Municipal Solid Waste in Southeastern Connecticut

Initial Findings and Next Steps

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SCCOG

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Connecticut's solid waste crisis is impacting southeastern Connecticut municipalities, residents, and businesses. With the closure of the MIRA Waste to Energy (WTE) facility in 2022, the state cannot dispose of all the waste generated in its borders in-state. We are facing a solid waste "self-sufficiency deficit" whereby ***40% (860,000 tons per year)*** of the state's undiverted municipal solid waste (MSW) cannot be accommodated at the state's remaining WTE facilities. MSW is being shipped out of state for disposal, receiving unfavorable economic terms, creating additional greenhouse gas emissions in transport, putting pressure on remaining WTE's, and increasing transport hazard risks.

At the direction of its Solid Waste Subcommittee, SCCOG staff analyzed municipal solid waste data in the region, including disposal tonnage and municipal cost data, for the five-year period from 2018-2022. The following key trends and findings emerge from the data:

1. **Regional trends show that MSW costs have been increasing while communities are throwing away less trash.** National inflation rates peaked at 7% in 2021. For 63% of SCCOG municipalities, total municipal budget allocation increases for solid waste activities exceeded inflation over the five-year study period, with budget increases reaching as high as 30%. Costs have been increasing while communities are throwing away less trash and processing less recyclable material. In the SCCOG region, MSW disposal decreased or saw no overall change in 15 municipalities (68%). Only two of these communities saw a reduction in their MSW budget.
2. **To support municipalities in reducing solid waste costs, we need solutions that continue to reduce tonnage disposed (a variable cost) in ways that can make better use of MSW fixed costs.** For example, continuing to encourage, incentivize, and support local organics collection and channeling these recoverable wastes into a lower-cost waste stream with commercially viable and profitable end products can help to mitigate costs. Working these collection systems into existing municipal MSW infrastructure (fixed costs) such as transfer stations or existing waste collection routes and services can continue to help municipalities reduce MSW costs.
3. **Tools that increase predictability in MSW costs can help municipalities prepare.** SCRRRA provides significant cost savings to member municipalities and predictability with long-term contracts. These contracts, however, are not a failsafe. They end and must be renewed over time in line with market costs and conditions. For example, the recycling component of SCRRRA's work will be renegotiated in September 2024, and may result in increased costs for municipalities. Not all southeastern Connecticut communities are members of SCRRRA. Overall MSW costs remain at risk for rapid inflation as waste is exported out of state, incurring additional transportation costs, and increasing exposure to competitive regional markets.
4. **Southeastern Connecticut has historically taken a proactive approach to solid waste management and seeks to continue this proactive approach heading into an uncertain future.** The creation of SCRRRA and its continued operation as a non-profit entity with an ability to subsidize MSW management costs has saved municipalities a tremendous amount of money. SCRRRA's service fees are significantly lower than MSW disposal tipping fees across CT, and include additional services. We need to monitor the sustainability of SCRRRA's financial structures and develop cost-effective MSW disposal alternatives to plan for diminished SCRRRA subsidies.

Local MSW Survey Comparison Table

In the preparation of this report, SCCOG staff also conducted a local survey directed at municipal staff and agents who have the most direct role in managing solid waste and solid waste contracts. During survey follow-up, SCCOG staff were introduced to a similar survey undertaken by SCRRRA in 2023 for its member jurisdictions. After considering different formatting options, the MSW Sub-Committee decided to build on SCRRRA's survey and report the results from SCCOG's outreach in the same, readily comparable format. With the publication of this Local MSW Survey Comparison Table, the same information now exists for both SCRRRA and non-SCRRA members in one summary document. The Local MSW Survey Comparison Table is included here as Appendix A.

Legislative Action Items

SCCOG's Solid Waste Subcommittee presents the following recommendations that match local needs and priorities in our region.

1. ENACT MANDATORY FOOD SCRAP & ORGANICS RECYCLING

The Issue: Approximately 30% of the solid waste stream is comprised of recyclable food waste and other organics. Organics can be recovered through diversion, representing excess WTE disposal materials that take up a large share of limited exiting capacity.

Recommendations:

- Pass a bill similar to SB 191 in its original form that classifies organic waste as a recyclable material and includes the requirement for municipalities and large commercial generators to establish mandatory organics recycling program by the original 2028 deadline.
- Allocate additional funding for the Sustainable Materials Management Grant Program.
- Support State investment in composting infrastructure.
- Fast track DEEP permitting for composting facilities.

2. STREAMLINE DISPOSAL FACILITY INFRASTRUCTURE PERMITTING

The Issue: State agencies have longer, more complex permitting processes for approval compared to local approval processes, delaying innovative solutions and additional waste reduction facilities. The 2016 DEEP CMMS plan acknowledges permitting as an identified barrier to the creation of additional disposal capacity. The length of permitting processes for the SCRRRA Composting Facility is an example from our region.

Recommendations:

- Support expedited state agency permitting of new solid waste, composting, and recycling infrastructure.
- Require increased transparency within all waste infrastructure permitting processes and establish benchmark timeline maximums for application and permit review procedures.

3. ALLOW INCREASED WASTE-TO-ENERGY CAPACITY

The Issue: The SCCOG region hosts two WTE plants; WIN Waste in Lisbon and Covanta in Preston. Existing in-state WTE plants operate at permitted tonnage capacity and cannot make up for facility closures. Some remaining WTE plants are nearing the end of their estimated lifespan (30 years).

Recommendations:

- Invest in continued maintenance and operation of existing WTE facilities.
- Support increased permitted capacity (i.e., adding another line) at existing WTE facilities.

4. ADDRESS LOCAL LACK OF REDEMPTION CENTERS

The Issue: While the bottle deposit increase is anticipated to have a positive outcome, there are no redemption centers in the SCCOG region to encourage capture of additional recyclables. Economic viability, based on current per-piece payout levels, is a major barrier.

Recommendations:

- Support statewide expansion of items subject to a deposit (wine, liquor, etc.).
- Lower the population eligibility threshold for redemption center grants from 25,000 to 10,000 so that the program is accessible to more communities in the region.
- Invest revenue from unclaimed bottle deposit fees in solid-waste specific infrastructure and programs rather than allocating it to the General Fund. These fee revenues should support public education and outreach, expansion of existing MSW grants, the creation of new waste-related grant programs, and other needed waste-related subsidies.
- Increase payout levels to redemption centers to make them economically viable.

5. USE MORE RECYCLED GLASS (GLASS CULLET/CRUSHED GLASS)

The Issue: Glass in single-stream recycling reduces the value of other recyclables when breakage and contamination occur. Diverting glass from the waste stream should be a priority, as it is an infinitely recyclable material.

Recommendations:

- CTDOT should require contractors to use recycled glass for state projects for pipe-bedding and trench backfill in place of virgin rock aggregate. This may require a review of the qualified materials list. Glass cullet is typically classified well graded sand or a Number 10 aggregate; States like New Hampshire successfully use recycled glass as an aggregate in highway construction projects.

6. ADD TO THE EXTENDED PRODUCER RESPONSIBILITY (EPR) PROGRAM

The Issue: Goods producers need to provide for safe, cost-effective and convenient disposal, particularly for hard-to-dispose-of products.

Recommendations:

- Prioritize lithium-ion battery EPR in particular, where there is industry support and sample language examples available through Call to Recycle.
- Support state efforts in the creation of new EPR programs including packaging, batteries and hazardous waste.
- Establish a fund from EPR revenues to address ongoing waste issues.

7. INCENTIVIZE UNIT-BASED PRICING

The Issue: There are significant challenges to implementing a Unit Based Pricing/PAYT program for municipalities, especially in low-income areas where the cost of bags, language barriers, and the integration of these practices with automatic pick-up infrastructure pose challenges.

Recommendations:

- Incentivize Unit Based Pricing/PAYT for municipalities.
- Support statewide Unit Based Pricing/PAYT program.

Key Terms

Municipal Solid Waste (MSW): Often referred to as "trash," "rubbish," or "garbage," MSW refers to everyday waste generated by households, offices, and retail but not industrial, hazardous and/or construction waste.

Waste Generation: Includes all materials that are thrown away, regardless of whether they are later recycled or disposed of.

Waste Diversion: Refers to practices such as recycling and/or composting, which are intended to divert certain solid waste from the waste stream.

Organic Waste: Materials generated by living organisms including food scraps, leaves, grass clippings, etc.

Composting: The process of recycling organic matter, such as food scraps and leaves, into a nutrient-rich soil product. Organic materials can be composted at a household level, in industrial-scale composting facilities, and in anaerobic digesters.

Glass Cullet: Glass collected through recycling is crushed into small pieces or powder to be used in other products.

Landfill: A designated location where municipal solid waste is disposed of by burying waste and covering it with soil once filled to capacity.

Extended Producer Responsibility (EPR): A policy approach that holds producers responsible for how products are created and disposed of; EPR can encourage product design changes that minimize environmental impacts and hold large producers accountable.

Unit Based Pricing (UBP): Also called "Pay as You Throw" (PAYT) and "Save Money and Reduce Trash" (SMART), these programs focus on charging consumers only for the amount of waste they dispose of.

Tip Fee: Fee for disposal of MSW, sometimes including hauling and other costs. Tip fees are usually charged by tonnage.

Redemption Center: A designated facility where consumers can bring empty cans and bottles to be processed and recycled.

Anaerobic Digester: An enclosed structure in which organic waste is broken down by microorganisms. Anaerobic digestion produces biogas such as methane, which can be used for energy, and digestate, a nutrient-rich mixture used as fertilizer.

Single Stream Recycling: A recycling collection system that mixes all recyclable paper, plastic, and glass materials into a single bin at the curb and in the collection truck.

Waste to Energy (WTE) Plant: A facility that incinerates municipal solid waste in boilers to produce steam as a source of electric power.

Resources Recovery Facility (RRF): A facility where solid waste is processed to separate and prepare solid waste for incineration at a waste to energy plant.

Materials Recovery Facility (MRF): A facility that receives, separates, and prepares dry recyclable materials to be sold to end buyers.

Aerated Static Pile: A facility in which large volumes of organic waste materials are broken down. Aeration is provided to compost piles by using a blower to push or pull air through the compost pile.

Comprehensive Materials Management Strategy (CMMS): The Comprehensive Materials Management Strategy (CMMS) serves as Connecticut's statewide Solid Waste Management Plan and was adopted in 2016. A draft revision to CMMS was released in January 2023.

Reverse Vending Machine (RVM): A machine that allows a person to insert a used or empty glass bottle, plastic bottle, or aluminum can in exchange for a bottle deposit refund.

Key Entities and Agencies

Southeastern Connecticut Council of Governments (SCCOG): SCCOG serves 22 municipalities with a total population of 280,430 and functions as the region's Metropolitan Planning Organization. SCCOG also counts as affiliate members Connecticut's two federally recognized Native American Tribes and works closely with the region's two military installations, the United States Naval Submarine Base, and the United States Coast Guard Academy. Primary focus areas of SCCOG are regional planning, which includes producing studies and plans that affect the responsible development of the region; transportation planning and prioritization of State and Federal transportation funding; and municipal services, which include staffing assistance to local land use commissions and coordinating intermunicipal cooperation.

