Memorandum

Date:	Monday, June 14, 2021
Project:	Long-Term Waste Management (LTWM) System Evaluation
To:	Cedar Rapids Linn County Solid Waste Agency (CRLCSWA) Karmin McShane, Executive Director
From:	HDR Engineering, Inc. (HDR) Dan Bacehowski, Morgan Mays, and Wendy Mifflin
Subject:	Task 1 - Solid Waste Management Practices

Introduction

The purpose of this memorandum is to provide the Cedar Rapids Linn County Solid Waste Agency (CRLCSWA) with a brief summary of successful management practices that may be replicated to aid in solid waste diversion and long-term financial sustainability.

The following five jurisdictions were ultimately selected for their management practices:

- Simcoe County, Ontario, Canada
- Lancaster County Solid Waste Management Authority, Pennsylvania
- Monterey Regional Waste Management District, California
- Yakima County, Washington
- Brown County, Wisconsin

These jurisdictions were selected based on a combination of factors, including:

- Population
- Annual tons of waste generated
- Disposal method
- Diversion programs
- Waste management strategy including partnership opportunities
- Funding model

The summary of practices provided in this memo, along with the Alternative Technologies memo and Summary of Solid Waste Volumes and Projections memo, is intended to lay the groundwork for the infrastructure options assessment portion of the Long-Term Waste Management (LTWM) System Evaluation.

Data Sources and Limitations

The data gathered from the benchmarked jurisdictions includes a general overview, operational and educational program descriptions, and fee structure information. The information gathered includes publicly available information from agreements, industry specific inquiries, and HDR project records. The results are discussed in the Comparison of Trends and Practices section of this memo.

Solid Waste Management Practices Municipality Overview

Table 1 – Municipality Population and Tonnage Overview

Criteria	System Overview					
	Cedar Rapids Linn County Solid Waste	Simcoe County, Ontario, Canada	Lancaster County Solid Waste Management Authority, Pennsylvania	Monterey Regional Waste Management District, California	Yakima County, Washington	Brown County, Wisconsin
Population	228,600	304,200	545,700	170,000	250,900	264,500
Total Tons Disposed	211,749	153,300	558,200	200,000	280,000	254,900
Tons Disposed per Capita per Year	0.92	0.50	1.02	1.18	1.12	0.96

The following provides a brief overview of the structure and programs for the respective solid waste systems for each municipality.

Simcoe County, Ontario, Canada

Simcoe County is located in south-central Ontario and is comprised of 16 member municipalities including Adjala-Tosorontio, Bradford West Gwillimbury, Clearview, Collingwood, Essa, Innisfil, Midland, New Tecumseth, Oro-Medonte, Penetanguishene, Ramara, Severn, Springwater, Tay, Tiny, and Wasaga Beach. Most of the population is located in settlement areas, with the remainder scattered through rural areas that make up the bulk of the land area within

the County. The County is experiencing significant population growth and, as a result, increased demand for municipal services such as waste management.

Simcoe County is directly responsible for the management of all municipal solid waste (MSW) generated by the residential sector in the County, which includes all the towns within the County. The County was allocated responsibility for management of MSW generated in the entire County under the Ontario Provincial Municipal Act. No agreements are required with the towns and townships that make up the County to address responsibility for managing solid waste. The only exception is that the Cities of Barrie and Orillia are separate incorporated cities under the Provincial Municipal Act. While they are physically located within the County, they are not part of the County government and are responsible for managing their own MSW. The County provides curbside collection services across the entire County, owns and operates a few small County landfills and yard waste composting areas, operates a series of residential drop-off facilities, contracts for the collection and diversion of household hazardous waste (HHW), contracts for external recyclables and household organics processing, and is currently developing a new transfer facility coupled with new household organics processing capacity.

