler basis, for the most recent full year of disposal data (2018). After 2018, Zero Waste Marin was no longer responsible for collecting disposal data for the state, and disposal and diversion tonnage data is incomplete beginning in the third quarter of 2019.

Approximately 73% of the overall waste stream would be considered recoverable based upon statewide data. Approximately 20% of the disposed material is from the residential sector, 26% is from the commercial sector, and the remaining 54% is attributed to non-franchised “self-haul,” or material hauled by residents and businesses directly to the transfer station or landfill (including wood chips used as ADC, which now counts as disposal and not recovery). Most of the “self-haul” disposal is reported from the Marin Resource Recovery Center (MRRRC).

54% is dramatically higher than the self-haul that R3 has observed in other communities; self-haul tends to be closer to 20-40% of total disposal. The host agencies for transfer stations and landfills tend to be allocated more disposal tonnages than agencies that do not host those facilities, as the origin of waste is declared by each customer at the gate. Table 1 shows the composition of the overall waste stream that would be classified as recoverable. This table clearly demonstrates that organic materials are the largest portion of that category, with food (edible and inedible) accounting for 15% of the overall recoverable materials.

**Table 1: Composition by Material Class<sup>2</sup>**

Material	Proportion	Recoverable
Special Waste	6.7%	6.3%
Metal	4.6%	3.6%
Glass	1.7%	1.5%
Electronic	0.6%	0.6%
HHW	0.2%	0.2%
Organic	34.1%	33.5%
Paper	16.6%	15.0%
Inerts and Others	14.1%	9.4%
Plastic	11.5%	3.0%
Miscellaneous	9.8%	0.0%
<b>Total</b>	<b>100%</b>	<b>73.1%</b>

Using the residential waste characterization as a basis, ~63% of the currently-disposed materials from the residential sector, or 26,500 tons, are still recoverable. For the commercial sector, ~64% of the currently-disposed materials, or 35,000 tons, are still recoverable.

<sup>2</sup> Source: 2018 Facility-Based Characterization of Solid Waste in California, CalRecycle, available at the following web address: <https://www2.calrecycle.ca.gov/Publications/Download/1458>

For the self-haul sector, based upon actual material composition and estimates based on the statewide averages, 70% of the material is recoverable, or 79,000 tons. Clean wood accounts for 16% of the disposed self-haul material.

Based upon this analysis, food waste and self-hauled wood waste are material categories that offer significant potential for diversion, with paper (in particular food-soiled compostable paper) and yard waste also contributing significantly to the recoverable materials still landfilled.

### Reframe Zero Waste Goal Expectations

Zero waste is an aspirational goal, and while it is often defined in alignment with the Zero Waste International Alliance's principles, it is the province of each jurisdiction to establish a framework for reducing waste generation, and responsibly managing materials that are generated.

Agencies such as the City of San Francisco and StopWaste in Alameda County have reframed goalsetting away from a pure landfill diversion percentage to instead target 100% diversion of the materials that can be diverted, with the understanding that "residuals" or other such material that lacks a recycling market would still be disposed. R3, via prior projects with Zero Waste Marin, has recommended similar approaches, in particular with C&D waste materials, which appear to be a primary reason for the increase in disposal in Marin County. Reframing the Zero Waste goal would allow Zero Waste Marin to focus programs on "high generation" materials that are actually recoverable via current systems.

The State of California has made disposal reduction a key goal and supported diversion programs by establishing a dedicated department and passing legislation that supports the ambitious goals set by prior legislation. Since AB 939 in 1990, the state has been a leader in collecting disposal data and benchmarking progress toward these statewide goals. The State is required to assess progress toward these goals, and these assessments have concluded that additional activities will be needed. As such, the more recent legislation passed by the state has shifted the focus of regulations toward implementation of specific programs, rather than achievement of diversion goals.

Communities throughout the state are adding recycling, composting, waste prevention and the use of compost to their climate action plans as GHG reduction and climate resilience measures. Additionally, the increased use of products made from recovered organic material, such as compost and mulch, have been identified as important contributors to improved soil health, which is at risk due to fires and other climate change impacts. Potentially edible food that is currently being disposed has been identified as a potential food source for the food insecure. Recycling, composting and waste prevention efforts have been given new impetus as communities and decisionmakers recognize their multiple environmental benefits, not least of which are GHG reduction benefits.

