

Prince George's County Waste Management Review

Final Report

Prepared for the Prince George's County Government

Prepared by the **Environmental Finance Center**



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Introduction

Background and Purpose

The Trash-Free Potomac Watershed Initiative (TFPWI) is a program initiated by the Alice Ferguson Foundation to reduce trash and increase recycling, education and awareness of trash issues in the Potomac Watershed. These goals are being addressed through the Potomac River Watershed Trash Treaty, Annual Potomac River Watershed Trash Summit, Annual Potomac River Watershed Cleanup and Regional Public Education & Awareness Campaign.

Prince Georges County is an active partner in the Initiative. Elected officials from Prince George's County have pledged to collaborate with the TFPWI towards trash reduction, and the Honorable Jack Johnson is a signatory to the Trash Treaty along with 70 additional elected leaders in the region. Prince Georges County is also a partner in the TFPWI anti-litter Regional Public Education Campaign, a seven year program in its first year and currently in the planning stages of the effort.

As a partner in this Initiative, the Environmental Finance Center (EFC) located at the National Center for Smart Growth Research and Education at the University of Maryland has developed a new program to assist communities within the Potomac River basin in their efforts to implement innovative solutions to waste management, thereby reducing impact on local waterways. These efforts have begun with a study conducted on behalf of the Prince George's County Government to identify economic impacts and market-based opportunities related to solid waste management. The end goal of the project is to provide Prince George's County officials with a suite of innovative program management and economic development options related to solid waste and trash management programs.

Research and Analysis Structure

This Waste Management Review consisted of a number of tasks undertaken by the EFC Project Team. First, the Project Team conducted a thorough review of current trash programs run by the County. This review included extensive research and interviews with County personnel from all levels of waste management programs. Based on this review, the EFC has developed a series of recommendations for improving the efficiency and effectiveness of existing programs.¹ In addition, the EFC has provided the County with suggestions on a variety of additional and market-based waste management opportunities.

The leadership interviews that took place with County personnel and waste management experts from the region were designed to assist the EFC Project Team in developing a clear understanding of the status of existing waste management programs in the County. These discussions also enabled the Project Team to assess the feasibility of potential recommendations based on their consistency with and relevance to current trash management programs and policies in the County. The leaders engaged by the EFC Project Team included:

¹ It should be noted that this analysis takes place on a holistic scale that looks at how effectively waste management activities in the county coordinate with one another, as well as with other community priorities. This analysis is not designed to serve as an audit of individual programs at the budgetary scale.

- *Michael O. Brown*, Chief for Special Services Division Department of Public Works and Transportation
- *Obie Patterson*, Living Communities Initiative, Prince George's County
- *Carol A. Bracaglia*, Section Head of Waste Management Division Recycling Section, Department of Environmental Resources
- *Beverly Warfield*, Assistant Associate Director, Department of Environmental Resources
- *Byron McReynolds*, Environmental Task Force, Prince George's County.
- *Joseph Perez*, Prince George's County Police.
- *Maclane Gibson*, Chief, Maryland Environmental Service
- *Richard Keller*, Manager of Recycling, Maryland Environmental Service
- *Steve Tomczewski*, Director Environmental Operations, Maryland Environmental Service
- *Jan Canterbury*, Office of Solid Waste, U.S. EPA
- *Stacey Demers*, Project Manager, SCS Engineers
- *Stephen Kallmyer*, Assoc. Director, University of MD Dept. of Residential Facilities
- *Maria Lonsbury*, Office of Vice President for Student Affairs, University of Maryland
- *Paivi Spoon*, Special Liason to Office of the County Executive for Prince George
- *Juan Torres*, Manager, Cheverly Department of Public Works
- *Dennis O. Bigley*, Deputy Director, Department of Environmental Resources
- *Walker Lunn*, Director, Envirelations,
- *Mark Smallwood*, Mid-Atlantic Green Specialist, Whole Foods
- *Mark Powell*, Assistant Principal, Patuxent Elementary School
- *Marsh Boehm*, Chesterfield Farms, Maryland
- *Elizabeth Chiedi*, Bates Trash Removal
- *Sandra Stafsord*, Director of Donations, The Loading Dock
- *Marcia Rotan*, Coordinator, Oregon Green Schools Program
- *Lucia Athens*, Department of Planning and Development, Seattle, WA
- *Kinley Deller*, Waste Reduction Specialist, King County Green Tools, Seattle, WA
- *Gabriella Uhlar-Heffner*, Planning and Development Specialist, Seattle Public Utilities
- *Shannon McClelland*, Program Specialist, Solid Waste, Department of Ecology, WA

Recommendations

Improving Existing Waste Management Programs

The EFC's initial analysis indicated that overall Prince George's County is managing trash programs and prioritizing waste management issues within the County at a relatively successful level. The total solid waste budget is approximately \$100 million with an estimated \$30 million of that for collecting trash and \$7 million for recycling collection. The County's recycling program has been successful as well. The County has managed to maintain a 37% recycling rate, which is slightly above the national average of 32.5%.²

The EFC Project Team investigated a number of broad waste management categories. These categories serve as the framework for the Project Team's recommendations for improving the effectiveness of existing programs, as well as suggestions for new programs to fill gaps in the County's waste management activities.

Livable Communities Initiative

The Livable Communities Initiative is a strategic plan designed to guide the County in implementing programs that promote cleaner, healthier, and safer communities. Short- and long-term action items that will help achieve this were created as the result of a needs-assessment conducted during the development of the initiative. Although there is no budget set aside specifically for this effort, the Living Communities Initiative also provides an excellent context for the analysis currently underway as a part of this project, as there are actions items addressing a number of waste management issues including blight removal, roadside debris management, code enforcement and outreach.

These action plans related to waste management, however, do not address targeted goals for waste reduction or increased recycling. The consideration of these issues demonstrated in the Initiative's short- and long-term action plans is a good starting point, but true and measurable progress will require specific, focused goals. The Livable Communities Initiative and the addition of the new single-stream recycling strategy provide an opportunity for the County to formulate these goals, and the experience of other municipalities may provide a good context. For example, Denver, Colorado saw an 18% increase in recycling volumes within a year of rolling out of its single-stream collection approach.³ In the tenth month of a twelve-month test run ending in 2005, Dallas, Texas experienced a recycling participation increase of 46% and a pound increase of 120%.⁴ As of summer 2003, Chula Vista, California was collecting approximately 1500 tons of recyclables per month, more than double the rate before a single-stream collection was implemented a year earlier.⁵ The recycling rate in Tucson, Arizona has also more than doubled, from a rate of 9% to 22% citywide, in the first six months after it switched from a multiple- to a single-stream recycling collection system.⁶ Locally, Frederick County

² For 2006, found at <http://www.epa.gov/msw/facts.htm>, accessed December 11, 2007.

³ http://www.rockymountainnews.com/drmn/local/article/0,1299,DRMN_15_4391589,00.html, accessed January 16, 2008.

⁴ <http://www.earth911.org/master.asp?s=lib&a=Curbside/description.asp>, accessed January 16, 2008.

⁵ <http://www.ciwmb.ca.gov/lglibrary/infoCycling/2003/Summer/ChulaVista.htm>, accessed January 16, 2008.

⁶ [http://yosemite.epa.gov/OAR/globalwarming.nsf/UniqueKeyLookup/TMAL6AGPMK/\\$File/EPA%20Dec%2006%202004%20revision.pdf](http://yosemite.epa.gov/OAR/globalwarming.nsf/UniqueKeyLookup/TMAL6AGPMK/$File/EPA%20Dec%2006%202004%20revision.pdf), accessed January 16, 2008.

Commissioners are estimating that the county can reach as much as a 50% recycling rate, up from 39%, if it switches to a single-stream system.⁷

Building on the priorities outlined in the Livable Communities Initiative, “Prince George’s County Goes Green” is a County-wide campaign designed to promote green building and energy conservation practices. This campaign and the associated outreach materials do not appear to incorporate the many ways recycling practices are relevant to these priorities.

Recommendations:

- *Establish incremental goals for trash reduction and increases in recycling as a part of the Livable Communities Initiative* – Having overall goals for waste reduction and improved recycling with incremental benchmarks establishes a level of accountability on these issues that less structured efforts do not. In addition, a clearly identified starting point and formal goals provide a baseline against which progress can be measured.
- *Revise short- and long-term Livable Communities Initiative action items* – Including more specific, goal-focused trash reduction and recycling activities as a part of the action items associated with the Livable Communities Initiative will serve as a roadmap for waste management efforts for the County.
- *Leverage other community priorities to promote trash reduction and recycling increases* – Fully incorporating waste management into web pages and other outreach materials associated with like-minded County campaigns such as “Prince George’s County Goes Green,” “Gorgeous Prince George’s,” and others is an immediate action that can be taken at a very low cost with broad-scale public education results.

