Strategy to Relimage Trash

Kent County, Michigan’s Landfill Reduction Plan

November 2016

A road map for public-private collaboration to help solve solid waste challenges
Our Vision: Implement sustainable materials management strategies to reduce dependency on landfill disposal

Our Mission: Foster collaborative and innovative solutions that deliver value to our stakeholders by managing discarded materials to conserve natural resources and promote a healthy, vibrant and sustainable community

Our Values:
- Employees are our most valuable resource and essential in delivering our mission.
- Visitors, customers and employees will receive prompt, courteous service that exceeds expectations.
- We will be innovative in our thinking, thoughtful in our planning and efficient in our execution.
- Community leadership, transparency and public-private partnerships drive our business decisions.
- We are committed to fostering a culture that embraces diversity, inclusion and equity. We believe that our unique differences enrich and empower the lives of all and we will work collaboratively to achieve common goals.
- We will not compromise on safety or environmental compliance.
- We consider today’s actions for tomorrow’s benefit.

Adopted by the Kent County Board of Public Works
August 6, 2015
By changing how we handle our waste, we can generate...

$56 MILLION

370 JOBS

WHAT WE THROW AWAY IN WEST MICHIGAN:

- 2% Glass
- 4% Metal
- 14% Plastic
- 15% Inorganic
- 21% Paper
- 35% Organic

WHAT THE “TRASH” WE THROW AWAY IS WORTH:

- Plastic: $20,270,206
- Metal: $15,057,855
- Paper: $11,702,116
- Textiles: $3,156,177
- MI Deposit: $1,841,995

2020 IMAGINETRASH.ORG 2030

A road map for public-private collaboration to help solve solid waste challenges
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Executive Summary

In the late 1960’s, the Kent County Department of Public Works (DPW) began providing waste disposal solutions for Kent County’s municipalities, businesses and residents. This brought to a close the problematic disposal era of the 1940s–1960’s where lack of oversight and environmental regulation resulted in 29 private and municipally-owned open dumps scattered across Kent County’s landscape. It also was the start of the legacy of two Superfund landfill sites resulting in long-term environmental, social and financial consequences.

Today, the Department provides waste management services with a fleet of processing facilities including the Recycling & Education Center, Waste-to-Energy Facility, North Kent Transfer Station and South Kent Landfill providing an integrated solid waste management system.
History demonstrates the progressive management of discarded material in the region. From piggeries more than a century ago to landfills and finally modern facilities that extract energy from waste and prepare material to be brokered as valuable commodities, this demonstrated leadership in managing discards has moved our communities in the right direction and affirmed the significance of thoughtful solid waste management policy.

The job, however, is far from done. Even with all of this work behind us, nearly 75 percent of our trash still goes for landfill disposal.
In 2015, Kent County disposed of 1.8 million cubic yards of trash, a staggering volume that would fill the University of Michigan’s Big House twice over. This sobering one-year statistic, when combined with the findings of the West Michigan Sustainable Business Forum’s Economic Impact Potential and Characterization study released in 2016 that affirmed 75 percent of what we call ‘trash’ can readily be diverted, is a sure call to action.

As we look ahead to envision what Kent County and what the West Michigan region will look like in the year 2030, the DPW finds itself asking questions about demographics, population growth, economic development, jobs, logistics, best practices, environmental protection, continuous improvement, reuse, recycling, trash, landfill capacity and land use.

It’s time for a paradigm shift. We can no longer perpetuate landfiling discards as the solution in Kent County. Placing valuable material in a landfill and using hundreds of acres of land for this ‘one and done’ purpose is not acceptable. Rather, we need to implement a sustainable materials management strategy where our discards, or “by products”, are not seen as ‘waste’. We need to collectively recover the nutrient value of organics and the commodity value of metal, plastics, glass and fiber; take advantage of opportunities to reuse materials that have intrinsic value; and utilize the energy and fuel value of remaining discards so that landfiling becomes very secondary in this process. Those of us in the waste industry must become more efficient and productive in the management of the materials on our side of the equation.

[KNOWING THAT] 75 PERCENT OF WHAT WE CALL ‘TRASH’ CAN READILY BE DIVERTED IS A SURE CALL TO ACTION...

WE CAN NO LONGER PERPETUATE LANDFILLING DISCARDS AS THE SOLUTION IN KENT COUNTY.
For the past two years, the Department of Public Works has taken a hard look at ourselves and sought the input of our customers, stakeholders and industry thought leaders. The Kent County Waste Reduction Conceptual Plan is a culmination of this effort.

The pages that follow are a road map for a public-private collaboration to solve solid waste issues and establish strategic partnerships where industry and municipal stakeholders will together attract investment in sustainable materials management collection and processing infrastructure to make us a truly sustainable community.
Waste Generated

Kent County residents and businesses landfilled 1.8 million cubic yards (602,083 tons) of waste in 2015, up 6.6% over 2014 and 19% over 2013. According to data released in June 2015 by the Environmental Protection Agency, solid waste generation across the United States averages 4.4 pounds per person per day.

Nationwide, the recycling rate for municipal solid waste (MSW) is over 34%, but Michigan languishes somewhere around the 15% mark.

In 2014, the West Michigan Sustainable Business Forum (WMSBF) received funding from the Michigan Department of Environmental Quality to assess the contents of what Michiganders throw away and the value of this material if it had instead been directed into the recycling marketplace.