In 2010, the Simcoe County Council approved a comprehensive, multi-staged Solid Waste Management Strategy (SWMS) designed to guide short- and long-term diversion and waste disposal programs for 20 years. Since that time, more than 25 SWMS recommended initiatives have been implemented, allowing Simcoe County to achieve higher diversion rates, synergies and efficiencies in waste collection, and innovations in waste management.

Simcoe County is one of the top-diverting counties in Ontario. Residents make good use of a two-stream blue box recycling program, curbside diversion of source-separated household organics (food scraps and compostable paper fiber), and diversion opportunities provided at waste facilities. Waste diversion rates have been relatively stagnant, sitting at approximately 60 percent for a number of years (calculated based on the total quantity of waste diverted as a proportion of the overall waste stream that was diverted and disposed). However, waste generation rates are increasing, and the curbside organics diversion program requires improvement. As such, the 2010 SWMS was updated in 2016. The 2016 update outlines the results of implementing the first 5 years of the SWMS-recommended initiatives to increase diversion along with an implementation plan for the next 5 years. The primary focus of the new initiatives is to implement disincentives for curbside garbage, such as transitioning to a standard garbage container. The implementation of these initiatives will assist in reaching the County Council approved target of 62 percent diversion by 2020. Additional long-term targeted diversion rates will be reassessed in the future as the SWMS is updated.

Lancaster County Solid Waste Management Authority, Pennsylvania

The Lancaster County Solid Waste Management Authority (Authority) has developed an Integrated Solid Waste System (System) that allows for waste disposal by combining the resources of a comprehensive recycling program, transfer station facility, waste-to-energy (WTE) facility, HHW facility, and a landfill. As a result, the volume of waste disposed at the landfill is reduced significantly. Natural resource consumption is reduced by generating clean, renewable energy (electricity) from the waste and diverting a large portion of the waste for recycling or reuse. The Authority is taking a balanced approach to solid waste management that protects the land, air, and water by implementing the System wisely.

The Authority, a corporate and political body organized under the Municipal Authorities Act of 1945 of the Commonwealth of Pennsylvania, manages the design, financing, construction, and operation of the county's System.

Lancaster County's commissioners appoint a nine-member board of directors. Seven members of the Executive Team oversee the organization's operations, finance, technical services, energy administration, capital projects, and business development. The Authority holds no taxing powers and receives no government backing of its debt. The organization's primary source of revenue is waste disposal ("tipping") fees, as well as revenue from the sale of electricity generated by its renewable energy projects.

The System involves a combination of public and private participation. Collection services for recyclables and all types of waste are managed by the private sector. The Authority manages MSW processing and disposal from residences and businesses. Processing and recycling/disposal of construction and demolition (C&D) waste and white goods are shared between the Authority and the private sector. The Authority assists with the consolidation and shipping of mixed recyclables at its transfer station, and the private sector manages the processing and marketing of recyclables. Yard waste, biosolids, and septage are managed by a combination of private and municipal entities. Infectious and chemotherapeutic waste is managed privately.

The Authority entered into a long-term contract with Inashco North America, Inc. in April 2016 to site a metals recovery facility (MRF) next to the Frey Farm Landfill. While the Authority's WTE facilities currently use in-line metal recovery systems, only larger metals are removed. Inashco offered an advanced metals recovery system to remove pebble-sized metals present in the ash. This includes both ferrous (iron) and non-ferrous (aluminum, copper, brass, zinc, gold, silver, etc.) metals.

The Authority integrated the WTE Facility with the adjacent Perdue AgriBusiness's Soybean Processing Facility in 2018. The Authority provides 15-20 percent of the steam from the WTE Facility, which reduces the Perdue Soybean Processing Facility's environmental footprint and lowers its emissions by avoiding the need to use fossil fuels. Using steam from the WTE Facility, instead of creating steam from natural gas or fossil fuels, avoids 20,000-30,000 metric tons of CO2 annually for this project.

The Authority also provides process water, eliminating the need to use water from the Susquehanna River for the Perdue Soybean Processing Facility. The process water is returned to the WTE Facility, where it is treated and recycled yet again in a closed-loop, zero discharge system.