Illegal Dumping and Bulky Items

Illegal dumping is a problem for the County’s highway crews, but due to Prince George’s proximity to the District of Columbia and Charles County, it is also a significant problem for remote locations in the County. In fact, there are at least ten designated “hot spots” where large quantities of illegal dumping occur close to the County’s borders.

The County has taken an important first step in addressing this issue with the establishment of the Environmental Crimes Task Force, a joint effort of the departments of Public Works and Transportation (DPW&T), Police (PGCPD), Corrections (DOC), and Environmental Resources (DER) and the State’s Attorney’s Office. This inter-agency partnership has developed an aggressive campaign designed to enforce illegal dumping laws and make it clear that this is a crime that will not be tolerated in Prince George’s County. Additional support comes from the 450 residents and businesses that make up the Community Partnering Program. Those who are found to be illegally dumping are fully prosecuted; there are currently 41 active cases. However, adding these cases to an already strained court system may not be the most efficient use of time or resources to combat this problem.

The majority of the illegal dumping in County hot spots seems to come from handyman service operations and automotive repair facilities. Large quantities of roofing shingles, construction

⁷ <http://www.fredericknewspost.com/sections/news/display.htm?StoryID=68431>, accessed January 16, 2008.

debris and tires are being disposed of at these remote sites, as well as mattresses, large electronics such as televisions, and white goods such as refrigerators, dishwashers and other large appliances. Clean-up and maintenance of these sites are costly for the County.

Recommendations:

- *Develop a coordinated approach to addressing “hot spot” issues.*
 - *Improving signage* – Adding signs that clearly state that dumping at the site is illegal and that the County intends to fully prosecute those who are caught is relatively inexpensive and will provide enough of a deterrent for some individuals. It may be advantageous to have these signs available in both English and Spanish.
 - *Install fencing* – Limiting access to these sites to whatever extent possible with fencing would be a slightly greater investment, but would also deter a greater number of potential violators.
 - *Install video surveillance* – Motion detector cameras would provide enforcement officials recorded evidence of illegal dumping activities at County hot spots. With the per camera costs ranging from \$4,500 to \$7,000, inclusive of mounting poles for stability, installation at all County hot spots is likely impractical. However, “dummy” cameras are available for approximately \$550 and could be rotated through area hot spots with the fully functional cameras. The initial investment in cameras would be offset in the long-term by the reduction in the amount of money the County spends to collect, transport, and landfill or process the trash, tires, and bulky items typically dumped at these sites. Community partnerships could possibly further reduce the costs associated with a video surveillance system. Businesses, homeowners associations, or other organizations may be interested in sharing in the cost of the cameras to realize the benefits of reduced blight and crime in their communities.

- *Address “dead space” areas* – To be most effective, this will need to take place for both existing and potential future “dead space” areas.
 - *Eliminate “dead space” in site-design* – Taking care to consider potential dumping sites in the planning process is a no-cost way of ensuring this issue does not expand into new geographic areas.
 - *Minimize existing “dead space”* – Incorporate greening strategies into designated hot spots to whatever degree possible. Simple landscape features around dead space areas gives the immediate impression these spaces are cared for and maintained and can make them a less likely target for dumping activities. These features can limit the amount of open area available for illegal dumping and beautify the surrounding neighborhood as well. Vacant hot spots could be offered to the surrounding community as collective gardens. This type of neighborhood investment in the hot spot could provide assistance with monitoring of dumping activities and ease surveillance burden on local police.

- *Implement a suite of dumping deterrents County-wide* – In recent months New York City passed legislation that allows for the arrest of illegal dumpers, the impoundment of their vehicles, and a significant increase in the fines they must pay. Twenty-eight

- impoundments were made in the month of December alone.⁸ Components of the New York program that would transfer well to Prince George's County include:
- *Impounding vehicles involved in illegal dumping activities:* In addition to being an effective deterrent, this could also be revenue generating if the length of impoundment were tied to the fee the vehicle owners is willing to pay – with those desiring shorter terms of impoundment required to pay higher fees to obtain their vehicle. Fees collected could then be directed to a fund that would cover the expenses associated with combating illegal dumping such as enforcement, additional surveillance, tip reward monies, and the like.
 - *Significantly increase the fines associated with illegal dumping:* Again, a deterrent that is also potentially a revenue generator as well.
 - *Make illegal dumpers responsible for the clean-up costs in addition to fines:* Making the violator responsible for clean-up expenses reduces the amount of County money needed to address illegal dumping issues.
 - *Create an anonymous toll-free hotline for reporting illegal dumping activities and establish a reward system for tips that lead to conviction:*⁹ This gives local residents and business the opportunity to help police this issue while maintaining their personal safety. In Montgomery County, these calls are routed to the Department of Environmental Protection. In New York City and many other jurisdictions, these calls are routed to code or law enforcement officials.
 - *Expand education and outreach programs to better address illegal dumping:* Making citizens aware of the refuse services that are available in the County as well as the facts about illegal dumping, perhaps in coordination with Keep Prince George's Beautiful, is an inexpensive way to reach a broad audience. These outreach materials should be presented in both English and Spanish.
- *Consider imposing an advanced disposal fee* – Some communities have chosen to remove any at-time-of-disposal fees on white goods, opting rather to impose an up-front fee collected by retailers at the time of sale. Because this fee is rolled into the price of the purchase, disposal of white goods seems “free” to most consumers, thus eliminating one of the major motivations for illegal dumping, yet revenue that can be directed towards the proper disposal of these items is still generated. In North Carolina, for example, a flat \$3 fee is collected when appliances are purchased. Retailers then transfer the funds collected to the State Department of Revenue. After a small set-aside for administrative costs, 72% of these funds are dispersed back to the counties for use in local programs, 20% is directed to a white goods management account that funds supplemental grants for county overruns, and 8% is placed in a waste management trust fund for broader recycling grants.¹⁰
 - *Promote an open dialogue with bulky item suppliers located within County* – The County should establish a cooperative relationship with local mattress companies, home improvement contractors and suppliers, and appliance stores to address the issue of illegal dumping. These companies can assist the County by distributing outreach

⁸ Information on New York City's illegal dumping program is available at <http://www.nyc.gov/html/dsny/html/pr2008/10408.shtml>, accessed January 8, 2008.

⁹ In New York City, individuals providing information that ultimately lead to the conviction or fining of an illegal dumper may receive a bounty of up to half of the fine collected.

¹⁰ Hughes, Jeff. “Paying Up Front for Disposal of Special Wastes.” *Popular Government*. Winter 2003. Available at <http://www.efc.umd.edu/publications/pdfs/Paying%20for%20Special%20Wastes%20article.pdf>, accessed January 19, 2008.

materials, developing solutions that ensure proper disposal of these goods, and supporting potential County initiatives such as an advance disposal fee.

Litter on Roads and Highways

More than 3,900 tons of litter and bulky items are dumped on Prince George's County roads annually from moving vehicles. The County employs a limited number of work crews in the Office of Highway Maintenance for litter control on highways and public roads. The County Executive has doubled this in-house support from fifteen to thirty people. Although this increase in capacity is a recent event and measuring progress in any quantifiable way is not currently possible, this decision will undoubtedly help to reduce trash on publicly maintained roads considerably.

In addition, the County contracts with two companies, Melwood and the Liberty Group, to supplement County roadway litter control crews. Melwood employs litter pick-up crew personnel, while the Liberty Group uses a specially designed vehicle to vacuum trash from roadsides. All of the litter collected is taken directly to the landfill, as separating out recyclable materials is considered overly time consuming.

Recommendations:¹¹

- *Work with current County contractors to identify any opportunity for separation of recyclable materials* – The newly renovated recycling facility in Capital Heights has the capacity to take on more materials than it is currently anticipated to receive. The County should work with the existing contractors to capitalize on this opportunity to redirect waste away from landfills and into the recycling stream.
- *Consider using work crews from the Department of Corrections for separation tasks* – Crews from the Department of Corrections Community Service Program already assist with litter control on roadways, dump sites and other locations. If the obstacle to separating recyclable materials for current contractors is a personnel capacity issue, the County could expand the role of the Corrections work crews to include this task with little additional expense to the County.
- *When current contracts expire, request waste management proposals that include procedures for separating out recyclable materials* – There is no obligation for the current private contractors to separate recyclable materials under the existing contracts. When these contracts are up for renewal, the County should make the inclusion of a separation process for recyclables a requirement in any new contract.
- *Expand use of the Adopt-a-Road and Adopt-a-Highway programs* – Although the County currently participates in these programs, seeking ways to expand the existing program makes good economic sense as the program offers a simple and cost effective way of reducing the burden of collecting litter for the County. A small effort to work more closely with the designated coordinator to get the word out to a greater number of

¹¹ It should be noted that although not specifically listed for highway litter control, many of the recommendations included in the illegal dumping section of this document, specifically those related to putting a suite of illegal dumping deterrents in place, could be easily extended to address highway litter concerns as well. To be truly cost-effective, highway litter control should be considered when developing any implementation plans for these particular recommendations.

businesses, church groups and volunteer organizations could result in a major increase sponsorship.

