[NOTE: This document was adapted from a longer one created by the Institute for Local Self-Reliance in Washington, DC, and was edited and shortened for easier readability and more local relevance. The original document was created for a jurisdiction that was facing the probable closure of a waste incinerator within two years so some of the language used might seem slightly off target. However, many of the waste reduction methods presented here can be applied to virtually any municipal or larger wasteshed. A coalition of organizations in Oregon is promoting these practices as more appropriate and safer than existing systems.

Please be sure to check out the Internet links – especially in Appendix A for additional methods.]

Transitioning Toward Zero Waste

Methodology

Review county documents, interview local and State officials, and consult with national Zero Waste experts and managers of Zero Waste programs throughout the country. Do a thorough review of proven, existing programs around the country to select a strategy tailored to the specific needs of Marion County.

As the strategies recommended in this paper are implemented and refined, the need for landfill will diminish; and the landfill will be deprived of organic materials that produce methane.

The following two sections identify the next steps needed to first, reach the goal of approximately 70% diversion. The second section delineates further action that could bring the County to a 90% diversion rate, eliminating almost entirely the need to landfill.

Over a period of years the full implementation of the materials management methods presented below would predictably reduce the overall cost of waste management for the County, and the savings could be redirected to Marion County Environmental Services staff funding and ongoing waste reduction.

Phase 1. Steps for Achieving 70%+ Diversion from Landfill

1.1. Processing Facility Upgrade and Center for Hard to Recycle Materials

Update operating equipment needed to manage increased amount of materials processed at the Recovery Facility, and establish a Center for Hard to Recycle Materials (CHARM) drop off center to manage such items as plate glass windows, plastic bags and bubble wrap, foam packaging sheets, #6 white block foam packaging, big durable #2 plastic, small plastic appliances, metal appliances, mattresses and box springs, bicycle parts, cooking oil, yoga mats, porcelain toilets, sinks & urinals, concrete, paper shredding service and shredded paper, fire extinguishers, and textiles. Much more

efficient and effective technologies are now available for handling and processing recyclable materials.

Check how the City of Berkeley, CA, is working to redesign and upgrade their 8 acre processing center/transfer station into a Zero Waste facility. (See, https://www.cityofberkeley.info/uploadedFiles/Finance/Level_3_-_General/FINAL%2018-11171-C%20-%20Solid%20Waste%20Transfer%20Station%20Feasibility%20Study%20FINAL.pdf .)

1.2 Unit Pricing

Charging households by amount of materials generated provides a direct incentive to recycle and compost.

Materials management services can be paid for through taxes and/or a service fee surcharge. Some 7,000 jurisdictions in the U.S. have implemented unit pricing for collection and processing services, referred to as Pay As You Throw (PAYT), Save As You Throw (SAYT) or Save Money and Reduce Trash (SMART) systems, which charge households based on the amount of materials generated for curbside collection. (See http://www.paytnow.org/ and click the links on that page.)
Source-separated materials can be collected at no or reduced charges to the household. The incentive to recycle and compost is direct. Studies indicate that unit pricing can double a city's recycling rate within one year of implementation. In addition to stimulating more source separation, an overall reduction in waste generation can be as high as 40%.

The city of Worcester, MA, population estimated at 200,000, is a useful example. In 1993, Worcester moved toward recycling and away from incineration by making recycling mandatory and implementing unit pricing. The recycling rate doubled within one year. Since then the city reports savings of $99 million in avoided disposal costs, making savings a far more important economic and financial asset than the market sale of recyclable materials. Unit pricing can also accelerate food scrap composting by encouraging backyard composting, and community scale composting to reduce discarded materials generated by households.

Unit pricing programs can include waivers or reduced fees for low-income residents made affordable by system savings as indicated.

The states of Connecticut and Rhode Island have contracted with Waste Zero, Inc. to assist jurisdictions interested in planning and implementing unit pricing. Carroll County, MD has also contracted with Waste Zero, Inc. to develop a unit pricing pilot program, which is about to commence.