### Focus on Organics

Food and other organics in landfill breakdown and form methane, a potent GHG. Since the adoption of the 2009 Study, there has been a steady shift, statewide and locally, toward an increased focus on getting organics (especially food) out of the landfill as a significant means of reducing statewide GHG. This focus has been targeted (although not exclusively) on the commercial sector as the biggest overall generator of landfilled organics. Prioritizing organics recovery in the commercial sector makes sense because commercial organics recovery has significant remaining potential and remains more challenging to implement than residential diversion, meaning that it requires a special focus.

Organics comprise the biggest part of the remaining recoverable waste stream, at approximately 40% in Marin and 50% statewide, underscoring the importance of prioritizing their recovery. Several laws targeting organics (and recycling) recovery in the commercial sector have passed in the last several years, placing numerous programmatic and reporting requirements on ZWM's member agencies.

Focusing on organics recovery offers several co-benefits in addition to targeting the greatest potential for increased diversion. Increasing organics recovery would help Zero Waste Marin's member agencies

comply with the new and complex organic disposal reduction requirements of SB 1383, as well as other co-benefits listed below:

- » Reducing a significant source of GHG (methane in landfills) and contributes to County and Member agency GHG reduction efforts and climate action planning.
- » Improving soil health in the member agencies through the increased use of compost and mulch, which also contributes to climate resiliency and helps member agencies comply with CALGreen, MWELo and SB 1383 requirements.
- » Recovering edible food that could be donated for human consumption.

### Other Zero Waste Goal Benchmarks

Other communities have also adopted Zero Waste plans that set ambitious goals for disposal reductions. Many of those communities have since adjusted their Zero Waste goals. A few examples are listed below:

- » Alameda updated its 2010 plan to instead focus on 5 key strategies that were adopted in 2018.
- » Castro Valley Sanitary District published a Zero Waste Strategic Plan in 2014 with the goal of Zero Waste by 2029. The District is currently developing an updated 2020 plan.
- » Davis adopted a Zero Waste Plan in 2013 that included strategies to attain a 75% reduction goal by 2020.
- » Fairfax passed a resolution to achieve Zero Waste (94% landfill diversion goal) by 2020.
- » Fresno adopted a goal in 2008 to achieve Zero Waste by 2025.
- » Glendale adopted a Zero Waste goal in 2011 aiming for 90% waste diversion by 2030, and a 75% goal set for 2020.
- » Irvine passed a resolution to “support Zero Waste as a long-term goal for City of Irvine” remains in place without alternation.
- » Los Angeles: pLAN updated to Mayor’s Green New Deal in 2019. The Green New Deal pushed back LA’s Zero Waste to landfill/incineration goal from 2025 to 2050.
- » Menlo Park adopted a Zero Waste plan and goal in 2017.
- » Mountain View’s Zero Waste Plan (with the goal of diverting 90% of waste from the landfill by 2030) remains unchanged.
- » Novato amended franchise agreement to include Zero Waste goals including an 80% diversion of waste to recycling by 2025.
- » Oakland adopted a Zero Waste plan in 2006 with a goal to achieve 90% reduction in landfill-bound materials (from 2005 baseline). Strategies, measurement approaches, and system design have been altered since adoption of the plan.
- » Oceanside’s Zero Waste Plan was adopted in 2012 by City Council and set a goal of reaching a 75-90% diversion rate by 2020.
- » A 2018 Zero Waste Plan updated Palo Alto’s original plan (adopted in 2007). The 2018 Plan contains new and revised provisions designed to meet aggressive goals adopted by the Palo Alto City Council in 2016 as part of its Sustainability/Climate Action Plan.
- » City of San Diego has retained its Zero Waste goals of 75 percent diversion by 2020, 90 percent by 2035, and 100 percent by 2040.
- » San Francisco’s original Zero Waste Plan stipulated a Zero Waste to landfill/incinerators goal by 2020. This was scaled back in 2018, instead calling for a reduction in total waste generation by 15 percent and disposal to landfill by 50 percent (of materials that can be diverted) by 2030.

