



## Final Report

# Composting Processing Capacity and Organic Materials Diversion Study

Presented to:

**County of Santa Clara**

**Consumer and Environmental Protection Agency**



1553 Berger Drive, Building 1  
San Jose, CA 95112

Presented by:

**SCS ENGINEERS**

7041 Koll Center Pkwy, Suite 135  
Pleasanton, CA 94566

**Cascadia Consulting Group**

1109 1<sup>st</sup> Ave, Suite 400  
Seattle, WA 98101

October 2017  
File No. 01217021

**Offices Nationwide**  
[www.scsengineers.com](http://www.scsengineers.com)

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2. Attachment B – Additional Composting Capacity Matrix
3. Attachment C – Food Waste Reduction Matrix

## EXECUTIVE SUMMARY

The County of Santa Clara (County) contracted with SCS Engineers (SCS) to complete a Composting Processing Capacity and Organic Materials Diversion Study (Study). The purpose of the Study was to provide the County with data that will assist in planning for the management of organic materials, and complying with legislative and regulatory requirements, including Assembly Bill (AB) 1826, AB 876 and Senate Bill (SB) 1383. The project included evaluating the existing capacity of compost facilities, quantifying organics generation and diversion within Santa Clara County, and preparing projections of future organics generation.

The information included in this report includes:

- Current and projected organic materials generated by the commercial and residential sectors.
- Quantities and types of organic materials accepted and processed by existing facilities.
- Requirements for organic materials processing facility development or expansion.
- Additional composting capacity, such as backyard composting, and mid-sized composting operations at schools, institutions, parks, community gardens, farms, golf courses, and horse stables.
- On-site processing technologies.
- Existing organic materials backhauling operations.
- Food waste reduction programs in the County.

The key findings from this study are:

1. It is estimated a total of 657,000 tons of organic materials were generated in Santa Clara County in 2015. Of the 657,000 tons of organic materials, 416,000 tons (63%) were diverted by some method of organics processing, and 241,300 (37%) tons were disposed.
2. The 11 Santa Clara County facilities interviewed for this project anticipate increased quantities of compostables (mixed food and compostable paper) will be collected from residential and commercial sources and require processing. Although the findings show unused permitted capacity, most interviewees reported that facilities are running close to through-put capacity and some are turning away material or transferring material out-of-county for processing.
3. Four of the 11 facilities are planning to modify their facilities, and three are increasing their tonnage to accommodate additional organic materials. The Sunnyvale Materials Recovery and Transfer Station (SMaRT Station®) is adding organics processing capabilities, but are not increasing the maximum amount of permitted tonnage of waste received at their facilities. For Zero Waste to Energy, Z-best and Kirby Canyon, the planned permitted tonnage increases range from 500 to 650 tons per day of organic materials, including source separated food scraps, compostable material, mixed MSW, and green waste.

4. The estimated amount of additional capacity projected to be available at organics facilities is 456,000 to 639,000 tons per year, which includes both current permitted capacity and potential expansion. No expansions have completed permitting and final capacity is subject to change.
5. It is anticipated that there will be a nine percent population growth over the next 15 years, which will increase organics by 117,000 tons. If you add in the 241,000 tons currently not diverted, and the anticipated increase in organics tonnage over the next 15 years, the County will need to find organics processing capacity for another 358,000 tons. This does not include additional capacity needed for organics tonnage from outside the County. Estimated capacity for expanding current operations ranges from 99,000 to 154,000 tons annually. If the new facilities anticipated are completed, estimated capacity will range from 481,000 to 609,000 tons annually. It is anticipated that there will not be enough capacity if all organics are processed.
6. Assembly Bill 876 requires the County to submit organics data in the 2017 CalRecycle Annual Report. These results include 1,142,100 tons/year of current organics permitted capacity, 1,598,100 to 1,781,100 tons/year estimated organics permitted capacity in 15-years, 657,100 tons/year of current estimate of organics generation and 772,100 tons/year projected estimate of organics generation in 15-years.
7. A total of 108 organics material processing facilities located outside of Santa Clara County (within 100 miles) were identified as part of the project. From this list, 62 were identified as not having available capacity for Santa Clara organics, either because they do not accept material from the public, or they are located too far from Santa Clara County to be considered viable. Three facilities do not have available capacity, and 40 facilities have some capacity available for organic materials, however the data is provided as a range, and therefore a specific number is not available.
8. Research on additional organics processing capacity included backyard composting, as well as composting occurring at parks, schools, golf courses, and stables. The information provided by the municipalities and the phone calls made to businesses did not provide significant data on the quantity of organic materials managed onsite.
9. Food rescue activities in the County include a number of gleaning organizations that harvest and donate fruits from trees, and seven food rescue organizations that utilize websites to connect donors with recipients. In 2016, Santa Clara County awarded a grant to Joint Venture Silicon Valley to work on a three-year tiered plan of action to help reduce hunger and food waste in Silicon Valley by developing a regional framework that matches surplus food to authorized agencies.

The results of the study indicate the need for additional efforts to reduce the quantity of organic waste generated in the County, and to divert organic materials from disposal. It would be valuable to establish a system that monitors and tracks the types and quantities of organic materials that are generated in each city to understand how much organic material is in the waste stream, how much is disposed, and how much is diverted. The County should consider establishing a metric to understand how much food is rescued and diverted from landfills.

Additionally, the County should consider a local organics ban that would require all organic material to be diverted, and implement enforcement actions for businesses and residents if organic materials are placed in waste containers.

New capacity to manage organic materials is necessary. It will be important for the County to establish and maintain communication with organics processors to gain an understanding of the planned capacity and timeline for adding new organics processing capacity. Furthermore, it is recommended the County work with CalRecycle to establish access to information regarding the proposed, planned, and permitted modifications and/or new facilities for organics processing.

## 1.0 QUANTITIES AND TYPES OF ORGANIC MATERIALS ACCEPTED AND PROCESSED BY EXISTING FACILITIES

In order to identify the types and quantities of organic materials that are taken to local processing facilities, and the existing capacity to process the materials, two surveys were performed: one of organic materials processing facilities within Santa Clara County; and one of regional facilities within 100 miles of Santa Clara County. The surveys were conducted to estimate the current processing at facilities within the County, as well as to calculate local and regional composting capacity.

### 1.1 SURVEY OF LOCAL ORGANIC MATERIALS PROCESSORS

The first survey focused on the organic processors located inside the County. A total of 11 local organic materials processors were identified, including composting, landfills, and Publicly Owned Treatment Works (POTWs)/wastewater treatment facilities. Landfills were included with the processing facilities because they mulch the organics material they receive, and in some cases, divert it to another processor. During the kick-off meeting, it was decided to remove Fats Oils & Grease (FOG) rendering businesses and biodiesel producers, and to remain focused on the organic materials processing facilities. The 11 facilities include:

1. Guadalupe Landfill - 15999 Guadalupe Mine Rd., San Jose, CA 951202.
2. Kirby Canyon Landfill – 910 Coyote Creek Golf Dr., Morgan Hill, CA 95037
3. Newby Island Resource Recovery Park – 1601 Dixon Landing Rd., Milpitas, CA 95035
4. Palo Alto Regional Water Quality Control Plant – 2501 Embarcadero Way, Palo Alto, CA 94303
5. San Jose / Santa Clara Regional Wastewater Facility – 700 Los Esteros Rd., San Jose, CA 95134
6. South County Organics – 3675 Pacheco Pass Highway, Gilroy, CA 95020
7. South County Regional Wastewater Authority – 1500 Southside Dr., Gilroy, CA 95020
8. Sunnyvale Donald M. Somers Water Pollution Control Plant - 1444 Borregas Ave., Sunnyvale, CA 94089
9. Sustainable Alternative Feed Enterprise (SAFE) / Sustainable Organics Solutions (SOS) - 1080 Walsh Ave, Santa Clara, CA 95050
10. Z-Best – 980 CA-25, Gilroy, CA 95020
11. Zero Waste Energy Development Company (ZWEDC) – 685 Los Esteros Rd. San Jose, CA 95134

Initially, research was performed to collect data on each facility, using CalRecycle’s Solid Waste Information System, Facility Information Toolbox (FacIT) Detailed Facility Search database.<sup>1</sup> For each facility, the following information was obtained:

- Facility category (e.g., composting)
- Permitted feedstocks (e.g., green materials, food waste, agricultural)
- Permitted capacity
- Maximum permitted throughput
- Quantity of organic materials used as alternative daily cover (ADC)

Interviews were conducted with the facilities to verify the types and quantities of organic materials they currently process, plans for facility modifications, and other related information. In advance of the interviews, a letter was prepared and sent to the processors explaining the purpose and objectives of the Study, and requesting their participation in an interview. To ensure the interviews were productive, a survey guide of key questions was developed and is included in **Table 1**.

**Table 1. Organic Materials Facility Key Questions**

1) Verify or request the following information.
- Facility category (e.g., composting).
- Permitted feedstocks (e.g., green materials, food waste, agricultural).
- Permitted capacity.
- Maximum permitted throughput.
- Quantity of organic materials used as alternative daily cover (ADC).
- Current commodities accepted
- Current quantities received
- Facility locations that receive material generated within Santa Clara County
2) From which sectors does your facility receive material: residential/commercial/industrial/institutional?
3) How much unused capacity does the facility (ies) have?
4) Does the facility have any plans to increase capacity or expand the types of commodities accepted? If there are plans to increase capacity, what is the current status?
5) Does the facility (ies) accept or would you consider accepting animal waste, manure, compostable diapers, or farm waste?
6) Does your facility have any expectations for future changes in the market for organics material (e.g., anticipated new facilities)? Looking 5 years into the future, what do you see as the needs in terms of additional capacity in Santa Clara County?
7) Do you see any barriers to expanding organics material diversion in Santa Clara County? Are you having any problems with material quality or contamination?

<sup>1</sup> **CalRecycle information sources:**

SWIS Facility/Site Search, [www.calrecycle.ca.gov/swfacilities/directory/Search.aspx](http://www.calrecycle.ca.gov/swfacilities/directory/Search.aspx);

Disposal Reporting System (DRS): Alternative Daily Cover (ADC) Tons by Facility and Material Type, [www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/ADCSiteTons.aspx](http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/ADCSiteTons.aspx);

Facility Information Toolbox (FacIT) Detailed Facility Search, [www.calrecycle.ca.gov/FacIT/Facility/Search.aspx](http://www.calrecycle.ca.gov/FacIT/Facility/Search.aspx).

During the interviews, processors reported that their ability to expand existing operations or build new facilities is highly dependent on obtaining air quality permits. Due to expanded collections, all facilities anticipate increased quantities of compostables (mixed food and compostable paper from residential or commercial sources) and see the need to add processing capacity. Many processors are opposed to composting diapers, even if made from compostable materials. Although the findings show unused permitted capacity, most interviewees reported their facilities are running close to through-put capacity, and some are turning away material or transferring material out-of-county for processing. Almost all sites reported having plans to apply for increased permitted capacity to accept more material or expand their facility. Processors were only able to predict capacity within the next five years.

## 1.2 SURVEY OF REGIONAL FACILITIES

SCS surveyed existing organic materials processing facilities to identify capacity in counties within 100 miles of Santa Clara County. In order to understand how this regional capacity might draw from Santa Clara County generators, SCS identified the facilities from the CalRecycle website, including the permitted volumes, annual throughput capacity, and actual incoming volumes of material. This survey was performed by researching the CalRecycle Solid Waste Information System, the Facility Information Toolbox (FacIT) Detailed Facility Search, and lists that have been developed by other municipalities. Information detailing the type and quantity of facility types is located in **Table 2**.