New unit pricing programs in Sweden, Norway, and France use a one-pass system as well. Household collection of garbage, recyclables, and organics are put in color-coded plastic bags. All bags are put in the collected curbside in one truck. The bags are sorted by color and sent by conveyor to recycling, composting and disposal. Labor, fuel, equipment costs and vehicle emissions are reduced. The per capita generation of discarded materials is also reduced.

1.3 Composting for Residential and Commercial Food Scraps; Wood Recovery from Fallen Trees

Explore the feasibility of a static pile compost system for residential organic materials. Prince George's County, MD, recently developed a similar system with the capacity of 85,000 tons annually.

1. Source separation of food scraps and food-soiled papers should be made mandatory for residential and commercial generators.

2. Continue to explore the feasibility of residential food scrap co-composting at sites closer to the source of generation, in consultation with community representatives.

3. For commercial organic materials, work with the private sector generators and haulers to create a 'green zone' for composting companies.

The County should emphasize distributed, or back yard composting and community scale composting as a complement to full scale facility co-composting sites. These strategies will reduce the need for collecting compostable materials curbside for a significant number of households. Food scraps and food-soiled papers are estimated at 15% of household discards. Backyard and community scale composting permanently eliminates these materials from the discard stream. Distribute free or low cost compost bins for yard trimmings at special events. Free or subsidized *closed* food scrap compost bins would alleviate homeowners concerns and increase usage.

Several jurisdictions subsidize the purchase of backyard compost bins for households. Washington, DC plans to offer a $75 rebate on new composting systems and training on how to use them. Through its NYC Compost Project established over 20 years ago, New York City has supported the growth of community compost sites through partnerships with cultural institutions and non-profit organizations, outreach, and education; there is now a network of hundreds of community compost sites, 225 of which are affiliated with the NYC Compost Project. (See https://www1.nyc.gov/assets/dsny/site/our-work/reduce-reuse-recycle/community-composting .)

1. Establish programs and incentives for back yard and community scale composting to be included in the overall plan for composting in the County.

The City of Baltimore has established a wood recovery enterprise at Camp Small in northern Baltimore. This facility receives fallen trees, processes them into marketable logs and wood products for local businesses. This is a municipal enterprise, financed by a $98,000 loan from the city. The investment has already repaid itself after just 2 years of operation.

2. Explore the feasibility of establishing a County wood recovery enterprise

The county should also consider stabilizing any remaining organic fraction of the waste stream through anaerobic digestion of mixed waste residues to get even closer to Zero Waste and further reduce greenhouse gas generation after final disposal in landfill. Anaerobic digestion captures methane generated by organic residuals to avoid gas generation and odors at the landfill. It captures the methane in an enclosed environment where capture is more complete. San Francisco,

CA has a good example of this technology, and Otter Lake Landfill in Halifax, Nova Scotia, Canada uses an aerobic process to similarly accomplish the needed biological stabilization.

1. Research the applicability of properly scaled anaerobic digestion facility for methane recovery from portions of the organic waste stream.

1.4 Construction and Demolition Debris (C&D)

Construction and demolition (C&D) materials should be reused, recycled or donated to non-profit organizations. These materials include asphalt shingles, wood and wood pallets, bricks, dry wall, concrete and glass. Cardboard and scrap metal should be required to be recycled.

C&D recycling and reuse could be made mandatory as in several cities in the U.S. Cities have imposed special permit requirements for companies applying for demolition permits. Companies must put up a bond prior to demolition. The bond is reimbursed when companies show that they have recycled at least 50% of their C&D debris. One jurisdiction, Monrovia, CA, requires 75% recovery of this material derived from building demolition. Austin, TX just passed regulations that phase in mandatory recycling of construction and demolition debris from households and commercial buildings over a two-year period. Portland, OR requires deconstruction of historic or old buildings slated for demolition. Since implementation of the new ordinance, several new building materials yards and deconstruction operators have begun operations in the city.

Require deconstruction, reuse, recovery and recycling of Construction and Demolition (C&D) debris.

1.5 Repair and Reuse

Reuse and repair generate even higher value and less environmental impact than recycling or composting. Based on data in a 2007 report analyzing the discarded materials from the state of Delaware, reusable products were just 3% of the total to start with, and were *worth* $550 per ton after repair and resale.