- » In 2008, the San Jose adopted a Zero Waste to landfill goal by 2022. An update with five specific objectives to help the City reach its goal was developed in 2017.
- » Santa Cruz County Zero Waste Plan was created in 2015 as a result of the County establishing a Zero Waste goal in 2005 for achieving a 75 percent diversion rate by the year 2010.
- » Santa Monica plans to “significantly extend timeline to achieve Zero Waste, eliminates Zero Waste policy and program, development and instead focus on regulatory compliance.”
- » Santa Rosa adopted a Zero Waste plan and goal in 2020 with a per capita disposal target goal, not based on diversion percentage.
- » Sunnyvale has retained its Zero Waste goals of 75 percent diversion by 2020, 80 percent by 2025 and 90 percent by 2030.

### State Law Requirements and Goals

Since AB 939 was passed, the state has continued to set ambitious new recycling goals through a variety of new legislation, including:

- » AB 341 set a goal of 75% diversion statewide by the year 2020 and requires businesses that generate more than 4 cubic yards of commercial solid waste per week and multifamily residential dwellings of 5 units or more to arrange for recycling services, on and after July 1, 2012. The law also requires local jurisdictions to promote recycling by taking certain actions, including informing covered businesses of the requirement.
- » AB 1826 required local jurisdictions to arrange an organics collection program that includes food scraps on and after July 1, 2016, and at this time requires businesses and multifamily residential dwellings of 5 units that generate more than 2 cubic yards of commercial solid waste per week or more to arrange for organics diversion services. The law also requires local jurisdictions to promote organics diversion by taking certain actions, including informing covered businesses of the requirement.
- » Motivated by the statewide limit on greenhouse gas emissions to 1990 levels, SB 1383 sets a statewide goal to reduce organic waste by 50% from the 2014 level by 2020 and 75% from the 2014 level by 2025. SB 1383 also establishes a target of recovering 20% of currently disposed edible food for human consumption by 2025. SB 1383's requirements will be in effect on January 1, 2022, and include extensive requirements for businesses, state agencies, and local jurisdictions.

The regulations set forth a variety of programmatic and policy related requirements on multiple entities including jurisdictions, residential and commercial generators, commercial edible food generators, haulers, self-haulers, food recovery organizations, and food recovery services to support achievement of these state-wide organic waste disposal reduction targets.

SB 1383 requirements go beyond AB 1826 and AB 341 in that there are far more specific program implementation, monitoring and enforcement requirements on jurisdictions, as well as a new required program component: an edible food recovery program.

### Marin County Solid Waste System Overview

Zero Waste Marin's member agencies – as well as the other special districts in the County – independently contract their collection and disposal services for residential, multi-family and commercial services. There are over 20 agencies that hold franchise agreements for collection of solid waste in the County. C&D materials can be collected either by the franchised hauler or the contractor conducting the C&D activity. Unincorporated areas of the County are serviced by five franchised haulers and a municipal hauler. The six haulers operating in Marin County and their service areas are provided in Table 2.

**Table 2: Marin County Franchised Haulers**

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

*Italics note parts of Unincorporated Marin County*

\*These haulers share a parent company, Recology, Inc.

Marin Resource Recovery Center (MRRC) is the only transfer station in the County, located in San Rafael and operated by Marin Sanitary Service (MSS). Redwood Landfill is the only landfill, located in unincorporated County near the City of Novato and operated by Waste Management. MRRC delivers franchised waste to Redwood Landfill and non-franchised waste to Potrero Hills Landfill located in Solano County. Marin Resource Recycling Association (MRRA – an MSS affiliated company) operates the one material recovery facility that processes curbside recycling and receives curbside recycling from MSS and Mill Valley Refuse Service (MVRS).

MRRC also operates a C&D sorting line and receives most C&D in the County, including C&D delivered for recycling at Redwood Landfill. Bay Cities Refuse delivers curbside recycling to a Republic-operated facility located in Richmond, and Recology Sonoma Marin delivers curbside recycling to a sorting facility located in Sonoma County. There are four composting facilities located in the County, although the vast majority of the organic materials are composted at Waste Management's Earth Care composting facility located at Redwood Landfill. Clean food scraps collected by MSS and Mill Valley Refuse Service (MVRS) are processed and transferred to Central Marin Sanitation Agency, where they are introduced into the sewage sludge and anaerobically digested to produce energy.