Three Kent County DPW facilities participated in the WMSBF research: South Kent Landfill, North Kent Transfer Station and Waste-to-Energy Facility. Among these facilities, the study found that Kent County residents and businesses are literally throwing away $28 million in material value that could have generated 198 jobs throughout the recycling industry supply chain (transportation, distribution,
processing, storage, etc.) had it been diverted to recycling. Further, if Kent County was to add infrastructure to adequately manage organic waste it could expect to divert nearly 75% of what currently goes to landfill or waste-to-energy from Kent County.

The 20x’20/90x’30 Vision
Shortly after the release of the WMSBF Waste Characterization and Valuation Study, Kent County adopted a strategy to rally Kent County residents and businesses to reduce the 602,083 tons of waste going to area landfills in 2015 by 20% by 2020 (to 481,670 tons) and by 90% by 2030 (to 60,210 tons). This initiative, the “20x’20/90x’30 Vision”, was launched in May 2016. With this vision, DPW intends to bring focus, private-public investment and the necessary infrastructure to West Michigan to achieve these diversion goals.
Adopted Waste Hierarchy

Solid waste professionals in Michigan historically focused on policy that ensured adequate landfill capacity needs were met. Past solid waste planning focused on the procedures necessary to site landfill capacity and focused very little, if any, on addressing alternative methods of waste handling.

In 2015, the Michigan Department of Environmental Quality convened the Solid Waste and Sustainability Advisory Panel to guide new solid waste management policy reflecting a sustainable materials management (SMM) approach.

Adopted by the U.S. Environmental Protection Agency and others, Sustainable Materials Management (SMM) focuses on the use and reuse of materials in the most productive and sustainable way across their entire life cycle. SMM conserves resources, reduces waste, slows climate change and minimizes the environmental impacts of the materials we use.
Measuring Recycling in the State of Michigan

The Michigan Recycling Coalition (MRC) completed a state-funded research study in May 2015 to quantify recycling participation in Michigan to measure access to recycling, evaluate participation in recycling, and calculate the rate of recycling for MSW in Michigan.

The MRC team collected information from private and public recycling operations, material recovery facilities, yard waste composting facilities and take-back program operators. The study used baseline data collected from these participants and supplemented data gaps through extrapolation modeling. The result was a better understanding of Michigan’s recycling systems and the learnings used to support state leadership, funding and attract investments to increase availability of low-cost, environmentally beneficial feedstock to manufacturers and improve program performance at all levels.

The study concluded Michigan’s current recycling rate is approximately 15% and that a multi-pronged strategy will be required to attain the state’s minimum 30% goal. It was noted that residential recycling alone will not be enough to meet this goal and that commercial participation in recycling and tracking performance will be needed. Additionally, the report called for better recycling and landfill reporting procedures.

The Governor’s Office, through the Governor’s Recycling Council, is developing a statewide strategy focused on increasing material recovery, providing convenient access to recycling services and recycling market development.

“AS A STATE, WE HAVE ONE OF THE LOWEST RECYCLING RATES IN THE MIDWEST. WE NEED TO LOOK BEYOND OUR RECYCLING OF CANS AND PLASTIC BOTTLES AND CREATIVELY FIGURE OUT WHAT WE CAN DO TO REDUCE OUR WASTE OVERALL.”

GOV. RICK SNYDER
STATE OF MICHIGAN
NOVEMBER 28, 2012
Review of Opportunities for Zero Waste to Landfills for Industries

In August 2015, Gershman, Brickner & Bratton, Inc. (GBB), submitted a report to the Kent County DPW that reviewed opportunities for Zero Waste to Landfill (ZWL) initiatives for commercial manufacturers throughout the Western Michigan region. A leadership group of eight manufacturers, meeting on a routine basis through The Right Place’s Michigan Manufacturers Technology Center, were the nucleus of this research.

GBB found that each of the companies share similar commitments to making Western Michigan a sustainable and responsible place to do business. Each company has implemented rigorous and repeatable processes for recycling and reusing materials to reduce waste in their commercial production and support internal measures to reach ZWL. GBB examined available methods and technology that could be deployed to divert their remaining waste streams from landfilling.

The study identified that three furniture manufacturers participating in the research also shared a similar quantity and content of waste products. When aggregated, wood waste alone accounted for nearly 6,000 tons of waste generated per week. Concentrated, high output, homogeneous waste streams like this provide the potential for sustainable solutions for Kent County.

Study findings also affirmed interest for achieving ZWL and an abundance of non-recyclable by-products in the region, in addition to the wood waste generated by the furniture manufacturers, with high energy value. Also identified were potentially scalable technical solutions with potential to provide a long-term life cycle, a credible and expandable operating capacity that could promote individual, corporate and institutional investment. Technologies included waste-to-energy conversion through various available technologies, development of a resource recovery/environmental park with energy recovery as its focus, and possible development of the third combustion train at the Kent County WTE Facility.
Efficiency Review of the Kent County Integrated Solid Waste Management System

Of the total tons of material discarded by Kent County’s residents, businesses and institutions each year, the Kent County DPW currently manages a significant portion of it (about 450,000 tons) with its various fleet of assets. Approximately 300,000 tons are managed by private companies inside and outside of the County.