To ensure the tipping fee revenues that are necessary to construct, operate, and maintain the System, municipal waste generated in Lancaster County is directed to Authority facilities through a combination of waste flow ordinances and hauler agreements. This flow-control system has been in effect continually and has further evolved over the past 20 years (hauler agreements began in 1994).

Monterey Regional Waste Management District, California

The Monterey Regional Waste Management District (District) was created in 1951 in response to illegal dumping and burning of waste on nearby sand dunes. The mission was to manage the Peninsula's waste by establishing a sanitary landfill to replace the old "dumps" then in operation. Since then, numerous new technologies, systems, and strategies have been put in place to maximize efficiency, effective disposal, and resource recovery for the local jurisdictions. Today, the District is recognized as one of the "Best Solid Waste Systems in North America." Member municipalities in the District include Carmel, Del Rey Oaks, Marina, Monterey, Pacific Grove, Pebble Beach, Sand City, Seaside, and Monterey County.

The District operates the Monterey Peninsula Landfill, which has a life expectancy of 100 years at current disposal rates. In 1983, the District developed one of the first landfill gas-to-electricity energy plants in the nation. Today, the landfill gas-to-energy project has four engine generators that provide approximately 5 megawatts of electricity, providing the District's power needs and supplying surplus energy to power 4,000 homes.

The District Materials Recovery Facility (MRF) opened in April 1996. The $9.6 million facility was designed to process construction and demolition debris, as well as to complement the recycling collected from homes and businesses. The MRF diverts 50 percent of the incoming mixed waste through reuse and recycling and receives green waste and wood scraps, which are used as raw

materials for making compost and wood chips for resale. The District is currently in the process of renovating the MRF to accept single-stream and commercial recyclables.

The District operates two composting systems at the site. A yard/green and food waste composting program is operated to produce an organic compost market for local agricultural demand. A separate composting operation processes biosolids from the adjacent wastewater treatment plant (WWTP). The biosolids compost is used as daily cover and landfill cover erosion control for both landfill capacity enhancement and soil erosion control purposes.

The first dry fermentation anaerobic digester (AD) in California, and only the second in the U.S., became operational at the District in March 2013. The 5,000-ton-per-year pilot demonstration project, operating in partnership with Zero Waste Energy, is effectively processing a blend of commercially generated food scraps and mulch from yard waste to produce renewable energy and compost. The AD system processes 65-ton batches of food scraps, received from restaurants in Monterey and Santa Cruz Counties, mixed with mulch to provide carbon and porosity. The "digestate" (organic mass) that is removed from the digester is then composted for 90–120 days to complete the decomposition process. The resulting compost is screened to remove contaminants and large wood pieces. The finished compost is then sold to orchards and vineyards. The success of the AD project is helping staff plan for the future of organics management within the District. Keeping organics out of the landfill with anaerobic digestion allows the energy value of the food scraps to be rapidly captured in an enclosed system and reduces greenhouse gas emissions.

The District currently owns and operates The Last Chance Mercantile (LCM), which has a resale store with an eclectic and ever-changing inventory, a convenient reusable goods drop-off area, a beverage container redemption center, electronic waste drop-off, and a bag-your-own landscape product area. Reuse was elevated to an art form with the establishment of the Artist in Residence program in 2016 in partnership with the Visual & Public Art Department at California State University Monterey Bay. The LCM also houses a drop-off/buy-back (DO/BB) center. The DO/BB center accepts electronic wastes, HHW, and source-separated recyclable commodities (e.g., beverage containers, rigid plastics, clean paper, cardboard). The LCM has been closed during the pandemic and is anticipated to be operated by a non-profit entity when re-opened.