**Table 2. Summary of Facility Type by County**

Facility Type	Alameda	Contra Costa	Marin	Merced	Monterey	Napa	San Benito	San Francisco	San Joaquin	San Mateo	Santa Cruz	Sonoma	Stanislaus
Anaerobic Digestion	1												
Biosolids Composting at POTWs (Publicly Operated Treatment)	1											2	
Composting Facility (Agricultural)			2	6	5	4	2		3		3	5	2
Composting Facility (Green Waste)	2	1	1	4	3	2	1	1	5		4	1	5
Composting Facility (Mixed) - A facility that composts sewage sludge, animal material, or green material, in addition to mixed solid waste	1	1	1	1	4	1			2				4
Composting Facility (Research)					1								
Chipping and Grinding Activity Facility/Operations	4	6	1	1	2		2	1	1	4		4	
<b>TOTAL</b>	<b>9</b>	<b>8</b>	<b>5</b>	<b>12</b>	<b>15</b>	<b>7</b>	<b>5</b>	<b>2</b>	<b>11</b>	<b>4</b>	<b>7</b>	<b>12</b>	<b>11</b>

A total of 108 organics material processing facilities located outside of Santa Clara County (within 100 miles) were identified as part of the project. From this list, 62 were identified as not having available capacity for Santa Clara organics, either because they do not accept material from the public, or they are located too far from Santa Clara County to be considered viable. Three facilities do not have available capacity, and 40 facilities have some capacity available for

organic materials, however the data is provided as a range, and therefore specific available capacity at each facility is difficult to determine. This is due in part to the way CalRecycle reports the daily and annual throughput for each facility. For example, a facility could have a range from 0 to 10,000 tons a year, while another facility could have a range of 80,000 to 240,000 tons a year. This range is provided to allow for a level of confidentiality, however it is unclear where the facility falls within the range. Additionally, in many instances, the top of the range for annual throughput was the same as the permitted capacity, therefore the facility may or may not have available capacity and the only way to determine the remaining capacity would be to contact each facility, which was outside the scope of work for this project. For further detail on the facilities located Outside-of-County, please refer to **Attachment A**.

## 2.0 CURRENT AND PROJECTED ORGANIC MATERIALS GENERATION

The SCS team used waste characterization data from similar communities to model the organic materials generated within the County. The steps below describe the methodology to model the quantities of organic materials generated by the residential and commercial sectors, as well as how the model would account for material that is currently processed.

### Step 1. Model Disposed and Recovered Organic Materials Composition

A modeling composition was performed using composition data from representative Bay Area communities included in the 2014 CalRecycle statewide study, composition data from City of Seattle waste characterization studies (2012-2015), and unpublished private sector data from the Bay Area. Distinguishing characteristics that were considered when selecting representative compositions for use in modeling included: similarity of business types and sizes (by employment); level of urbanization; geographic proximity; and availability of waste collection and diversion systems such as single-stream recycling collection, acceptance of food waste in the organics material curbside service, and use of mixed waste processing.

The modeled composition was performed for seven material types: yard waste, food, compostable paper, clean wood, animal waste, potentially compostable material, and other waste. Specific sources and assumptions used to model disposal and organic materials composition by generator are described below.

- **Single-family residential.** The modeled single-family disposal and organic materials composition was from the 2014 CalRecycle residential composition, composition data from City of Seattle waste characterization studies (2012-2015), and unpublished private sector data from the Bay Area.
- **Multifamily residential.** The modeled multifamily disposal composition was from the 2014 CalRecycle generator-based data. To model disposal and organic recovery compositions for San Jose multifamily material that was sent to the Newby Island mixed waste processing facility, the team relied on the SMaRT Station Annual Report for 2015-2016 and the City of Palo Alto Waste Characterization Report from 2013.
- **Commercial.** Weighting factors were assigned to the CalRecycle composition data by commercial sector based on Santa Clara County's commercial sector employment profiles (as reported by the California Employment Development Department). The statewide modeled data was then refined by using unpublished private sector data from the Bay Area. The disposed composition of commercial material sent to mixed waste processing at the SMaRT Station and Newby Island was estimated by using the composition of residuals from mixed waste processing from the SMaRT Station Annual Report for 2015-2016 and the 2013 City of Palo Alto Waste Characterization Report.

- **Self-haul.** Self-haul includes material that generators disposed directly at transfer stations or the landfill. The team modeled self-haul disposal composition and organic materials recovery rates from a combination of 2014 CalRecycle self-haul composition data and data from the city of Seattle and King County in Washington, both of which have aggressive organics material recovery programs in place. Self-hauled organic materials were assumed to be exclusively yard waste.

## Step 2. Modeled Baseline (2015) Organic Materials Generation

Reported tonnage data from haulers was used for waste and organic materials collection from cities in Santa Clara County and unincorporated areas to estimate the quantities of organic materials generated (both disposed and recovered) in 2015 for the residential and commercial sectors. Available hauler data covered 96 percent of the County by population. The remaining four percent was modeled based on per capita discard rates from hauler data for each of the cities and the respective population for each city. Recovered organic tons were estimated from hauler reported data and from the processor interviews. The modeled disposal and recovered organic materials compositions were used from the previous step to estimate the quantity of organic materials in the disposed waste stream.

To estimate self-haul quantities, Santa Clara County reported tonnage was combined with composition data from City of Seattle waste characterization studies (2012-2015) and representative Bay Area communities. The estimated self-haul quantities from these jurisdictions by population was scaled to estimate the organics material quantities generated by the self-haul sector in Santa Clara County.

The results from the modeling composition study are included in the following sections.

### 2.1 RESIDENTIAL SECTOR MODELING

To model the residential waste, waste characterization data, as noted above in the methodology, was used to identify recent residential composition data from jurisdictions that are similar to Santa Clara County in both demographics and service levels. This took into account the mixed-waste processing used in some jurisdictions in Santa Clara County. The composition data was applied to County-supplied residential waste tonnages to estimate the quantities of materials, including organics material, generated in Santa Clara County.

The model was developed to understand the breakdown of organic materials found in the residential sector. The residential sector generates approximately 345,500 tons of organic materials per year, approximately 140,600 tons more than the commercial sector.

**Table 3** shows the breakdown of organic materials found in the residential organic materials stream. Food waste is the largest organic material type that is estimated to be disposed, accounting for 60 percent, yet only 30 percent is diverted. Yard waste is the largest contributor to materials being diverted at 63 percent or 140,500 tons per year.

**Table 3. Residential Organic Materials Stream**

Material Type	Disposed		Diverted		Generated	
	%	Tons	%	Tons	%	Tons
<b>Organic Materials</b>	<b>100%</b>	<b>123,400</b>	<b>100%</b>	<b>222,100</b>	<b>100%</b>	<b>345,500</b>
Yard Waste	12%	14,800	63%	140,500	45%	155,300
Food	60%	74,100	30%	66,500	41%	140,600
Compostable Paper	22%	26,800	5%	11,200	11%	38,000
Clean Wood	2%	1,900	0%	300	1%	2,200
Animal Waste	2%	3,100	0%	100	1%	3,200
Potentially Compostable	2%	2,700	2%	3,500	2%	6,200

*Tons by material may not sum to total due to rounding.*

## 2.2 COMMERCIAL SECTOR MODELING

The disposed quantity of organics material was calculated by subtracting the quantity currently being processed (calculated through facility and processor interviews in Section 1) from the generated quantity (calculated as described above). Estimates of current organic commodities and future organic commodities remaining in the disposed waste stream, for the commercial/industrial/institutional sectors are described below.

Organic materials remaining in the disposed waste stream could be targeted for additional diversion. The model was developed to understand the breakdown of organic materials found in the commercial sector. The commercial sector generates approximately 204,900 tons of organic materials per year, approximately 140,600 tons less than the residential sector.

**Table 4** shows the breakdown of organic materials found in the commercial organics material stream. Food waste is the largest organics materials type that is being disposed; accounting for 39 percent, with 62 percent being diverted. Food waste is also the largest type of material being diverted and generated, accounting for 53 percent or 109,300 tons generated per year.

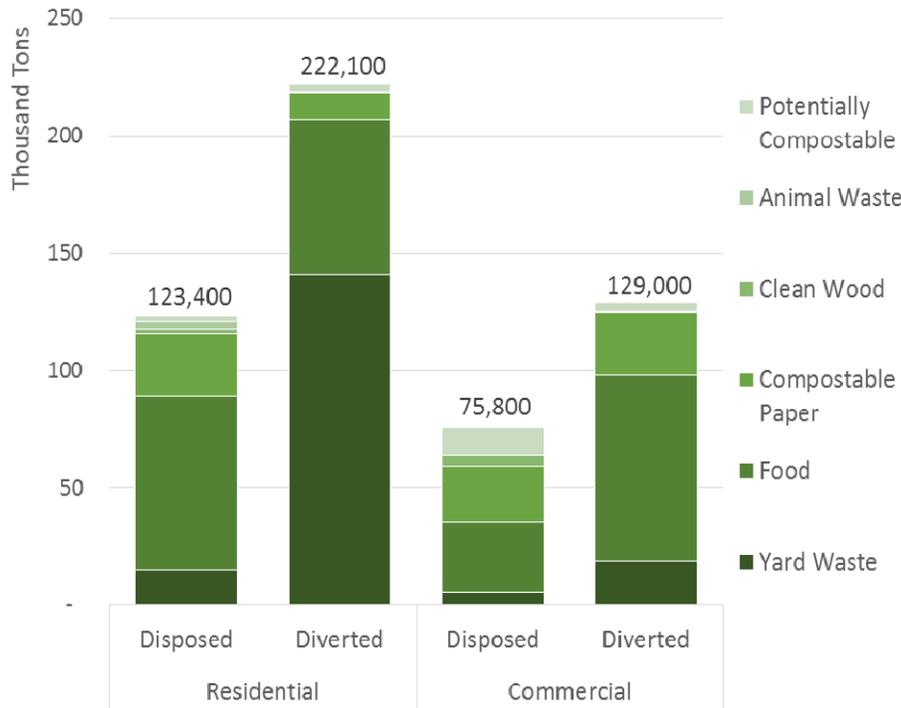
**Table 4. Commercial Organics Material Stream**

Material Type	Disposed		Diverted		Generated	
	%	Tons	%	Tons	%	Tons
<b>Organic Materials</b>	<b>100%</b>	<b>75,800</b>	<b>100%</b>	<b>129,100</b>	<b>100%</b>	<b>204,900</b>
Yard Waste	7%	5,500	15%	18,700	12%	24,200
<b>Food</b>	<b>39%</b>	<b>29,900</b>	<b>62%</b>	<b>79,400</b>	<b>53%</b>	<b>109,300</b>
Compostable Paper	31%	23,600	21%	26,800	25%	50,400
Clean Wood	7%	5,100	0%	400	3%	5,500
Animal Waste	0%	100	0%	-	0%	100
Potentially Compostable	15%	11,600	3%	3,700	7%	15,300

*Tons by material may not sum to total due to rounding.*

Both the commercial and residential sector data are shown in **Exhibit 1**. This reflects the difference between disposed and diverted material, for each business sector. Animal waste only shows up in the residential disposal column.

**Exhibit 1. Comparison of Commercial and Residential Disposed and Diverted Materials**



## 2.3 ORGANIC MATERIALS PROJECTIONS

### 2.3.1 Current and Projected Permitted Capacity

Existing and potential processors were interviewed in order to determine the current and future potential capacity for compost processing, as stated in Section 1. Due to expanded collections, all facilities anticipate increased quantities of compostables (mixed food and compostable paper from residential or commercial sources) and see the need to add processing capacity. Although the findings show unused permitted capacity, most interviewees reported that facilities are running close to through-put capacity and some are turning away material or transferring material out-of-county for processing. Processors were only able to predict capacity within the next five years.

**Table 5** presents estimates of current and future processing quantities and permitted capacities as obtained from permit records and interviews with organics material processing facilities. All processing types are currently operating below their permitted capacity, with the exception of food waste only, which is currently processing and permitted at 100 tons per year. Future

organics material processing, refers to the next five years which is as far as the processors could predict. The estimated future available capacity was calculated by summing unused and additional permitted capacity, and then subtracting future estimated additional processing and estimated additional capacity needed for re-processing of material. Processors that are expanding organics operations were not certain of their permitted capacity, and therefore the numbers provided are an estimate that will more than likely change.