### 3. ZERO WASTE STRATEGY CONSIDERATIONS

#### Continue Existing Zero Waste Marin Programs & Clarify Responsibilities for Other Existing Zero Waste Strategies

Zero Waste Marin should also continue (and potentially expand) its existing suite of programs including the HHW program, schools outreach and education program, C&D recycling support program, outreach and education program focusing on source reduction, support for individual member agency Zero Waste efforts, and County-wide data gathering, analysis, and reporting to enhance coordination and access to necessary data for policymaking and innovation. Clarification regarding responsibilities for the strategies listed in the 2009 Study is needed. Table 3 provides a summary of each of the strategy recommendations presented in the 2009 Study and an assessment on whether the strategies should be continued in Marin County and who should bear primary responsibility for implementing those strategies.

In Table 3, strategies without highlighting are recommended for further consideration via the Organizational Assessment currently underway. Those highlighted in green directly relate to the new strategy options listed in the prior pages and should be further explored. Strategies highlighted in blue are recommended for continuation by ZWM and the member agencies, and those highlighted in grey have already been completed, with no further actions being necessary. ZWM should seek to clarify that the strategies highlighted in peach are the direct responsibility of the member agencies. Member agencies are currently best suited to be responsible for and implement these strategies (as desired) because they pertain to matters of individual member agency control (i.e., individual franchise agreements and solid waste operations and solid waste ordinances).

#### Focus on Areas of Large Potential

Zero Waste Marin should consider focusing new strategies on targeting the largest landfilled waste streams: organics, wood waste, and more generally non-franchised “self-hauled” waste. Organics comprise the largest single category of recoverable materials in landfilled waste (~40%) and is also the subject of state regulations, while non-franchised self-hauled waste is the primary area of increasing disposal in Marin County.

Specific actionable strategies targeting these waste streams are summarized in Attachment 1 with a tentative timeline of activities included in Attachment 2. Strategies are listed in general order of relative costs, diversion outcomes, timeline, and ease of implementation. Strategies for consideration purposefully demonstrate a range of options based on these criteria. These options also represent a range of necessary ZWM commitments, with the lower cost/impact strategies being feasible given current organizational structures, and the higher cost/impact strategies requiring broader organizational changes in order to be feasible.

Finally, recommended strategies fall into two primary categories – those that support compliance with State mandates such as SB 1383 and those that support achievement of zero waste leadership. While these two categories of activities are both of importance to Zero Waste Marin, the former category is of more immediate urgency for the member agencies while the latter category is of broader relevance to an overall culture of sustainability and climate action in Marin County.

#### Zero Waste Strategy Outline and Phasing

##### Phase 1: Plan and Finalize Next Steps for Future Phases (FY 21-22)

- » Continue current programs
- » Consider and implement necessary organizational changes
- » Finalize plans for new programs for implementation in future phases

### **Phase 2: Provide support for community compliance with State mandates (FY 22-23)**

- » Fiscal Impact:
  - ~\$2.4 million in new funding
  - ~1% increase in collection rates
  - ~\$0.46 per month residential 32-gallon customer
- » Organizational Impact: Requires significant “ramp up” period and may require FT ED, increased Board meeting freq. & engagement with electeds and public
- » Supports compliance with State mandates

### **Phase 3: Focus on big areas for new recovery (FY 23-24)**

- » Fiscal Impact:
  - Up to ~\$6 million in new funding
  - ~2.25% increase in collection rates
  - ~\$1.06 per month residential 32-gallon customer
- » Organizational Impact: Requires significant “ramp up” period and may require FT ED, increased Board meeting freq. & engagement with electeds and public
- » Supports compliance with State mandates and advances Zero Waste leadership

### **Phase 4: Support growth of in-county capacity (FY 24-25)**

- » Fiscal Impact:
  - Up to ~\$20 million in new funding
  - ~7.46% increase in collection rates
  - ~\$3.50 per month residential 32-gallon customer
- » Organizational Impact: Requires significant “ramp up” period and may require FT ED, increased Board meeting freq. & engagement with electeds and public
- » Advances Zero Waste leadership

**Table 3: Assessment of Strategies Selected in 2009 to Achieve Zero Waste**

Strategies without highlighting are recommended for further consideration via the Organizational Assessment currently underway. Those highlighted in green directly relate to the new strategy options listed in the prior pages and should be further explored. Strategies highlighted in blue are recommended for continuation by ZWM and the member agencies, and those highlighted in grey have already been completed, with no further actions being necessary.