Yakima County, Washington

Washington State law assigns primary responsibility for managing MSW and moderate risk waste (MRW) to local governments and requires local governments to maintain current solid waste and hazardous waste management plans. MRW in Washington is HHW and conditionally exempt small

quantity generator waste (CESQG). The Solid Waste and Moderate Risk Waste Management Plan (Plan) for Yakima County recommends strategies to manage solid waste and MRW generated in the County. Solid waste handling includes management, storage, collection, diversion, transportation, treatment, use, processing, and final disposal. This Plan includes recommendations for MSW, MRW, diversion, recycling, education and promotion, C&D debris, organics, and special wastes.

The 14 incorporated communities in the County have signed an Interlocal Agreement that authorizes Yakima County to prepare a countywide solid waste and MRW management plan. Participating cities and towns have both the opportunity and the responsibility to participate in Plan development, to review and comment on the draft Plan, and to adopt the final Plan. The Interlocal Agreements also authorize Yakima County to manage, plan, and operate the solid waste system including disposal, rate setting, and development of educational materials. The incorporated communities have the responsibility to collect waste within their jurisdictions and guarantee delivery to Yakima County disposal facilities.

The County operates two MSW landfills, three transfer stations, three HHW facilities, three drop box recycling programs, septage lagoons, and a gravel pit. The Terrace Heights Landfill, located near the City of Yakima population center, has capacity until 2027 and the Cheyne Landfill, approximately 15 miles away, has permitted capacity until 2055 with area for expansion. In 2027, when the Terrace Heights Landfill closes, waste will be transferred from the Terrace Heights transfer station to the Cheyne Landfill facility for disposal.

The County has four public-private partnerships for recyclables and organics handling. The County delivers all paper, cardboard, and newspapers to a private facility that processes the commodities and manufactures food-grade fruit-packing trays. The County previously partnered for composting of yard waste with a privately owned and operating compost facility. This partnership was discontinued in 2019 due to apple maggot quarantine restrictions put in place by the Washington State Department of Agriculture. The County currently grinds all source-separated yard waste and utilizes it as alternate daily cover material on the landfill. In addition, the County works with private non-profit groups for recycling and provides a discounted disposal fee.

All incorporated jurisdictions within the County have mandatory garbage collection, but not recycling or yard debris collection. Residents in unincorporated areas may choose whether to subscribe to waste collection services or self-haul to disposal facilities. There are four municipal collection programs and two private haulers currently providing collection services in Yakima County. The two private haulers that operate in the County's unincorporated areas are franchised through the Washington Utilities and Transportation Commission and have the exclusive permit to collect curbside waste within the County. Each of the cities within Yakima

County is using automated (or semi-automated) cart collection. Curbside recycling and yard debris services are available to residents in three municipalities.

Brown County, Wisconsin

Brown County is located in eastern Wisconsin on Lake Michigan and includes the county seat of Green Bay. The Brown County Resource Recovery Division of the Port & Resource Recovery Department (Department) manages a wide variety of facilities and programs with policies set by the Brown County Solid Waste Management Board (SWMB), as authorized by Wisconsin State Statute. The nine-member SWMB is appointed by the County Executive and serve as an oversight committee.

The Department participates in a three-County regional waste and recycling agreement between Brown, Outagamie, and Winnebago counties, known as the BOW. These three counties coordinate waste disposal sequentially starting with Winnebago County's landfill, which has reached capacity and closed. BOW is currently utilizing Outagamie County's landfill, which is expected to reach capacity in 2022. At that time the Brown County landfill site construction will be complete and the landfill operational. The BOW also operates a centralized single-stream recycling facility (MRF) sharing administrative and operating costs.

The three counties are currently negotiating a new long-term agreement for continued cooperative operations and partnership expansion.

The Department operates a transfer station that receives, compacts, and transports MSW to the current BOW landfill; operates a single-stream recycling transfer station that collects and transports materials to the regional MRF in Outagamie County; operates a regional Hazardous Materials Recovery Facility for residents of Brown County and Northeast Wisconsin; and coordinates various recycling and resource recovery programs.