**Table 5. Current and Future Processing Quantities and Permitted Capacities**

Material Type	Current Organics Material Processing Operations(Tons/Yr)			Future Organics Material Processing Operations (Range of Tons/Yr)		
	Current Processing	Permitted Capacity	Unused Permitted Capacity	Est. Additional Processing	Est. Additional Permitted Capacity	Est. Future Available Capacity
ADC	16,800	NA	NA	-	-	NA
Recovery	1,018,100	1,142,100	124,000	99,000 - 154,000	456,000 - 639,000	481,000 - 609,000
Yard Waste only	280,000	292,000	12,000	31,000	0 - 183,000	0 - 164,000
Yard Waste & MSW (MRF organic fraction) Compost	730,000	840,000	110,000	55,000 - 110,000	456,000	485,000 - 430,000
Food Waste Only	100	100	-	13,000	-	-
Animal Waste	8,000	10,000	2,000	-	-	2,000
<b>Total Tons per Year</b>	<b>1,034,900</b>	<b>1,142,100</b>	<b>124,000</b>	<b>99,000 - 154,000</b>	<b>456,000 - 639,000</b>	<b>481,000 - 609,000</b>

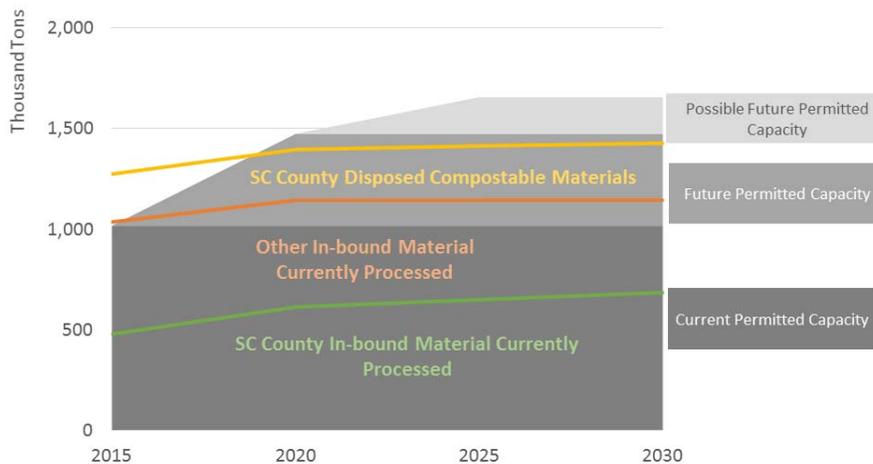
The overall estimate shows an additional 481,000 to 609,000 tons annually of future available capacity for organics processing.

The estimated future capacity and organics material generation and capture are shown in **Exhibit 2**. The difference between inbound material and processed compostable material generated by Santa Clara County is due to several factors.

1. Quantities of organic materials, specifically yard waste, are seasonal.
2. Incoming material to processors includes contamination, sometimes as high as 30%.
3. Some processors are accepting material from out-of-county and some are also sending material out of county.
4. Some material needs to be reprocessed, such as digestate from anaerobic digesters.
5. Limitations of the model and estimated processing quantities from processors.

As seen in **Exhibit 2** below, between the County in-bound material currently processed (477,224 tons), the other in-bound material currently processed (557,676 tons per year), and the County disposed compostable materials (241,300 tons per year), there is a total of 1,276,203 tons each year of organic material taken to the In-County organics processing facilities. There is 1,018,100 tons of current permitted capacity for In-County organics processing, with 456,250 tons per year of estimated future permitted capacity, and another 182,500 tons per year of possible future permitted capacity (range as seen in **Table 5** above, 456,000 to 639,000 tons per year). There is not enough current capacity to manage the county's estimated organic material. No expansion projects have completed permitting and final capacity is subject to change.

### Exhibit 2. Projected Permitted Capacity and Generation



### 2.3.2 Current and Projected Tonnage by Generator

The quantities of organic materials accepted and processed by existing facilities was analyzed in order to recognize potential gaps in processing capacity in the future. Projections of future types and quantities of organic materials generated (both disposed and recovered) in Santa Clara County were developed through the following steps:

1. Modeled disposed and recovered organics material compositions
2. Modeled baseline (2015) organics material generation
3. Estimated organics material generation rates and developing future projections

In order to estimate organic materials generation rates and develop projections, the following methodology was used.

Using the total quantities of organic materials generated by sector (residential, commercial, and self-haul) estimated in the beginning of Section 2, generation rates were estimated from publicly available demographics data as follows:

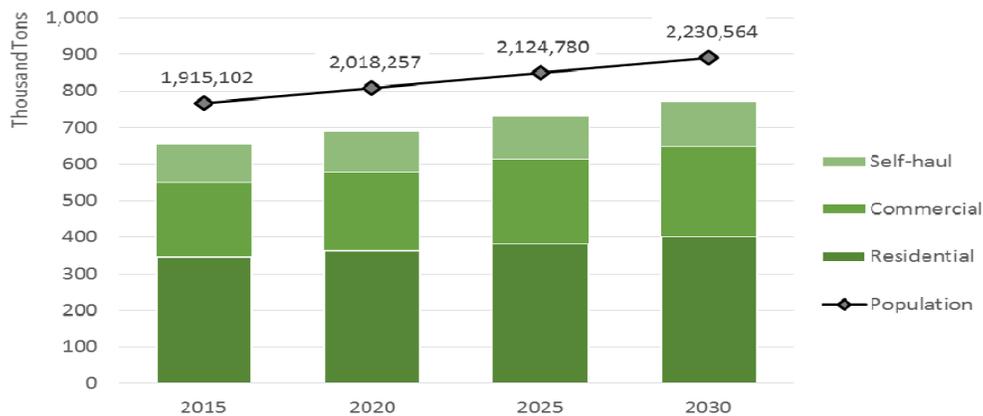
- Residential organic materials generation rates as **tons per year per household**, based on housing unit data from the California Department of Finance.

- Commercial organic materials generation rates as **tons per year per employee**, based on total number of full-time employees from the California Employment Development Department.
- Self-haul generation rates as **tons per year per capita**, based on the total County population as reported by the Department of Finance.

The organic materials generation rates in terms of tons per year per household, per employee, and per capita were applied to projections of future housing unit counts, employment, and population in order to estimate organics material generation in Santa Clara County through 2030.

The population of Santa Clara County was 1.9 million in 2015, and it is estimated by 2030 there will be 2.23 million, or 9% growth over 15 years. The projected quantity of organic materials by generator are shown in **Exhibit 3**.

**Exhibit 3. Projected Annual Organic Tons by Generator**



### 2.3.3 AB 876 Organics Capacity

As part of this study SCS compiled data needed to comply with Assembly Bill 876, which requires the County to submit specific information in the 2017 CalRecycle Annual Report. The data required for input into the 2017 annual report includes the following:

- Current organics permitted capacity: 1,142,100 tons/year
  - Organics material processed: 1,034,900 tons/year
  - Unused capacity: 124,000 tons/year
- Estimated organics permitted capacity in 15-years: 1,598,100 to 1,781,100 tons/year
  - 1,142,100 tons/year current capacity plus additional 456,000 to 639,000 tons/year capacity if expansions happen. The areas identified by the County as locations for new or expanded organic waste recycling facilities can be found in section 1 above.
- Current estimate of organics generation: 657,100 tons/year
- Projected estimate of organics generation in 15-years: 772,100 tons/year

## 3.0 PROCESSING FACILITY DEVELOPMENT AND/OR MODIFICATION

Developing a new organic materials processing facility, or modifying an existing one requires a number of state and local permits and approvals. This memorandum includes a description of these permits and approvals, as well as the results of research performed on potential facility modifications, including the facility name and location, current status of any modification plans, the planned new capacity for the facility, any new materials that may be accepted, and the date of the anticipated modification.

### 3.1 PERMITTING REQUIREMENTS AND REGULATIONS

Development of a new organics material processing facility or the expansion of current facilities include a number of permits and approvals from State and local agencies. The permit process varies based on the location of the facility, types and quantities of materials to be handled, and the type of composting process. There are seven issues discussed below, some or all of which may apply to a specific facility, depending on the extent of the proposed project.

#### 3.0.1 Compostable Materials Handling Permit

Depending on the type and quantity of the material to be handled and the type of processing, a new organic materials facility may fall under the notification, registration, or full solid waste facility permit tier. The facility tiers are shown in **Table 6**.

In order to obtain a permit, a number of documents must be prepared, reviewed and subsequently approved by the regional regulatory body, typically the County Health Department, acting as the Local Enforcement Agency (LEA) for CalRecycle. The permit will be concurred upon by CalRecycle. The permit documents include the Permit Application and the Report of Composting Site Operation. The modification of an existing compost facility could cause a facility to fall under a different regulatory tier, based on the change of feedstock and/or change in capacity.

**Table 6. Compostable Material Handling Facility Tiers**

Enforcement Agency Notification	Registration Permit	Full Solid Waste Facility Permit
Agricultural Material Composting Operations (all) Section 17856		Composting Facilities (all) (e.g., biosolids, digestate, food material, mixed material) Section 17854
Green Material Composting Operations ( $\leq 12,500$ yd <sup>3</sup> ) Section 17857.1(a)	Vegetative Food Material Composting Facilities ( $\leq 12,500$ yd <sup>3</sup> ) Section 17857.2	Green Material Composting Facilities ( $> 12,500$ yd <sup>3</sup> ) Section 17857.1(c)
Biosolids Composting Operations at POTWs (all) Section 17859.1		Vegetative Food Material Composting Facilities ( $> 12,500$ yd <sup>3</sup> ) Section 17857.2
Research Composting Operations ( $\leq 5,000$ yd <sup>3</sup> )(Within-vessel $> 5,000$ yd <sup>3</sup> with EA determination) Section 17862		

Feedstock types are defined by CalRecycle as follows:

- **Agricultural Material** - Waste material of plant or animal resulting directly from agriculture.
- **Biosolids** - Residue from treated septage or wastewater.
- **Chipping and Grinding** – Green compost material mechanically reduced in size but not composted.
- **Compostable Material** – Organic Material
- **Food Material** – Waste material of plant or animal resulting from preparation or processing of food.
- **Green Material** – Plant material excluding food material and vegetative food material.
- **Vegetative Food Material** – A subcategory of food material of only plant origin.

**County Siting Element**

For a new facility, a Finding of Conformance with the County Siting Element (CSE) must be approved by CalRecycle. The CSE requires that prior to the development of such facilities in a County, the facility proponent must: (1) show the project is consistent with the CSE; (2) undergo a vigorous site specific assessment and permitting process at the Federal, State, and local levels; and (3) address all environmental concerns as mandated by CEQA. The local task force would determine whether a particular project is consistent with the CSE and its Siting Criteria through a Finding of Conformance process.

### **Odor Impact Minimization Plan**

All compostable material handling operations and facilities must prepare, implement and maintain a site-specific odor impact minimization plan. A complete plan must be submitted to the LEA with the permit application. The odor impact minimization plan provides guidance to on-site operation personnel by describing, at a minimum, the following items.

- Odor monitoring protocol
- Meteorological Conditions
- Compliant Response Protocol
- Operating Procedures to Minimize Odors

If the operator will not be implementing any of these procedures, the plan must explain why it is not necessary.

### **California Environmental Quality Act**

A new or modified facility would also undergo review under the California Environmental Quality Act (CEQA). Evaluation of potential significant impacts associated with construction and operation of the facility would determine whether a Mitigated Negative Declaration or full Environmental Impact Report (EIR) would be required. Potential impacts could include Air Quality, Odors, Traffic, and Land Use, to name just a few. If development of an anaerobic digestion facility is proposed, the project could utilize the EIR prepared by the State for that purpose.

### **Land Use Permits**

Local land use approval for a new or modified facility would be required, including consistency with the General Plan and Zoning ordinance. Issues such as location in a County Community Standards District, proposed operation type, and type and quantity of materials to be handled are all factors that would be evaluated to determine the land use approval process for a proposed organic materials facility. The authority for determining the consistency with the General Plan lies with the government of the local jurisdiction in which the facility is located or to be located. As such, the siting and protection of the areas identified for future use as solid waste facilities are subject to the land use regulations of the local planning agency.