Southeastern Connecticut Regional Resources Recovery Authority (SCRRRA): SCRRRA is comprised of twelve member municipalities in Southeastern Connecticut: East Lyme, Griswold, Groton, Ledyard, Montville, New London, Norwich, North Stonington, Preston, Sprague, Stonington, and Waterford. SCRRRA is responsible for implementing solid waste recovery systems, recycling, and disposal services. Revenues generated by SCRRRA operations, primarily disposal fees and investments, provide for the support of the Authority and its operations on a self-sustaining basis.

Casella Waste Systems: Casella Waste Systems is the largest recycling company in the Northeast and owns one of the largest recycling facilities in the country. Casella purchased the Willimantic Waste Paper Company in 2021. Casella owns and operates six facilities in Connecticut: Willimantic, Plainfield, Franklin, Killingly, and Norwich. Additionally, Casella collects source separated organics (SSO) and delivers the SSO to Quantum Biopower in Southington, Connecticut.

CWPM, LLC: A private company that provides waste removal, recycling services, and dumpster rentals to customers throughout the states of Connecticut and Rhode Island. The company owns, operates, and maintains a fleet of over 250 vehicles, and owns and operates four CT DEEP permitted transfer stations (Berlin, Bozrah, Plainville, and New London) as well as municipally owned facilities.

Covanta: A private waste management company that specializes in WTE plant operation. Covanta operates WTE plants in Bristol and Preston.

Win Waste Innovations: The company, formerly known as Wheelabrator, is a private waste management company that operates waste-to-energy plants. Win Waste owns and operates WTE plants in Bridgeport and Lisbon and an ash residue landfill in Putnam.

CT Department of Energy and Environmental Protection (DEEP): DEEP plays a key role in planning for solid waste management at the state level. As guided by statute, DEEP authors a periodic Comprehensive Materials Management Strategy that sets goals and action items for the management of solid waste statewide. The most recent of these plans was issued in 2016, with a follow-up update drafted in 2023 in light of the discontinuation of waste to energy operations at a key Connecticut facility (described below). DEEP also sits in a regulatory role, reviewing applications for new waste-to-energy facilities and creating and ensuring compliance with MSW reporting structures, as well as a convening role, bringing together municipal and other stakeholders with a role in solid waste management to develop best practices (such as participation in the Connecticut Coalition for Sustainable Materials Management working group process).

Project Purpose and Background

In May 2023, the SCCOG Executive Board recommended the creation of a temporary subcommittee that would seek to gain a better understanding of municipal solid waste operations, capacity, and innovations in the region. The subcommittee first convened in July 2023, and met biweekly throughout the fall. The goal of the subcommittee was to produce a list of recommendations that SCCOG's Legislative Committee could pursue for the 2024 Regular Session of the Connecticut General Assembly, and to prepare a white paper to share with member municipalities. This report provides background information on the solid waste system, identifies data sources, and makes initial observations and recommendations for the region.

Connecticut's Solid Waste Crisis

In Connecticut, the municipal solid waste (MSW) system was constructed as a hub and spoke system. Resource recovery facilities (RRFs), also known as waste to energy (WTE) plants, act as the hub where material is processed, while surrounding municipalities in a region act as the spokes, where material is collected and then fed to the hub. The functionality of the regional and statewide MSW system has been challenged in recent years due to two main factors: (1) the closure of multiple WTE plants in Connecticut and more broadly, and (2) a changing and volatile market for recyclable materials. Additionally, the State has set new ambitions to reduce MSW with an amendment to the Comprehensive Materials Management Strategy (CMMS) in early 2023.

Waste to Energy (WTE) Plant Closures

Connecticut has seen its waste-to-energy (WTE) processing capacity shrink dramatically over the last decade. The closure of two of six WTE plants has decreased overall permitted WTE processing capacity from 2.4 million tons per year to 1.5 million tons.

In 2014, Covanta began discussing a closure of their WTE plant in Wallingford after recycling efforts reduced trash supply in their service area. Rather than completely closing the facility, the WTE plant was shut down and the facility was converted into a transfer station. MSW is still accepted at the facility but is hauled to another location for disposal.

In 2022, the Materials Innovation and Recycling Authority (MIRA) WTE plant in Hartford was closed. In 2020, MIRA requested $330 million to refurbish the plant from the state, but that renovation proposal was rejected by DEEP. The facility previously processed between approximately 700,000 and 800,000 tons of waste (about one-third of Connecticut's undiverted waste stream) and was a key part of the state's efforts to move away from the use of landfills.

Source: SCRRRA Navigating the Connecticut Waste Crisis

Four Connecticut-based WTE plants remain in operation: WIN Waste Innovations plants in Bridgeport and Lisbon, and Covanta plants in

Bristol and Preston. The total permitted capacity of these remaining four WTF facilities is approximately 1.5 million tons, leaving Connecticut in a "self-sufficiency deficit." We cannot process all the MSW generated in Connecticut in-state.[1] MIRA's closure increased the self-sufficiency deficit from 17% in 2021 (when MIRA still operated) to 40%, or to approximately 860,000 tons per year. Connecticut is not alone in this challenge. Over the past two decades, 48 WTE plants have been permanently closed in the US. Only 75 WTE plants remain in operation, and most are in the Northeast. Landfills, a principal alternative to processing waste into energy, cannot offer a long-term solution. It is estimated that the US has 18 years of remaining landfill capacity left.

Recyclables Market Disruptions

In recent years, the international market for receiving and processing recyclable materials has experienced major shifts. Historically, the US exported much of its recyclable material to processing facilities abroad. China was a major importer of these recycled materials until 2013, when Chinese authorities implemented the Green Fence policy to restrict the intake of recyclable materials contaminated by food residue or other non-target materials (for example, broken glass intermixed with plastics).

The policy set a 1.5% limit on allowable contaminants on imported recyclables, which resulted in a 5.5% reduction in the amount of plastic waste that China accepted. Then, in 2017, the National Sword policy set a 0.5% contamination limit on plastic waste and banned the import of 24 types of waste materials. Prior to these policy changes, it is estimated that over 70% of plastics collected in the US were shipped to China.[2] Single Stream Recycling, while convenient for households, makes it near impossible to meet China's contamination requirements and exports to China have nearly ceased.

State-Level Solid Waste Management Planning in Connecticut

Local jurisdictions are impacted by state-level MSW planning and policy. The State has codified a "solid waste hierarchy" that favors source reduction and reuse, recycling, and composting with remaining materials managed for energy recovery (such as that accomplished at WTE facilities) and disposal in landfill as a last resort.

The most recent Comprehensive Materials Management Strategy (CMMS) was originally adopted in 2016, with an amendment published by CT DEEP in January 2023. The 2016 plan established an overarching goal of achieving 60% diversion in MSW (at least 2.3 million tons) by the year 2024 from an FY2005 baseline. The plan created three main goals for solid waste management statewide: (1) improve the performance of municipal recycling programs and reduce waste, including increasing participation and compliance with mandatory recycling provisions;[3] (2) develop and improve recycling and waste conversion technologies;[4] and (3) encourage corporations that design, produce, and market products to

[1] Total permitted WTE disposal capacity across all facilities is approximately 71% of the 2.2 million tons of undiverted MSW that were generated in CT in 2021. WTE facilities generally have an operational capacity of 85% of permitted capacity. CT DEEP, *CMMS Amendment Draft,* January 2023, p. 6-7.

[2] Flower, Will. "What operation green fence has meant for recycling." Waste360. 10 February, 2016.

[3] DEEP estimated that accomplishing a 60% diversion would require boosting recycling rates from 35% to 45%. CT DEEP, *2016 Comprehensive Materials Management Strategy,* 2016, p. 48.

[4] DEEP estimated that accomplishing a 60% diversion would require at least 10% of materials to be diverted using technological processes that are not yet fully developed in state. Ibid, p. 52.

share responsibility for stewarding those materials in an environmentally sensitive way. The plan distributed responsibility for recommended action items across several responsible parties. Municipally driven actions revolve around achieving full compliance with statutory recycling requirements and engaging in additional discretionary diversion practices (e.g. implementing unit-based pricing systems). Of note, o*bjective 1.4* states that "organics management provides the largest opportunity to increase Connecticut's waste diversion," with a goal of diverting 300,000 tons of organic waste annually.

Source: CT DEEP, CMMS Amendment Draft

In the 2016 plan, DEEP authors were already contemplating the capacity issue that would result from the closure of the Hartford WTE facility. The 2023 CMMS Amendment is the response to this event and the "self-sufficiency deficit," described above, that it contributed to in MWS disposal. DEEP's stated aim is to restore self-sufficiency by 2030 through two principal approaches: (1) accelerating and maximizing diversion solutions consistent with the CMMS and the state's statutory waste hierarchy; and (2) investing in disposal infrastructure for the balance of tonnage not addressed through diversion. To maximize **diversion**, DEEP supports:

- Legislation to authorize an Extended Producer Responsibility (ERP) Program for product packaging that would assign responsibility to manufacturers for paper and packaging material currently collected curbside or at transfer stations, reducing MSW disposal by an estimated 190,000 tons per year while saving $50 million per year for municipalities.[5]
- A set of organics reuse and diversion strategies that can accomplish 185,000 tons of MSW disposal per year, including: (1) adding proximity to transfer stations that are authorized to receive source-separated organics as a trigger for the Commercial Organics Recycling Law;[6] (2) expanding the Commercial Organics Recycling Law to cover institutions; and (3) providing universal access to source separated food scrap collection to all residents and businesses. The plan notes that the state could adopt legislation that would require universal access for organics source separated collection, similar to recycling requirements, with an effective date set at five years after passage to allow for the buildup of municipal programs.

[5] Alongside this approach, DEEP issued model legislation for Post Consumer Recycling standards for plastic products and packaging in August 2022. CT DEEP, *CMMS Amendment Draft,* January 2023, p. 17.

[6] Right now, the law is triggered if a covered entity is located within 20 miles of an authorized source-separated organic material compositing facility; a change to include authorized transfer stations alongside compositing facilities would cast a wider net for triggering this requirement. Ibid, p. 22.

DEEP has funded pilot projects and technical assistance through the Sustainable Materials Management grant program for developing local organics collection systems.[7] (See the description of innovative regional efforts later in this report for a description of SCCOG member municipality and SCRRRA participation.) A consistent supply of organics waste inputs will be essential to assure potential developers of organics processing facilities of the cost-effectiveness of their investments. DEEP states that they are interested in entertaining larger grant requests to support groups of towns in launching organics collection programs on a broader scale.