The new South Landfill construction in Brown County will occur throughout 2021 on the 392-acre site with negotiated leachate discharge and treatment agreements and bulk excavation of over 1 million cubic yards of material. Ancillary landfill facilities and equipment acquisition are expected to be completed in 2021 as well.

The Department completed the Resource Recovery Department Strategic Plan in 2017 with goals and objectives to be accomplished. The Strategic Plan refines the Port & Resource Recovery Department's mission statement, goals, and objectives; identifies strategic issues that will affect the Department's ability to achieve its mission; identifies and evaluates options for addressing issues; and recommends an implementation plan for the selected options. These strategies and options are considered on a yearly basis for incorporation into the annual budget.

Comparison of Trends and Practices

The jurisdictions selected for comparison of their trends and practices were based on commonalities that included population, waste generation, disposal methods, funding model and diversion strategies. The ability to flow control waste and recyclable materials to facilities and funding sources implemented are similar in all jurisdictions selected. These practices ensure a stable funding source for operations and programs.

The jurisdictions selected have also implemented partnerships to complement their operations that include innovative initiatives supporting economic development and a demonstrated ability to build and sustain effective public/private partnership opportunities.

Building educational and diversion programs that eliminate materials from disposal and provide a comprehensive messaging campaign for system users were also instrumental in selection for comparison.

Table 2 presents a comparison of solid waste management trends and practices, showing criteria that include types of facilities, programs, partnerships, flow control practices, and fee models.

Based on the evaluation of similarly sized facilities with similar populations served, CRLCSWA generally manages equivalent volumes of waste, equivalent programs provided, similar partnerships, and equal to lower pricing structure. One of the primary differences between the management practices in the locations evaluated is associated with operation of waste-to-energy technologies at Lancaster County Solid Waste Management Authority and Monterey Regional Waste Management District. Additionally, the tri-county agreement between Brown County and three adjacent counties (public-public partnership) enables waste diversion programs and landfilling to occur regionally with revenue sharing between the counties.

Table 2 – Solid Waste Management Practices Comparison							
Criteria		**Cedar Rapids Linn County Solid Waste**	**Simcoe County, Ontario, Canada**	**Lancaster County SWMA, Pennsylvania**	**Monterey Regional Waste Management District, California**	**Yakima County, Washington**	**Brown County, Wisconsin**
Population		228,600	304,200	545,700	170,000	250,900	264,500
Tons Disposed		211,749	153,300	558,200	200,000	280,000	254,900
Tons Per Capita		0.92	0.50	1.02	1.18	1.12	0.96
1. Facilities							
a	Landfills	1 MSW (Public)	3 MSW (Public)	1 MSW (Public)	1 MSW (Public)	2 MSW (Public) 2 C&D (Private)	1 MSW (Public) 1 MSW – Under Construction (Public)
b	Transfer Stations	1 (Private)	5 (Public)	1 (Public)	0	2 (Private) 1 (Public)	1 (Public)

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c	Recycling/ MRF	• 2 MRF (Private) • 1 Resource Recovery Building (Public) • 2 Compost (Public) • "Free Paint, Etc. Room"	• MMF/Organics (Public) • MRF (Public) • 5 Compost (Public)	• 1 C&D (Public) • 1 MRF/TS (Public) • 8 Compost (Public) • 3 Compost (Private)	• 1 MRF (Public) • 2 Compost (Public) • 1 Organics AD (Public) • Last Chance Mercantile	• 1 MRF (Private)	• 1 MRF (Public)
d	HHW	1 (Public)	4 (Public)	1 (Public)	1 (Public)	3 (Public)	1 (Public)
e	Waste to Energy	0	0	1 (Public)	0	0	0
f	Renewable Energy	Landfill Gas to Energy	Landfill Gas to Energy	0	LF Gas to Energy AD Biogas to Energy	0	1 - Future