The DPW recognizes the importance of its infrastructure and is committed to managing them well. Keeping with this commitment, DPW asked GBB to complete an efficiency review of the Kent County Integrated Solid Waste Management System administered and operated by the DPW. The purpose was to help identify opportunities for improvement within Kent County’s existing infrastructure and services and identify strategies to achieve higher levels of waste diversion and sustainability practices. GBB’s review, completed in October 2015, concluded that Kent County has much to be proud of in the way it operates its solid waste system and increasing recycling rates is possible.
GBB has estimated that the Kent County recycling diversion rate is somewhere around 8-10 percent. The following major actions were recommended to help achieve higher levels of waste diversion:

- Modernize DPW’s infrastructure with upgrades and expanded services, especially the drop-off stations and the Material Resource Facility (MRF)
- Become more engaged in expanding recycling opportunities for both residential and commercial customers throughout the County so greater flows can reach the MRF.
- Study the feasibility of adding C&D materials processing for materials currently received at DPW facilities
- Consider developing a third line for the Waste-to-Energy Facility along with potential alternative energy generating options while preparing for the expiration of the Consumers Energy Power Purchase Agreement in 2022.
- Advance opportunities for Zero Waste to Landfill with major manufacturers in the region, including the development of a resource recovery park on property adjacent to the South Kent Landfill.

**Economic Impact Potential and Characterization of Municipal Solid Waste in Michigan**

Resulting from Governor Rick Snyder’s State of the State call to action to increase the recycling rate in Michigan, the West Michigan Sustainable Business Forum led a coalition of organizations to conduct a study on the composition of municipal solid waste (MSW) currently landfilled/incinerated in Michigan and the estimated economic value of the recyclable material being disposed. Released in early 2016, the study is based on field observation, verifiable market prices for recycled commodities and peer-reviewed academic studies. Study results findings estimate the total value of Michigan MSW disposed each year is upwards of $368 million.
Driven by West Michigan stakeholders, added focus was placed on the West Michigan Prosperity Region (Region 4b; Allegan, Barry, Ionia, Kent, Montcalm, Muskegon and Ottawa). The seven-county region generated 1,046,031 tons of municipal solid waste in 2014. Based on prices obtained by the Kent County DPW, if the materials with value had been extracted it would total approximately $52 million.

Kent County generated 586,105 tons of MSW that was disposed in landfills and incinerators in 2014. The vast majority is disposed of at the South Kent Landfill in Byron Center and the Kent County Waste-to-Energy Facility in Grand Rapids. If the materials with recycled value were extracted, the value would total approximately $28 million.

The study also concluded that a primary benefit of increased recycling is the economic value found from reclaiming materials destined for disposal and selling them to the market.

IF THE MATERIAL OF VALUE, BASED ON PRICES OBTAINED BY THE KENT COUNTY MATERIAL RECOVERY FACILITY, WERE EXTRACTED, THE VALUE WOULD TOTAL APPROXIMATELY $28 MILLION.

![Total Value of Kent MSW Material Disposed ($)](chart.png)
Kent County Board of Public Works Actions

West Michigan has diverse local ownership, a collaborative energy, economic vibrancy, and culture that is supported by philanthropists, manufacturers, retail establishments, restaurants and industry. These influential resources have the ability to come together to affect positive change in the way we manage waste in the region.

Kent County DPW continues to encourage thought leadership and a healthy discussion around the effectiveness of controversial policies that ban specific items or mandate recycling for a constituent or stakeholder including extended producer responsibility (EPR) laws and product stewardship laws.
Introduction to Proposed Implementation Plan

Vision
Kent County is advancing the vision of reducing Kent County-generated waste headed to landfills by 20% by 2020 and by 90% by 2030. This vision, launched in May 2016 as Kent County’s ‘Imagine Trash’ campaign, aims to bring Kent County and West Michigan closer to a circular economy system instead of a linear ‘make-take-dispose’ system.

Admittedly aggressive, this plan is consistent with some of the largest and most progressive communities in the United States including New York City, San Francisco, Austin and Phoenix.

According to the Ellen McArthur Foundation, “A circular economy is restorative and regenerative by design, and aims to keep products, components, and materials at their highest utility and value at all times... A circular economy is a continuous positive development cycle that preserves and enhances natural capital, optimizes resource yields, and minimizes system risks by managing finite stocks and renewable flows. It works effectively at every scale.”

KENT COUNTY IS ADVANCING TOWARD THE VISION OF REDUCING KENT COUNTY-GENERATED WASTE HEADED TO LANDFILLS BY 20% BY 2020 AND BY 90% BY 2030.
**Priority Materials & Diversion Goals**

Kent County’s goal is to divert materials from landfill that provide environmental benefit to conserve landfill airspace and reduce greenhouse gas emissions; have material and/or recyclable value; and/or have energy potential. Significant opportunity exists to divert materials to recover value for reuse, recycling, compost and/or energy recovery.

- **Organics & Yard Waste**
  At least 33% of the waste headed to landfill today is compostable food and yard waste, soiled paper and other organic material. With just a handful of organic material processing facilities in West Michigan and a small market share held by curbside organics collection companies, Kent County sees significant opportunity to develop the market for organics processing to help meet the goal of the 20x’20/90x’30 vision. Using property at the existing South Kent Landfill as well as the expansion property in Allegan County, the DPW can work collaboratively to develop a robust organics processing program, partnering with hauling companies to collect and transport the organic material with the ultimate goal of diverting a larger fraction of organics as a marketable end-product.

- **Construction and Demolition Debris**
  Based on observations at disposal sites and construction sites as well as conversations with construction managers and site workers, the industry is generally in agreement that there are significant opportunities to better utilize the mixed waste that is generated by the construction trades. Though not specifically quantified at this time, the wastes that could be diverted from construction sites include:
  - Corrugated cardboard
  - Whiteboard/Dimensional lumber
  - Pallets
  - Concrete/asphalt
  - New drywall/Gypsum wallboard
  - Shingles
  - Plywood
- Plastic film
- Metals

Some of the markets for these materials are similar to those of the Kent County Recycling Facility and others need development. Feedback from other regions where construction and demolition is processed for recovery (specifically California and Florida) show recovery/diversion rates approaching 90 percent. Though markets currently do not exist for all these materials, Kent County will engage in a dialog with construction industry representatives and others to evaluate the existing system and develop potential changes that would significantly reduce landfilled construction waste.