If estimates are correct, these diversion strategies (organics and the packaging EPR) would reduce the self-sufficiency gap by 375,000 tons. Per the plan, the remaining 485,000 tons of the self-sufficiency deficit will need to be addressed by additional source reduction and/or WTE disposal infrastructure. DEEP supports activities to:

- Assist municipalities in forming Regional Waste Authorities (RWAs), which have historically backed the development of waste infrastructure in CT.[8]
- Issue a Request for Information (RFI) from developers of diverse types of waste infrastructure.
- Fund some of these capital investments by enhancing the state Solid Waste Assessment fee. The fee, currently set at $1.50 per ton of MSW, applies to waste that is managed at in-state RRFs. The fee could be increased and extended to waste received at commercial multi-town transfer stations and volume reduction facilities. Revenues received above the current levels contributed to the General Fund could, by legislative authorization, be dedicated to the SMM Grant Program or to backstop bonds for MSW capacity expansion infrastructure projects.

DEEP notes the recent success of legislation modernizing the state's beverage container redemption program, which it hopes will increase redemption rates from 50% to 80-90%. The plan also notes that a statewide unit-based-pricing plan would be expected to achieve an immediate and durable reduction of 44% in MSW tonnage that would more than eliminate the self-sufficiency deficit without the need to build new waste disposal infrastructure, but that public opinion on such an approach is mixed and the path to implementation is unclear.

DEEP anticipates that exporting 40% of the state's MSW to out-of-state facilities will have negative economic impacts from increased tipping fees, longer haul routes, and more competition for disposal at fewer facilities. Achieving self-sufficiency is important to stabilizing costs to the benefit of municipalities as competition for landfill space and RRF capacity intensifies across northeast, reducing greenhouse gas emissions from waste transportation and landfill-related methane, and reducing the risks of transporting waste.

[7] Of note on the SMM Grant Program – some municipalities were prevented from participating in the program because of exclusivity contract clauses; their current municipal disposal contracts do not appear to allow contracting separately for organics collection. Ibid, p. 26.

[8] DEEP notes that low-income and communities or color host a disproportionate share of the state's existing waste disposal infrastructure. Ibid, p. 33.

Regional Practices and Needs

While waste management policy may be set at the state level, day-to-day operations are mainly pursued and accomplished at a regional, local, and even household and individual level. SCCOG staff approached the task of gaining a better initial understanding of municipal solid waste operations, capacity, and innovations in the SCCOG region through a variety of mechanisms. These methods included: solid waste subcommittee meetings, a municipal survey, and data collection from state and municipal sources. This initial investigation revealed the limitations and contradictions of some existing datasets, and resulted in an understanding of current waste management issues and of data gaps that SCCOG and partners can help to resolve in a subsequent study phase.

Subcommittee Meetings

The SCCOG Solid Waste Subcommittee met bi-weekly from July 2023 to January 2024. The goal of the subcommittee meetings was to gain a better understanding of municipal solid waste operations, capacity, and innovations in the region. Chief elected officials from SCCOG municipalities shared their experiences and concerns and guests from the waste industry were invited to subcommittee meetings to share their expertise.[9]

Early subcommittee meeting discussions focused on general information about the solid waste crisis, such as the closure of MIRA and the most recent CMMS amendment. Subsequent meetings included discussions on single stream recycling, WTE ash, glass recycling, new technology, transportation considerations, and the bottle bill. Summaries of the discussion topics are included below.

Single Stream Recycling

Single stream recycling is a type of collection system that mixes all recyclable paper, plastic, and glass materials into a single bin at the curb and in the collection truck. Rather than sorting materials curbside, materials are sorted by machines and workers at MRFs. Single stream recycling has been promoted as a system that makes recycling easier for households and waste haulers, which in turn has increased recycling rates. Contamination, however, is a major concern in this collection method. Residents often place non-recyclable materials in their curbside recycling bin that must be removed at an MRF. Residents also often leave food residue on materials or leave containers wet. Recyclables may be compacted and broken (particularly glass) during the collection process or mixed and broken during transportation to an MRF. Contamination results in large quantities of materials not being recycled. As highlighted in the Innovative Regional Efforts and Programs section below, SCCOG member municipalities are working with advanced technology to reduce recycling contamination issues.

Glass Recycling

Glass is a heavier material than other recyclables, which means that it costs more for haulers to transport long distances and can lead to increased recycling tip fees for municipalities. If glass products are removed from single-stream recycling and from the solid waste stream, it would lower the tonnage and save municipalities money. Additionally, removing glass products would reduce contamination rates

[9] Guests included Jill Senior, Solid Waste Department Director, Stonington; David Aldridge, Executive Director, SCRRRA; Marc Morgan, Strategic Account Manager, Casella Waste Systems; and Mike Calandra, Vice President of Operations and Ryan Fargo, Operations Manager, CWPM.

traditionally associated with single stream recycling. Glass is 100% recyclable and can be recycled indefinitely, making it an ideal material for diversion.

CT DEEP established a pilot program in 2018 to encourage the separation of glass materials.[10] Housatonic Resource Recovery Agency (HRRA) was the first agency in the state to implement the pilot program. HRRA partnered with its 14 member municipalities and a glass recycling company to separately collect glass items at town transfer stations. Rather than placing glass items in curbside single stream recycling bins, residents were encouraged to dispose of items in specific glass-only dumpsters. Once the dumpsters were full, they were sent directly to a glass recycling company rather than an MRF.[11]

Multiple examples of recycled glass products were discussed at subcommittee meetings. In Connecticut, Urban Mining, LLC breaks down, cleans, and then transforms glass into a product called Pozzotive, which can be added to concrete mix in place of other compounds like cement that are more environmentally and economically costly.[12] In New London, New Hampshire, glass cullet is used for fill around sewer connections from homes to city lines, fill for electrical conduit, backfill and drainage aggregate along walls, and as frost heave protection fill under pathways and parking lots.[13] In Philadelphia, ultra-lightweight foamed glass aggregate (UL-FGA) was used in the creation of a temporary roadway on Interstate 95 after a tanker fire resulted in the collapse of a bridge.[14] The material, produced by Aero Aggregates, is made from 99% post-consumer recycled glass and is estimated to be 85% lighter than traditional aggregates.

Waste to Energy (WTE) Ash

WTE plants incinerate municipal solid waste in boilers to produce steam as a source of electric power. Large quantities of ash, a byproduct of incineration, are produced at WTE plants. The two million tons of MSW that are disposed of in Connecticut each year generate about 500,000 tons of ash per year. There is currently only one landfill in the state, located in Putnam, designated solely for ash. The landfill receives ash residue from WTE plants in Bridgeport, Lisbon, Plainfield, and Preston, Connecticut, as well as Peekskill, New York.

The Putnam landfill opened in 1999 with 60 acres of land dedicated to ash. By 2021, only 1.2 million cubic yards of space remained. The owner of the landfill, Win Waste Innovations, submitted permit application materials to DEEP for an expansion. In late 2021, DEEP approved an additional 68 acres of land and 17 million cubic yards of space for ash, extending the useful life of the landfill for an estimated additional 25 years.[15] Discussions about increasing WTE plant capacity must be paired with consideration of ash disposal capacity.

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[10] Substitute House Bill No. 5360 Public Act No. 18-181 Sec. 12 (Passed in June. Effective Oct 1, 2018).

[11] Housatonic Resources Recovery Authority. “Glass Recycling” webpage. Retrieved 10 January 2024. https://hrra.org/glass-recycling/

[12] Frazer, Skyler. “Green Mix: From glass to concrete, CT company offers construction industry environmentally conscious cement alternative.” *Hartford Business Journal*. 4 September 2023.

[13] Reindl, John. “Reuse/Recycling of Glass Cullet for Non-container Uses.” Dane County Department of Public Works. 17 July 2023.

[14] Pennsylvania Department of Transportation. “I-95 Updates” webpage. Retrieved 10 January 2024. https://www.penndot.pa.gov/RegionalOffices/district-6/Pages/AlertDetails.aspx

[15] CT DEEP. “Proposed Final Decision for Wheelabrator Putnam, Inc.” 8 December 2021.

New Technology

The growing nationwide solid waste crisis has spurred the development of technologies for increasing waste diversion and preventing single stream recycling contamination. The Solid Waste Subcommittee discussed the use of artificial intelligence (AI) in waste audits as one emerging technological innovation. Waste audits, conducted to understand the makeup of solid waste streams and identify issues in solid waste disposal, are usually conducted by physically sorting through materials in a trash or recycling bin. With new technology, cameras equipped with AI programming can identify key contaminants during curbside collection. The cameras, which are attached to collection trucks, quickly identify and photograph potential contaminants. The AI program generates a postcard with a photo of the contaminant that can be sent to the resident, along with educational materials on the proper disposal of the identified item. This process aims to educate residents and encourage proper waste diversion. AI camera technology is currently being piloted in Ledyard and East Lyme.

Another new technology discussed by the subcommittee is the emergence of countertop organic waste processing appliances. Products like FoodCycler and Lomi are countertop appliances that grind and dry food scraps in an aerobic environment, producing a dry, nutrient-rich output that resembles dirt and can (depending on food inputs) be further composted as "browns" in home composing units or applied directly into gardens and other soils.[16] The process takes between 4 and 9 hours for food waste to be completely dehydrated and processed, depending on the amount, density and moisture level of the food waste processed. Each cycle consumes 1.5 kWh of electricity, which costs consumers between $2 and $4 per month. Given the expensive costs of these units (ranging generally between $399 and $599), there are equity and access considerations in offering this option as a solution to organics waste diversion. There is a pilot program in Mansfield where residents can rent the equipment from Casella for $20 per month ($240 per year).[17] These appliances may assist in organic waste diversion in rural communities, where long distances between households and potential wildlife issues are concerns for collecting organic waste, especially when paired with a rebate program to defray costs.

The end product "dirt" of a Lomi countertop composter.

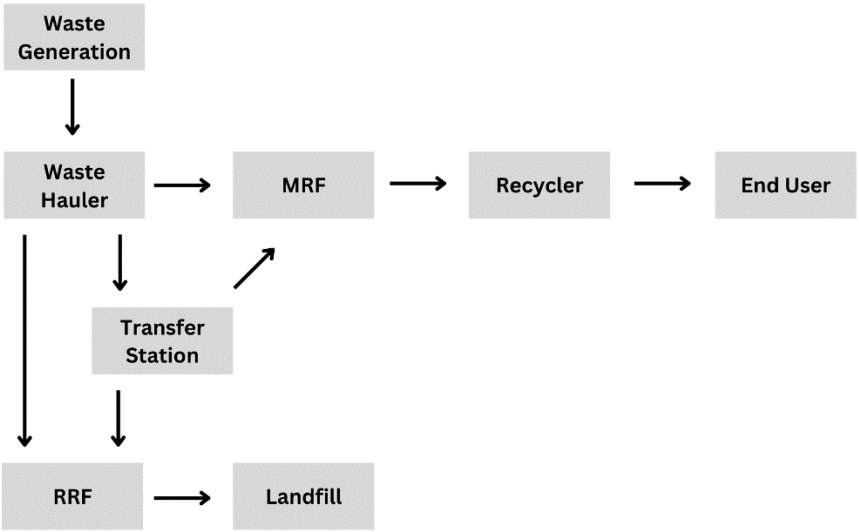
Transportation and Hauling

As previously stated, the MSW system in Connecticut was constructed as a hub and spoke system. Resource Recovery Facilities (RRFs) act as hubs where material is processed, while municipalities in a region act as the spokes, where material is collected and then fed to the hub.