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2. Diversion Programs							
a	Types of Waste Diversion Programs	• Yard Waste • Clean Wood Waste • Organics (food waste) • Recycling • Tires • Appliance / Metal • HHW • Electronics • Batteries • Fluorescent Bulbs • Sharps	• Yard Waste • Organics (food waste) • Recycling • Tires • Appliances / Metal • HHW • Electronics • • C&D • Mattresses/Textiles	• Recycling • Tires • HHW • Electronics • Metals from Ash Recovery	• Yard Waste • Wood Waste • Recycling • Tires • Appliances / Metal • HHW • Electronics • Mattresses • Last Chance Mercantile	• Yard Waste • Wood Waste • Recycling • Tires • Appliances / Metal • HHW • Electronics • Fluorescent Bulbs	• Yard Waste • Wood Waste • Recycling • Tires • Appliances • HHW • Electronics • Pharmaceuticals • Shingles • C&D

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3. Public/Private Partnerships							
a	Types of Public/ Private Partnerships	• Sale of Generated Electricity • Hauler Agreements • Composting • Metal Recovery	Non-Profit	• Sale of Generated Electricity • WTE Operations • Hauler Agreements • Composting • Sale of Water • Metal Recovery	AD Facility CNG Facility	Non-Profit	• Sale of Generated Electricity • Composting • Metal Recovery

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4. Flow Control Practices							
a	Flow Control Model	N/A	Flow Control through the Provincial Municipal Act for residential No Flow control for commercial/ industrial	Flow Control through Solid Waste Management Authority Hauler Agreements and Ordinances	N/A	Flow Control through Interlocal Agreements with all 14 Municipalities	Agreements with communities and businesses
5. Interlocal Agreements							
a	Type of Agreement	N/A	N/A	Solid Waste Management Authority with Board of Directors	N/A	Interlocal Agreements with all 14 Municipalities	Regional tri-County solid waste agreement

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6. Funding Model							
a	Type of Fund	User-Fee	Enterprise	Enterprise	Enterprise	Enterprise	Enterprise
b	Model	MSW $40/ton YW $24/ton Compost $24/ton Electronics $15/unit Tires $3/tire Appliances $9/unit Fluorescent $1/bulb Special Waste $48/ton	MSW $155/ton YW Free System funded through recovery of net costs (after revenue sources like the sale of recyclables) through municipal property taxes	MSW $78/ton YW $30/ton Tires $5/tire Appliances $15/unit C&D $60/ton	MSW $65/ton YW $42/ton Tires $5/tire Appliances $20/unit Special Waste $95/ton Liquid Waste $45/ton	MSW $38/ton YW $19/ton Tires $2/tire Appliances $6/unit	MSW $52/ton YW $37.22/ton Tires $325/ton Appliances $5/unit Shingles $16/ton

Considerations

The following summarizes criteria that will be considered for enhancement by CRLCSWA as potential solid waste management practices and initiatives:

- **Flow Control –** Flow-control practices vary by jurisdictions based on the needs and objectives of each entity and are enacted through agreements and/or ordinances.
- **Planning –** All municipalities have comprehensive waste-planning strategies, which are inclusive of other municipalities within their boundaries.
- **Partnerships –** Successful public/private and public/public partnerships are executed in many of the municipalities that include private non-profit agreements, recycling, and other facility operational agreements.
- **Funding –** The comparison municipalities use enterprise funds to account for revenues and expenditures. Tip fees are the most relied-upon funding source, with additional funds from sale of materials, household taxes, property taxes, and/or grants.
- **Diversion Programs –** The municipalities have comprehensive diversion programs to eliminate waste from their landfills or WTE facilities. The more aggressive diversion programs saw a per capita reduction in waste flowing to landfills, in particular for yard debris, C&D debris, and food waste.

These management practices, along with the Alternative Technologies memo and Summary of Solid Waste Volumes and Projections memo, are intended to lay the groundwork for the Infrastructure Options assessment portion of the Long-Term Waste Management (LTWM) System Evaluation.