### **Air Quality**

Compliance with local air quality rules and regulations are required for organic materials processing facilities. Locally, the Bay Area Air Quality Management District (BAAQMD) requires either a Synthetic Minor Operating Permit for facilities that operate with annual emissions below all of the Title V trigger levels, or a Title V Permit for facilities that emit at least one major source threshold at or above the trigger levels for new composting operations, modifications to the existing composting operations, and modifications of related feed stock and compost processing equipment. Trigger levels are: (1) 100 tons per year of a criteria air pollutant (NO<sub>x</sub>, SO<sub>2</sub>, Pb, VOC, CO or PM<sub>10</sub>); (2) 10 tons per year of a Hazardous Air Pollutant (HAP); or (3) 25 tons per year of any combination of HAPs.

## Water Quality

New and existing composting operations are required to submit an Industrial Storm Water General Permit or obtain the appropriate National Pollutant Discharge Elimination System (NPDES) wastewater discharge permit from the Regional Water Quality Control Board. The local Regional Water Quality Control Board for all cities within Santa Clara County except Morgan Hill is the San Francisco Regional Water Quality Control Board. The local Regional Water Quality Board for Morgan Hill is the Central Coast Regional Water Quality Control Board. A Notice of Intent along with a filing fee and technical report must be completed and submitted with the application. A new facility must submit no less than 90 days prior to commencement of composting operations. The Regional Water Board will issue a Notice of Applicability that confirms the Discharger's Tier, timeline for compliance, monitoring requirements and monitoring methods.

### 3.2 PROPOSED AND PENDING FACILITY MODIFICATIONS

Based on research performed for this project, 11 facilities within Santa Clara County were surveyed to understand their current capacity and future plans. Of the 11 facilities researched, five are planning some type of modification, and three are adding new tonnage: Kirby Canyon Landfill, Z-Best and ZWEDC. SMaRT Station is adding organics processing, but not adding new organics capacity to their permits. The planned facility expansions range from 500 to 650 tons per day of organic material, including source separated food scraps, compostable material, mixed MSW, and green waste. According to the research, no new organic materials processing facilities are planned in Santa Clara County.

The planned facility modifications, along with their current status, new materials, capacity, and anticipated date of completion are included in **Table 7**.

**Table 7. Facility Modifications**

Facility Name	Current Status	Current Materials & Capacity	New Materials & Capacity	Anticipated Expansion Date
Kirby Canyon Landfill	Early planning stages	C & D, Industrial, special waste, solid waste, chipping and grinding. 2,600 tons per day (tpd)	Possibly 500 tons per day (tpd)	Not Available
Palo Alto Regional Water Quality Control Plant	Organics Facility Plan adopted in 2014 with 4 components. Component one: Biosolids Dewatering is under construction. Component two (wet anaerobic digestion) and Component three (food processing facility) on hold pending study.	Biosolids	Food Scraps. Capacity unknown	Unknown
SMaRT Station	Installing Auger / Press System.	C&D, industrial, mixed Municipal Solid Waste MSW, green waste 1,500 tons per day (tpd)	Source separated food scraps. No additional tonnage, adding system to process current program materials.	10/1/2017
Z-Best (Gilroy)	Have not yet resubmitted revised application. Preliminary CEQA activities in process.	Agriculture, food scraps, green materials, manure, MSW. 1,500 tons per day	Expand and convert a Compost Technology Inc. (CTI) system to an engineered Composting System (ECS), open aerated model.	Not Available
ZWEDC	Through-put permit in process.	Source Separated Food Scraps and Compostable material from Mixed Material MRF 500 tpd	Same materials, expanding 650 tpd	Not Available

## 4.0 ADDITIONAL COMPOSTING CAPACITY

In order to thoroughly evaluate composting capacity available in Santa Clara County, supplementary research was performed to understand additional capacity other than organic processing facilities. In collaboration with the County, SCS developed a list of alternative composting programs to research and identify potential available capacity. This list includes locations that have on-site composting that manage in-house organic materials. The following programs were researched:

- Backyard composting
- Mid-sized compost operations at schools and institutions
- Parks, community gardens, and farms
- Golf courses
- Horse stables and boarding

SCS sent a survey to each city within Santa Clara County to receive a comprehensive list of alternative composting programs. Of the fifteen (15) cities in the County, only two (2) did not respond to the survey. These details can be found in **Attachment B**.

### 4.1 BACKYARD COMPOSTING

Backyard composting can provide an outlet for residential organic materials. All cities and the unincorporated county sell organics bins to residents at a discounted rate, and also provide free composting classes. The number of bins sold in each city since 2010 is included in **Table 8**.<sup>2</sup>

**Table 8. Number of Composting Bins Sold by City**

City	2010	2011	2012	2013	2014
Campbell	0	8	10	6	4
Cupertino	63	40	5	12	5
Gilroy	0	4	2	0	2
Los Altos	4	4	6	0	1
Los Altos Hills	1	2	1	1	0
Milpitas	5	13	6	17	6
Monte Sereno	0	0	0	4	0
Morgan Hill	3	7	2	9	7
Mountain View	8	17	21	41	12
Palo Alto	27	20	9	46	83
San Jose	59	122	158	187	26
Santa Clara	10	11	22	34	13
Saratoga	5	4	14	8	18
Sunnyvale	32	71	85	41	39
<b>Total</b>	<b>217</b>	<b>323</b>	<b>341</b>	<b>406</b>	<b>216</b>

\*2010 Data consisted of June-December. 2014 Data consisted of January-June.

<sup>2</sup> Data provided for compost sales was only for 2010 to 2014

As part of the survey, each city was asked how many households backyard compost. The City of Palo Alto had previously surveyed their residents, and was the only city that provided an estimate of the number of residents that backyard compost. According to Palo Alto's survey, 10% of their resident's backyard compost on a regular basis. Although the estimate may be high for other communities, it is the only local data available, and is used in the projections in **Table 9**. Table 9 includes an estimate of the number of households (as provided in the United States Census Bureau 2011 to 2015), then multiplied by 0.24 tons of organic materials composted per household annually, to estimate the tons of organic materials composted in back yards each year.

**Table 9. Backyard Composting by City**

City	Population	# Households (United States Census Bureau 2011-2015)	Estimated No. of Households that Backyard Compost (10% of total HH)	Tons per Household per year of Food Scraps**	Estimated Food Scraps Backyard Composted (tons / year)
Campbell	42,584	16,042	1,604	0.24	385
Cupertino	60,189	20,422	2,042	0.24	490
Gilroy	51,701	14,989	1,499	0.24	360
Los Altos	30,177	10,877	1,088	0.24	261
Los Altos Hills	7,922	3,047	305	0.24	73
Los Gatos	30,000	12,146	1,215	0.24	292
Milpitas	69,783	20,792	2,079	0.24	499
Morgan Hill	40,872	13,460	1,346	0.24	323
Mountain View	76,260	32,714	3,271	0.24	785
Monte Sereno	3,485	1,211	121	0.24	29
Palo Alto	75,000	26,087	2,609	0.24	626
San Jose	1,042,094	314,297	31,430	0.24	7,543
Santa Clara	120,245	43,433	4,343	0.24	1,042
Santa Clara County RWRD	87,764	26,052	2,605	0.24	625
Saratoga	30,000	10,800	1,080	0.24	259
Sunnyvale	148,372	55,094	5,509	0.24	1,322
<b>TOTAL in County</b>	<b>1,916,448</b>	<b>621,463</b>	<b>62,146</b>	<b>0.24</b>	<b>14,915</b>

An estimated 14,915 tons per year of food scraps are composted in backyards. The potential increase in number of bins sales is estimated to be 12 % per year, based on the average percent change between 2011 and 2013. **Table 10** reveals the projected number of households that will backyard compost, calculated by adding the yearly bin sales and the 14,915 baseline for 2016. Table 12 also demonstrates the annual pounds of food scraps that could potentially be removed from the waste stream by backyard composting.

**Table 10. Projected Backyard Composting 2016 to 2020 (tons per year)**

Year	Number of Households that Backyard Compost	Projected Composter Sales	Annual Average Tons per Household of Food Scraps	Estimated Overall Tons of Food Scraps that will be Backyard Composted Annually	Additional Tons of Food Scraps that will be Backyard Composted
2016	62,146	570	0.24	14,915	
2017	62,765	639	0.24	15,068	153
2018	63,390	716	0.24	15,240	172
2019	64,021	801	0.24	15,432	192
2020	64,658	898	0.24	15,648	216

## 4.2 MID-SIZED COMPOST OPERATIONS AT SCHOOLS AND INSTITUTIONS

The 15 jurisdictions within Santa Clara County were surveyed regarding mid-sized compost operations at schools and institutions. Two of the cities did not respond to the survey, four cities were uncertain of whether any of the schools in their area had onsite composting, and one city was able to provide the number of schools that had onsite composting. Seven cities were aware of the number of schools that had their hauler collect organic materials and compost. None of the jurisdictions could report the volume of material that was composted onsite. Based on the results of the survey, onsite compost programs at schools does not appear to contribute a great deal to the diversion of organic materials. **Table 11** provides the overall results.

**Table 11. Onsite Composting at Schools**

Cities	Number of Schools in Jurisdiction	Number of Schools with onsite Composting	Number of Schools that have Organics Collected by Hauler	Total Volume of Material
Campbell	36	0	3	Unknown
Cupertino	27	Unknown	Unknown	Unknown
Gilroy	Unknown	Unknown	Unknown	Unknown
Los Altos	Unknown	Unknown	Unknown	Unknown
Los Gatos	29	0	5	Unknown
Milpitas	14	0	Unknown	Unknown
Monte Sereno	1	0	1	3yds and 95 gal/week
Morgan Hill	15	0	0	Unknown
Mountain View	11	Unknown	2	Unknown

Cities	Number of Schools in Jurisdiction	Number of Schools with onsite Composting	Number of Schools that have Organics Collected by Hauler	Total Volume of Material
Palo Alto	35 (17 private)	0	18	Unknown
San Jose	92	City was uncertain (37 gardens)	9	Unknown
Santa Clara	1	Unknown	Unknown	Unknown
Santa Clara County	3	2	Unknown	Unknown
Saratoga	25	0	0	Unknown
Sunnyvale	31	0	9	Unknown

Eleven jurisdictions in the County have some type of small or large institution. SCS contacted all of the larger institutions, however only a few responses were received. It does not appear that any of the institutions have onsite composting, the smaller institutions use landscapers, and the larger facilities either mulch, chip, or have their organic materials collected by a hauling company. **Table 12** shows the results from the survey and phone calls made to large institutions.