[16] Casella Waste Systems. "FoodCycler By Casella" webpage. Retrieved 10 January 2024. https://www.casella.com/foodcycler

[17] Mansfield, Connecticut. "New Services for Residents to Reduce Food Waste." 28 November 2023.

The graphic below shows a simplified explanation of how waste moves throughout the MSW system. Transportation is a key component in the system, both locally and regionally. Costs associated with transportation include, but are not limited to, driver labor, fuel, and truck maintenance costs. As distance between facilities in the MSW system increases, transportation costs increase, ultimately leading to higher disposal and hauling costs for municipalities. In Connecticut, the financial and cost implications of hauling an estimated 860k tons of MSW out of the state for disposal each year will have a significant impact on costs.



A simplified graphical representation of how waste moves throughout the MSW system.

The New York Metropolitan Transportation Council (NYMTC) is currently undertaking a Regional Waste Movement Study. While the SCCOG region is outside of the defined study area, the results of the study will be important for understanding transportation issues related to solid waste and could provide the model for similar studies in other regions.

Bottle Bill

Connecticut is one of 10 states in the country that has a bottle bill, also known as a container redemption program.[18] Bottle bills work by charging consumers a small deposit on a container at the time of purchase, which is returned to the consumer when the empty bottle is returned for recycling. The refundable deposit acts as an incentive for consumers to return recyclable containers, ensuring that containers are recycled properly. In Connecticut, the deposit applies to carbonated beverages such as beer and other malt beverages, hard seltzer, hard cider and mineral waters, soda water, and carbonated soft drinks, as well as noncarbonated beverages such as any water (including flavored water), nutritionally enhanced water, juice, juice drinks, tea, coffee, kombucha, plant infused drinks, sports drinks, and energy drinks.

Consumers can return containers for deposit to two kinds of facilities. Retailers that sell bottled products, such as grocery stores, drug stores, and big box stores like Walmart and Target must offer

[18] Substitute Senate Bill No. 1037. Public Act 21-58 "An Act Concerning Solid Waste Management." Effective January 1, 2023.

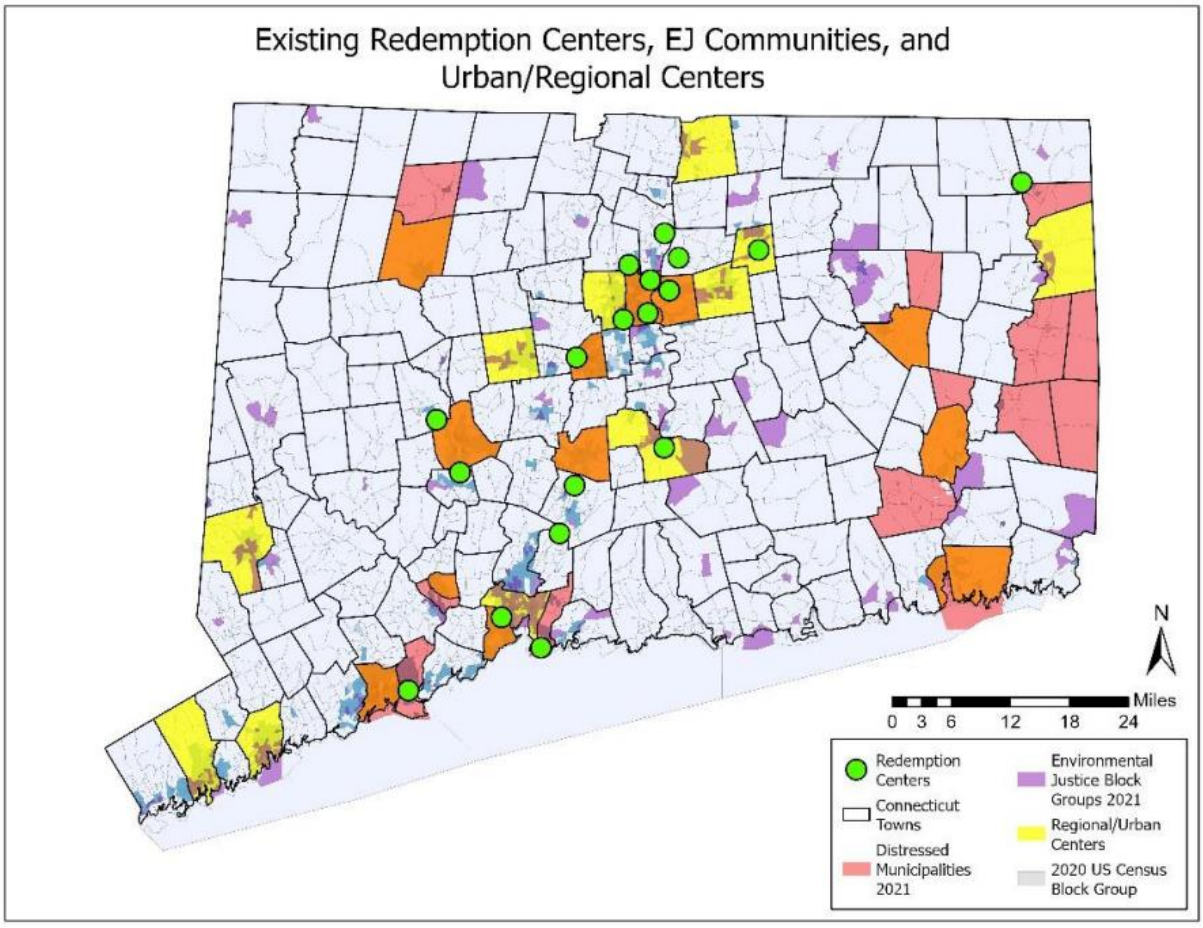
bottle redemption equipment, but only for brands that they offer for sale. Items not sold by a given retailer may not be accepted at their redemption facility.[19] Containers are usually counted using reverse vending machines (RVMs) that accept one item at a time and scan the barcode. As an alternative to retailers, redemption centers are private businesses that accept and process containers with a deposit. Some redemption centers use RVMs, while others sort containers by hand. Redemption centers accept all redeemable containers, regardless of where the containers were purchased.

According to DEEP Bottle Bill Redemption Data, between 40% and 50% of eligible items are returned for deposit. DEEP expects the new 10-cent bottle bill deposit amount to result in higher redemption rates in the range of 80-90% Unclaimed deposit revenues, which are generated when consumers purchase products with deposits that are not returned for redemption, go to the state general fund. Since 2009, approximately $53 million in unclaimed deposits have been added to the state's general fund.

CT DEEP established a grant program to encourage new redemption centers in urban areas and environmental justice communities. The grant limited program eligibility to municipalities that: (1) have a population greater than 25,000 residents; (2) are classified regional urban centers; and (3) do not already have a redemption center. In the SCCOG region, eligible locations included Groton, New London, Norwich, and Windham. During the first two rounds of grant funding, no applications were submitted to the State for these locations.

To better understand how redemption centers operate, SCCOG staff met with staff from the ARC Eastern Connecticut, which operates a redemption program. The ARC is a non-profit organization that supports people with intellectual and developmental disabilities across the region. The ARC owns and operates Donation Station, which is currently the only redemption center in eastern Connecticut. The center is used as a job training facility where employees unload, sort, and process containers using reverse vending machines. The location receives over 36,000 containers per week, amounting to almost 2 million items per year.[20] People can drop off redeemable containers at the facility, and either donate the deposit to the ARC or request their deposit back. The ARC estimates that close to 80% of deposits are donated, which allows the Donation Station to remain economically viable. While additional capacity is available at the existing location, the ARC is hoping to open a second facility in the SCCOG region closer to potential employees in the Norwich/New London area.

[19] PA 21-58 added additional requirements for retailers with 10 or more locations under common ownership and with more than 7,000 square feet of display of merchandise to install and maintain at least two RVMs. Ibid, p. 13.
[20] The Arc Eastern Connecticut. "The Donation Station" webpage. Retrieved 10 January 2024. https://www.thearcect.org/donation-station



Redemption Center locations map as presented in DEEP's Beverage Container Recycling Grant Program second round narrative (2021).

Data Compilation

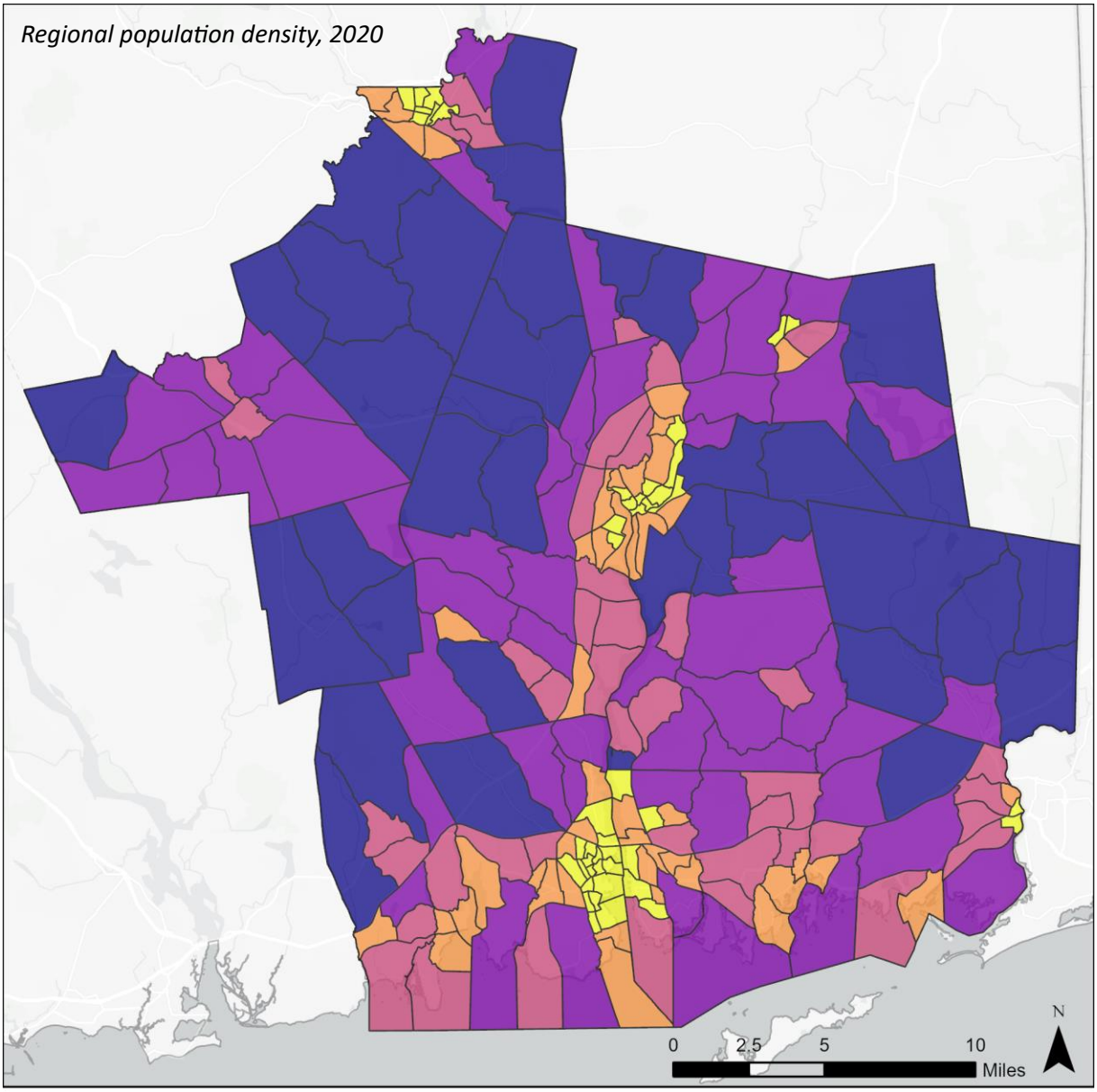
SCCOG staff pursued multiple avenues for identifying and reviewing MSW data. These data sources are described below, including discussion of data gaps, limitations, and observed conflicts between data sources. For this report's purposes, data was used for a high-level analysis and observation. SCCOG staff and municipal and state partners will need to work together to reconcile MSW data and to continue to expand our collective understanding of the complexity of various topics like cost, export, transportation, etc.