Parks and Recreation

Although litter control in parks and recreational areas in the County has not presented a major issue to this point, there does appear to be a shortage of receptacles that results in small amounts of localized dumping by park users. In addition, recycling compliance at these facilities is poor. A number of simple improvements could make litter control at parks and recreational areas in the County significantly more efficient.

Recommendations:

- *Place additional trash and recycling receptacles in parks and recreational areas* – Adding a few strategically placed trash and recycling receptacles will serve as a visual reminder to park visitors to properly dispose of waste and make doing so more convenient.
- *Include these facilities in the collection route for recyclables* – Although there will be the additional expense of adding these routes to recycling pick-ups, there will also be the associated cost-savings of diverting recyclable materials away from landfills to recycling facilities.
- *Develop a social marketing campaign to increase proper trash disposal and recycling compliance in parks and recreational areas* – Posting signs and offering brochures with photos of the impact of trash on local wildlife can be a very compelling way of reaching the public and encouraging behavior change. Perhaps the design of the brochure could be an annual competition for County high school photography/graphic design classes and could be tied to a major annual outreach event offered in conjunction with local community organizations.

Transfer Station

By 2011, the County landfill at Brown Station Road will have reached its permitted capacity. Rather than develop a new landfill, the County has chosen to transfer waste to a more modern commercial landfill elsewhere in the mid-Atlantic region. For this, the County will require a transfer facility where refuse can be consolidated for shipping outside of the County. A siting study and community input process for the new transfer station is currently underway and will undoubtedly provide a great deal of insight into how best to meet the waste management needs of the community while addressing community concerns. Although recommendations with regard to the transfer facility should be reserved until full completion of the study, the EFC Project Team does offer a number of suggestions that are most practically considered at this planning stage.

Recommendations:

- *Consider proximity to rail lines in siting the new facility* – Although initially establishing rail connections carries a higher construction price tag, long-term benefits are realized in reduced spending on increasingly expensive fuel and maintenance for hauling vehicles. There are also air quality and highway safety benefits associated with not having a fleet of waste-hauling trucks on Maryland roadways.

- *Consider what types of ancillary facilities might be practical to incorporate into the transfer station site* – The Western Branch Composting Facility receives more than 80,000 tons the County's yard and garden waste annually and, with the assistance of Maryland Environmental Services (MES), composts it into a soil amendment called Leafgro; however, this facility does not have the capacity to compost wood or food waste, which end up in the County's landfills. Now, during the early planning stages, is the most practical time for the County to consider whether incorporating these types of facilities that divert waste from landfills into the design of the new transfer station site makes economic sense for the County. New and market-based opportunities associated with wood waste or food waste recycling are discussed later in this report.

Recycling Programs

Recycling is not mandatory in Prince George's County, but the County currently recycles on a voluntary basis at a rate of 37%, with a 45% diversion rate. This is likely to climb even higher as the County has chosen to use to a more efficient single-stream recycling process. This single-stream system allows for all household recyclable material to be placed into the same collection container, a 65-gallon wheeled cart to be provided to citizens at no charge. It is expected that simplifying the recycling process and eliminating the need to sort materials will result in higher participation from County citizens and a recovery of up to 30% more recyclable materials than the conventional system.

In 2007, the County renovated its 65,000 square-foot Materials Recycling Facility (MRF) in Capital Heights to accommodate this process, making this one of the largest single-stream facilities in the nation and Prince George's County the only jurisdiction in the state of Maryland to own one. The newly reopened MRF has the capacity to process twenty-five tons of recyclables per hour. It is expected to receive 11,000 tons of recyclable material each month, including approximately 7,700 tons of paper and 3,300 tons of co-mingled glass, plastics and metals.

Prince George's County's large businesses have, overall, made efforts to implement recycling programs for their organizations. This, however, does not hold true for the small- to medium-sized businesses located within the County. Although the County offers technical assistance designed to help businesses establish their recycling strategy, few small- to medium-sized businesses typically participate, because it is not economically practical for businesses of this size to adopt such a program, and there are no incentives currently in place to do so.

Multi-family housing units in the County are required to recycle; however, it is the responsibility of the property-owners to establish and maintain the program. Participation from this sector is very low for a number of reasons including building manager resistance, lack of adequate space to set up recycling center, and lack of capacity by the County. There are currently two DER staff members responsible for the more than 600 multi-family properties in the County. At this ratio, individual, site-by-site inspections would take years to accomplish, forcing DER to prioritize enforcement based on citizen complaints to the department.

Recommendations:

- *Restore the Business Recycling Advisory Council* – This is an opportune time to reestablish the business recycling advisory council that existed in the 1990s. This advisory council would be made up of agency staff, business community representatives, conservation organizations, and local citizens and would be tasked with providing input to the County

- on recycling innovations and solutions of relevance to County businesses, particularly those that are small-and medium-sized.
- *Offer additional technical assistance to businesses* – Enhance the technical assistance offered to small and medium-sized business, perhaps with the assistance of MES, to include a suite of services and opportunities such as:
 - *Offer half-day training workshops on setting up a recycling strategy:* Sessions such as these would enable the County to better explain the benefits of recycling and engage more local businesses in establishing programs.
 - *Provide additional assistance in coordinating consolidated recycling programs:* Helping business centers, strip malls, office parks, and corporate campuses work in concert with one another would enable more County businesses to participate in recycling programs at expense levels that are more economically feasible for the small- to mid-size business.
 - *Expand the technical assistance offered to the multi-family housing community*
 - *Increase staff or identify a community partner that can fill this capacity gap* – The County will need at least one more staff person to strengthen and monitor the multi-family housing recycling program. If adding staff is not financially feasible, then perhaps there is a local community organization that could assist with addressing some of these responsibilities. Without an increase in the capacity to implement and monitor recycling for multi-family dwellings, little progress will be made.
 - *Conduct more targeted outreach with this audience* – Educating building managers is the first step in the process. The County could develop “new resident” recycling information packets and make their distribution mandatory. However, relying on building managers alone has not proven to be an effective strategy for the County to date. Successfully getting multi-family dwelling facilities to adopt better recycling programs will require the engagement of more than just the building manager. Having a recycling coordinator for each building could be key to maintaining an effective community recycling program. A coordinator can help enlist the support of residents, building managers, condo associations, and building maintenance staff as well as serve as the point person for outreach efforts.
 - *Build an awards program* – The County can consider offering building managers or owners a one time \$100 award for their assistance in establishing a recycling outreach program at their MFD or for making noticeable improvements in their recycling program. The County can solicit names for nomination of an “outstanding residence” award for communities that have gone above and beyond in their recycling efforts. This award will be an added attraction for environmentally conscious residents seeking a more eco-friendly place to rent and would be an incentive for building managers to improve their current program.
 - *Strengthen regulations and increase enforcement penalties* – A stiff penalty for non-compliant building managers should be implemented. Initially, a violation could lead to a written notice or possibly two, followed by a very stiff penalty with the funds generated used for education and outreach.
 - *Expand the existing recycling program*

- *Make recycling mandatory County-wide* – Recycling is not currently mandatory in the County. Not only do mandatory recycling programs, when coupled with appropriate outreach and education, achieve higher participation rates than voluntary programs, they also ensure a consistent level of recyclable commodities, making the County a more attractive potential source for businesses that contact to purchase recyclable materials.
- *Collect materials not currently permitted* – Although the market value for these types of plastics is unstable, collecting tub-style plastics as a part of the recycling process would divert additional waste from landfills.

Waste to Energy (WTE) Facility

As the name implies, the waste-to-energy process simply refers to any process that generates energy from waste. Typically this is done through incineration, whereby organic materials are burned at very high heat and combust, releasing their energy. Waste-to-energy can also come from processes other than incineration, such as anaerobic digestion and landfill gas recapture.

Prince George's County has been operating their award winning landfill gas (LFG) recapture program at the Brown Station Road Landfill for more than twenty years. The LFG is used to create steam and electricity at the nearby Prince George's County Correctional Facility, as well as generate additional electricity which is then sold to the to Potomac Electric Power Company (PEPCO). A similar facility is operated at the Sandy Hill landfill in conjunction with Waste Management, Inc and Toro Energy, Inc. to provide heat at NASA's Goddard Space Flight Center in Greenbelt. Not only do these programs reduce greenhouse gas and vehicle emissions, but they also provide a significant economic contribution to the County in the form of \$750,000 annually.¹²

Recommendations

- *Look for opportunities to build on the existing program* – Because waste-to-energy facilities, particularly incinerators, are an incredibly expensive and often politically and publicly charged endeavor, it is not recommended to begin a new program from the ground up. However, because Prince George's County has been at the forefront of this industry for over two decades, it may be feasible to expand or duplicate the success of the Brown Station Road facility at an expense that would be quickly countered by the income from the sale of the power generated.