**Table 12. Onsite Composting at Large Institutions**

Table 12. Onsite Composting at Large Institutions

Cities	No. of Institutions in Jurisdiction*	Name of Institution	On-Site Composting?	No on-site, what else are they doing with compost?	Total Volume of Material? Entire amt. from Cafeteria? Only parts of material? Need % and information entered in NOTES column
Campbell	0	N/A	N/A	N/A	N/A
Cupertino	3	DeAnza Community College	No	Recology Services	~8 tons/month
Gilroy	1	Gavilan College	Unknown	Unknown	6-2-17 left v/m w/ Jeff Gopp
Los Altos	1	Foothill College	Unknown	Unknown	closed after 12pm Fridays ( 6.2.17); 6-5-17 need to call back w/ auto system; left v/m with Andrea Hanstein-pub. Relations/admiration
Los Gatos	0	N/A	N/A	N/A	N/A
Milpitas	1	California Science and Technology University	No	Landscaper	Not sure
Monte Sereno	0	N/A	N/A	N/A	N/A
Morgan Hill	1	Gavilan College	Unknown	Unknown	6-2-17 left v/m w/ Jeff Gopp
Mountain View	0	N/A	N/A	N/A	N/A
Palo Alto		Palo Alto University	No	Landscaper	Not sure
San Jose	14	San Jose City College	Unknown	Unknown	N/A?
San Jose		San Jose State	No	Hauling Company	not sure
San Jose		University of Phoenix	No	Landscaper	Not sure
San Jose		USF College	No	Landscaper	Not sure
San Jose		Cogswell College	No	Landscaper	Not sure
San Jose		Henley Putnam University	No	Landscaper	Not sure
San Jose		Everest College	No	Landscaper	Not sure
San Jose		San Jose - Evergreen Community College	Unknown	Unknown	
San Jose		William Jessup University	No	Landscaper	Not sure
San Jose		Carrington College	No	Landscaper	Not sure
San Jose		DeVry University	No	Landscaper	Not sure
San Jose		JFK University	No	Landscaper	Not sure
San Jose		Silicon Valley University	No	Landscaper	Not sure
San Jose		Pepperdine University Executive Program	No	Landscaper	Not sure
Santa Clara	6	Santa Clara University	No	Mission Trail Waste Systems	Not sure
Santa Clara		Golden Gate University	No	Landscaper	Not sure
Santa Clara		Golden State Baptist College	No	Landscaper	Not sure
Santa Clara		Mission College	No	Mission Trail Waste Systems	Not sure
Santa Clara		California College of Communications	No	Landscaper	Not sure
Santa Clara County	0	N/A	N/A	N/A	N/A
Saratoga	1	West Valley Junior College	Unknown	Unknown	closed on Fridays ( 6.2.17); 6-5-17 cannot get thru automated system (11min wait time) ; left v/m with Kim Aufhauser-park mgmt.
Stanford	4	Stanford	No	Peninsula Sanitary Services Inc. Hauls Material to Newby	Not sure
Sunnyvale	2	Art Institute of California Sunnyvale (closing), Foothill De Anza Community College, Herguan university, TBD	No	New site, no material; within 6 months they will be utilizing City landscape bins	

\* The number of known institutions were added in this column, only the larger institutions were documented in the table

### 4.3 PARKS, COMMUNITY GARDENS, AND FARMS

SCS surveyed County of Santa Clara municipalities to identify the number of parks, community gardens, and farms within each city, and if there are composting operations. The survey was used to identify current capacity and what is anticipated regarding future growth of the program. Due to limited responses, understanding the amount of materials composted on site at parks, community gardens, and farms is limited. A total of 253 parks are located within Santa Clara County. **Table 13** shows that Mountain View, Palo Alto and Sunnyvale all report composting operations in place. Milpitas, Mountain View, Santa Clara and Santa Clara County parks have their materials sent to their hauler for composting. Cupertino, Morgan Hill, Mountain View and Sunnyvale responded that they grasscycle on site at some of their parks.

There are 10 community gardens throughout Cupertino, Milpitas, Morgan Hill, Mountain View, Palo Alto, and Sunnyvale, with a new garden in Santa Clara County starting in 2018. The amount of composted materials the different gardens was not reported by the cities.

There are 106 farms reported throughout Santa Clara County. The amount of composted material at farms was unknown. SCS did contact farms to see what they did with their material, and were unsuccessful getting a response.

### 4.4 GOLF COURSES

The survey performed with the County of Santa Clara municipalities as well as web-based research identified 24 golf courses within Santa Clara County. It is known that Blackberry Farm in Cupertino grasscycles its grass clippings. All other golf courses were unable to provide information on type and quantity of materials composted onsite. Additional follow up calls were made to golf courses to better understand the current program and its capacity, the future direction of the program, and anticipated projected growth. Unfortunately, of the 13 golf courses we contacted, none of them returned our calls. **Table 14** shows the results of the survey and phone calls.

### 4.5 HORSE STABLES AND BOARDING

The survey answered by the municipalities within the County of Santa Clara identified 27 horse stables and equestrian centers within the County. Of the 15 municipalities surveyed, four (4) do not have stables and seven (7) did not know what was done with the manure. Los Gatos, Milpitas, San Jose and Sunnyvale provided some information on what their stables are doing. Additional follow up calls were made in an attempt to get more information on what they are doing with their manure, however we only received one response. **Table 15**, shows the details of horse stables in Santa Clara County and their composting activities.

**Table 13. Composting Operations at Parks, Community Gardens and Farms**

Table 13. Composting Operations at Parks, Community Gardens, and Farms

Cities	No. of Parks	No. of Composting Operations	Amt. of Material Composted	Amt. Sent to Hauler	Amt. Grasscycled	No. of Gardens	No. of Composting Operations	Amt. of Material Composted	No. of Farms	Amt. of material Composted	Amt. sent to Hauler	Amt. Grasscycled
Campbell	9	Unknown	Unknown	Unknown	Unknown	0	N/A	N/A	1	Unknown	Unknown	Unknown
Cupertino	19	Unknown	Unknown	Unknown	Grasscycling done at all turf areas except 4 infields where clippings are hauled to Service Center to be collected for composting	1	Compost piles on site and bin service by hauler	Unknown	0	N/A	N/A	N/A
Gilroy	2	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	10	Unknown	Unknown	Unknown
Los Altos		Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Los Gatos	7	Unknown	Unknown	Unknown		0	N/A	N/A	28	Unknown	Unknown	Unknown
Milpitas	33	0	Not listed	Unknown	hauled off by to composting facility (96gal cart of yard trim/organics from Spring Valley ea. Week	1	Unknown	Not Listed	0	N/A	N/A	N/A
Monte Sereno	0	N/A	N/A	N/A	N/A	0	N/A	N/A	0	N/A	N/A	N/A
Morgan Hill	26	Unknown	Unknown	Unknown	mowing and tree trimming is performed by contractors; amt. unknown	1	mhcommunitygarden.org home page does not include email or contact phone		10	Unknown	Unknown	Unknown
Mountain View	29	2	Unknown	Unknown-debris box sent to Smart Station	115 acres	2 (3 including Los Altos?)	Unknown	Unknown	0	N/A	N/A	N/A
Palo Alto	36	2	Unknown	32 gallons	Unknown	4	4?	Unknown	0	N/A	N/A	N/A
San Jose	17	Unknown	Unknown	Unknown	Unknown	0	N/A	N/A	31	Unknown	Unknown	Unknown
Santa Clara	33	Unknown	Unknown	hauled back to yards and collected by MTWS for processing	Unknown	0 (1 in 2018)	Unknown	Unknown	0	N/A	N/A	N/A
Santa Clara County	7	Unknown	Unknown	92 cy weekly (Trash)	Unknown	0	N/A	N/A	24	Unknown	56 cy weekly (Trash)	Unknown
Saratoga	12	Unknown	Unknown	Unknown	Unknown	0	N/A	N/A	2	Garrod Farms 6-5-17 Jan Garrod called bk ~30yds month composted on-site then given to comm. Gardens and vineyards	Unknown	Unknown
Sunnyvale	23	2	Unknown	Unknown	400 acres	1	Unknown	Unknown	2	Unknown	Unknown	Unknown

**Table 14. Composting Operations at Golf Courses**

<b>Cities</b>	<b>No. of Golf Courses</b>	<b>Composting Onsite</b>	<b>Mulch Onsite</b>	<b>Does Hauler pick up material?</b>	<b>Estimated Volume of Compost Material</b>
<b>Campbell</b>	0	N/A	N/A	N/A	N/A
<b>Cupertino</b>	2	Blackberry grasscycles		Landscape trimmings/tree waste pickup/collected for composting	Not Listed
<b>Gilroy</b>	3	Unknown	Unknown	Unknown	Unknown
<b>Los Altos</b>	1	Unknown	Unknown	Unknown	Unknown
<b>Los Gatos</b>	1	Unknown	Unknown	Unknown	Unknown
<b>Milpitas</b>	2	Unknown	Unknown	Spring Valley Recology collects 96 gal. cart of yard trimmings	Unknown
<b>Monte Sereno</b>	0	N/A	N/A	N/A	N/A
<b>Morgan Hill</b>	2	Unknown	Unknown	Unknown	Unknown
<b>Mountain View</b>	1	none	none	Tree trimmings collected and sent to SMaRT Station	Unknown
<b>Palo Alto</b>	1 (and 1 currently under construction)	Unknown	Unknown	Unknown	Unknown
<b>San Jose</b>	2	Unknown	Unknown	Unknown	Unknown
<b>Santa Clara</b>	2	Unknown	Unknown	Unknown	Unknown
<b>Santa Clara County RWRD</b>	4	Unknown	Unknown	Recology - no data reported	Unknown
<b>Saratoga</b>	1	Unknown	Unknown	Unknown	Unknown
<b>Sunnyvale</b>	2	Yes	None	Yes	Grasscycle unknown

**Table 15. Composting Operations at Horse Stables**

Cities	No. of Horse Stables and Eq. Centers	Mulch/Compost/ or Haul	Volume of Manure
Campbell	0	N/A	N/A
Cupertino	2	Unknown	Unknown
Gilroy	3	Unknown	Unknown
Los Altos	3	Unknown	Unknown
Los Gatos	4	(Bear Creek Stables hauls off)	Bear Creek Stables ~66 cy/wk
Milpitas	3	Chaparral compost onsite; Indian Hills haul to offsite location	11 cy/wk spread on-site (Chaparral Ranch)40cy/per wk (Indian Hills Ranch)
Monte Sereno	0	N/A	N/A
Morgan Hill	1	Unknown	Unknown
Mountain View	0	N/A	N/A
Palo Alto	2	Unknown	Unknown
San Jose	4	(Lakeview Stable) partially compost and spread onsite	Unknown
Santa Clara	0	N/A	N/A
Santa Clara County RWRD	2	Unknown	Unknown
Saratoga	2	Unknown	Unknown
Sunnyvale	1 (Animal Assisted Happiness)	Haul to offsite location	Unknown

## 5.0 ONSITE PROCESSING TECHNOLOGIES

There are many technology options for managing organic materials in the waste stream, each striving to optimize the use of the biological conditions of the material to achieve the most uniform, mature product in a reasonable amount of time. When evaluating alternative processing methods or technologies, criteria include available space, labor requirements, feedstock, products, utilities, etc. SCS identified three primary organic materials processing technologies to provide onsite support of managing organics materials. These different technologies include mini-aerobic systems, bio-digesters, and dehydrators. Businesses and institutions would benefit from these small scale systems to help manage their food scraps, compostable paper and green waste onsite. These technologies can potentially save money and the business can use the by-products as compost or soil additives for their landscaping or gardens. It is advised that any vendors installing a technology should work with the city to obtain permits, properly site and install devices with special attention to the characteristics and quantities of liquids discharged and the energy inputs required. SCS identified seven small scale organics material processing technologies that have the potential for onsite applications. These are described in the following section. SCS selected technologies that have a proven track record of operation in the U.S, including two vendors (Totally Green and Global Composting Solutions) with operating systems in California.

### 5.1 SMALL SCALE PROCESSING TECHNOLOGIES

#### 5.1.1 Mini-Aerobic Systems

A mini-aerobic system is an in-vessel technology that provides a controlled environment similar to static piles or windrows, but fully enclosed. The system mixes and aerates material to accelerate the composting process, and generates a compost material that can be applied to landscaped areas. These systems require additional curing prior to using as compost. Two companies that provide this type of system are described below: DT Environmental and Global Composting Solutions. SCS does not endorse either company or equipment, and there are other companies that provide similar equipment.

#### **DT Environmental**

DT Environmental, operating since 2009, developed a mini-aerobic system called the DTE Enviro Drum, which can be used at large campus settings such as universities, hotels, theme parks, correctional facilities, and business centers. The waste capacity for the DTE Enviro Drum can range from 8 to 60 cubic yards, depending on the selected drum size. Space requirements are approximately 8'x 54', including the mixer and other equipment components. The in-vessel composting method artificially accelerates the temperature to kill any pathogens and is maintained at 55° Celsius or higher for three



**DTE Enviro Drum**

consecutive days. The system requires one hour per day per load of labor time, and can manage up to two loads per day. The volume of weight reduction typically ranges from 20-80 percent, depending on feedstock characteristics. The finished compost is stacked in piles for approximately 30 days to cure. Storage requirements for the compost curing process will be dependent on the selected system and daily utilization. The DTE Enviro Drum accepts manure, food waste, bio-solids, green waste, paper and bioplastics. Benefits include versatility for customized designed needs, elimination of transport costs and tipping fees, and generation of usable soil amendment.