Demographics and Solid Waste Implications

As of the most recent decennial census in 2020, the SCCOG region has a population of 280,430. The smallest town by population is Franklin, with 1,863 residents, and the largest is Norwich with 40,125 residents. There are 113,140 households, with an average household size of 2.48. Population density, household income, and English language proficiency may impact the choice of municipal solid waste programs appropriate for the region's diverse municipalities.

Population density is important because rural, suburban, and urban areas have different waste disposal needs and challenges. For example, rural areas may generate less waste overall given limited populations but have longer hauling requirements. They may structure their solid waste streams around transfer stations, whereas more urban and suburban areas may have larger concerns around overall volume and the coordination of municipally provided contracted curbside pickup.

Regional population density, 2020



Population Density in Persons per Acre by Census Block Group Geography

- 0 - 0.3
- 0.3001 - 1.0
- 1.001 - 2.0
- 2.001 - 5.0
- 5.001 - 19.71

Produced by SCCOG on 1/22/24. Maps are for illustrative purposes only and should not be used for legal boundary definitions. Data Sources: US Decennial Census 2020 TIGER files and P1 Total Population Block Group geography shapefile and data table. Block group divisions were first classified into quantiles, and then rounded to nearest figures for clear interpretation of the layer legend.

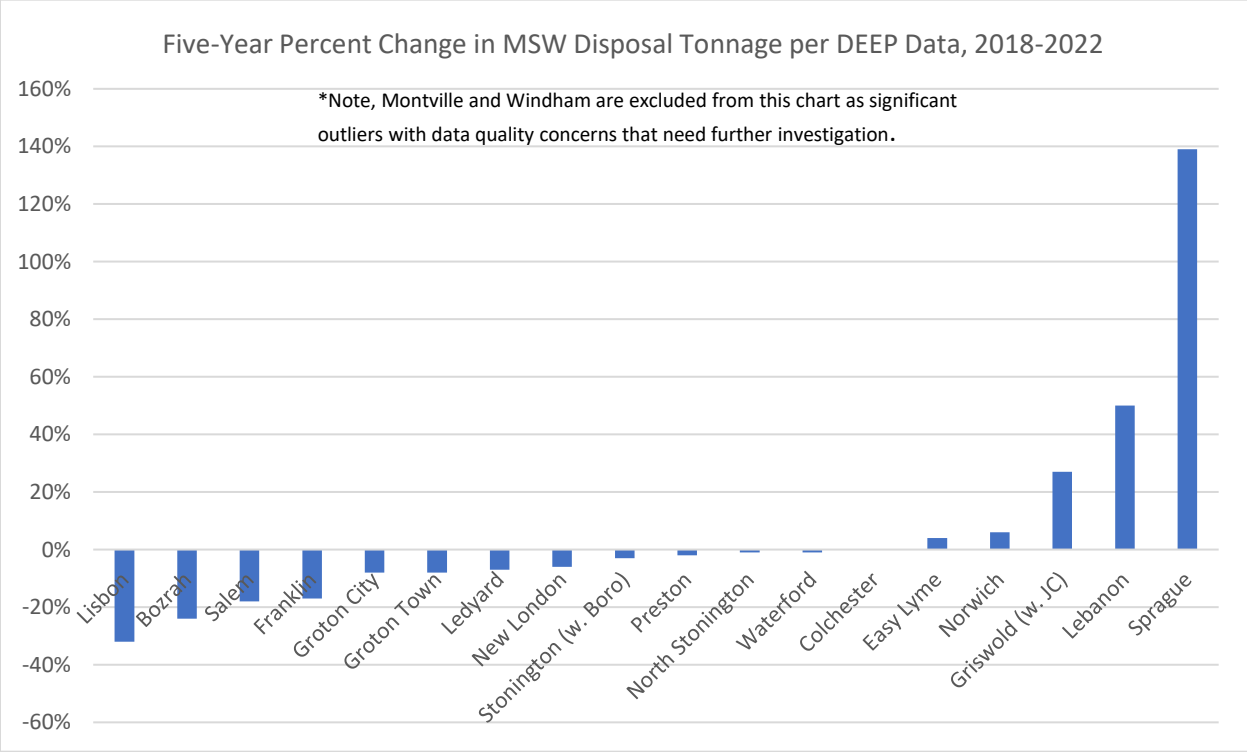
SCCOG Southeastern Connecticut Council of Governments

The SCCOG region has several environmental justice and economically distressed communities. In 2023, the four member municipalities of Windham, Griswold, New London, and Norwich are listed in the top 10 distressed municipalities list produced by the Department of Economic and Community Development (DECD). The 2023 list also includes Sprague, Lisbon, and Montville.

CT DEEP Data

SCCOG staff submitted a data request to CT DEEP for MSW data from 2018 to 2022 for all 22 member municipalities. CT DEEP provided several spreadsheets of data, including A) town-level data for MSW disposed, recycled, and composted; B) facility-level data for solid waste facilities and VRFs/recycling facilities; and C) summaries by town and facility. Additionally, CT DEEP provided additional notes on data limitations and qualifiers since the data is based on self-reported information provided in quarterly reports submitted to CT DEEP. SCCOG staff originally developed metrics and reports based on DEEP data, but also obtained municipal reports produced by SCRRRA, and quickly noted that there are significant discrepancies between these data sources in reported MSW tonnages per year. Figures quoted in this report continue to rely on DEEP data, but SCCOG staff encourage follow-up conversations with DEEP, the Solid Waste Subcommittee, and SCRRRA to determine the most accurate and valid datasets to use in analyses going forward.

Based on DEEP data, MSW disposal in the SCCOG region decreased or saw no overall change in 15 municipalities (68%). It is noted that the data presents datapoints that require further investigation-- e.g. only 146 tons of MSW are reported for Montville in 2021, when other years' tonnage is in the thousands; Windham averaged about 16,000 tons from 2018-2020, and then 73,500 tons in 2021 and 79,800 tons in 2022.

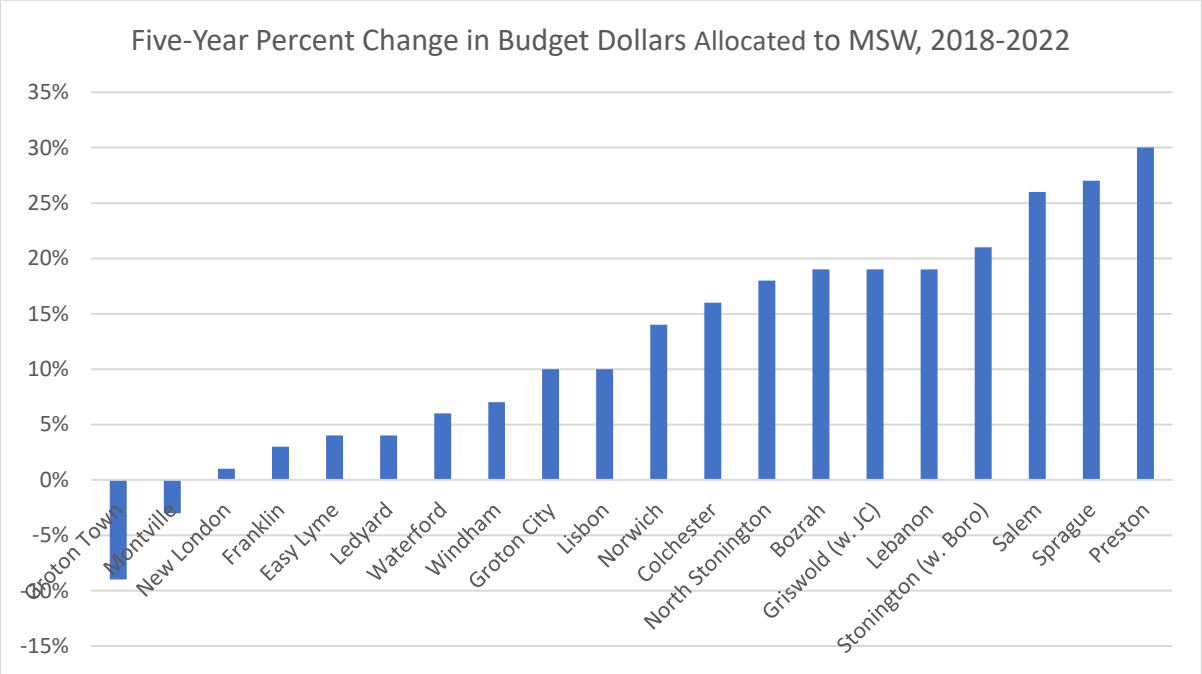


Municipal Contract and Budget Information

Municipal budget and solid waste contracts, where available, were compiled for each SCCOG member municipality for FY18 to FY22. Some smaller municipalities partner around solid waste pickup and contracting. Jewett City is included in Griswold's solid waste management. Similarly, Stonington Borough is included in Town of Stonington MSW operations.