Potential New Program Areas and Market-Based Opportunities

Although regulatory approaches and technological advances provide one set of avenues to achieving waste reduction goals, market-based instruments provide a number of waste management opportunities that must be considered as well. In the context of waste management, market-based instruments are mechanisms that provide either direct or indirect incentives for improved waste reduction or recycling efforts. Because these opportunities operate as a function of marketplace supply and demand, they can often offer desired outcomes more rapidly and at an expense less than that of traditional approaches.

¹² Fickes, Michael. "It's a Gas." *Waste Age*. Penton Media. June 2004. Via http://wasteage.com/mag/waste_gas/ accessed January 30, 2008.

Encouraging Markets for Recycled Products

Getting the residents and businesses of a jurisdiction the size of Prince George's County to actively participate in recycling activities is no small task, and as this report has documented, the County has taken a number of steps to streamline and improve participation levels in these programs. However, making recyclable materials available for collection is only the first step in the recycling process. The County's public education and promotion of "closing the loop," or in other words, purchasing products produced from recycled materials, shows recognition of this fact.¹³

Consumers, both individual and business, have the power to influence the marketplace with their purchases. When consumers show a preference for products with recycled content, it raises the value of the materials collected by the County and can improve the cost-benefit ratio for collection programs. In addition, raising the value of recyclable materials can create new markets for recycled product, reduce disposal of recyclable materials, and improve revenues from recycling programs.

Recommendations:

- *Offer a series of "Buy Recycled" workshops* – Offering a series of programs tailored to specific consumer audiences such as County procurement officers, schools, residents, property managers, and local businesses designed to explain the benefits of buying recycled products and encourage changes in consumer behaviors will improve the market for recycled products and will reduce the flow of recyclable materials to landfills.
- *Lead by example* – Establish recycled product purchasing thresholds for County government, as well as all government vendors.
- *Encourage businesses that promote or offer recycled products to locate in the County* – Offering tax abatement or other incentives to business that already employ green business practices will be a draw for the County.
- *Create an incubator program to spark innovation* – Establish a program, similar to what was done with the County's Technology Assistance Center, designed to foster the development of small-businesses innovations in waste management and recycling. Few are better positioned to address the waste management and recycling issues facing small businesses than a small business itself. Many creative small-scale organizations simply need a little help in overcoming internal capacity gaps.

Source Reduction

Over the course of the last three and a half decades, the amount of waste per capita has nearly doubled, going from 2.7 to 4.4 pounds per person per day. Preventing waste in the first place, or source reduction, is an important part of addressing this trend. Small changes in packaging can have big impact in terms of reductions in waste and toxicity. For example, a redesign of two-liter bottles, which took them from 68 grams to 51 grams, means 250 million pounds of plastic are removed from the waste stream each year. Source reduction does more than reduce waste and save natural resources, though. When businesses practice source reduction, they use fewer raw materials, which is economically beneficial to their bottom line. When consumers purchase in bulk or select products with less packaging, they save money as well.¹⁴

¹³ http://www.co.pg.md.us/government/agencyindex/der/about_recycling.asp , accessed 10 December 2007.

¹⁴ Summarized from <http://www.epa.gov/msw/sourcred.htm>, accessed February 6, 2008.

The Maryland Recycling Act mandates that all counties and Baltimore City recycle 15% or 20% of their waste, depending upon population size. In 2000, Maryland established a voluntary statewide Waste Diversion Rate goal of 40% annually. The State, recognizing the role source reduction plays in waste management, also put a credit system in place whereby counties and Baltimore City can earn credits, anywhere from 2% to 5%, towards this goal by participating in source reduction activities.¹⁵ In the past, Prince George's County has received 4 out of 5 possible percentage points for their source reduction activities. Expanding source reduction activities would better position the County to receive a full five point Waste Diversion Rate credit.¹⁶

Recommendations:

- *Offer grants or low interest loans* – A grant or small loan to a local business or entrepreneur may be all that is needed to launch a new and innovative source reduction practice. In California, the Alameda County Source Reduction and Recycling Board offers mini-grants as well as low-interest loans for source reduction, recycling, composting, processing or recycled market development efforts. While mini-grants are open to all applicants and can fund education programs as well, the loans are available to existing and start-up businesses in the county, can be made for up to five years, and seek to fund projects that will divert waste from county landfills.¹⁷
- *Consider a plastic bag ban* – Plastic bags are at the core of one of the most controversial conversations in source reduction. Not only are plastic bags a major source of pollution, their production uses petroleum products. In fact, a gallon of oil is saved for every 300 bags not produced. Yet, numerous municipalities in the U.S. have tried, and failed, to ban plastic bags. Reducing or eliminating plastic bag use, however, has been accomplished in several foreign countries in a variety of ways. In January of this year, China's State Council implemented a ban on plastic bags, and all stores must be plastic bag-free by June, 2008. The move is slated to save the nation over 37 million barrels of crude oil annually.¹⁸ In Ireland, rather than an outright banning of bags, the 2002 PlasTax places a 20¢ levy on each plastic bag used by consumers, currently this tax stands at 33¢. Within weeks, the use of plastic bags dropped 94% in the country, and since then millions have been raised for recycling programs from the tax revenues collected on the small number of bags that are still distributed.¹⁹ Much of the rest of

¹⁵ Two points are earned for grasscycling programs, while additional points, up to a total of 3 points, can be earned for other source reduction activities. From <http://www.mde.state.md.us/Programs/LandPrograms/Recycling/faqs/index.asp#4>, accessed February 6, 2008.

¹⁶ County data summarized from http://www.mde.state.md.us/assets/document/SR_Checklist_05.pdf, accessed February 6, 2008.

¹⁷ From <http://www.stopwaste.org/home/index.asp?page=530>, accessed February 6, 2008.

¹⁸ It should be noted that China's unique political structure provides the national government a level of authority that makes this type of ban more easily implemented than would be the case in other nations. From <http://www.thedailygreen.com/environmental-news/latest/china-plastic-bags-47010907>, accessed February 6, 2008.

¹⁹ It should be noted that there were no plastic bag manufacturers located in Ireland, so the opposition from the industry was minimal compared to what has been experienced to date in the U.S. Information summarized from <http://www.commondreams.org/headlines04/0721-04.htm> and <http://www.nytimes.com/2008/02/02/world/europe/02bags.html?hp=&pagewanted=all>, accessed February 6, 2008.

the U.K. is considering similar bag measures and Australia is working on plans to eliminate their use by the end of 2008.²⁰

Here in North America, there has been a flurry of proposed regulations and ordinances aimed at plastic bags that have met with mixed success. Proposed bans or bag taxes in Los Angeles, Oakland, and Ontario have failed. New York City, which faced stiff resistance from the business sector, settled for requiring stores that offer free plastic bags to have a collection process in place to recycle them. However, the interest remains. Plastic bag ordinances are currently on the table in Seattle, Hawaii, and a host of other U.S. jurisdictions. And last year, San Francisco became the first city in the U.S. to ban plastic bags, taking 100 million bags out of the waste stream and eliminating the need for 340,000 gallons of oil – the equivalent of taking 140,000 cars off the street for a day.²¹

Retailers are getting involved as well. Whole Foods has plans in place to eliminate plastic bags in all 270 of their stores in the U.S., Canada, and the U.K. by Earth Day of this year. This is estimated to remove 100 million bags from the waste stream by the end of 2008.²² Last year IKEA began charging patrons 5¢ per plastic bag, with proceeds benefiting American Forests, to discourage their use. A similar fee was imposed in IKEA's U.K. stores in 2006 and bag use has dropped 95%. IKEA anticipates that the U.S. program will achieve a 50% reduction in bag use in its first year.²³

Locally, according to data collected by the Alice Ferguson Foundation, plastic bags are one of the most prevalent waste items polluting the Chesapeake Bay and its tributaries. More than 12,000 plastic bags were collected during the course of the 2007 Potomac River Watershed Cleanup. Although most local grocers collect these bags for recycling – in fact Giant, which is based in Prince George's County, recycles 2,200 tons annually²⁴ – the EPA estimates that only 1% of the plastic bags used in the U.S. are actually recycled. Despite failing efforts to ban plastic bag in Annapolis and Baltimore, there is still great interest in the state in addressing this issue, and a County municipality, the City of Hyattsville, is already investigating ways to coordinate with local businesses to promote the use of reusable totes as an alternative to plastic bags. Coordinating with the City and local retailers such as Giant to develop a successful plastic bag reduction pilot program could help make the case for expanding the concept Countywide.