Reuse is the second highest priority in the waste management plan, after waste reduction. In Frederick, MD, E-End USA is a successful electronic scrap deconstruction company. Second Chance, Baltimore, deconstructs buildings and resells used building materials in its warehouses located in downtown Baltimore. It has grown in the last 13 years to 165 workers, recruited and trained from the city's unemployed and underemployed residents. Humanim is a robust social enterprise that specializes in deconstruction of public housing facilities and other reuse operations that employ challenged and hard-to-employ residents. The nonprofit organization has recently opened Brick+Board, which specializes in sorting and selling materials recovered from deconstructed buildings. The Loading Dock, a nonprofit reuse store, has been operating since 1980. Community Forklift in Hyattsville, MD operates a 30,000 square foot store for used building materials, household goods and antiques. Habitat for Humanity operates "Restores" which make used household goods available to low-income households. eWorks is a private company that has partnered with Melwood, a non-profit social enterprise that employs challenged workers, in Upper Marlboro, MD to deconstruct electronic scrap for resale of valuable parts and alloys.

Cities have also provided sales tax exemptions, grants, and other subsidies to the local reuse sector. Companies such as Oakland's Repair Revolution and East Bay Center for Creative Reuse provide education and technical assistance as well as inspiration for new ideas for reuse. Saint Vincent De Paul, Lane County, OR (SVDP) has established several successful reuse enterprises with 700 workers based in Eugene, OR. Under grants from national foundations they have replicated these enterprises on the East Coast starting 10 social enterprises and creating $10 million in economic activity. SVDP has expressed interest in working with non-profit partners.
Local governments also nurture Repair Cafes, Fix It and Repair Stations, where staff and volunteers train residents. The Digital Rights network is pressing for additional assistance from original equipment manufacturers to provide repair kits and tools to people who purchase their products.

Reuse enterprises have a social impact as they provide income for non-profit organizations to carry out their missions. Also, employment in reuse companies has shown to reduce recidivism rates among employees who are returning from incarceration. In Indianapolis, electronic scrap recyclers at RecycleForce have a recidivism rate of 26%, compared to a citywide average of 76%.

Explore the feasibility of attracting social enterprises to establish a reuse hub in an existing warehouse. Find unused and outdated office parks that might be reused for this purpose.

Phase 2. Recommended Next Steps for Approaching Zero Waste

To be recognized as a Zero Waste community, the County would move from 70% to 90% diversion or greater following the internationally peer-reviewed Zero Waste definition and Zero Waste Hierarchy as defined by Zero Waste International Alliance and Zero Waste organizations around the globe. The following next steps can help the County reach this goal.

2.1 Additional Incentives

In addition to unit pricing, there are other ways to provide monetary incentives for household recycling. Some companies provide vouchers redeemable for dollars at local and brand name stores. Cities provide direct incentives through contests that award $1,000 to households through random inspection of recycling bins. Seattle coordinates a community-level competition with an annual award of $50,000 to the leading recycling community, to be used for community improvements.

2.2 Co-Collection of Source-Separated Garbage, Recyclable and Compostable Materials

The cities of Gaithersburg, Rockville and Tacoma Park, MD, use single stream recycling systems. Co-collection of source-separated garbage, recyclables and compostable materials can reduce the number of trucks needed per collection route; and cities have implemented innovative hybrid collection protocols and equipment.

Toronto uses trucks with two compartments to efficiently collect three streams of materials (garbage, recyclables and organic materials) using one truck over a two-week period. Organics are

collected every week. Single stream recyclables and garbage are collected every other week, respectively.

This system requires that co-collected materials are delivered to one facility for processing of all materials collected; or, that vehicles unload sequentially at designated processing sites.

2.3 Bulky Item Collection

Bulky items can be collected curbside from households which call in for service. Metal objects are recycled, and non-recyclable items are processed at a transfer station. Bulky item collection is an expensive component of any materials management system. The County could increase the volume of the collection of these items and reduce costs by partnering with a non-profit or commercial subcontractor.