**Bulky materials** that have market potential including

- **Mattresses**
- **Carpeting**
- **Plastics:**
  - Bulky rigid plastics including 5-gallon buckets, children’s outdoor toys, and other recyclable plastics that require special handling due to size.
  - Film plastic including high-density polyethylene (HDPE) and low-density polyethylene (LDPE) shopping bags, shrink wrap (i.e. around paper towels) and large sheets of shrink wrap (i.e. shrink wrap used to winterize boats)
  - Mixed rigid plastics, including polyvinyl chloride (PVC), polypropylene (PP), polystyrene (PS) from food and beverages that are processed at Kent County’s Materials Recovery Facility but have limited marketability.

Maximize recycling through existing infrastructure and evaluate and resolve missing infrastructure to help manage material that should not be landfilled.
Resource Innovation Park

Research supports that there is market demand for using high-energy value landfill waste to produce energy; that a regional composting facility is needed to address organic matter currently going to landfill; and opportunity exists to divert construction and demolition waste for reuse. One or more of these needs could enable the County to create anchor infrastructure to spur additional development of recycling technologies using County operations, joint-venture with the private sector or private sector operators.

Kent County will move strategically to support the development of an area for private, public and partnerships opportunities to flourish to begin to find solutions to our waste challenges. Named a Resource Innovation Park or reManufacturing Park in other communities, the facility must provide cost competitive logistics and processing capacity to drive customers to use them instead of the relatively inexpensive option of landfilling.

Opportunities at the Resource Innovation Park are diverse and could provide the region with solutions to waste issues that have long been burdening manufacturers, landfills and recycling centers.

Expanding the South Kent Landfill into a facility such as a Resource Recovery Park (RRP) or an Eco-Industrial Park (EIP) is a way to foster the connectivity of the marketplace locally and offer better options for waste reduction to residents and businesses without being a direct participant in those lines of business. The parks help connect generators of various wastes—better viewed as resources—with processors, remanufacturers, and other users of the materials. In other words, Kent County can “provide” additional opportunities without having to “run” the facilities. Due to the special condition of the site being located in another county, Kent County would want to serve as the “landlord” of the EIP. Rent might be based on production, such as revenue, volume, or weight. This subsidizes the tenants as they grow their businesses and helps them weather irregularities in activity such as seasonality or feedstock supply fluctuations.
Kent County owns approximately 110 acres of 200 acres set aside for future landfill capacity. Kent County must determine by 2020 whether the property will be used for landfill or other purposes.
The benefits of hosting a facility and how it fits into comprehensive solid waste management planning:

- Builds environmental industry
  - Employment - leases could stipulate mandatory hiring levels for Kent County residents.
  - Green jobs - recycling and remanufacturing generates many more jobs per ton than disposal.
  - Redevelopment - EIPs are often sited at shuttered facilities such as factories.

- Increases options for residents and businesses to divert waste from disposal
  - Expands capacity for processing of source-separated recyclables and mixed waste.
  - Keep resources at home - not dependent on export.
  - Create a solution to the Green Fence in China - what does get exported is higher value.

Due to the adjacent landfill, the Kent County facility would contain elements of both a Resource Recovery Park (RRP) and an Eco-Industrial Park (EIP).

**A Resource Recovery Park:**
- Takes waste directly
- Processes mixed trash, recyclables, organics, and construction debris
- Usually includes a disposal facility
- Some direct sale, but most outputs are raw materials, fuels, or energy

**An Eco-Industrial Park:**
- Is not a solid waste management facility
- Takes in materials to re-manufacture or further refine them
- Co-locates and connects circular economies
- Some direct sale, but mostly to wholesale or distributors
Developing Circular Economies:
These types of facilities are far more than waste destinations. They are a way to foster self-sustaining economic activity that recovers resources from waste and amplifies them into employment, value and business benefits.

Potential Technology Options
Waste conversion technologies exist for managing low-value materials that remain after recyclables are removed. Locally, the Kent County WTE facility, and a private company, Heat Transfer Technology International (HTI), offer energy conversion technology for mixed waste for energy recovery; additional companies exist on a national basis providing fuel and energy conversion technologies.

- **Thermal breakdown** technology, used at the WTE facility, is a proven technology that combusts waste in chambers with air induction, reaching temperatures up to 2000 degrees Fahrenheit. The Kent County WTE facility has a current processing capacity of 625 tons per day. Heat is converted to energy. After combustion, ash remains as a residue that needs to be landfilled. An option exists to add a third line to the WTE facility increasing process capacity by 312 tons per day and adding 13 MW of electrical generation or steam for export.

- **Gasification/Pyrolysis** technologies use thermal decomposition in the presence of little or no oxygen in temperatures ranging from 400 to 3000 degrees Fahrenheit. Both technologies capture gases that are converted to energy. Gasification decomposes the volatile components of both organics and non-organics, and pyrolysis is better at decomposing volatile compounds from organic substances. Gasification results in an ash residue, and pyrolysis leaves an unreacted carbon char as a residue.