- *Develop outreach activities* – To maximize impact, while minimizing the need for County resources, it would be wise to coordinate these outreach efforts with those aimed at encouraging the market for recycled products and “closing the loop.”
 - “*Think Before You Print.*” A simple “*Think Before You Print*” campaign within the County government and school system could save an enormous amount of paper. Endless emails, reports and memos are printed unnecessarily when electronic formats of these documents would suffice. Encouraging employees to

²⁰ From <http://news.bbc.co.uk/2/hi/asia-pacific/7180365.stm>, accessed February 7, 2008.

²¹ From <http://www.sfgate.com/cgi-bin/article.cgi?file=/c/a/2007/03/28/MNGDROT5QNI.DTL>, accessed February 6, 2008.

²² From http://www.usatoday.com/money/industries/food/2008-01-21-whole-foods-bags_N.htm, accessed February 7, 2008.

²³ From http://www.treehugger.com/files/2007/02/ikea_us_to_bag.php, accessed February 7, 2008.

²⁴ From <http://www.nytimes.com/2007/07/24/us/24plastic.html?partner=rssnyt&emc=rss>, accessed February 6, 2008.

take a moment to consider whether printing is truly necessary or if double-sided printing is possible would help to address this issue. Incorporating the “Think Before You Print” slogan into the signature line of all County emails would help spread the concept beyond the County government. This could potentially be expanded to local businesses and residents.

- *Offer a seminar series:* A “traveling” brown bag series providing information on a number of source reduction issues could be very useful for County employees, procurement personnel, schools, local businesses and the like. Topics could include proper office-place recycling, source reduction considerations during the procurement process, reducing packaging, and more. These session could also be videotaped and uploaded to the County website to have readily available when training new employees or to reach a much broader audience without having to use additional staff time and County resources.
 - *Offer guided shopping tours:* Walking tours of area grocery stores and other retailers can be used as a springboard to discussing packaging, recycling, and “green” shopping habits. A similar program was established in Passaic, New Jersey in an effort to help the region meet waste reduction goals. The sessions were targeted at a variety of citizens groups, school groups, teachers, garden clubs, home owners associations, and the like, and tours were tailored to fit the audience.²⁵
- *Use vendors that reduce waste* – Demonstrating a preference for vendors that reduce unnecessary packaging and eliminate waste where possible will force potential contractors that hope to work with the County to consider their waste management practices. Some communities have put ordinances in place in an effort to encourage vendors to be more responsible. Boulder, Colorado, for example, has expressed a commitment to using the principles of Zero Waste as a guide for decision-making in the municipality. This includes requiring a demonstration of packaging reduction and intended materials reuse in vendor bids.²⁶

Pay-As-You-Throw

Pay-as-You-Throw (PAYT) solid waste management is a market-based waste management strategy which provides a direct economic incentive for citizens to reduce their household waste. Residents are charged for the collection of their trash based on the amount discarded, in a manner similar to how they are charged for other services such as water or electricity usage. PAYT programs tend to complement effective recycling programs because residents are motivated to reduce their trash expenses by recycling a greater portion of their household waste. PAYT programs also have the potential to raise substantial revenue for municipalities, possibly covering the cost of solid waste management programs.

These programs tend to be community specific, but operate on the same basic set of principles. Some communities charge residents for their trash by weight, however the vast majority charge

²⁵ From <http://www.passaiccountynj.org/Departments/naturalresources/envshop.htm>, accessed February 7, 2008.

²⁶ Full language of Boulder’s Invitation to Bid can be found at [http://wwwsearch.bouldercounty.org/search?q=cache:FCCLo0-oG38j:www.bouldercounty.org/rfp/2007/4829-07.doc+packaging&access=p&output=xml_no_dtd&site=All Boulder County&ie=UTF-8&client=www_frontend&proxystylesheet=www_frontend&oe=UTF-8](http://wwwsearch.bouldercounty.org/search?q=cache:FCCLo0-oG38j:www.bouldercounty.org/rfp/2007/4829-07.doc+packaging&access=p&output=xml_no_dtd&site=All+Boulder+County&ie=UTF-8&client=www_frontend&proxystylesheet=www_frontend&oe=UTF-8), accessed February 4, 2008.

by volume, using “regulation” cans, plastic bags, or tags to collect garbage. There are three basic fee structures used in PAYT systems:

- *Proportional*: Residents are charged the same amount of money for each unit they set out for collection (e.g., \$1.50 for each 30-gallon bag).
- *Variable*: Residents are charged a different amount per different-size units of garbage to which they subscribe (e.g., 32- to 64-gallon containers). Subsequent containers cost extra.
- *Two-Tiered or Multi-tiered*: Residents subscribe to a base level of service, for which they pay a flat fee. They then pay a second-tier fee based on the amount of waste they set out, either variable or proportional.

In 2006, over 7,000 communities in the United States used some manner of PAYT to manage their solid waste. In fact, there are 49 such programs in Maryland, constituting 13% of all communities in the State. A report sponsored by the EPA found that “PAYT is the most effective single action that can increase recycling and diversion, and can also be one of the most cost-effective.”²⁷ The same study found that nationwide PAYT reduces residential disposal by an average of 17%.

In a nationwide study of PAYT systems, EPA found that the city of Fort Worth, Texas, with a population close to that of Prince George's County, more than tripled its diversion rate in less than three years. San Jose, California saw the rate of recyclables collected more than double after initiation of their variable rate trash collection system, which serves 186,000 households. Notably, in less than three years, 90% of San Jose residents were satisfied with the program.

Currently Prince George's County residents finance the solid waste management program in the County by means of a fee collected with their property tax bill. Most residents do not likely know how much they are charged for trash pick-up, and while PAYT charges may seem on the surface like an additional tax, it would give residents the power to in fact *reduce* their tax burden while simultaneously improving their environment and the sustainability of their community.

Recommendations:

- *Investigate the feasibility of implementing a PAYT program.* A hybrid PAYT program could potentially serve the dual purpose of increasing the diversion of waste from landfills and generating revenue that could help offset the costs of waste management in the County. EPA has an online toolkit available to municipalities interested in assessing the feasibility of applying a PAYT scheme in their community.²⁸

Prince George's County School System

An enormous amount of glass, paper, plastic, food and other waste is created in school systems. Although potentially time consuming and initially costly, working with the County school system is not only an effective way to address the issue of waste reduction, but also becomes a lesson in stewardship for the students. The school system represents a huge opportunity to reduce waste, improve recycling efforts, and create markets for recycled products. A handful of states and a number of local jurisdictions require some form of recycling from the school systems.

²⁷ Skumatz, L.A. & D.J. Freeman, “Pay as you Throw (PAYT) in the US: 2006 Update and Analyses,” prepared for US EPA and SERA, by Skumatz Economic Research Associates, Superior CO, December 2006.

²⁸ Available at <http://www.epa.gov/epaoswer/non-hw/payt/tools/toolkit.htm>.

Other states and jurisdictions have voluntary waste reduction at schools as a way to meet overarching state or local landfill diversion goals.²⁹

Recommendations:

- *Develop goals for waste reduction in the school system* – Although recycling does occur at varying levels at numerous County schools, creating a uniform program for the County would create efficiencies that reduce implementation costs. Establishing an overall waste reduction target for schools to aim for is important, but allowing enough flexibility for each school to determine exactly how they will reach the goal is also critical. Because of the diversity in student bodies, geographic locations and site-specific limitations, what may work well at one school may not be the best answer for another. Each plan should address:
 - *Source reduction*: With the scale of the school and office supplies and food purchased for schools, there is great potential for small changes to have significant waste reduction impacts. Schools should look to products produced with less packaging and opportunities to down-size food portions as well as the food amounts prepared and purchased routinely. At North Plains Elementary School in Oregon, when portions were made smaller and a “food choice” program was implemented, the school saw a 47% reduction of waste and a 14¢ decrease in the cost per meal.³⁰
 - *Recycling*: Programs to recycle glass, paper, cans, and plastics could be incorporated into existing surrounding neighborhood collection runs. Food waste could be composted on-site as a part of the curriculum or could be folded into a County-scale food waste program.
 - *The use of recycled products*: Purchasing recycled paper products is a great first step, but a diverse array of recycled products would be appropriate for use in school settings. Scrap tires can be used for poured-in-place playground and athletic matting; carpets, flooring tile, and office furniture with recycled content are available from even the most mainstream suppliers; and recycled printer ink and toner cartridges and other office supplies are also available.
- *Begin with a waste composition study* – Conducting this type of study at each school will provide a clear sense of waste sources and relevant methods of waste reduction. It will also provide a starting point against which to measure program success.
- *Solicit buy-in starting from the top* – An important step in making any school recycling program successful will be to gain the support from the school superintendent, administration, all the way through to the custodial managers and the directors of the facilities. A good way to begin is with monthly meetings to talk about what direction the school is taking and how it will be organized. Feedback and support from these groups will be a crucial first step in developing any school-wide program. Teacher buy-in is also essential. Motivate teachers and students through kick off assembly programs, classroom presentations, contests, rallies and class awards.
- *Overcome potential barriers* – Once there is general support from various levels of the school system, understand potential barriers for creating a program and be prepared to

²⁹ The State of California has a particularly useful and effective model established. For more information see <http://www.ciwmb.ca.gov/Schools/WasteReduce/>, accessed February 4, 2008.