Oceanside, CA, in partnership with Goodwill Industries, now repairs and recycles over 50% of bulky items (furniture, appliances, and mattresses) collected through the bulky item pickup system. The Curb UP program allows households to donate their excess products through curbside pickup and delivery to Goodwill Industries. Rather than being dumped forever in a landfill, these materials remain in the community and help provide jobs through Goodwill's services and programs. This reduces the overall costs of this expensive service and nurtures an array of reuse enterprises.

Determine the feasibility of bulky item-reuse strategies to reduce costs of bulky item pick up and disposal and create jobs through reuse.

2.4 Special Events

Jurisdictions can provide planning assistance for special event recycling and composting. The County can make a recycling and composting plan a requirement for obtaining permits for events such as festivals, concerts and fairs. (See https://www.calrecycle.ca.gov/venues .)

Require recyclable and compostable material collection at all special events in the County.

2.5 Product bans, landfill bans and take back programs

Many jurisdictions have banned polystyrene foam, and free plastic shopping bags. Additional products and materials that harm the environment and overload the materials management system have also been banned by various jurisdictions around the U.S. These include aerosol cans, single use food service utensils, polyvinyl chloride food packaging, coffee pods, "brickpack" juice containers and products with phthalates. Outright product bans are typically phased-in to give manufacturers and businesses time to transition to acceptable materials and products. The County could also adopt these bans to further reduce its volume of waste.

Forty-seven states have declared bans on at least one product, including electronic scrap and yard trimmings from the waste stream. In Vermont, a 2015 universal ban on recyclable materials from landfills and incinerators has already resulted in a 5% reduction in the state's overall disposal rate. (See https://ilsr.org/rule/food-scrap-ban/vermont-organics-recovery/ .) Seattle banned significant amounts of recyclable materials from disposal from homes and apartment houses in 2005 that led to a jump in recycling rates from 59% to 71%. Fresno also imposed a ban on disposal of recyclables from businesses in 2005. Their recycling rate jumped from 32% to 64%.

Yard trimmings have been banned from landfills and incinerators in 20 states.

Take back programs established by the San Luis Obispo County, CA Integrated Waste Management Authority works with local manufacturers and distributers to take back products such as paint, household batteries, fluorescent tubes, CFLs, mercury thermostats, sharps (needles), and unwanted pharmaceuticals. The Integrated Waste Management Authority collects those products from the retailers and then sends them for recycling or proper disposal. The distributors of the products reimburse the Authority. (See https://www.iwma.com/about/ordinances/ .) Even though these items do not represent a significant volume of waste they are important to remove because of their toxicity.

2.6 Green Procurement and Source Reduction

Waste reduction measures through purchasing protocols have the following features:

- the purchase of products with reduced waste,
- the purchase of recycled products,
- the purchase of products that are reusable,
- the purchase of products that can be recycled,
- the choice of durable, multiple use products, and
- the use of life cycle costing.

By stating a preference in their procurement protocols, communities can stimulate demand for products that contain recycled materials, last longer, and can be reused. Alameda County, CA saved $120,000 from 2004-2014 by reducing paper use and purchasing recycled paper. Prince George's County, MD, has a checklist of steps local government and businesses can take to reduce waste at its source.

City efforts in this area are well documented by San Francisco's Responsible Purchasing Network. City policies can require labeling or illustrations that identify products that last longer. (See http://www.responsiblepurchasing.org/ .)

Cities have also prepared comprehensive databases on reuse enterprises for citizens and businesses. These range from longstanding organizations such as Goodwill Industries to smaller neighborhood-based Swap Shops. Many universities have established Move Out programs, in which the school provides drop-off containers for students to deposit unwanted, but valuable, clothes, furniture, computers, and appliances. These goods are then delivered to area churches for distribution to low-income residents.

The Procurement Institute, working with the Urban Sustainability Directors Network, (USDN), created the Sustainable Procurement Playbook for Cities. (http://www.responsiblepurchasing.org/purchasing_guides/playbook_for_cities/index.php) The Institute is working with a dozen cities that are benchmarking themselves against the best practices identified.