The DTE Enviro Drum model sizes and pricing range from:

- Model 6-20: 41'.4" Length x 12'.4" Width x 8'.6" Height  
Cost of system, \$140,000-\$200,000 including installation
- Model 6-32: 53'.5" Length x 12'.4" Width x 9'.2" Height  
Cost of system, \$200,000-\$250,000 including installation
- Model 8-40: 53'.5" Length x 12'.4" Width x 9'.2" Height  
Cost of system, \$275,000-\$350,000 including installation

DT Environmental equipment can be customized to meet regulatory requirements, however, all permitting is managed at a local level. DT Environmental was unable to provide estimates for return on investment as this will be based on a facility's revenue source ie: avoided landfill costs, tipping costs, or compost sales.

### **Global Composting Solutions**



**Hot Rot Composting System**

Global Composting Solutions developed a mini-aerobic system (HotRot) designed to process organic materials from restaurants, commercial premises, and larger facilities such as a campus setting. The HotRot aerobic system has been in operation since 2000 with units operating in California and Canada. The HotRot requires 2 hours of labor per day, and has a throughput capacity ranging from 800 to 1,102 pounds per day, depending on the selected model. These systems run continuously with a 10 to 12 day cycle, starting with the initial input of organic material, to the end of the process when the composted material is discharged. These units do not produce leachate and instead expel excess water as vapor through an exhaust air duct. HotRot benefits include a guarantee of no objectionable odors, weatherproof units, and acceptance of most types of organics materials including small bones and compostable paper. This system can allow for some other compostable products (i.e. silverware, bags), however it is recommended to shred for full degradation.

The HotRot systems are modular, fully enclosed, and range in size and cost as indicated:

- HotRot 1206: 7.15m Length x 1.40m Width x 2.70m Height (with exhaust duct removed 1.60m Height). Cost of system, \$100,000 including installation. This does not include any civil work, connection services, or permitting.
- HotRot 1811: 12.780 Length x 2.3m Width x 2.24m Height plus ancillaries. Cost of System, \$300,000 - \$350,000, this includes the feed system, discharge screw, biofilter, electrical, freight, install, commissioning and training. This does not include any civil work, connection services, or permitting.

### 5.1.2 Bio-Digesters

A bio-digester uses the addition of proprietary biological agents and water to accelerate decomposition. The system is designed to break down the organic material enough to deposit through the sewer system, which distinguishes them from garbage disposals. If utilizing this technology, all material goes down the sewer after process is complete. Proper set up is required to ensure the effluent material is disposed of properly. Two companies that provide this type of system are: Totally Green, Inc.; and BioHighTech Global. SCS does not endorse either company or equipment, and there are other companies that provide similar equipment.

#### Totally Green, Inc.

Totally Green, Inc. provides a variety of different sizes of the ORCA system, which is designed for businesses that produce high volumes of food scraps, including supermarkets, hotels, large office buildings, convention centers, stadiums, and shopping malls. Totally Green has been in operation since 2012, and has over 200 units operating in the United States, including California. The ORCA's proprietary natural microorganism solution works with water and recycled plastic bio chips to break down and digest organic waste. When filled to capacity, the ORCA models can process between 25 to 100 pounds per hour of food scraps. These systems are designed to run continuously over a 24 hour period, turning food scraps into wastewater that drains directly to the municipal sewage system with no other byproducts generated. The ORCA will only accept food waste. Contaminants including bones and avocado seeds will cause operational issues, and presorting is required.



**ORCA**

The ORCAs stainless steel container model sizes and pricing range from:

- OG25: 50" Length x 33.5" Width x 49" Height  
\$28,000, plus \$200 monthly services
- OG50: 68.5" Length x 33.5 Width x 49" Height  
\$34,000, plus \$375 monthly services
- OG100: 115" Length x 33.5" Width x 49" Height  
\$39,000, plus \$425 monthly services

The ORCA monthly service fees cover the required ORCA Bio Chips & ORCA Microorganisms from Totally Green. After the initial cost of the system the typical return on investment is about 3 years or less. There is no additional permitting required to operate this system.

These models require minimal labor, with recommended feeding every two to three hours for maximum efficiency. These systems have the potential to divert up to 270 cubic yards of food scraps per year from landfills.

### **Bio High Tech Global**

Bio High Tech Global has developed three Eco-Safe digesters which are designed for small scale (e.g. quick service restaurants) to large scale (e.g. food distribution centers) food scrap management. They have systems in 15 countries and 38 states, including California. These digesters are continual feed units that can process between 29 to 89 cubic yards of food scraps within a 24 hour period. These digesters only accept food waste, excluding large bones, mussel and clam shells and pineapple tops. The digesters will not accept packaging, general waste or cutlery. The Eco-Safe digester ranges in size from:



**Eco-Safe Digester**

- Eco-Safe 4: 45.75” Length x 35.25” Width x 50” Height
- Eco-Safe 8: 59.25” Length x 44.25” Width x 55.25 Height
- Eco-Safe 12: 69.25” Length x 44.25” Width x 55.25” Height

These digesters require minimal maintenance and can be continually fed as needed. These units convert food scraps into wastewater which is then drained to the municipal sewage system with no other byproducts generated. Bio High Tech Global was unresponsive to SCS’s inquires regarding information on pricing, permitting and return on investment.

### **5.1.3 Dehydrators**

Dehydrators use a mechanical/thermal approach that effectively separates liquids from the solids. These systems can include pulping within the dehydrator, or can be coupled with stand-alone pulping and dewatering systems. The liquid portion is disposed of through the sewer system and the reduced solid portion is landfilled or diverted for recycling. Three companies that provide this type of system are: OnSite Waste Solutions; Somat; and Ecovim. SCS does not endorse any of these companies or equipment, and there are other companies that provide similar equipment.

### **OnSite Waste Solutions**

OnSite Waste Solutions, operating since 2012, provides a Dehydration and Recovery Technology system (DaRT), which is ideal for hotels, restaurants, resorts, and colleges

throughout the U.S. These units have a built-in shredder that can process food waste ranging from 110 to 165 pounds a day depending on the selected model.

The dehydrators can run up to two cycles per day, with 9 to 10 hours, per cycle. DaRt systems required minimal labor, requiring about 15 minutes for each cycle to load, collect discharge, and clean equipment filters.

The benefits of using DaRT include 90% waste reduction with 10% of highly concentrated organic material remaining. The highly concentrated organic material should be blended 10 to 1 with other composting materials before use, due to high concentrations of nitrates, or can be sent to a local composting site. The DaRT system can accept bones and about 10-15% contamination, including small packaging containers, and compostable tableware and paper napkins. These systems heat up to 300 ° Fahrenheit, killing all pathogens, and generate approximately 20 gallons of filtered water per day. This filtered water can be collected and reused in the system by adding a small water pump and reservoir to the system. The DaRT dehydrator ranges in size and price from:

- DaRT GC-100: 57” Length x 36” Width x 51” Height  
Cost of system, \$32,000  
Leasing, \$600 per/month
- DaRT GC-100: 63” Length x 40” Width x 59” Height  
Cost of system, \$45,000  
Leasing, \$900 per/month



**DaRT GC-100**

The DaRT GC systems have a potential return on investment between 2 to 3 years or 4 to 5 years, depending on the facility’s current waste collection practices.

### **Somat**

Somat has been in business since the late 1940s, and currently has 100 systems operating in the U.S., 15 of which are in California. Somat provides the DH-100w Waste Dehydrator system that can process waste for medium size foodservice operations up to very large institutions or facilities. The input capacity of the system ranges from 110 to 220 pounds per 12 to 18 hour cycle. This system requires minimal maintenance, including the labor to load each cycle and collection of the finished soil amendment material. The system accepts food scraps, cardboard and compostable disposables (e.g. paper plates), and requires an electrical connection and condensate drain. There is no venting or fresh water required to operate. The DH-100w system processes the compostable material in the decomposing chamber to kill any bacteria and reduce the waste matter by up to 92% of the original input.



**DH-100w Waste Dehydrator**

A Somat pulper is recommended prior to processing and can reduce the waste volume by an additional 80% and increases the waste capacity of the DH-100. The by-product produced is a dry, light and odor free sterile material that can be used as a soil additive or as an accelerant in a composting facility.

The Somat DH-100 system is 45 feet in Length, 37.5 feet in Width and 44.5 feet in Height. The cost of this system is \$38,000. The return on investment will depend upon a facility's disposal costs.

### **Ecovim**

Ecovim systems were launched in 2008 and machines are currently operating throughout the U.S. Ecovim has developed a food dehydrating and composting machine that can process food waste for small generators (grocers and fast food restaurants) to large generators (casinos and resorts). These systems can process between 650 to 1,100 pounds of food waste per day depending on the selected model. The treatment cycle times range from 21 to 23 hours with an 80 to 90% reduction in material volume. The Ecovim unit can treat food waste including 15 percent paper and untreated cardboard. This system is simple to operate, and does not require venting or plumbing, and can convert 250 pounds of waste into 25 gallons of potable water and 25 pounds of 100% sterile bio-mass that can be used as a soil amendment or compost accelerant without any further off-site composting. The Ecovim unit sizes and cost range from:



**Ecovim unit**

- Eco 650w: 63.0" Length x 57.5" Width x 60.2" Height  
Cost of system, \$72,000
- Eco 1100: 86.6" Length x 57.1" Width x 68.9" Height  
Cost of system, \$85,000

The Ecovim systems have 3 to 5 year return on investment. This system has no permitting requirements.

## **5.2 ONSITE PROCESSING OPPORTUNITIES**

SCS developed a list of potential locations within Santa Clara County that could implement and benefit from onsite organics material management, and would further assist the County of Santa Clara to divert organic materials. The list of facilities was developed by reviewing the survey responses from cities within Santa Clara County, as well as research performed to identify local hospitals, jails, universities, institutions, and large campus's. **Table 16** includes the businesses identified as having a high potential for generating large volumes of organic materials, and the potential ability to manage organics onsite. It is important to recognize each business should be evaluated to confirm they have the correct type and amount of material, as well as space for this type of technology.

**Table 16. Potential On-site Composting Opportunities**

<b>Facility Name</b>	<b>Location</b>
<b>Colleges</b>	
Carrington College	San Jose
De Anza Community College	Cupertino
Evergreen Valley College	San Jose
Foothill Jr. College	Los Altos
Gavilan Jr. College	Gilroy
Mission Jr. College	Santa Clara
San Jose City College	San Jose
San Jose State University	San Jose
Santa Clara University	Santa Clara
Stanford University	Palo Alto/Stanford
West Valley Jr. College	Saratoga
<b>High-Tech</b>	
Adobe Systems, Inc.	San Jose
Apple, Inc.	Cupertino
Central & Wolfe	Sunnyvale
Cisco	San Jose
Google	Mountain View
HP Hewlett Packard	Palo Alto
Intel Corporation	Santa Clara
Netflix	Los Gatos
Nvidia Headquarters	Santa Clara
Samsung Headquarters	San Jose
Symantec	Mountain View

Facility Name	Location
<b>Hotels</b>	
Courtyard by Marriott San Jose	Campbell
Courtyard by Marriott South San Jose / Morgan Hill	Morgan Hill
Embassy Suites by Hilton Milpitas Silicon Valley	Milpitas
Embassy Suites by Hilton Santa Clara Silicon Valley	Santa Clara
Fairmont Hotel	San Jose
Four Season Hotel Silicon Valley at East Palo Alto	Palo Alto
Hilton Garden Inn	Cupertino
Hilton Garden Inn	Mountain View
Hyatt Regency	Santa Clara
Juniper Hotel Cupertino, Curio Collection by Hilton	Cupertino
San Jose Marriott	San Jose
Santa Clara Marriott	Santa Clara
Spring Hill Suites by Marriott	San Jose
<b>Event Centers/Stadiums</b>	
Avaya Stadium	San Jose
CEFCU Stadium	San Jose
Great America Pavilion	Santa Clara
Levi's Stadium	Santa Clara
San Jose McEnergy Convention Center	San Jose
Santa Clara Convention Center	Santa Clara
SAP Center	San Jose

<b>Facility Name</b>	<b>Location</b>
Shoreline Amphitheatre	Mountain View
Stanford Stadium	Palo Alto/Stanford
Stevens Stadium	Santa Clara
<b>Exploration Center and Amusement Park</b>	
California's Great America	Santa Clara
NASA Ames Exploration Center	Mountain View
<b>Hospitals</b>	
El Camino Hospital	Mountain View
Good Samaritan Hospital	San Jose
Kaiser Permanente San Jose Medical Center and Medical Offices	San Jose
Kaiser Permanente Santa Clara Medical Center and Medical Offices	Santa Clara
O'Connor Hospital	San Jose
Regional Medical Center	San Jose
Santa Clara Valley Medical Center	Santa Clara
Stanford Children's Health, Lucile Packard Children's Hospital	Stanford
Stanford Health Care-Stanford Hospital	Stanford
<b>Correctional Facility</b>	
Elmwood Correctional Facility	Milpitas
Santa Clara County Jail	Santa Clara
Santa Clara Juvenile Detention Center	San Jose

## 6.0 BACKHAULING OF ORGANIC MATERIAL

Large organics material generators, such as grocery stores, often backhaul their organics material to their distribution centers for consolidation and processing. Understanding the volume of material that is taken outside Santa Clara County is important for planning purposes.