2009 Study Strategy Name	Should Strategy Remain in Place?
<b>1. Increase ZWM's Role in Assisting Administration of Member Agency and Countywide Programs</b>	
<b>2. Increase ZWM Staffing and Their Role in Assisting Administration of Member Agency and Countywide Programs</b>	
<b>3. Increase Board of Directors Meeting Frequency</b>	
<b>4. Help with Siting/Permitting Processes of a) Solid Waste Facilities and b) Non-Solid Waste Facilities</b>	<b>Potentially</b> – <u>Explore via 2021 Zero Waste Feasibility Study Update</u> . ZWM may choose to continue with this strategy, with a recommended focus on organics recovery and recovery from self-hauled waste.
<b>5. Support Extended Producer Responsibility (EPR) and Waste Reduction Policies at State and National Level Public education</b>	<b>Yes</b> – <u>Continue current ZWM program</u> . ZWM should continue efforts to support EPR, with the knowledge that there is no direct linkage to Zero Waste goal achievement. Consider higher levels of support for EPR efforts.
<b>6. Revise Solid Waste Ordinances</b>	<b>Yes</b> – <u>Responsibility of ZWM member agencies</u> . All agencies must update their solid waste ordinances in 2021 to meet the requirements of SB 1383.
<b>7. Revise Franchise Agreement Language</b>	<b>Potentially</b> – <u>Responsibility of ZWM member agencies</u> . ZWM member agencies may choose to revise their franchise agreements with their operators and may consider the model franchise language developed by CalRecycle <sup>3</sup> .
<b>8. Adopt, Enforce, and Homogenize the Construction and Demolition Ordinance</b>	<b>Yes</b> – <u>Continue current ZWM program</u> . ZWM should continue efforts to support member agencies C&D implementation. Prior ZWM recommendations to homogenize ordinances were not implemented by the member agencies. ZWM member agencies have responsibility for implementation and enforcement.

<sup>3</sup> CalRecycle's model tools for SB 1383 implementation can be found at the following web address: <https://calrecycle.ca.gov/organics/slcp/education>

## Zero Waste Strategy Considerations

2009 Study Strategy Name	Should Strategy Remain in Place?
<b>9. Adopt and Enforce Multifamily Dwelling and Business Recycling Ordinance</b>	<b>Yes</b> – <u>Responsibility of ZWM member agencies</u> . All agencies must update their solid waste ordinances in 2021 to meet the requirements of SB 1383.
<b>10. Encourage Consumption and Disposal Changes Through Public Education</b>	<b>Yes</b> – <u>Continue current ZWM program</u> . ZWM should continue public education efforts and should consider specifically focusing on reduction and recovery of organic wastes and self-hauled wastes. Consider higher levels of investment in public education and outreach programs.
<b>11. Promote Countywide Sale and/or Disposal Bans</b>	<b>Yes</b> – <u>Responsibility of ZWM member agencies</u> . Some member agencies are promoting these efforts on their own, and the County is developing a countywide approach to reduce single use food ware wastes.
<b>12. Implement Wet/Dry Collection Routes</b>	<b>Potentially</b> – <u>Responsibility of ZWM member agencies</u> . ZWM member agencies may choose collection operation approaches in coordination with their haulers.
<b>13. Offer Residential Unlimited Services of Recycling and Green Waste Containers</b>	<b>Potentially</b> – <u>Responsibility of ZWM member agencies</u> . ZWM member agencies may choose collection operation approaches in coordination with their haulers.
<b>14. Add Materials Collected to the Recycling Stream</b>	<b>Completed</b> – Maximum levels of recyclable materials are already included in recyclables waste streams.
<b>15. Add Food Waste Diversion to Collection Services (Residential and Commercial)</b>	<b>Completed</b> – Food waste and other organics are already included in green waste/organics waste streams.
<b>16. Implement Food Waste Digestion</b>	<b>Completed</b> – Food waste and other organics are already included in green waste/organics waste streams.
<b>17. Promote Backyard Composting</b>	<b>Yes</b> – <u>Continue current ZWM program</u> to promote home composting.
<b>18. Require Deconstruction/Salvage/Resale of Construction and Demolition Materials</b>	<b>Potentially</b> – <u>Explore via 2021 Zero Waste Feasibility Study Update</u> . ZWM may choose to continue with this strategy, with a recommended focus on recovery of all recoverable C&D materials at processing facilities.