- **Anaerobic Digestion** is a biological technology that degrades organic material in the absence of oxygen. Products include biogas fuel and heat production. The residual liquid digestate can be composted to be used as a soil amendment.
Future Biorefineries are facilities that integrate biomass conversion processes and equipment to produce fuels, power, heat, and value-added chemicals from biomass such as wood waste or other organic materials. It is the environmentally-friendly processing of biomass into a spectrum of bio-based products (food, feed, chemicals, materials) and bioenergy (biofuels, power and/or heat). A biorefinery could, for example, produce one or several low-volume, but high-value, chemical or nutraceutical products and a low-value, but high-volume liquid transportation fuel such as biodiesel or bioethanol (or alcohol fuel), while at the same time generating electricity and process heat, through combined heat and power (CHP) technology, for its own use and perhaps enough for sale of electricity to the local utility. The high-value products increase profitability, the high-volume fuel helps meet energy needs, and the power production helps to lower energy costs and reduce greenhouse gas emissions from traditional power plant facilities. Although some facilities exist that can be called bio-refineries, the bio-refinery has yet to be fully realized. Future biorefineries may play a major role in producing chemicals and materials that are traditionally produced from petroleum.
Resource Industrial Park Financial Model

Currently the Kent County Department of Public Works operates as an enterprise fund and receives no revenue from the general fund. Its revenues are derived from service fees and tipping fees charged for services at the various facilities owned by the DPW. The rates are established and posted at its facilities. Revenue is also derived from the sale of energy and material products. Energy revenues from the WTE facility are shared with the contractor, while revenues from the MRF help offset MRF costs. Most recently there is a service fee for deliveries of recyclables to the MRF.

In the future, when the DPW system is expanded to a resource recovery park at the South Kent Landfill, there will be additional types of materials and customers delivering materials/waste for processing, additional processing and conversion functionalities added, and manufacturing companies that will utilize portions of the materials, fuel, and energy products generated nearby. The additional infrastructure will in fact increase the DPW’s enterprise revenues and expenses even with the traditional revenues that are likely to be derived from the sales of materials, fuels, and energy derived therein.

It will be important to establish additional revenue sources for DPW to stay as a self-funded enterprise as well as continue to have competitive service fees for the waste and materials it receives. Some of these additional sources which should be evaluated and considered include:

- Land lease charges for companies locating in the resource recovery park. Fees could be tied to the value of end products sold in the marketplace;
- System benefit charges to waste generators in the county for having the expanded integrated waste management system and resource recovery park system;
- Development fees from project financings for DPW infrastructure implementation and resource recovery park company financings
As the vision for the resource recovery park concept evolves, it will be important to vet these additional revenue ideas to gage their acceptability to the residents and businesses in Kent County.

Additionally, the DPW has leveraging funds to use to help catalyze the development of this concept.
## Indicators & Targets

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<thead>
<tr>
<th>Task</th>
<th>Start Date</th>
<th>End Date</th>
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<tbody>
<tr>
<td>Launch &amp; execute 20x’20/90x’30 Vision</td>
<td>May-16</td>
<td>Dec-30</td>
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<tr>
<td>Engage community partners to expand availability of recycling</td>
<td>May-16</td>
<td>Jan-30</td>
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<tr>
<td>Determine decision to permit landfill airspace in Byron Township/Allegan</td>
<td>May-16</td>
<td>Dec-20</td>
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<td>Expand SafeChem household hazardous waste program to encourage higher participation and volumes of waste collected</td>
<td>Aug-16</td>
<td>Dec-17</td>
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<tr>
<td>Pilot one-on-one small business assistance for sustainable materials management (partnership with WMSBF)</td>
<td>Aug-16</td>
<td>Jun-17</td>
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<tr>
<td>Issue Kent County Waste Reduction Conceptual Plan</td>
<td>Nov-16</td>
<td>Dec-16</td>
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<tr>
<td>Request to Board of Public Works for Concept/Development Proposals for Resource Innovation Park</td>
<td>Nov-16</td>
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<tr>
<td>Service fees raised for haulers using Kent County Recycling &amp; Education Center to achieve sustainable break-even level</td>
<td>Jan-17</td>
<td>Dec-17</td>
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<tr>
<td>Establish organics processing capacity as a public-private partnership</td>
<td>Jan-17</td>
<td>Dec-18</td>
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<tr>
<td>Explore business-to-business materials exchange</td>
<td>Jan-17</td>
<td>Dec-18</td>
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<tr>
<td>Request Letters of Interest/Requests for Qualifications for development of Resource Park in Byron Township/Allegan County</td>
<td>Feb-17</td>
<td>Jul-17</td>
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<tr>
<td>Evaluate developing a C&amp;D processing line on/adjacent to South Kent Landfill property as a public-private partnership</td>
<td>Feb-17</td>
<td>Dec-19</td>
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<td>Complete 5-year Review Waste Characterization Study</td>
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<tr>
<td>Complete 5-year Review Waste Characterization Study</td>
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## Milestones

<table>
<thead>
<tr>
<th>Milestones</th>
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<tbody>
<tr>
<td>Achieve 20% reduction in landfilled tonnage from Kent County sources</td>
<td>Dec-20</td>
</tr>
<tr>
<td>Achieve 90% reduction in landfilled tonnage from Kent County sources</td>
<td>Dec-30</td>
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Goals & Initiatives

Material Recovery Facility Strategy
The Kent County Recycling & Education Center opened in 2010 with the expectation that recycling tonnage would gradually rise, peaking at 30,500 tons per year after 20 years. With this new single stream facility, new sorting technology and a renewed excitement for recycling in West Michigan, inbound tons of residential recyclables have doubled in just three years and 40,000 tons are expected to be processed in 2016.