³⁰ Found at <http://www.deq.state.or.us/lq/sw/cwrc/success/material/food.htm>, accessed January 24, 2008.

offer solutions. Custodial staff, for example, may not want to add additional work to their existing contract or assigned tasks. Providing an easy pick-up of recycled materials will help this. Bins in classrooms can be emptied by students into a larger cart in the halls. Involve students as much as possible to reduce the workload of custodial staff and develop a sense of stewardship among the student body. Make recycling easy in the school system by offering conveniently located recycling bins or hang blue recycle bags in lunchroom and assign student lunch monitors to help supervise collection of bottles and cans.

- *Offer training* – In-school and web-based sessions, as well as accompanying print materials, for students, teachers, and administrators will be critical to program success. Training can be done in steps. Initial training can be designed for school administration reasons to set up a recycle program, the potential savings to the school on reduced fees, and the ways to implement an effective recycling program. Additional training sessions can be designed for teachers and students to build support and launch the program.
- *Create a recognition program* – An awards program provides an opportunity for the student to take pride in their school and accomplishments as well as to reward their hard work. In addition, gentle competition between institutions can foster program engagement and increase implementation. This will also give a sense of pride to the school and ideally, will carry over into students' homes, creating life-long habits.

Electronic Waste

With technological advances in computers, music players, and other electronics occurring at a breakneck pace, the refuse from discarded, broken or outdated electronic products, also referred to as e-waste, is becoming and increasingly challenging waste management issue. It has been estimated that e-waste accounts for 2% of all of the waste in landfills in the U.S., yet it represents 70% of the toxic garbage in the country.³¹ Improperly disposed of electronics leach lead, mercury, and other toxins, carcinogens, and contaminates into the surrounding environment and aquatic resources.

Electronic items must be disposed of or recycled properly to ensure public and environmental safety, as well as protect the County from future liabilities. Currently, Prince George's County has outsourced the recycling of these materials. Disposal of hazardous material such as e-waste is currently the most expensive line item in DER's recycling budget. The end of analog broadcasting in 2009 will likely encourage the many in the viewing public to replace existing analog sets with digital televisions, rather than opt for the available adapter, spurring the need to have outreach and disposal programs in place as soon as possible.

Recommendations:

- *Establish an advance disposal fee* – An e-waste disposal fee at the initial sale of certain electronics would operate similarly to the one suggested for white goods earlier in this report. Locations such as California and Massachusetts have established programs such as this and use the funds to cover the costs associated with recycling these items.

³¹ From <http://www.motherjones.com/commentary/columns/2007/03/iwaste.html>, accessed December 11, 2007.

- *Consider expanding the used-phones-for-tax-credits program* – This program currently operated by the sheriff's department could be expanded to include other electronics or to reach a broader audience.
- *Facilitate donations to charitable organizations* – Establish a County sponsored donation program connecting usable electronics with local schools, recreation centers, or non-profit organizations in need.
- *Develop partnerships with local retailers to address e-waste issues* – Perhaps the greatest opportunity to address the e-waste with the smallest financial investment would be to work closely with local electronics retailers and manufacturers. This has been done in a variety of ways in other communities. The Illinois Solid Waste Agency has worked with Motorola for the past nine years, collecting more than 750 tons of e-waste such as computers, small appliances, and other electronics at annual collection events.
- *Participate in the Race to Recycle Program* – Race to Recycle is a fund-raising program for accredited K-12 schools in the U.S. Schools collect old and used cell phones and return them to Motorola. Motorola then reuses, refurbishes or recycles the phones and a portion of the proceeds (up to \$21,000 annually) are returned to the school.³²
- *Encourage Waste Management, Inc. to use the MRF facility as a drop-off point for Sony's Take Back Program* – Sony has partnered with Waste Management, Inc. (WM) on a "Take Back" program whereby citizens can bring up to five Sony products to WM drop-off facilities for recycling. Currently, the closest participating facility is in Pennsylvania. The County should work with WM to have the newly renovated MRF facility they manage for the County to become a designated drop-off spot for this program. This is a way of diverting toxic waste from County landfills through an existing program that could be of no cost to the County.³³
- *Improve e-waste outreach efforts* – Development of a cohesive outreach effort that includes the following will encourage the proper disposal of e-waste materials.
 - *Public Education:* Create targeted brochures, workshops, websites and other outreach materials for variety of audiences including general consumers, local businesses, County employees, and the school system that explain the significance and scale of e-waste issues and acceptable disposal methods.
 - *Events Promotion:* There are numerous e-waste recycling opportunities such as local collection events, dedicated retail collection outlets, donation-accepting resellers, and manufacturers' programs already in existence that County residents do not know about. For example, County residents can turn their old and used cell phones into any Staples office supply store and, through CollectiveGood, the phones are recycled and most of the proceeds are donated to the Sierra Club.³⁴ Verizon Wireless, of which there are more than a half-dozen outlets in the County, runs a similar program, HopeLine, whereby recycled phones are given to victims of domestic

³² Information available at <http://www.racetorecycle.com/index.asp>, accessed January 28, 2008.

³³ Information available at www.wm.com/sony, accessed January 28, 2008.

³⁴ Information available at http://www.collectivegood.com/donate_phone_Staples.asp, accessed January 28, 2008.

violence.³⁵ It is likely that most County residents are not aware of these and other existing programs that make it easy to recycle their cell phones and divert dangerous waste from landfills with the added bonus of supporting a good cause with little if any expense to the County.

- *Resale and reuse opportunities:* If establishing a County sponsored donation program is not feasible, then in addition to promoting local e-waste events and retailers, the County should also raise public awareness of resale or reuse opportunities such as Craigslist, Freecycle, or local charitable organizations.

Recycling Food Waste

Organic matter such as food and yard trimmings account for nearly a quarter of the waste in the U.S.³⁶ In fact, it is estimated that as much as \$100 billion of food waste is generated by households, restaurants, grocery stores, schools, hospitals, and commercial institutions across the country, with households contributing \$43 billion of that amount.³⁷ In addition, the EPA estimates that the nation spends another \$1 billion a year to dispose of this excess food.³⁸

Much of the food waste currently disposed of in landfills could instead be composted. Kitchen and floral trimmings, coffee grounds and filters, tea bags, baked goods, and fresh yard waste are an excellent source of nitrogen for composting, while paper cups, plates, cardboard, pizza boxes, saw dust and dried yard waste provide much needed carbon. These materials breakdown in the composting process and the end result is a rich, natural soil amendment that can be used on lawns, gardens, and potted plants. Although the compost industry has traditionally been a public sector operation, private companies are accounting for an increasing share of the compost market. Entrepreneurs are creating “value-added” end-products through the incorporation of additional elements, processing, and marketing. In fact, the price for compost has risen as high as \$26 per ton for landscape mulch to over \$100 per ton for high-grade, bagged retail compost.³⁹

In addition to diverting waste from landfills and creating a very useful, marketable after-product, composting food waste tends to be a less expensive alternative to landfilling this material. Separating food from the waste stream removes one of the heaviest components of trash, reducing the transportation and tipping fees associated with landfilling these materials which are often based on total weight. In addition, although the national average for tipping fees in the U.S. tends to be less than that for composting, in the Mid-Atlantic region, due to rising fuel costs and dwindling landfill space, this is not the case.⁴⁰ Tipping fees at the Brown Street Station facility were raised to \$59 per ton in 2007, while tipping fees at Chesterfield Farms, the only receiving facility in the area, are approximately \$40 per ton. This is the case in some other regions of the U.S. experiencing a similar fuel and landfill crunch as well. In Ann Arbor Michigan,

³⁵ Information available at <http://aboutus.vzw.com/communityservice/hopeLine.html>, accessed January 28, 2008.

³⁶ From <http://www.mde.state.md.us/programs/landprograms/recycling/education/compostinfo.asp>, accessed January 29, 2008.

³⁷ Biocycle Magazine page 27 August 2007

³⁸ From <http://www.epa.gov/epaoswer/non-hw/reduce/wastenot.htm>, accessed January 29, 2008.