### 3. ZERO WASTE STRATEGY CONSIDERATIONS

*Please see Attachments 1 and 2.*

## 2021 Update to the Zero Waste Marin Feasibility Study

### Summary of Objectives for Programs Funded by the Zero Waste Fund

Zero Waste Objective		Summary Description	Est. Decrease in Disposed Tons	Est. Additional Annual Costs	Est. Impact to Collection Rates	Est. Impact to Res. 32-Gallon Rate (Monthly)
<b>PHASE 1   PLAN AND FINALIZE NEXT STEPS FOR FUTURE PHASES (FY 21-22)</b>		<b>Plan and Finalize Next Steps for Future Phases.</b>				
<b>PHASE 2   COMPLIANCE SUPPORT (FY 22-23)</b>		<b>Provide support for compliance with State mandates.</b>				
1	Expand Public and School Education and Outreach Programs	Expand awareness by increasing funding for public and school education and outreach programs including focus on organic waste reduction and recovery.	Minimal	\$500,000	0.19%	\$ 0.09
2	Expand Waste Reduction Program	Continue ongoing support for Extended Producer Responsibility (EPR) and Waste Reduction Policies in coordination with the LTF.		\$250,000	0.10%	\$ 0.05
3	Expand Zero Waste Grant Program	Continue ZW Grant Program and encourage or require member agencies to focus on organics recycling with ZWM grant funds.		\$350,000	0.14%	\$ 0.07
4	Fund and Support Members' Development of CalRecycle Compliance Programs	Fund one-time project to provide technical guidance to Members to outline and clarify Member and JPA ongoing requirements under State Laws (AB 341, AB 1826, and SB 1383).	Minimal	\$240,000	0.09%	\$ 0.04
5	Fund Targeted Technical Assistance to Business and Multi-Family	Provide ongoing funding to Members for direct hands-on technical assistance to the largest organics waste generators to reduce and capture organic waste.		\$600,000	0.23%	\$ 0.11
	Fund Digital Technology Solutions	Identify and fund ongoing implementation of new technologies to improve data collection and monitoring for increased diversion and waste prevention.		\$120,000	0.05%	\$ 0.02
	Fund Edible Food Recovery Program Assistance	Fund one-time coordination of edible food recovery program activities with Members.		\$180,000	0.07%	\$ 0.03
6	Fund Development/Expansion of CRV Redemption Opportunities	Fund ongoing partnerships with entities that redeem CRV containers to increase community access to CRV redemption opportunities.	N/A - will not increase recovery.	\$300,000	0.12%	\$ 0.06
<b>PHASE 2   SUBTOTAL</b>			<b>Minimal</b>	<b>\$2,540,000</b>	<b>0.99%</b>	<b>\$ 0.47</b>
<b>PHASE 3   NEW RECOVERY PROGRAMS (FY 23-24)</b>		<b>Advance Zero Waste Leadership: Fund and implement new materials recovery programs for wood waste, non-franchised waste, and hard-to-recycle materials.</b>				
7	Fund Development / Expansion of Reuse / Hard-to-Recycle Item Facilities	Fund ongoing partnerships with facilities for recovery and reuse of hard-to-recycle and reusable items <u>(assumes joint funding from partnership, not only ZWM).</u>	Up to 3%	\$1,000,000	0.38%	\$ 0.18
8	Fund Partnerships for Recovery of "Self-Hauled" and C&D Waste	Fund ongoing partnerships with facilities for recovery of self-hauled and C&D waste <u>(assumes joint funding from partnership, not only ZWM).</u>	Up to 5%	\$2,000,000	0.75%	\$ 0.35
9	Fund Partnerships for Wood Recovery and Energy Production	Fund ongoing partnerships with facilities for recovery of clean wood waste for energy production <u>(i.e. biomass; assumes joint funding from partnership, not only ZWM).</u>	Up to 5%	\$3,000,000	1.12%	\$ 0.53
<b>PHASE 3   SUBTOTAL</b>			<b>Up to 13%</b>	<b>\$6,000,000</b>	<b>2.25%</b>	<b>\$ 1.06</b>
<b>PHASE 4   IN-COUNTY PROCESSING CAPACITY (FY 24-25)</b>		<b>Advance Zero Waste Leadership: Fund and implement processing of garbage/trash to recover and compost organics.</b>				
10	Fund Commercial and Multi-Family Garbage Processing and Composting Agreement(s)	Fund ongoing partnerships with facility operators and haulers to process commercial and multi-family "garbage" for processing and recovery of recyclables and organics and subsequent composting of organics.	Up to 10%	\$10,000,000	3.73%	\$ 1.75
11	Fund Single Family Garbage Processing and Composting Agreement(s)	Fund ongoing partnerships with facility operators and haulers to process single-family "garbage" for processing and recovery of recyclables and organics and subsequent composting of organics.	Up to 10%	\$10,000,000	3.73%	\$ 1.75
<b>PHASE 4   SUBTOTAL</b>			<b>Up to 20%</b>	<b>\$20,000,000</b>	<b>7.46%</b>	<b>\$ 3.51</b>
<b>ESTIMATED GRAND TOTAL OF ALL PHASES</b>			<b>Up to 33%</b>	<b>\$28,540,000</b>	<b>10.70%</b>	<b>\$ 5.03</b>