Kent County receives residential recyclables from haulers in West Michigan including the City of Grand Rapids, the sole municipal hauler, and from private haulers from at least five of the seven counties surrounding Kent County. Additionally, Kent County has fielded inquiries from other parts of Michigan for recyclable material processing and occasionally accepts material from the Battle Creek, Portage and Kalamazoo areas.
Fluctuation and the recent downward trend in commodity prices have caused significant challenges for the recycling industry. Processers no longer rely solely on the sale of materials to cover debt service, cost of operation and capital refurbishment. In 2016, Kent County established a service fee on all inbound tons of recyclables. Applied to all inbound material regardless of origin the service fee is expected to generate approximately $400,000 in 2016 and, raised to $35-$45 per ton in 2017 will bring the Recycling and Education Center back to break-even, assuming commodity sales remain at current levels.

Goals & Initiatives
To provide West Michigan with processing capacity for residential recyclables, Kent County is working toward the following goals:

*Increase Processing to Maximum of 60,000 TPY.* Kent County hired GBB in 2015 to assess efficiency of operations at Kent County DPW facilities, including the Recycling & Education Center. GBB recommended minor modifications to staffing, equipment settings and equipment additions to maximize efficiency and throughput. Following their assessment, GBB concluded that Kent County’s maximum annual processing capacity is 60,000 tons. This level of processing will allow Kent County the appropriate time to properly maintain equipment and process material. With the expectation that tonnage will increase 3-5,000 tons per year, Kent County may reach annual processing capacity at the existing facility as early as 2020.

Kent County will strive to accept the maximum amount possible with priority given to recyclables generated within Kent County.
**Evaluate new outlets for challenging material streams.** Kent County accepts and processes a variety of materials and markets these items at a value equal to or greater than the cost to accept and process them. This is not always the case, as evidenced by the recent closure of the primary outlet for low-value plastics, the very limited opportunity to sell single-stream-grade film plastics and market challenges for single-stream glass. Kent County will seek out opportunities to work with industry leaders to evaluate alternative outlets for these challenging materials that continue to provide value to the community through landfill diversion but also have consistent market potential.

**Improve quality of recyclables (Right Recycling).** National averages for residue (the material that is placed in recycling carts mistakenly because of misinformed users, intentionally due to a lack of disposal service or the smaller fraction of recyclable materials that cannot be captured by processing equipment) for a single stream recycling facility average 15 percent but have been reported to be as high as 25 percent at some facilities. Kent County’s residue rate in 2015 was 14 percent, rising disproportionally each year, faster than tonnages. 2016 residue disposal costs exceed $150,000 and further handicap Kent County’s ability to operate in cost-neutral way.

To improve inbound recycling quality, Kent County will engage the community to improve the recyclables put in curbside and drop-off containers through a comprehensive outreach plan (see Outreach and Education Awareness Strategy).
Kent County Landfill Strategy

South Kent Landfill in Byron Township, MI opened in 1982 to coincide with the pending closure of North Kent Landfill located in Rockford, MI. Should regional disposal rates continue at their current pace, and assuming economic conditions remain stable, South Kent Landfill will approach maximum capacity in 2030. In anticipation of additional landfill capacity needs, Kent County DPW has purchased 110 acres of nearly 200 acres of property in a footprint designated for landfill expansion. These properties were purchased as they became available on the real estate market. Should this acreage be used for landfill expansion, Kent County Department of Public Works will begin the process of planning, study, design and permitting this expansion by 2020.

Goals & Initiatives

Kent County’s operating philosophy is to preserve landfill airspace and conserve natural resources and is seeking strategies to divert material from the landfill to impact the triple bottom line - social, environmental and financial - creating greater business value.

Kent County will work toward the following landfill diversion goals:

- Maximize the existing footprint for the remaining 13 years of capacity.
- Identify opportunities to divert specific materials from landfill, including organic material, construction & demolition material, recyclable materials, bulky materials and concrete.
With the development of infrastructure, programs and outreach/education on landfill alternatives, waste being landfilled from Kent County will decline. By 2030, when wastes going to Kent County’s landfill are reduced by 90%, Kent County intends to dramatically reduce its role as landfill owner/operator.
1. Waste to Energy ash monofill
2. South Kent Landfill
3. Approximately 200 acres set aside for future landfill
Kent County Waste to Energy Strategy

The Kent County Waste to Energy (WTE) facility began commercial operation in February of 1990 and is integral to Kent County’s zero waste to landfill strategy. Presently the facility meets the disposal needs of the cities of Grand Rapids, Kentwood, Grandville, Wyoming and East Grand Rapids. Processing up to 625 tons of municipal waste daily, the facility recovers energy from 185,000 tons of municipal waste a year, representing 25 percent of the volume generated in Kent County and providing a 90 percent reduction that would have otherwise filled a 150 acre landfill and has recovered 124,389 tons of ferrous metal.

A $65 million investment that today would cost $156 million to construct, the WTE produces 15 MW of renewable, base load electricity – enough to power 11,000 homes in Kent County or the equivalent of the City of East Grand Rapids and Walker. A $4 million retrofit in 1999 was completed to meet new federal air emission requirements and ongoing plant refurbishment will ensure the facility continues to generate electricity well beyond 2022 when the power purchase agreement with Consumers Energy expires.