³⁹ From <http://www.epa.gov/composting/basic.htm>, accessed February 16, 2008.

⁴⁰ Goldstein, Nora. “Food Composting Overview,” presented at the Mid-Atlantic Organics Summit. Beltsville, Maryland. November 30, 2006.

for example, when a food recycling pilot program was implemented at the University of Michigan a cost savings of 40% to 60% per cubic yard of waste was experienced.⁴¹

Communities across the country are adopting food recycling programs to better manage waste, meet mandated waste reduction requirements, or realize cost-savings. In Orange County, North Carolina, nearly 70 tons of commercial food waste from nearly two dozen restaurants, florists, and grocers is picked up monthly. The scraps are then composted and the end product sold at \$25 per cubic yard. Upon discovering that food and food-soaked paper products accounted for 38% of the city's unrecycled waste, Berkeley, California, implemented a food recycle program. Curbside pick-up began in September of 2007 with the goal of reducing landfill-bound waste by 75% by the year 2010 and the composted materials are to be used by local farmers and landscapers.⁴² PETCO Park, home of the San Diego Padres, has put a food waste collection program in place at the ballpark which composted approximately 90 tons over the course of the 2007 season. The park saves in the neighborhood of \$1200 per home game on reduced waste hauling fees.⁴³

Some communities are rolling out subscription style pilot programs to help offset start-up costs and determine community interest. In Dubuque, Iowa, for example, a refuse analysis estimated that 20% of the trash placed for curbside pickup was food waste. In an effort to maintain their 25% recycling rate, the city is in the initial year of a food waste program slated for approximately 300 participants whereby interested residential customers pay \$1.25 per-month and commercial clients pay between \$5 and \$7.50 per month for curbside pick up of food scraps from April through November. This will then be processed into compost for use by the city and for sale to the general public.⁴⁴

Commercial operations have discovered the cost savings associated with diverting food scraps from the waste stream as well. Whole Foods grocery stores have built their reputation on being eco-friendly, but the company has also found that recycling food waste saves money. Whole Foods recycles food waste at as many of their stores as possible. For their stores in Montgomery County, Maryland, where landfill tipping fees are \$78 per ton, the stores are saving thousands of dollars every month by composting at \$40 per ton. In Portland, Oregon, the commercial food waste recycling program is voluntary, but each year the city publishes a restaurant guide featuring all of the establishments that choose to recycle in an effort to promote both the program and its participants.⁴⁵

The savings from composting food waste extends beyond trash collection fees; there are also significant savings on infrastructure and maintenance costs. Typically, a large portion of food waste winds its way through dishwashers, kitchen sinks, and garbage disposals and ends up in wastewater treatment facilities. Pastas, breads and the like expand and clog pipes; discarded vegetable and various fry oils, as well as other food wastes, collect on the interior of pipes and cause additional damage. Giving the community the option to compost many of these items

⁴¹ Landfilling costs were \$9.59 per cubic yard while composting costs ranged from \$4 to \$6 per cubic yard. Taken from http://www.ur.umich.edu/9798/Apr22_98/cafe.htm, accessed January 29, 2008.

⁴² From <http://www.ci.berkeley.ca.us/pressreleasemain.aspx?id=1096>, Accessed January 29, 2008.

⁴³ This represents a potential savings of close to \$1 million, as the Padres had approximately 80 home games in the 2007 season. From Biocycle's *City Captures, Composts Ballpark Organics* which can be found at http://www.jgpress.com/archives/_free/001465.html, accessed January 29, 2008.

⁴⁴ From <http://www.cityofdubuque.org/index.cfm?pageid=1109>, accessed January 29, 2008.

⁴⁵ From <http://www.portlandonline.com/osd/index.cfm?c=42454&>, accessed January 29, 2008.

would lessen the strain on the sewer system and reduce related investments in the hard infrastructure.

In Maryland, Anne Arundel County is home to Chesterfield Farm the state's only food waste composting facility. A number of waste hauling companies will deliver food scraps to the facility including Bates Trash Service, Allied Waste, and Interstate Waste Service. At the farm, the food waste is then mixed with yard waste materials such as branches, leaves, and grass. It is then put into windrows and turned every few days. The result is a very rich soil used for a variety of purposes. Chesterfield Farms is planning to expand and is currently in the process of identifying an appropriate secondary site in Maryland.⁴⁶ Envirelation, a food waste collection service based in the District, contracts out of state delivery of food waste from private companies.

Recommendations:⁴⁷

- *Establish a food waste recycling program in the County* – Reducing the amount of food waste sent to the landfill will save money and will be a significant help in meeting any waste reduction or diversion goals set as a part of the LCI. Pilot programs in a variety of settings will help identify potential public interest as well as indicate potential cost-savings. In the course of the EFC's research, a number of opportunities arose:
 - *Municipalities*: The town of Cheverly has expressed a desire to learn more about the potential of food recycling and would be interested in piloting a food waste program with the County.
 - *Institutions*: The University of Maryland has an excellent food waste composting program and is eager to work with Prince George's County to build a similar program at other higher learning institutions such as Bowie State University and Prince George's Community College.⁴⁸
 - *Local Schools*: Patuxent Elementary School in Upper Marlboro is a progressive school that has received numerous awards for its environmental efforts. This school has expressed great interest in working with the County to develop a food recycle program and related curriculum.⁴⁹
 - *Local Businesses*: There are a number of progressive businesses located in Prince George's County. IKEA in particular has expressed an interest in adopting a food waste recycling program. The County could work with IKEA to establish a pilot program, one that perhaps looks to link in other smaller businesses in the new and adjacent shopping center into the route to spread collection costs, such Mo's Southwest Grill, Potbelly Sandwich Shop, and Starbuck's. These retailers might not otherwise be able to make specialized food waste pick ups cost effective. Once established, this could serve as a model for businesses County-wide.
 - *Outreach and Partners*: Establish a specific area on the County website that provides additional information on the pilot programs, food composting how-to's, and participating businesses and institutions. Creating a guidebook might be helpful for those who are looking to establish a food waste program independently. In addition, partner organizations like Chesterfield Farms and

⁴⁶ For additional information on working with Chesterfield Farms, contact Marsha Boehm at 410-721-0073.

⁴⁷ It should be noted that the majority of the recommendations listed would qualify the County for additional source reduction credits with MDE.

⁴⁸ For additional information, contact Maria Lonsbury, the University of Maryland's Project Specialist for the Vice President of Student Affairs at 301-314-8441.

⁴⁹ For additional information, contact Mike Powell at 301-952-7700.

Maryland Environmental Services have both expressed an interest in assisting with informational workshops and other outreach.

- *Innovations*: Because separating food waste reduces local costs and provides a marketable after-product, the County's first priority in food waste should be to encourage and promote composting. However, a particularly innovative new technology may be appropriate for locations where participation in a food waste collection program is not feasible. A Korean company, *Waste to Water*, has developed a stainless steel container system containing composting microbes that is relatively small in size as well as affordable. The microbes quickly break down food waste leaving only the water generated from the food waste behind. This grey water is then sent to a wastewater treatment plant or used for irrigation. These systems can process a ton of food waste daily and can be purchased for \$45,000 or leased for \$1,300 a month. Whole Foods is among the many companies that are starting to use these units, particularly in stores where food waste collection is not possible, and anticipates that the savings from tipping fees will quickly pay for the price of the unit.

Construction and Demolition Waste

Hundreds of millions of tons of construction and demolition waste are produced in the U.S. each year. This waste, which includes wood, metal, concrete/mixed rubble, asphalt roofing, and the like, comes from the demolition and renovation of existing commercial and residential structures, as well as the construction of new structures. The majority of this waste is typically disposed of at municipal landfills or landfill specifically created to receive these materials.⁵⁰ The State of Maryland has 14 such landfills and manages more than 2 million tons of this waste annually.⁵¹

There are, however, a variety of ways that construction and demolition waste can be reduced, reused or recycled. A *salvage* process prior to demolition can recover appliances, cabinets, doors, fixtures, flooring, lighting, hardware, lumber, steel beams, machinery, fencing, windows, or other reusable materials and creates little on-site disruption. *Deconstruction* goes a step beyond salvage and includes dismantling the site in a manner that allows for the recovery of reusable building materials such as lumber and windows as well as recyclable materials like glass and metal. Much of the material that cannot be recovered or reused as is can be recycled. *Recycling* programs exist for everything from asphalt shingles, to bricks and concrete, to metals and wood.⁵²

With the scale of growth, development, and redevelopment expected in Prince George's County in the coming years, it is critical that measures be put in place now to encourage the diversion of these materials from landfills. Properly assessing a program's capacity to reduce the amount of construction and demolition that is landfilled will require a clear understanding of the starting point. The County's first step should be to determine exactly how much construction and demolition waste is currently generated in the County.