Some municipal budgets separate various solid waste and recycling costs into specific line items such as tipping fees and transfer station operation costs, while other budgets had one line item for all solid waste and recycling expenses. The data compiled from these budgets provides high-level information about MSW costs for municipalities in the region. The inclusion of various levels of detail and various kinds of expenses in each municipal solid waste budget make it difficult to compare across municipalities. More detailed and consistent breakdowns could identify how costs are calculated and passed on to taxpayers. Consequently, we only draw top-level conclusions on how much each municipality presents as budgeting for total solid waste expenditures.

The chart below relies on SCCOG's research into and review of available municipal budget documents and the cost categories associated therein with MSW. Based on this data, MSW costs are rising rapidly throughout the region. National inflation rates peaked at 7% in 2021. For 63% of SCCOG municipalities, total municipal budget allocation increases for solid waste activities exceeded inflation over the five-year study period, with budget increases reaching as high as 30%. In concert with the tonnage data described above, costs have been increasing while communities are throwing away less trash.



A small number of contracts were available on municipal websites, and a few others were submitted via the survey sent to member municipalities. Contracts included information about services provided, annual cost increases, exclusivity requirements, and contract expiration and renegotiation dates.

Additional documentation from one-on-one meetings with municipalities and SCRRRA would provide additional insight into contract terms.

Survey to Member Municipalities

The subcommittee suggested the delivery of an online survey to member municipalities that included questions discussed at subcommittee meetings. SCCOG staff created a 14-question online survey as a method of initial outreach to municipalities. The survey was sent to each member municipality using contact information for the Chief Elected Official, Public Works Directors, and other relevant municipal staff. The survey description read:

The Southeastern Connecticut Council of Governments (SCCOG) is currently working on a Municipal Solid Waste study. SCCOG will analyze how all 22 member municipalities are handling municipal solid waste. The study will address rising costs associated with municipal solid waste management, identify best practices, and provide recommendations for local and state action. A final report will be published at the conclusion of the study.

Results for each question are reported below.

1. **Which municipality are you responding for?**
   Responses were received for 18 out of 22 municipalities: all SCCOG members with the exception of Bozrah, City of Groton, Lebanon, and Sprague. However, where appropriate, we use 17 as the baseline for total responses as the Borough of Jewett City indicated that the Town of Griswold, also a respondent, handles all solid waste for the Borough.

2. **What is your position in the municipality?**
   In most cases, the survey was completed by a director or Supervisor of Public Works (8). In other cases, First Selectpersons (4), Wardens (2), or a mayor (1), Supervisor (1), Transfer Station Foreman (1), and Director of Solid Waste & Recycling (1) responded.

3. **Is the municipality a member of Southeastern Connecticut Regional Resource Recovery Authority (SCRRRA)?**
   All 12 members of SCRRRA responded to the survey. Six (6) non-SCRRRA communities responded.

4. **If the municipality is a member of SCRRRA, how much does the city or town save by belonging to SCRRRA?**
   Answers to this question varied in specificity. Figures-based responses ranged from values of $11,318 to $550,000 plus with an average of $284,600. Anecdotal responses ranged from “nothing,” to “a lot there is a long list of benefits…” to “MSA which provides the town with low tipping fee, and other transfers station services at no cost” to “town saves on the tip fee for MSW, the cost for the tip fee for recyclables, provides various services such as Haz Waste Day, tub grinding and disposal for various.”

5. **What type of solid/waste recycling disposal services does the municipality use?**
   Respondents could select as many options as applicable from the following services. We also indicate the rate of response for each option from the 18 total respondents:
   - Municipality-contract service: 35% (6)
   - Municipality-provided service: 29% (5)

- Municipality-transfer station service: 76% (13)
- Private subscription-based service: 24% (4)
- Other: 12% (2) [these responses provided more detail; in Groton, housing on federal property is provided curbside collection while other areas require subscription service, and in Preston, residents purchase private subscriptions directly]

6. **What company serves as the solid waste disposal provider for the municipality?**
   Casella is the most popular solid waste disposal provider for the region, with 10 municipalities (59%) indicating their use of the company. In one case, this is not an exclusive contract and is for commercial waste only. F.E. Crandall is a provider in two municipalities (one of these is a residential contract, not commercial). CWPM is a provider in two municipalities, in one case, for bulky waste only. Perkins and Sons is a provider in one municipality, as is Willimantic Waste. One reply noted that several haulers are registered in Town. Two towns indicated that their waste disposal provider is part of their MSA with SCRRRA, with Lisbon (Win Waste) and Wheelabrator providing service in those cases. The City of New London provides its own MSW disposal, and Montville self-hauls from the transfer station.

7. **How is solid waste/recycling collected in the municipality?**
   In about half of municipalities, waste collection is an exclusively automatic system in which waste containers are emptied by machines (9 or 53%). In three municipalities (18%) waste collection is an exclusively manual system whereby an employee manually empties containers. A final three municipalities (18%) have a hybrid mix of automatic and manual operations.

8. **How many households in the municipality are served?**
   Results varied significantly by municipality. An extra step in analysis can help to normalize results across municipalities with varying populations by considering the percentage of households served. We did not calculate the percentages as follow-up questions would likely better inform this response.

9. **Please provide a link to the municipality's solid waste contract to email to nhaggerty@seccog.org.** See the Municipal Budgets and Solid Waste Contracts section above.

10. **Does the municipality have a transfer station?**
    Almost all municipalities have a transfer station (16/17 responses).

11. **If the municipality has a transfer station, please provide the cost to residents and the hours of operation.**
    Fee structures for transfer station costs to residents and users very widely, and are summarized in individual town annexes to this report.

12. **Does the municipality provide any outreach or education to residents regarding solid waste and/or recycling?**
    Most respondents (12 or 70%) indicated that they do provide some education or outreach.

13. **Does the municipality provide any additional waste services beyond traditional household solid waste and recycling? (i.e., textile recycling, bulky waste, etc.)**
    Seven respondents indicated an affirmative yes response and pointed to information available online or at the transfer station. Detailed answers include the following:

Town	Response
Town of Waterford	Bulky
East Lyme	Bulky waste (by fees), fall leaf pickup, Christmas tree collection
Town of Salem	Bulky Waste, Hazardous Waste, Fluorescent, oil, Metal Recycling, Mattress recycle, Electronics
Griswold	Bulky Waste, oil, antifreeze, tires, propane tanks, alkaline and lead acid batteries, fluorescent bulbs, covered electronic devices, freon appliances and mattresses
Preston	Bulky waste, SCRRRA recycling programs, in the process of evaluating composting and textile recycling
New London	Bulky/Metal/Bulbs/White goods/Propane tanks/Mattresses/Paint/Electronics/Oil/Tires/Antifreeze
Norwich	Residences are entitled to two bulky waste pick-ups per year. We also have a spring and fall brush collection, as well as a fall bagged leaf pick-up
Montville	Textile/bulky waste/brush/free re-use area
STONINGTON	Textiles, Plastic Film, Pilot Food Waste Collection Program, Bulky Waste & C&D
Lisbon	Yearly bulky waste collection

14. **Is there any additional information the municipality would like to provide regarding municipal solid waste?**
    Respondents suggested coordination with SCRRRA obtaining data and information and wanted additional information about grant opportunities.

In all, survey-collected data filled knowledge gaps. SCCOG staff conducted additional data collection and outreach to municipalities to collect consistent information.

Local MSW Survey Comparison Table

During survey follow-up, SCCOG staff were introduced to a similar survey undertaken by SCRRRA in 2023 for its member jurisdictions. After considering different format options, the MSW Sub-Committee decided to build on SCRRRA's survey and report the results from SCCOG's outreach in the same, readily-comparable format. With the publication of this Local MSW Survey Comparison Table, the same information now exists for both SCRRRA and non-SCRRA members in one summary document. The Local MSW Survey Comparison Table is included here as Appendix A.

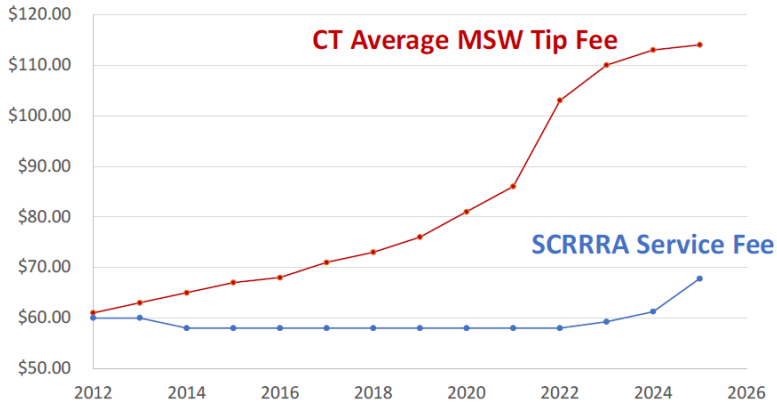
Regional Coordination

The SCCOG region has a long history of taking regional approaches to municipal solid waste. Southeastern Connecticut Regional Resource Recovery Authority (SCRRRA) was formed in 1984 by joint resolution of 12 municipalities: East Lyme, Griswold, Groton, Ledyard, Montville, New London, North Stonington, Norwich, Preston, Sprague, Stonington, and Waterford. In entering this agreement, these communities were able to aggregate their bonding power to support infrastructure investment and secure predictable MSW service fees. SCRRRA towns also entered into multi-year power purchase

agreements for the electricity produced at the facility. After the bonds were repaid, ownership of the facility reverted to Covanta, which currently leases the RRF site from SCRRRA.

SCRRRA provides solid waste disposal services to its twelve member municipalities through service contract agreements. Services provided to member municipalities include alkaline battery recycling, tire recycling, fluorescent bulb recycling, electronic waste recycling, freon recycling, used oil and antifreeze recycling, oil filter and oily debris recycling, wood grinding, wood chip hauling, propane tank recycling, mattress recycling, household hazardous waste collection, tip fees for trash, tip fees for recycling, and transportation subsidies. Costs of services are subsidized for member municipalities through SCRRRA's reserve fund. According to SCRRRA, member municipalities saved a total of $2,634,623 in FY2023 by contracting with SCRRRA for these services.[21] Once the reserve fund is depleted, SCRRRA will no longer be able to offer subsidies for member municipalities.

SCRRRA currently has a ten-year waste disposal agreement with WIN Waste Innovations (formerly Wheelabrator Technologies) that is set to expire at the end of 2030. SCRRRA has a five-year recycled materials processing agreement with Casella Waste Systems (formerly Willimantic Wastepaper Co.) that is set to expire September 30, 2024. Contracts will be renegotiated at that time, and prices are expected to be much higher than current prices. In 2024, the SCRRRA member municipality service fee is $61.25 per ton, while average tip fees in Connecticut are expected to be over $110.00 per ton.