Goals & Initiatives

- Co-Generation – the facility is capable of generating electricity and/or exporting steam for heating or production needs. Diversifying future outputs may provide the best opportunity for future revenue generation.
- Third line – the facility is presently at capacity but was constructed to accommodate a third combustion train. Depending on the technology used, a third line could
provide an additional 300 TPD processing capacity and generate 13 MW of electricity. This added capacity could be used to process traditional municipal solid waste or industrial/manufacturing byproducts.

- Divert Higher Value (recyclable value) material away from the WTE to achieve optimum BTU – corrugated cardboard, plastic, paper and other recyclable material, particularly from the commercial sector needs to be diverted both to capture highest best use (commodity value), reduce the high heating value (HHV) of the material combusted and provide combustion capacity for alternate materials.

- Increase Special waste – special or “profile” wastes are byproducts from industry that can be combusted for energy production and are often accepted at a higher tip fee that other materials.

**Private/Public Sector Hauler Facilitation Strategy**

As we identify and establish new processing capacity for byproducts (waste) the Department of Public Works is committed to find solutions that foster public/private collaboration and offer value added infrastructure that waste hauling companies can use to service their customers and achieve the 20x’20/90x’30 Vision that enhances profitability for the hauling community.

**Goals & Initiatives**

*Collaborate with hauler community to promote recycling.*

There are approximately 70 licensed waste haulers operating in Kent County. Most of these companies are small, family-owned business that are not vertically integrated with their own landfill. They service their customer’s waste disposal and recycling needs by efficiently scheduling, routing, and collecting waste materials curbside. Many have indicated that it does not matter if they are hauling waste or recyclables as long as they can do it profitably. Kent County DPW is working to create a robust resource conservation and recycling infrastructure providing processing and recovery that enables haulers to create value for their customer, and operate their businesses profitably while increasing the amount of materials recovered.
Increase options for haulers to deliver recyclables with the least cost. The hauling community typically develops customer accounts in a service area for route efficiency and their capabilities. In many cases, this has resulted in service areas that are not solely in Kent County or West Michigan. Kent County will work with haulers to explore other transportation efficiencies, such as transfer stations, to help aggregate organics, C&D and other recyclable materials and keep logistic costs competitive for haulers.

Provide revenue potential for recycled materials delivered to the proposed resource recovery industrial park. Haulers that offer recycling services for standard recyclable materials are sometimes compensated for the materials delivered, generally based on a profit-share agreement. A profit/loss sharing system should be studied for use at the resource recovery park that would allow haulers to receive compensation when markets perform above established revenue benchmarks.

Residential Diversion Strategy
Providing access to recycling to all Kent County residents is important. The Michigan Department of Environmental Quality defines ‘convenient access’ according to the following criteria:

- The county must provide a collection program to each resident through ordinance, public/private partnerships, private-hauler contracting, or a publicly managed program.
- Each community with 10,000 or more people must provide each resident access to curbside recycling.
- In a community without curbside recycling, there must be at least one drop-off location per 10,000 people.

Goals & Initiatives
Improve infrastructure and access to recycling to enable more participation. The West Michigan region experiences similar gaps in infrastructure and access to single stream recycling as many other communities around the nation. Residents in multi-family housing (apartments, duplexes and condominiums) are particularly frustrated by a lack of
recycling opportunities. Residents living in rural areas often lack curbside recycling services and the travel distance to drop-off recycling stations can be a limiting factor for participation. Many educational institutions struggle to implement thoughtful recycling programs that instill values and individual responsibility in their students while not burdening the custodians and teachers with infrastructure deficiencies.

To reduce known service gaps and better determine other barriers to participation Kent County will engage community-based organizations connected to underserved residents to understand deficiencies, learn demographic needs and provide solutions that can will be sustainable.

The following recycling gaps are known: multifamily housing, educational institutions, small business/light commercial, rural residential, public space (parks, thoroughfares, and public community gathering places) and special events.
Providing access to all residents and those with residential-like recyclable material (schools, small businesses), Kent County and partner agencies will work directly with each sector to assess the deficiencies, determine solutions and deploy resources to ensure that anyone who wants to recycle has access.

**Light Commercial, Retail, Small Office**
Small businesses are an underserved population regarding recycling services. Kent County will increase participation and the recycling rate of the commercial/industrial sector in the Western Michigan region served by Kent County facilities. The County will develop technical assistance programs that foster collection and recycling for the small business sector.

**Goals & Initiatives**

*Improve outreach and education to the small business community.* Historically, the light commercial, retail and small office sectors of the business community have been underserved by recycling services, falling outside the scope of residential collection services and also far under-generating the volume of waste compared to a large business. The County will strengthen its outreach and work closer with business organizations in the region to promote recycling to their members and their partners. Numerous research reports (many listed in this strategy) have indicated that a significant volume of recyclable material is still sent to disposal even though there is demonstrated willingness by the business community to improve their recycling efforts. A small business outreach and education program will be initiated to address these issues.

*Provide a small business waste reduction assistance program.* A pilot program is in progress currently with the West Michigan Sustainable Business Forum. Fifty (50) small businesses will be solicited to participate in a waste reduction and recycling assessment of their operations conducted to make recommendations on how to capture a greater portion of the recyclable materials generated. This will include discussions about establishing a “green
team” in the office to advocate for continuous improvement; an assessment of the materials that are easily captured and recycled and suggestions on how to set up the internal and external collection systems to be compatible with materials accepted at the County’s MRF. The objective of this program is to divert a cumulative 5,000 cubic yards of materials for recycling from the participating businesses. If this pilot program is successful, the County will work with partners to establish a permanent assistance programs.