ATTACHMENT for Garth Schultz, 5.28.21

**Biomass Recovery Study Comments on 2020 Zero Waste Feasibility Study and Zero Waste Strategy Considerations**

I. Overall Comment

The document is invaluable. It complements and adds to what we have learned from waste management providers, entrepreneurs and others. These sections were particularly useful: overview of the solid waste systems, summary of the progress made toward zero waste in Marin and statewide, the analysis of potential additional recovery in Marin County, and the initial draft strategies for consideration.

II. Observations and Suggestions

1. ZWM funds a number of key programs in the County. We recommend adding a county-wide program that assesses and implements short term and longer term **solutions for end uses of organic materials (biomass)** that create economic incentives for public/private sector investment in feasible technologies and products that lower carbon emissions and enhance carbon sequestration.

2. We recommend that ZWM serve as the source of **county-wide data and analysis** of solid waste management systems in Marin county and facilitator for incentivizing investment in a resilient waste management infrastructure. Responding effectively to trends in disposal, diversion, carbon goals, organics focus (see examples below) will be enhanced if ZWM serves this role. We encourage expanding capability of ZWM to assure that planners, researchers and entrepreneurs across the county have access to current and reliable county wide data on tonnage, capacity and forecasts as well as to feasible options for investment.

A few problem areas are outlined below because their solutions depend on availability of such information and optimization models:

- Because zero waste goes beyond “diverting” waste, and because CalRecycle, in 2014, changed the methodology for demonstrating compliance with AB 939 from a diversion percentage to a “pounds of disposal per person” goal, many jurisdictions stopped tracking and reporting diversion rates, which remain important.
- Regardless of the methodology used for tracking progress toward higher diversion and zero waste, achieving zero waste goals has always been partially dependent on factors that go beyond local collection and processing programs, such as markets and value for scrap material, and the elimination or reduction of problematic packaging.
- The vast majority of the increases in disposal have been in non-franchised materials hauled by residents and businesses directly to the transfer station and landfill, and not



the materials collected by franchised haulers from permanent collection containers. Zero Waste Marin did not meet its goal of 80% diversion from landfill in 2012 and is not on track to meet the zero waste goal by 2025 given that disposal is increasing.