Source: SCRRRA Navigating the Connecticut Waste Crisis

Innovative Regional Efforts and Programs

Municipal Efforts

Pay As You Throw (PAYT)

Stonington's Pay as You Throw (PAYT) program was first adopted as a program for residents in 1992. In 1997, the program was expanded to commercial entities. Residential customers must purchase town-approved yellow trash bags from local merchants. Bags are sold in two sizes: a sleeve of five 33-gallon bags costs $9.00, and a sleeve of five 15-gallon bags costs $6.00. The cost of the bag includes the cost of transportation to, and disposal at, the WTE plant where Stonington's MSW is disposed. The program's goal is to incentivize residents to recycle more, generate less trash, and achieve greater equity by charging those disposing of a large amount of trash more than those disposing of less. It is estimated that the town has saved $7.4 million in MSW costs since the program started.[22] In addition to the cost-

[21] SCRRRA. Annual Operations & Town Savings Report FY 2023.

[22] Hobbs, Bill. "Nature Notes: Stonington's trash program should be used as a model." *The Day*. 2 March 2022.

saving benefit of PAYT, the program has influenced how residents handle their trash. Stonington residents currently generate about 380 pounds per person per year, which is significantly less than towns without a PAYT program where residents generate about 700 pounds per person per year. All other recyclable materials, which are accepted without charge to residents, are placed in a town-provided, blue plastic bin at the curbside.

Bozrah and Sprague also have PAYT programs; however, rather than placing bags at the curbside for collection, residents must bring their own trash to their town's transfer station.

Textile Curbside Collection Pilot Program

Stonington implemented a textile curbside collection pilot program in early 2020, which allowed residents to place unwanted clothing and textiles at the curbside for disposal. Residents were able to get pink plastic bags, free of charge, from the Town's Solid Waste Department and set them out at the curbside on their normal waste collection day. The intent of the pilot program was to demonstrate how many clothing and textile items could be removed from the waste stream, thereby decreasing the Town's cost of disposing trash and reducing the impact on the environment.

As of January 2024, the program has been discontinued by the vendor. Residents are instead encouraged to donate clothing and textiles to community thrift stores, drop items off at a collection shed at town facility, or drop items off in Goodwill bins at the town transfer station.[23]

Food Waste Curbside Collection Pilot Program

Stonington was awarded a Sustainable Materials Management (SMM) grant from CT DEEP for a town-wide food waste curbside collection pilot program. The pilot program's purpose is to have residents separate heavy, wet food waste from their usual household trash bags. Green trash bags are supplied to residents by the Town, and the contracted hauler (F.E. Crandall Disposal) brings separated food waste to Quantum BioPower in Southington. Usual household waste is still collected in yellow bags and brought to the Win Waste Innovations WTE plant in Lisbon. The 12-month pilot program kicked off in January 2023. SCCOG will work with the Town and other partners to share the results of the pilot.

In general, organics collection programs need to weigh several factors in program design. Economies of scale in program participation are required to offset the cost of curbside organics collection with a dedicated route (a "cart-based" collection program). However, should cart-based programs be successful and divert enough waste with weekly pickup, costs may be equalized by reducing non-organics trash pickup to every other week. Early experiences in Connecticut of co-collection of organics through separated and differentiated bags (by color) show that voluntary free curbside pickup of food scrap collection captures about ¼ of recoverable food scrap tonnage (DEEP evaluation of the Meriden pilot program). At this rate of participation, the cost of collection per ton diverted may exceed the savings from lower tip fees at organics processing facilities and generate extra costs to municipalities. A voluntary organics program that is paired with a unit-based-pricing waste collection structure may see increased rates of organics diversion (DEEP estimates an increase to a 52% diversion rate when coupled with the UBP).

[23] Town of Stonington. "Solid Waste Department" webpage. Retrieved 10 January 2024. https://www.stonington-ct.gov/solid-waste-department/pages/textile-recycling-pink-bag-program

Shellfish Shell Recycling Program

Though in very early days, the University of Connecticut Sea Grant and UConn Extension are working with advocates to develop a recycling program for shellfish shells so that this important natural resource can be returned to aquatic ecosystems, where they play a vital part in providing substrate for the next generation of oysters and clams. UConn Marine Sciences Professor Zofia Baumann has been working to develop a shell recycling program in the Town of Groton. The program builds on grassroots and municipal efforts in Fairfield to collect, cure, and return recycled shells to the water. Shells are heavy and represent additional tonnage that incurs MSW cost. CT Sea Grant is working closely with the Connecticut Department of Agriculture, the shellfish industry and other partners such as the CT Restaurant Association to better understand how they can divert shells from the food waste stream, and to develop supportive infrastructure.[24]

SCRRRA

Organic Waste Pilot Program and Proposed Aerated Static Pile Facility

As a part of an organic waste pilot program, SCRRRA tested an approach to composting that involved an aerated static pile at Stonington's transfer station. The pilot program allowed Stonington residents to bring food scraps to the transfer station, where it was mixed with wood chips in the compost pile. The goal of the pilot was to collect data on the composting process, composting costs, and final product quality. SCCOG will work with SCRRRA and other partners to share the results of the pilot.

To service a larger-scale need, SCRRRA is developing an aerated static pile composting facility in Preston. There is currently only one facility in the state that can process organic waste – Quantum BioPower in Southington, CT. The cost for municipalities in the SCCOG region to haul heavy, wet organic waste to Southington is higher than it would be if there was a local solution. The proposed SCRRRA facility would service this local need. It is designed to process 5,000 to 10,000 tons of organic waste to start, with a maximum capacity of 35,000 tons. As of August 2024, SCRRRA is in the process of obtaining local and state permits to construct and operate the facility, and is working with specialized non-profits to develop organic waste collection points and hauling networks. The estimated tipping fee is $50, which would keep the cost competitive and make composting cost half the amount of normal solid waste (compared to state MSW tipping fee averages, and still at a savings to SCRRRA members). SCRRRA estimates that if a facility was available in the SCCOG region, there could be a 25% reduction in MSW.

AI Technology Pilot Program

SCRRRA is currently working with Prairie Robotics to pilot artificial intelligence technologies in East Lyme and Ledyard. Prairie Robotics is a Canadian company that utilizes cameras and AI technology to identify contaminants in the recycling stream. Contaminants may include materials such as plastic bags and Styrofoam and may also include recyclable materials soiled with food residue. These contaminants increase operational costs for MRFs, haulers, and municipalities in the long run.

The company attaches cameras with AI technology to trucks that recognize key contaminants in the waste stream. The cameras quickly identify and photograph potential contaminants. The AI program

[24] CT Department of Agriculture Press Release: Shell Recycling Initiative being introduced in Connecticut, 03/28/23, https://portal.ct.gov/DOAG/Press-Room/Press-Releases/2023/March/Shell-Recycling-Initiative-Being-Introduced-in-Connecticut

generates a postcard with a photo of the contaminant that can be sent to the resident, along with educational materials on the proper disposal of the identified item. Prairie Robotics estimates that over time, this targeted educational approach can achieve approximately a 40% reduction in contaminants. Results for the pilot municipalities of Ledyard and East Lyme should be available soon.

Textile Pilot Program

SCRRRA signed a contract with a company called Apparel Impact that collects textile waste. The company provides bins that have a sensor inside, which notifies the company when the contents of the bin need to be picked up. The bins have been placed in Montville, New London, Norwich, and Stonington.

What Goes Where?

SCRRRA currently has a page on their website titled "What Goes Where?" dedicated to proper disposal education. Users can specify the SCRRRA member municipality in which they live or operate, type the name of a waste item, and be told how to recycle or dispose of that item within that specific municipality. The webpage also includes "SCRRRA's Recycling Challenge," a game that makes recycling fun by prompting users to sort waste materials correctly to earn rewards. A list of upcoming SCRRRA paper shredding and household hazardous waste collection events is also available on this webpage.

Next Steps for Future Research

This report provides background information on the solid waste system, identifies data sources, and makes initial observations and recommendations for the region. One of our major findings is that additional research is necessary to understand the complexity of the solid waste system in Southeastern Connecticut. The initial investigation revealed the limitations and contradictions of some existing datasets, and resulted in an understanding of current waste management issues and of data gaps that SCCOG and partners can help to resolve in a subsequent study phase. Below we list additional questions that should be pursued in follow-on studies and discussions, and projects to continue to track.

Transportation

- Continue to monitor NYMTC's Regional Waste Movement Study. What are the distances between transfer stations, MRFs, RRFs, and organic waste facilities? Could a similar study in our region shed additional light on SCCOG regional needs?
- For MSW and recycling transported into the SCCOG region, where is it coming from? Data and information could be requested from the Lisbon and Preston WTEs.
- For MSW and recycling transported out of the SCCOG region, where is it going to? Data and information could be requested from haulers, especially those serving non-SCRRRA municipalities.
- How many trucks are required to haul 800k tons of waste out of the state?
- What are the capital costs associated with hauling MSW and SSR, and how are those costs passed on to municipalities and residents?

Waste to Energy

- Are there opportunities for expanding capacity at existing WTE plants?

- What is the volume of MSW that is reduced through the incineration process?
- Are there opportunities to reduce the amount of ash produced by WTE plants?
- How much energy is produced, on average, by a WTE plant? How are WTE energy markets distributed (e.g. who is purchasing power from the WTE's in our region). Who sets purchase rates, and how does energy sale contribute to WTE revenues?
- What is the true remaining lifespan for existing WTE plants? The state has made estimates, but is another review appropriate, along with planned facility upgrades?

Municipal and Regional Data Integrity

- Continue to compile municipal contracts.
- Meet one-on-one with member municipalities, especially to build confidence in our evaluation of municipal MSW budgets and line items. How are MSW costs passed on to taxpayers?
- How are municipalities reporting MSW data to DEEP, and how could DEEP reduce barriers and time requirements for reporting?
- Meet one-on-one with key players in the region, such as SCRRRA and Casella. What data can they provide and how does their data collection feed into DEEP data and reporting?

Municipal and Regional MSW Practices

- What education and outreach are municipalities providing, if any?
- How do municipalities categorize single family vs. multi-family households for collection?
- Is it possible for additional municipalities to join SCRRRA?

Bottle Bill and Redemption Centers

- How much money do redemption centers receive from the state?
- Is it feasible for transfer stations to host reverse vending machines?

SCCOG can continue to host conversations and conduct research around these questions as Municipal Solid Waste concerns remain top priorities for member jurisdictions.