2.7 Resource Recovery Park (RRP)

A transfer and recycling facility could be integrated into a larger Resource Recovery Park (RRP). An RRP is an industrial park reserved for recycling, reuse and composting companies. They have been

established in Alachua County, FL, (40 acres) and Austin, TX, (100 acres). In Alachua County, FL, the RRP is integrated with the County trash transfer station and material processing center, MRF. California pioneered in establishing Recycling Market Development Zones (RMDZs) in urban and rural areas of the state. (See https://www.calrecycle.ca.gov/RMDZ/ .) Companies that locate in these designated zones benefit from reduced taxes on energy and equipment purchases, low interest loans and loan guarantees. RMDZ's do not have to be contiguous properties. Los Angeles and Ventura County provide RMDZ support to companies that locate on any industrially zoned land in their jurisdictions.

Alameda County, CA has set up a revolving loan fund for recycling businesses through its StopWaste program. The fund is financed by a per ton landfill surcharge and provides grants, loans and technical assistance to help expand existing recycling businesses and attract new ones. The County can possibly finance such a loan fund with state support.

1. Review operations of RRPs in Austin, Alachua County and California; explore interest in state support for a regional RRP.

2.8 Education and Public Awareness

Create a multi-phased education and public awareness program, including in-school instruction and annual public awards programs.

1. Assess and evaluate the current in-school and public awareness programs for their effectiveness; prepare a targeted program developed to increase community participation in under-performing initiatives.

2. Integrate commercial and industrial internships for high school juniors and seniors and community college students into recycling curricula to introduce young people to blue collar and professional jobs and careers in materials management and recycling, composting and reuse.

2.9 Special Arrangements with Selected Companies and Industries

A number of companies and associations provide assistance to cities to expand recycling and add value to recovered recycled materials. Ripple Glass Company and Strategic Materials, Inc. work in several cities to recover high quality glass, even as many companies exclude glass from curbside collection. These companies need the glass for new containers, abrasives, and insulation products. Ripple Glass hauls glass for the glass recycling program in Fayetteville, AR, at no charge to the city. In Nashville, the city initiated a pilot commercial glass recycling with bars and restaurants. Metro Public Works is using its trucks to pick up glass bottles twice a day, seven days a week. The department says it is researching ways to reuse and recycle the glass locally. The Glass Packaging Institute recently initiated a technical assistance program for cities interested in recovering more glass from their discards. Other companies want glass for the abrasives and cement industries.

Baltimore County succeeded in attracting QRS, Inc., which manufactures products from mixed recycled plastic. Baltimore has also attracted RoadRunner, an innovative company that specializes in commercial recycling using existing infrastructure to reduce costs through recycling. (See https://ilsr.org/the-small-private-sector-to-the-rescue-roadrunner-recycling-inc/ .) eWorks is an electronic scrap deconstruction company, which developed a successful program in partnership with Melwood; a non-profit agency that serves challenged workers in Prince George's County, MD.

In Boulder, CO, Ecocycle has developed a working relationship with a mattress recycling company. The non-profit organization serves as a drop off site for mattresses and box springs, which are picked up by the private company. Local environmentalists and legislators are developing a mattress recycling bill for Maryland.

One regional company, Aero Aggregates, Eddystone, PA has commercialized foam glass aggregate production for roadways, and other construction projects. It is seeking sources of glass for its factory.

1. Convene a daylong workshop with companies interested in expanding into the County in conjunction with Business Oregon (State economic development agency).

2. Develop an economic incentive program in conjunction with the Business Oregon and Strategic Economic Development Corporation (SEDCOR in Salem, Oregon).

Conclusion

The County should be able to achieve a 70% recycling rate in 4 to 6 years.

Another four years of work on incentive programs, changing legislation and developing reuse and repurpose strategies both in the public and private sector should bring the County to a 90% diversion rate with very small amounts still going to landfill.

Appendix A: Additional Resources

The U.S. EPA has developed a tool for communities pursuing Zero Waste strategies (with assistance from Zero Waste USA/Zero Waste Brain Trust):
"Managing and Transforming Waste Streams: A Tool for Communities" provides information about 100 different policies and programs with references and examples from around the country. (See www.epa.gov/transforming-waste-tool .) <----BE SURE TO LOOK AT THIS ONE.

Zero Waste USA has developed additional tools and resources and provides Zero Waste trainings and certifications. (See www.zerowasteusa.org)