- Communities throughout the state are adding recycling, composting, waste prevention and the use of compost to their climate action plans as GHG reduction and climate resilience measures.
  - Focusing on organics recovery offers several co-benefits in addition to targeting the greatest potential for increased diversion. Increasing organics recovery would help Zero Waste Marin’s member agencies meet their resource recovery and climate goals.
3. We recommend that ZWM initiate this role by updating the Inventory of Waste Flow contained in the R3 Report entitled “Organics Generation and Capacity Analysis’, April 2, 2018. An **updated Biomass Inventory and Characterization Study** would be invaluable in assessing the potential for new and improved pathways to achieve zero waste and eliminate methane emissions from the resource-processing stream, in accordance with SB 1383. Since such information is foundational to our Biomass Recovery Project, we would like to participate in the framing of such a study in the near term. We look forward to working with you to develop such an inventory.
  4. We further recommend and request that the **recovery pathways** identified in our study so far be included among the recovery infrastructure to be analyzed and supported by ZWM going forward. These potential pathways include:
    - Enhanced on-site processing of biomass to reduce need to haul
    - Enhanced Compost production
    - Biochar Production
    - Anaerobic Digestion (AD)
    - Wood products
  
    - Transportation fuels, including aviation fuels
    - Hydrogen powered public transit, including ferries
  5. We are particularly pleased to see the **ZWM Strategies** that are starred below. We would like to be part of process that develops and works on those items:

ZWM Strategies from 2009 per 2/2021 R3 Update (Phase 1)

- Continue #4 ‘Help with Siting/Permitting Processes of Waste Facilities’ (“with focus on organics recovery and recovery from self-hauled waste”)\*
- Continue #18 ‘Resale of Construction & Demolition Materials’ (We could help develop a ‘wood products’ biomass conversion pathway).\*

#### ZWM Strategies from 2/2021 R3 Update (Phase 2, FY 22-23)

- *‘Support for compliance with State mandates’\**
- # 1 ‘Education & Outreach . . . including focus on organic waste reduction and recovery.’\*
- #3 Grants to ‘encourage or require members agencies to focus on organics recycling.’
- #4 CalRecycle Compliance Programs ‘technical guidance’ (including SB 1383)\*
- #5a ‘Technical Assistance to Business & Multi-family . . . for organic waste.’

#### ZWM Strategies from 2/2021 R3 Update (Phase 3, FY 23-24)

- *‘Fund and implement new materials recovery programs for wood waste, non-franchised waste . . .’\**
- #8 ‘Fund Partnerships for Recovery of “Self-Hauled” and C&D Waste.’
- #9 ‘Fund Partnerships for Wood Recovery and Energy Production.’\*

#### ZWM Strategies from 2/2021 R3 Update (Phase 4, FY 24-25)

- *‘Fund and implement processing of garbage/trash to recover and compost organics.’*
- #10 & 11 ‘Processing and Composting Agreements’\*

6.. Finally, we recommend that ZWM include reference to County **GHG emissions and sequestration goals**, as other public agencies are doing, to reinforce the urgency of enacting R3 solutions.



June 7, 2021

Dear R3 Consulting Group and Zero Waste Marin Board and Staff,

On behalf of Recology Sonoma Marin, I would like to provide our comments on the draft update to the Zero Waste Feasibility Study presented to the JPA Board on February 25, 2021. We have reviewed the plan and generally concur with the recommendations. A few general observations:

- We are supportive of continuing and expanding existing successful programs, such as the Zero Waste Schools Program – as we have observed its positive impact.
- We support the recommendation of adding new outreach and education programs related to apartment complexes and technical assistance to apartment complexes.
- Lastly, we support the transition of the JPA into a body with exclusive staff and expanded function. We have found that this style of JPA is very successful with program management (i.e. HHW and Zero Waste programs) as well as compliance management/reporting on numerous CA state laws (i.e. AB939, AB341, AB1826, SB1383). With the complex requirements of SB1383 coming into effect on January 1, 2022, dedicated JPA staff will be needed to bring the County into compliance.

We appreciate the opportunity to provide these comments and our inclusion in the process.

Please feel free to reach out with any additional questions or clarification.

Thank you,

Garen Kazanjian, Waste Zero Specialist

GKazanjian@Recology.com

707-312-3182