In order to identify the volume of material that is backhauled from large generators, our Team utilized the estimates identified in Section 2. The data and modeling tool provided backhaul generation numbers from the commercial sector in Santa Clara County. As part of the CalRecycle business sector waste characterization performed in 2014, field staff visited different business sectors throughout California, including large generators that backhaul material. As part of the CalRecycle study, field staff identified volumes of material that were being backhauled from these locations, and incorporated those numbers into the CalRecycle characterization database. SCS anticipated to use these numbers, however CalRecycle was not certain these numbers were an accurate representation of the backhauling occurring within the commercial sector. Furthermore, the numbers were not highlighted as a unique number, and the backhauling data was combined with other data and added together in one category.

The survey did not provide any information on how much backhauling was occurring, and many of the hauling companies contacted were uncertain as well. Given the limited information available, our team was not able to rely on the CalRecycle backhaul number. Furthermore, the fact that any material that was backhauled to a distribution center could not be calculated in the current waste stream (i.e. not in the generation numbers identified in Section 2 above), therefore this number does not appear to be an important factor in understanding organic materials processing in the County.

## 7.0 FOOD WASTE REDUCTION PROGRAMS

A variety of food waste reduction programs exist to support businesses and residents of Santa Clara County. Food banks, non-profits and innovative companies are leading the way and making it easier for individuals and businesses to reduce the amount of food waste destined for the landfill. SCS Engineers (SCS) researched local programs that offer educational efforts and tools to reduce or prevent food waste. Food banks have the capacity and labor to accept surplus food from stores and businesses and redistribute to the local community. Organizations such as Peninsula Food Runners in Santa Clara County also exist to help non-profit organizations providing food or meal assistance to connect with businesses, farmers markets and other groups who have surplus food. Innovative companies, such as matching programs and/or software solutions include a compilation of local for profit and non-profit companies, such as Replate and Copia, Chow Match, Wastenofood.org, Food Runners, Food Recovery Network, Rock and Wrap It Up, and the Food Donation Connection, to name a few. These methods address food donation opportunities by incorporating some form of communication technology to connect surplus food to agencies assisting people in need. Together, these groups and businesses are developing a long-term solution to recover food that is destined for the landfill, which can be reduced or provided to hungry people.

### 7.1 FOOD WASTE REDUCTION PROGRAMS IN SANTA CLARA COUNTY

Reducing the quantity of wasted food is a critical element of the solid waste hierarchy and the goal of increased diversion. If we can reduce the production of excess food, then we can lower the amount of material being landfilled and composted. In order to identify what food waste reduction programs are currently managed within Santa Clara County, and what should be added in the future, SCS identified the following activities taking place within the County:

- The cities of Mountain View, Palo Alto, San Jose and Sunnyvale have adopted zero waste policies with the goal of no waste going to the landfill by 2020-2025. For example, Mountain View's Zero Waste Vision is to recover materials for their highest and best use by 2025. This means additional efforts will be taken to recover food waste before sending it to a compost facility.
- Gleaning organizations are community led groups who harvest and donate fruits from trees, often from neighborhood backyards and local orchards. Gleaning helps reduce food waste by gathering excess or not harvested produce that would otherwise go to waste. These groups have developed a network of people who grow fruits and vegetables, and donate surplus quantities to local food banks/non-profit 501c3 organizations. Village Harvest and Garden to Table are two gleaning groups that help growers connect with food banks and the community to help improve healthy food access and reduce food waste.
- Food rescue organizations working in Santa Clara County help reduce food waste by recovering uneaten food from events or cafeterias and delivering them to soup kitchens and food banks. Most of these organizations rely heavily on volunteers for deliveries and

preparations. Peninsula Food Runners, Santa Clara University: Food Recovery Network, Stanford Project on Hunger (SPOON), Replate, and Rock and Wrap it Up are all food rescue organizations at work in Santa Clara County.

- Food rescue organizations are helping people and/or businesses locate where surplus food can be donated by using the web or mobile apps. WasteNoFood.org is a website where farms, restaurants, cafeterias and hotels can post excess food for “aid” groups to confirm what food they want prior to pick up. RecycleStuff and RecycleWhere are web based marketplaces or informational centers where users can find locations to donate food.
- Food banks such as the Second Harvest Food Bank of Santa Clara is a community-based organization that provides the food source umbrella to partner non-profit agencies assisting people. Donors can donate backyard produce, groceries, or large scale food donations. Second Harvest Food Bank has an easy to use website where people can sign up to become a donor or volunteer.
- Joint Venture Silicon Valley (<https://jointventure.org/initiatives/surplus-harvest>) is an organization that brings together businesses, government and the community to highlight issues and help resolve them through innovation. Santa Clara County and Joint Venture have been collaborating on a three-year long project to help reduce hunger and food waste in Silicon Valley by developing a regional framework that matches surplus food to authorized agencies.

In spring of 2015 the County of Santa Clara conducted a month long food waste study with Food Shift. Concurrently, the Surplus Harvest Initiative began in June 2015 as Joint Venture first partnered with Urban Harvester. Their 16-month endeavor addressed the challenges and gaps in three counties, including Santa Clara County, identifying agencies capabilities and readiness, as well as a detailed intake, technology development, food donor sources, and policy needs. Urban Harvester presented their findings and recommendations for a regional plan to Joint Venture.

In spring of 2016, Santa Clara County awarded a grant to Joint Venture to begin a three-year tiered plan of action. To date, Joint Venture has extensively researched the landscape to understand the key stakeholders, the current food rescue activity, the barriers to rescuing more food, and the resources available. They have researched other food rescue programs throughout Santa Clara County to learn best practices and potential pitfalls. An implementation plan has been developed to bring together the disparate food rescue efforts under one umbrella initiative, a centralized "hub" of all things food rescue, so there is one-stop for information for donors and agencies alike. This initiative will be utilizing a central platform to manage the matching of donors to agencies and to provide the transportation solution, which also capturing critical metrics. Additionally, they are focusing on building capacity within the agencies to allow them greater ability to receive and distribute food.

Within the last year and a half, Joint Venture has applied for grant funding to help support the needs of food assistance agencies. They have also compiled a list of all food assistance agencies in the County and begin surveying them to understand their needs and

how to better support the agencies. Joint Venture has also selected an online platform to match donations to food assistance agencies. In addition, they have also comprised a small group of key stakeholders in the County to provide input and guidance on the efforts, and to serve as ambassadors of the initiative. Joint Venture is working on developing a partnership with city waste reduction and sustainability staff to work on these efforts. Creating a conversation about government policy is an important step that is needed in order to help reduce food waste within Santa Clara County.

- The *Food Rescue Services, Barriers, and Recommendations in Santa Clara* study completed by Food Shift on behalf of Santa Clara County outlines how food waste is being managed within the County. Several organizations and community groups have been working in the Santa Clara County area, such as Food Runners (which matches and transports food to pantries and meal assistance kitchens) and Second Harvest Food Bank (which transports, distributes on site, and distributes through their partner pantries), and are well established. As outlined in the report, common barriers are seen in Santa Clara County regarding rescuing food. The greatest barriers for food rescue organizations is the lack of infrastructure and capacity. Limited staff, transportation, and storage can impact how much food can be delivered and donated. Unpredictable donations and unreliable collections can also make it difficult for donors and rescuers to move food through their networks. An increase in capacity and collaboration among the stakeholders is needed to help reduce food waste and improve recovery efforts.

Each of the above mentioned activities increasing capacity and collaboration play a critical role in reducing waste by either not generating as much food scraps prior to disposal or finding innovative ways to move edible food to organizations that can feed hungry people. There are over 25 organizations in the Santa Clara County region providing opportunities to reduce wasted food and landfilling of food scraps.

## 7.2 RECOMMENDATIONS FOR ADDITIONAL EFFORTS

In order to understand the expanse of the food waste reduction activities within Santa Clara County, SCS researched each of the cities within the County to understand what food waste reduction activities occur through city staff efforts, and companies that provide food waste recovery programs.

### 7.2.1 City Food Waste Reduction Efforts

SCS researched food waste reduction programs for each of the fourteen cities and the County to identify existing education efforts and available tools to reduce or prevent food waste. The research was initiated with a survey distributed to the cities with the following questions.

- Other than the Countywide program, what else have you done to contribute to food waste donation and recovery?
- Is information available on the number of businesses and/or volume of material that is donated on a weekly, monthly or annual basis?

- How many locations with your jurisdiction accept donated food? Provide name and address if possible.
- Do you track the quantity of food they accept each month?
- What food waste reduction programs do you have?

Of the fifteen municipalities surveyed, three did not respond, and six said that they have not contributed to food waste donation and recovery efforts. There were six municipalities that provided information on the food waste donation and recovery efforts happening within their jurisdiction. The programs range from Save the Food media campaign, providing reusable produce bags with food storage tips to reduce waste, outreach methods via cooking classes, broadcast outreach, events with interactive tables, bill inserts, and social media. Full details of all responses are included in **Attachment C**, and information from the six active municipalities are summarized in **Table 17**.

**Table 17. Food Waste Reduction Activities**

City	Other than the Countywide program what else have you done to contribute to food waste donation & recovery?	Is information available on the number of businesses and/or volume of material that is donated on a weekly, monthly or annual basis?	How many locations within your jurisdiction accept donated food? Provide name/address if possible.	Do you track the quantity of food they accept each month?	What food waste reduction programs do you have?
Cupertino	Encourage donation to West Valley Community Services	Cupertino, in partnership with the franchised hauler, participates in data gathering as part of the EPA's Food Recovery Challenge. Estimated donated quantity was 130.3 tons in 2016.	1 - West Valley Community Services 10104 Vista Dr, Cupertino, CA 95014	No	We support "Save the Food" media campaign and provide reusable produce bags with food storage tips included to reduce waste.
Milpitas	No	No	No	No	Public awareness and community promotion via "Save the Food" media campaign that is pushed to City webpage and Facebook.
Mountain View	Nothing	No. We only know how many people took the home composting class offered by the County.	1 - Community Services Agency, 204 Stierlin Road, Mountain View, 94043 2 - Hopes Corner (at Trinity United Methodist Church) 3- 748 Mercy Street,	No	No specific programs, just outreach through our newsletters, social media and website, for example tagging onto the EPA Food Too Good Waste, Ad Council and BayRoc campaigns.
Palo Alto	Palo Alto has connected Piazza's Grocery Store with Second Harvest Food Bank. Palo Alto is looking to make a similar connection with Mollie Stone's Market.	No	All Saints Church Food Pantry, Jerusalem Baptist Church, Opportunity Center	No	We have worked mainly with residents - cooking classes, broadcast outreach, events with interactive tables (e.g., making EAT FIRST boxes). We have done some outreach to the business community via bill insert and a survey of restaurants, but we have no way to measure if that increased donations. Probably not.
Santa Clara County	Provide information through businesses via AB 1826 outreach visits and Green Business Newsletter.	No	Levi's stadium, Santa Clara University and the convention center are some of the venues that donate food.	No	N/A
Sunnyvale	Sunnyvale is working with Second Harvest Food Bank currently on a food rescue pilot at grocery stores.	Check with Second Harvest to get this information. They track the number of businesses and total tons collected.	Sunnyvale Community Services and Ecumenical Hunger Program participate in food rescue in Sunnyvale.	No	We will be doing more food waste reduction education as we implement our residential food scraps program city-wide in fall 2017.