**Commercial, Manufacturing and Industrial Diversion Strategy**

Through the Zero Waste to Landfill work group, Kent County will continue working with the larger manufacturers in the region and partner with them in attaining their corporate Zero Waste to Landfill goals. Provide a safety net that materials recycled at County facilities are best practices and offer local lower risk solutions to using national or global options.

**Goals & Initiatives**

*Offer business users certificates of recycling.* Many larger organizations are concerned about the risk and potential liability of offering their recyclable materials to a broker that moves materials to an offshore processor that causes human health and/or environmental harm. The County can help lessen the problem experienced by regional businesses by offering a location and establishing a set of standardized operating procedures that require operators to use verifiable best practices at the industrial park and issue certificates of recycling to users that demonstrate their materials were not taken to an improper operation.
Outreach and Education Awareness Strategy
Kent County has a well-established solid waste education program offering tours, programs and other opportunities for educators, parents, students and the general public. Annually over 5,000 people visit the Recycling & Education Center and South Kent Landfill for tours by Kent County Resource Recovery staff and over 1,000 people visit the Waste to Energy Facility for tours by Covanta staff. Introducing an awareness campaign through a combination of DPW-hosted programs and partner programs, a broader audience including adults and children will be reached.

Goals & Initiatives
Using the 20x’20/90x’30 vision as the basis for the outreach, Kent County will work with partners on the following initiatives:

**Improve quality of recyclables sent to Kent County’s Recycling & Education Center.** The introduction of single stream recycling to West Michigan in 2010 significantly increased the tonnage of residential curbside recyclables coming to Kent County’s Recycling & Education Center. By eliminating the requirement for residents to separate fiber material from other recyclables, introducing a lidded cart on wheels for increased volume and ease of transporting and storing recyclables, and renewed excitement surrounding recycling are all contributing factors to the growth. A common side effect of single stream recycling, however, is an increase in contamination. In 2015, Kent County landfilled 4,480 tons of material at a cost of $150,000. The source of the contamination is threefold:

- **Wishful recycling,** where someone questions whether something is recyclable and, with good intentions, erroneously includes it in their recycling bin with the hopes that it will get recycled;
- **Opportunist recycling,** where someone takes advantage of the fact that their recycling container now has a lid, no longer enabling neighbors or the hauling company to see the contents of the recycling bin. The recycling container becomes a trash container;
• Process inefficiency due to limitations of the equipment in the recycling facility. Recyclable materials are processed normally but materials that are small in size or not prepared properly are discarded as waste despite their potential to be recycled. This material is considered residue, not contamination, however considering it is disposed of as trash there is opportunity for improvement.

To develop consistency in recycling messaging (i.e. what is recyclable and how to prepare it) and reduce the likelihood of recycling the wrong items, Kent County will engage the community at all levels with outreach materials, support and feedback on “Right Recycling”. This education campaign will provide opportunities for all stakeholders (haulers, municipalities, property managers) to spread the “Right Recycling” message.

To improve the stream of recyclables inbound to recycling processing facilities and to address the three key sources of contamination, Kent County and partners will engage the community with targeted education campaigns. Door-to-door education, place-based education and traditional advertising avenues will educate and inform residents on “Right Recycling”. Marketing materials will be developed in at least two languages (English and Spanish), and possibly more.

**Improve quantity of recyclables sent to Kent County’s Recycling & Education Center.** To maximize the throughput at Kent County’s Recycling & Education Center, Kent County will work with partners to improve access to recycling (see Residential Diversion Strategy) and provide awareness of recycling opportunities to all audiences.

**Create awareness of opportunities to divert waste away from landfills.** As programs and infrastructure are developed to divert waste away from landfills, Kent County will work with existing and new partners to bring awareness of the importance of utilizing the programs.
Coordination with Regional Stakeholders

The Right Place

Grand Rapids Chamber of Commerce

Grand Valley Metro Council
- Obtain support on the opportunities presented by the Kent County Regional Waste Reduction Conceptual Plan
- Communicate Plan to member communities
- Seek suggestions for improvement to attract more strategic partners

West Michigan Sustainable Business Forum

MMTC - Zero Waste to Landfill User Group – The Right Place

West Michigan Environmental Action Council

Air & Waste Management Association of West Michigan

ArtPrize

Michigan Department of Environmental Quality

Surrounding Counties ( Allegan, Ottawa, Muskegon, Newaygo, Montcalm, Ionia and Barry Counties & others regionally)
- Communicate goals and objectives of Regional Waste Reduction Conceptual Plan
- Seek support and participation in ensuring Plan success
- Identify regional resource recovery needs or business development opportunities

Municipalities within Kent County
- Expand single stream recycling cart program outside the City
- Establish a coordinated/consolidated organics management program operated by the County
- Assist in developing a standardized residential recycling program through private haulers
- Provide a lower cost/higher value organics management option
References

1. Measuring Recycling in the State of Michigan

2. Review of Opportunities for Zero Waste to Landfills for Industries

3. Efficiency Review of the Kent County Integrated Solid Waste Management System


5. Ensuring our Future: Energy and the Environment - Governor Rick Snyder

In 2015, Kent County disposed of 1.8 million cubic yards of trash, a staggering volume that would fill the University of Michigan’s Big House twice over. This sobering one-year statistic, when combined with the findings of the West Michigan Sustainable Business Forum’s Economic Impact Potential and Characterization study released in 2016 that affirmed 75 percent of what we call “trash” can readily be diverted, is a sure call to action.

We can no longer perpetuate landfilling discards as the solution in Kent County.

For more information or to support the vision:
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