Appendix A. Local MSW Survey Comparison Table

Local MSW Comparison Table

Town	Bozrah	Colchester	East Lyme	Franklin	Griswold	Groton City	Groton Town*	Lebanon	Ledyard	Lisbon	Montville	New London	No. Stonington	Norwich	Preston	Salem	Sprague	Stonington	Waterford	Windham
SCRRRA?	No	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Contact	Glenn Pianka	Joseph Lyone	Joe Bragaw	Alden Miner	Todd Babbitt	William Sedlmeier	Stacey Leitch	Sarah Hill	Steve Masalin	Thomas Sparkman	Ron McDaniel	Brian Sear	Don Hill	Brian Long	Jim Corley	Gary Alligood	Cheryl Blanchard	Jill Senior	Gary Schneider	Don Fascio
Contact Phone #	860-889-2689, ext. 202	860-537-7288	860-215-6658	860-642-8602	860-213-1522	860-446-4126	860-448-4083	860-642-6100	860-912-8266	860-376-3400	(860) 848-6776	(860) 447-5250	860-984-1432	850-823-3798	860-886-7220	(860) 859-2964	860-822-3000	860-535-5099	860-444-5864	860-465-3090
2020 census population	2,429	15,555	18,693	1,863	11,402	9,387	38,411	7,142	15,413	4,195	18,387	27,367	5149	40,125	4,788	4,213	2,967	18,335	19,571	23,833*
SCRRRA Voting shares	n/a	n/a	8.5	n/a	5.2	n/a	17.4	n/a	7.0	n/a	8.3	12.4	2.3	18.2	2.2	n/a	1.3	8.3	8.9	n/a
Who does Res MSW?	PAYT at Transfer Station or privatized curbside	Privatized	Municipal	Municipal	Privatized	Municipal	Subscription	Privatized	Privatized	Privatized	Subscription	Municipal	Subscription	Contracted	Subscription **	PAYT at Transfer Station or privatized curbside	Privatized	Contracted	Municipal	Contracted
Res privatized MSW hauler?	Various-CWPM, Casella	Various - Casella, All Waste Control, others	n/a	CWPM (As of 7/1/2024)	n/a	n/a	Various	Casella or CWPM	Casella (WW)	Various - Casella, CWPM, Crandall	n/a	n/a	CWPM	Casella (WW)	Various	Various	Casella/CWPM	Crandall	n/a	Casella
Who does Com MSW?	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Privatized	Contracted	Private	Private
Com privatized MSW hauler?	Various	Various	Various	Various	Privatized	Various	Various	Various	Various	Various	Various	Various	Various	Various	Various	Various	Various	Casella (WW)	All Waste/CWPM	Various
Who does Rec Coll?	Privatized	Privatized	Municipal	Municipal	Privatized	Municipal	Subscription	Privatized	Privatized	Contracted	Privatized	Municipal	Subscription	Contracted	Privatized	Privatized	Privatized	Contracted	Municipal	Contracted
Recycling privatized hauler?	Various	Various - Casella, All Waste Control, others	n/a	CWPM (As of 7/1/2024)	n/a	n/a	n/a	Casella or CWPM	Casella (WW)	Casella	Casella (WW)	n/a	Perkins & Sons	Casella (WW)	Various	CWPM	Willi Waste	Res SSR - Crandall Comm SSR - Casella (WW)	All Waste/CWPM	Casella
Who pays for cost of MSW?	Household	Household (pickup), Town Budget (Transfer Station / Casella hauling from transfer station)	Town Budget	Taxes	Household	Household	Household	Residents	Town Budget	Household	Household	Town Budget	Town Budget	Town Budget	Household/TB	Household	Household/TB	Town Budget	Town Budget	Taxes
Transfer Sta Sun hrs	closed	closed	closed	closed	closed	closed	closed	closed	closed	n/a	0800-1500	closed	closed	closed	closed	0800-1400	closed	0800-1300	closed	closed
Transfer Sta Mon hrs	1230-1630	closed	closed	closed	closed	closed	closed	closed	closed	n/a	closed	0730-1500	closed	0800-1500	closed	closed	Dec-Mar closed, Apr-Nov 1000 1800	0900-1500	0730-1530	closed

Local MSW Comparison Table

Town	Bozrah	Colchester	East Lyme	Franklin	Griswold	Groton City	Groton Town*	Lebanon	Ledyard	Lisbon	Montville	New London	No. Stonington	Norwich	Preston	Salem	Sprague	Stonington	Waterford	Windham
Transfer Sta Tue hrs	closed	0800-1500	0730-1430	closed	closed	closed	closed to public	closed	0900-1530	n/a	closed	0730-1500	closed	0800-1500	closed	closed	closed	0900-1500	0730-1530(summer)	closed
Transfer Sta Wed hrs	1430-1900 (summer)/ 1430-1630 (winter)	closed	0730-1430	closed	1000-1400	0800-1600	0800-1600	0800-1600	0900-1530	n/a	0800-1600	0730-1500	1200-1600	0800-1500	closed	0800-1400	1000-1800	closed to public	closed	closed
Transfer Sta Thurs hrs	closed	closed	0730-1430	closed	closed	0800-1600	0800-1600	closed	closed	n/a	0800-1600	0730-1500	0800-1600	0800-1500	closed	closed	closed	0900-1500	0730-1500	0730-1430
Transfer Sta Fri hrs	closed	closed	0730-1430	closed	closed	0800-1600	0800-1600	closed	closed	n/a	0800-1600	0730-1500	1200-1600	0800-1500	0800-1615	closed	closed	0900-1500	closed	0730-1431
Transfer Sta Sat hrs	0800-1500	0800-1500	0730-1430	1st Saturday of Each Month: 8:00am to 12:00 noon	1st and 3rd 0700-1200	0800-1600	0800-1600	0800-1600	0900-1530	n/a	0800-1500	open only 1st Sat of month 0730-1500	0800-1600	0800-1300	0800-1615	0800-1400	0800-1600	0800-1500	0730-1530(S)1200 (W)	0730-1432
How many TS employees on a typical day?	2	2	3	1	2	3	3	45355	1	n/a	3	3	2, 3 on sat	2 Contracted out	1/fri - 2/sat	1	1	3-6 depending on the day 1 Add'l P/T summer help	3	2
Employee OT on weekends?	No	No	No	Yes	Yes	No	No	No	No	n/a	Yes	Yes	No	No	PT empl	No	No	No	Yes	No
Where do you send bulky waste?	Casella	Casella hauls away	Casella in Willimantic	CWPM (As of 7/1/2024)	Casella	Casella or CWPM	Casella or CWPM	CWPM	CWPM hauls (bidding for FY24 now)	Households bring to Roode Road Transfer Station/VR Plant in Plainfield	Casella in willimantic	CWPM	Transfer Station	Casella in Willimantic	Casella in Willimantic? ?	CWPM	Casella	Casella (WW)	CWPM	Casella
Do you self haul bulky?	No	No	No	No	Yes	Yes	Yes	No	No	n/a	Yes	Yes	No	No	No	No	No	Yes	No	Yes
What is your bulky tip fee?		$95 per Ton (2023), increases each year per contract	$95/ton, going up to $115/ton on 7/1/23	varies	$102.00	$107	$107	$105	$100 until 6/30/23	n/a	Dec 2022 $95 Jan 2023 $102.00	$98/ton	None	$78.55/ton fixed until 6/30/2025	$75.04/ton, increasing 7/1/23		$88.43/ton	$60/ton	$105/ton	$98.40/ton
What is your bulky haul fee?		$141.77 per load (2023), increases 2.5% annually	$195/haul, going up to $300/haul on 7/1/23	$630/haul	Self-Haul	Town	Town	$175	$170 until 6/30/23	n/a	n/a	n/a	None	$52K per year for curbside pickup	$146.86		$135.25	Self Haul	$415/pull	Self Haul

Local MSW Comparison Table

Town	Bozrah	Colchester	East Lyme	Franklin	Griswold	Groton City	Groton Town*	Lebanon	Ledyard	Lisbon	Montville	New London	No. Stonington	Norwich	Preston	Salem	Sprague	Stonington	Waterford	Windham
Bulky waste charge to public?	$45/ half a load, $65/ load	$5 per cubic yard	0.0945/lb or $189/ton	n/a	$10/cu. Yd	$20/day, $100/yr,$90/yr mil- ret, $75/yr +65	$20/day, $100/yr,$90/yr mil- ret, $75/yr +65	$20 per cubic yard (max 5 a day)	$35/$125/ $250	$160 per ton	$20/CY	$85/ton	None	$151/ton at Transfer Station	$25-250 depending on volume	$5/$10 depending on size	$10/ cu yd	$125/ton	$110/ton	$5-$10
Do you have curbside bulky collection?	No	No	yes, last wed of month from apr to oct	No	No	no. TC revisiting 5/9/23	no. TC revisiting 5/9/23	by appointment	yes; 2 collections per resident per year	No	No	By Appointment	No	Yes on-call up to 2 per year per unit	No	no	No	No	Summer per appt	No
IF yes to above, do you charge for it?	n/a	n/a	yes, up to 5 items - $75, 5-10 items - $125	No	n/a	n/a	n/a	Yes	No, it is part of the curbside contract	n/a	n/a	$20 appointment/then per item	N/A	No, in the City Budget	N/A	n/a	n/a	n/a	$20 for appt additional charge for unit	n/a
Brush charge?	No	Wood Waste - $5 per cu.yd / Unbagged leaves - No Charge	$0.025/lb	415/ haul	No	see #20	see #20	No	res - no charge comm - $5/$15/$25	n/a	no charge	$5 Car/Pickup	None	no charge	No	No	No	$80/ton landcapers, no charge for residents	$5-15/load	$10/load
Appliances w/freon charge?	$20	No charge	$15 ea	$11	No	$20 ea	$20 ea	$10 each	$5 ea	No charge	$25 ea	$25 Large truck	$5.00	free	No	$15	No	$10 ea	$15 ea	$10 ea
Tires charge?	$4	$5, $3, $4, $20 depending on size	$5,$6 & $10 depending on size	$2/$7/$21/ $21/$45 depending on size and if on rim	No	$5	$5	$3/ $15 depending on size	$1/$2/$25	$5 each	$3	$3	$3.00	$3 & $5 depending on size	No	$2/$10 depending on size	No	No	$2 ea pass tires	$1.50/ passenger tire
Mattess charge?	No	$40 for poor condition, no charge for good condition	No	No	No	No	No	No	No	$20	no	No	No	No	No	No	No	No	No	No
Charge to comm haulers?		$105/ton	$64/ton, I am planning to increase for 7/1/23	$170,000/yr	$100 registration per hauler, $2/ton at incinerator	$61.25/ton 7/1/23	$61.25/ton 7/1/23	No	SCRRRA tip rate + $4	Residential only	$63/ton	$62/ton	scrrra rate	$68/ton $70/ton effective 7/1/2023	SCRRRA Rate	$10/cubic yard for brush	$61/ton, planning increase	Residential Only	$63/ton	No
Annual fee to comm haulers ?	No	No	Yes	No	Yes	No	No	No	No	n/a	Yes	No	No	Yes	No	No	No	n/a	Yes	No
If yes, how much?	n/a	n/a	$100/vehicle up to max of $500	n/a	$100/vehicle	n/a	n/a	n/a	n/a	n/a	$125/vehicle	n/a	n/a	$100/vehicle	N/A	N/A	n/a	n/a	$25/vehicle/ yr	n/a

* In Groton, Noank FD, Groton Long Pt, Mystic FF and the City all handle their trash and recycling separately from the Town ** they accept it at the TS

** Unique aspects as WIN Waste Host Community, no transfer station