### 7.2.2 Companies Providing Food Recovery

There are seven companies that provide food recovery options for local businesses:

- **Copia**, a San Francisco based food recovery company that uses technology to provide a solution for food waste. Users log on to their app and get matched in real-time with the most appropriate nonprofit that will accept their food. Customers also receive access to food waste trends to help improve purchasing and cut back on food waste. Copia serves most of the San Francisco Bay Area and customers in Santa Clara County include the San Francisco 49ers and Zesty Catering in San Jose.
- **Re-Plate** is another food recovery company that uses a similar technology as Copia to match business' excess food with those who are in need. Replate is a rapidly growing company in the Bay Area with operations in Silicon Valley and San Jose.
- **CropMobster** is an online community-based exchange system for food and agricultural companies who want to exchange surplus food, equipment, jobs or information. Similar to Craigslist.com, users post ads for excess foods which other users can reply to and coordinate a pickup. Santa Clara County residents can post and see ads for excess food and help reduce the amount that is wasted through donation.
- **Peninsula Food Runners** is a volunteer organization dedicated to alleviating hunger by providing free collection of excess perishable and prepared food from restaurants, caterers, bakeries, wholesalers, event planners, corporate cafeterias, farmer market vendors, and hotels. Food Runners has a growing network of 160 volunteers which pickup at more than 100 donor locations to serve over 30,000 meals a week. Donors create online accounts and are matched with nearby agencies where their food can be donated.
- **ChowMatch** is a software company based in Silicon Valley that uses matching logic to connect agencies with surplus food donated by restaurants, grocery stores, caterers, farms, and many others. The technology helps to streamline the distribution of untouched surplus food to agencies and organizations such as family shelters, homeless shelters, neighborhood-feeding programs, churches, schools, 100% affordable housing programs, and many other outreach programs. Peninsula Food Runners currently uses this technology to connect their donors within Santa Clara County to recipients in the community.
- **Village Harvest** is a nonprofit volunteer organization based in San Jose whose mission is to provide food for the hungry, and promote sustainable use of urban resources. Village Harvest works closely with food agencies and community groups in Santa Clara County to provide food banks with local healthy food that would go to waste in Bay Area backyards. Volunteers harvest and transport food, and organize events throughout the year.

### 7.3 FOOD RECOVERY RECOMMENDATIONS

Based on the results of the research, SCS has developed a number of recommendations for enhancing food recovery efforts in Santa Clara County:

- Develop a business recognition program to encourage businesses to reduce food waste. Santa Clara County can then reward businesses who have achieved a high percentage of food waste diversion. This will help reduce food waste and create beneficial marketing opportunities for businesses.
- Develop a social media contest for businesses showing how they reduce food waste at work. Getting the community to use hashtags when circulating information via social media may increase awareness of food waste reduction activities happening within Santa Clara County. Prizes can be offered to those who are the most creative or have the greatest impact on the environment.
- Offer workshops where people can learn and discuss opportunities to reduce food waste at home and at their workplace. Workshops should be offered annually or quarterly, and should include topics such as food waste reduction strategies, smart storage, shopping guidelines, and meal planning.
- Offer free cookbooks to help reduce food waste by guiding readers how to shop, portion, and store foods. An example of this is the “Waste Free Kitchen Handbook” by Dana Gunders. By offering free cookbooks, people can educate themselves on how to prepare and cook foods while wasting less.
- Initiate a program to connect farmers with surplus crops to food banks. Start a coalition of food banks and other organizations that are in need of food to connect with local farmers association. Establishing a network between these two groups can help bridge the gap between surplus food and people in need of food.
- Require or reach out to grocery stores to stock produce that is blemished or less than perfect. Stores can start by requesting their suppliers and farmers to send shipments of less than perfect produce and selling it at a discounted rate.
- Educate businesses and residents about the Bill Emerson Good Samaritan Donations Act, which is a federal law ensuring that donors are protected from any civil and criminal liability, as long as the product is donated in good faith.
- Assist with collaboration among the stakeholders to help reduce food waste and improve recovery efforts. Educate businesses and growers on food donation and the available federal tax deductions. There are a variety of tax incentives in the form of tax credits or deductions that are available to donating businesses. For more details, refer to the Tax Deduction for Food Donation Legal Guide. In order to be eligible for a tax deduction, the donor must meet three main requirements:

1. The donor organization must donate food to qualified domestic 501(c)(3) nonprofit organizations that use the food solely for care of the ill, the needy or infants.
2. The recipient must use the donated food in a manner consistent with the purpose constituting that organization's exempt 501(c)(3) status.
3. The recipient organization may not use or transfer the food "in exchange for money, other property, or services".

## 8.0 CONCLUSIONS AND RECOMMENDATIONS

The information presented in this study provides the County with an understanding of the existing and future generation of organic materials, as well as the existing and future capacity of organic materials facilities and programs. This data is critical to plan for the organic materials infrastructure that will be necessary to reduce, recover, collect, and process the anticipated volumes of materials that will be diverted as a result of new legislation and regulatory requirements. The Study conclusions and recommendations are included below.

### 8.1 CONCLUSIONS

The conclusions of this study are based on the research conducted on existing and projected quantities of organic material generated within the County, the available and projected needed capacity at organics processing facilities, alternative organics processing, and food rescue activities. The first priority was to understand the quantities and types of organic material accepted and processed by existing facilities. Due to expanded collections, all facilities anticipate increased quantities of compostables (mixed food and compostable paper from residential or commercial sources) and see the need to add processing capacity. Although the findings show unused permitted capacity, most interviewees reported that facilities are running close to through-put capacity and some are turning away material or transferring material out-of-county for processing. Almost all sites reportedly have plans to apply for increased permitted capacity to accept more material or expand their facility. However, the ability to expand existing operations or build new facilities is highly dependent on obtaining air quality permits.

It is estimated a total of 657,100 tons of organic materials are generated annually from both commercial and residential sectors in the County. Of the total organic materials generated, 415,800 tons (63%) are diverted and 241,300 tons (37%) are disposed.

It is anticipated that there will be a nine percent population growth over the next 15 years, which will increase organics by 117,000 tons. If you add in the 241,000 tons currently not diverted, and the anticipated increase in organics tonnage over the next 15 years, the County will need to find organics processing capacity for another 358,000 tons. This does not include additional capacity needed for organics tonnage from outside the County. Estimated capacity for expanding current operations ranges from 99,000 to 154,000 tons annually. If the new facilities anticipated are completed, estimated capacity will range from 481,000 to 609,000 tons annually. It is anticipated that there will not be enough capacity if all organics are processed.

Assembly Bill 876 requires the County to submit organics data in the 2017 CalRecycle Annual Report. These results include 1,142,100 tons/year of current organics permitted capacity, 1,598,100 to 1,781,100 tons/year estimated organics permitted capacity in 15-years, 657,100 tons of current estimate of organics generation and 772,100 tons/year projected estimate of organics generation in 15-years.

A total of 108 organics material processing facilities located outside of Santa Clara County (within 100 miles) were identified as having the potential to process organic materials from the County. Sixty two of the facilities were classified as not available for processing materials from

the County, because they either do not accept material from the public, or they are located too far from Santa Clara County to be considered viable. Three facilities do not have available capacity and 40 facilities have some capacity available for organic materials, however the data is provided as a range, and therefore a specific number is not available.

The estimated amount of additional capacity projected to be available at organics facilities is 456,000 to 639,000 tons per year, which includes both current permitted capacity and potential expansion. Four facilities are planning some type of modification, and only three are adding new capacity: Kirby Canyon Landfill, Z-Best and ZWEDC. The facility expansions range from 500 to 650 tons per day of organic material, and material types vary from source separated food scraps, compostable material, mixed MSW, and green waste. There are no new organic materials processing facilities planned within Santa Clara County and no expansions have completed permitting and final capacity is subject to change. The SMaRT Station has a date for their anticipated modification. SMaRT Station however they are not adding volume to their approved capacity.

New organics processing technologies or other processing approaches were researched to address the gap in capacity, including the following:

**Additional composting capacity:** Research on backyard composting, mid-sized composting operations at schools and institutions, parks, community gardens and farms, golf courses, and horse stables was conducted but limited information was available on the disposition of their materials. Some activities are occurring, including grasscycling, and on-site composting, however due to the limited information available, the quantity of organics diverted through these measures is unknown.

**Onsite processing technologies:** These include small scale composting processes that could be utilized on-site by large food waste generators. Examples include dehydrators or small composters, however depending on the technology, the generator may still need to contract for the collection, removal, and composting of the end product. This solution is viable, however it will account for a small percentage of the organic materials generated by commercial businesses.

**Backhauling of organic material:** The survey did not provide any information on how much backhauling was happening, and many of the hauling companies contacted were uncertain as well. Given the limited information available, our team not able to rely on the CalRecycle backhaul number, and the fact that any material that was backhauled to a distribution center would not be calculated in the current waste stream (i.e. not in the generation numbers identified in Section 2 above), this number does not appear to be as important to the scheme of understanding all organics.

Another activity that was researched was food recovery. There are a number of gleaning organizations that harvest and donate fruits from trees, often from neighborhood backyards and local orchards. There are seven food rescue organizations working in Santa Clara County, including organizations that utilize websites to connect donors with recipients. A partnership that was started a few years ago between Santa Clara County and Joint Venture Silicon Valley has provided a close collaboration working on a three-year long project to help reduce hunger and

food waste in Silicon Valley by developing a regional framework that matches surplus food to authorized agencies.

## 8.2 RECOMMENDATIONS

Additional capacity for organic materials will be necessary over the next 15 years in order for Santa Clara County municipalities to reduce and divert their organic materials. To meet this need, it is recommended that the following steps be considered.

1. Regularly communicate with local and regional organics processors to gain an understanding of their plans and timelines for adding processing capacity.
2. Consider establishing a collaborative process with the municipalities in the County for hauling and/or processing contracts to facilitate advance planning for collection and facilities.
3. Work with CalRecycle to obtain easier access to information on facility permitting and expansion plans and proposals.
4. Monitor and track grant opportunities from CalRecycle and other agencies, and make the information available to potential grant recipients.
5. Monitor and track the quantity of organics generated from each city to gain a better understanding of the types and quantities of organic materials disposed and diverted, as well as the availability of alternative composting activities in the cities.
6. Require backhaulers to either obtain a license from cities, weigh amounts of material and report back to cities on material transported, or require them to subscribe to service from franchised hauler instead of backhauling.
7. Consider implementing a local organics landfill disposal ban.
8. Consider implementing enforcement measures to reduce the quantity of organic materials placed in waste receptacles.
9. Create incentives to support the transition to drought tolerant landscaping that reduces organic waste.
10. Develop outreach campaigns to encourage drought tolerant landscaping, grasscycling, backyard composting, and correct food purchasing.
11. Consider conducting kitchen audits to measure the quantity of waste generated from the residential sector.

Research was performed on food waste reduction, focusing on food rescue. Section 7 of this report includes recommendations for enhancing food recovery efforts in the County. The recommendations include:

- Continue to work with Joint Venture Silicon Valley to establish a comprehensive food rescue system, and track how much food is rescued and diverted.
- Require or reach out to grocery stores to stock produce that is blemished or less than perfect. Stores can start by requesting their suppliers and farmers to send shipments of less than perfect produce and selling it at a discounted rate.
- Educate businesses and residents about the Bill Emerson Good Samaritan Donations Act, which is a federal law ensuring that donors are protected from any civil and criminal liability, as long as the product is donated in good faith.
- Continue to collaborate with stakeholders to help reduce food waste and improve recovery efforts, including educating businesses and growers on food donation and available federal tax deductions.