⁵⁰Information summarized from the US EPA at <http://www.epa.gov/epaoswer/non-hw/debris-new/basic.htm>, accessed on January 7, 2007.

⁵¹ From: http://www.mde.state.md.us/assets/document/SW_Managed_in_MD_Report_CY_2005.pdf, accessed January 31, 2008.

⁵² A directory of participating businesses in the State of Maryland can be found at www.mdrecycles.org, accessed January 31, 2008.

Recommendations:⁵³

- *Evaluate the permitting process* – There may be opportunities to improve the current permitting process to encourage the separation of reusable and recyclable materials. Adding a separate demolition process permit would provide the opportunity to either better regulate – by requiring a deconstruction and waste management plan and compliance report in order to receive a building permit, perhaps tied to a deposit fee that would be returned upon proper completion – or incentivize – by offering a priority or expedited permit for those plans that include salvage and deconstruction prior to demolition. Another option, as has been done in San Jose, California, would be to create a sliding scale or permit rebates for the permitting process, whereby the final fee charged is dependant on the amount of waste reclaimed, reused, recycled or otherwise diverted.⁵⁴

- *Develop incentives for salvage, deconstruction, and other diversion activities* –
 - *Create a “Rewards Points” program* – This type of program would operate similarly to the reward or bonus mile programs offered by many credit card companies where cardholders collect points based on their purchases. A general construction and demolition waste diversion target could be set for projects occurring in the County, and contractors that go above and beyond the targets could collect rewards points that could be used towards expedited permitting, perhaps reduced tipping fees, and the like. This could be coupled with a non-refundable processing fee collected at the time of permit application to help offset the lost tipping fees and additional staff time needed. Points could also be collected for attending training sessions offered by the County, perhaps in conjunction with MES. These sessions could information on deconstruction and other relevant practices and resources. Some jurisdictions have offered a more simplified version of this by offering per-ton tipping fee rebates to contractors who separate out recyclables or deliver their loads to a municipal facility that will do the separating for them.
 - *Consider the use of a regulatory driver for an incentive program* – A regulatory driver can be a very compelling way to encourage program participation. When the state of California passed a law requiring all cities and counties in the state reduce the waste going to landfills by 50% by 2005 or face fines of up to \$10,000 a day, Alameda County raised the bar, setting a county-wide goal of increasing waste diversion by 75% by 2010. One of the steps the City of Piedmont, located in Alameda County, has taken to accomplish this was to establish construction and demolition debris recycling requirements. Projects having a permit value greater than or equal to \$50,000 are required to divert at least 50% of the waste generated. At the time of permit application, a special “drop box” to be used exclusively for separation of recyclable materials is

⁵³ It should be noted that recommendations related to setting up a program with reuse centers, facilitating the use of a materials exchange, and incorporating green building practices are activities that could garner the County additional source reduction credits from MDE as well as LEED accreditation points.

⁵⁴ For more information see: <http://www.sjrecycles.org/business/cddd.htm>, accessed February 4, 2008.

rented from the City's franchised construction debris hauler. When the franchised hauler confirms, following the project, that the contractor has diverted at least 50% of the waste, the City reimburses half of the fee charged for use of the "drop box."⁵⁵ A sliding scale could be used, with greater rebates going to those who go above and beyond the required level of diversion to further incentivize separation.

- *Make better use of available local partners* – There are two major nonprofit organizations in the region that focus on the resale of salvaged materials. Both have expressed an interest in working more closely with Prince George's County in an effort to improve waste diversion in construction and demolition.
 - *Develop a relationship with The Loading Dock* – Howard, Montgomery, Baltimore and Anne Arundel counties all work extensively with The Loading Dock, a 501(c)3 building material reuse center located in Baltimore, to reduce land fill waste and to meet federal requirements of recycled materials percentages.⁵⁶ Established in 1984, The Loading Dock has served as the state's clearinghouse for surplus building materials diverting over 33,000 tons of material from the waste stream and saving low-income housing and community projects more than \$16.5 million.⁵⁷
 - *Develop a relationship with Community Forklift* – Community Forklift is a home improvement center located in Hyattsville dedicated to reselling surplus and salvaged building materials in an effort to reduce construction waste, promote green building practices, and make renovation and development more affordable for low-income communities and residents.⁵⁸
 - *Create a central drop-off point* – Establishing a depot-type facility in the County that would accept reusable and recyclable building materials would simplify the separation process for contractors and other building supply users and encourage greater participation in waste diversion, particularly if the program is voluntary.
- *Consider the role of green building standards* – The U.S. Green Building Council has established a Leadership in Energy and Environmental Design (LEED) rating system which has become a nationally accepted benchmark for green building design,

⁵⁵ Program fact sheet available at http://www.ci.piedmont.ca.us/html/forms/c_d_debris.pdf, accessed December 13, 2007.

⁵⁶ The Loading Dock's Donations Director, Sondra Stafsord has expressed an interest in providing Prince George's Officials a tour of the facility and assistance in establishing a customized program for the County. She can be reached at 410-558-3625 ext. 18.

⁵⁷ From <http://www.loadingdock.org/about/TLDSTORY/index.html>, accessed February 1, 2008.

⁵⁸ The Community Forklift has expressed an interest in becoming more closely tied to waste reduction efforts in its home County. They can be contacted at 301-985-5180. More information is available at www.communityforklift.com.

- construction, and operation. There are LEED rating systems for a variety of construction types and varying levels of achievement within each system.⁵⁹
- *Encourage pursuit of LEED certification* – This can be done in a number of ways:
 - *Regulation* – During the 2007 session, Maryland's General Assembly created the Maryland Green Building Council to develop recommendations on construction and renovation practices that are both resource-conscious and energy efficient. This year, the Administration intends to introduce legislation, based on the Council's recommendations, which would require that all new public schools and any new or significantly renovated state buildings (over 7,500 ft²) meet LEED's silver green building standards. In addition, the University of Maryland has committed to attaining LEED silver accreditation for all new construction. Prince George's County can follow the example set by the State and require all future County buildings and schools meet a certain level of LEED certification.
 - *Incentive Programs* – Arlington County, Virginia has used a combination of incentive and disincentives to encourage greater acceptance of green building practices in the county. Developers whose projects receive official LEED accreditation are able to request building sizes and densities slightly above code – how much above is dependant on the level of certification achieved. In 2003, the county coupled this program with a Green Building Fund. Developers who do not commit to achieving some level of LEED certification are required to make a 3¢ per-square-foot contribution to the fund. These funds are then used to conduct outreach and public education for developers and the community. If the developer ultimately achieves 26 or more points and LEED certification, the contribution to the fund is reimbursed.⁶⁰ A similar program would address a variety of Prince George's County's community priorities.
 - *Develop outreach that addresses these issues* – There will be a public education process that needs to take place for these efforts to be successful.
 - *Launch an education campaign*: Developers and contractors may not be aware of the potential cost savings from incorporating salvage and deconstruction practices into their projects, or of the tax deductions available for material donated to a non-profit organization.
 - *Promote online resources* – The Washington State Department of Ecology manages the website 2good2toss.com, an online materials exchange for varying quantities of used or surplus building materials and household items. The site is

⁵⁹ LEED rating systems exist for new construction, existing buildings, commercial interiors, schools, retail, healthcare, homes, and neighborhoods. For more information, see <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222>, accessed February 3, 2008.

⁶⁰ From: www.arlingtonva.us/departments/EnvironmentalServices/epo/EnvironmentalServicesEpoGreenBuildings.aspx, accessed February 5, 2008.

sponsored by participating local governments who pay a small subsidy to the program and, as with programs such as Craigslist and Freecycle, little oversight is necessary because all transactions take place privately between buyer and seller. The system was designed by iWasteNot Systems, who, for a small fee, provides website services to local communities interested in setting up online waste exchanges.⁶¹ Portland, Oregon's BoneyardNW.com operates similarly, but focuses strictly on construction materials.⁶²

Similar resources are available in the Baltimore-Washington region. The Mid-Atlantic Council on Recycling and Economic Development (MACREDO) focuses on enhancing recycling and economic development opportunities in the Mid-Atlantic region. In addition to creating publications and other information on these issues, MACREDO also operates a directory of businesses that reuse or recycled recovered or surplus building materials.⁶³ MDRcycles.org hosts a similar directory listing Maryland businesses that accept a variety of materials for reuse or recycling. The County is in a position to help the businesses and residents of the community better connect with these opportunities, which results in more waste diversion with little cost to the County.

- Offer training on a suite of green building practices – Whether in person or via web-based videos or seminars, the building, development, and construction community, as well as the general public, need a better understanding of why deconstruction and other green building practices are important and the potential economic and environmental benefits of this practices. The National Association of Home Builders Research Center is located in Upper Marlboro.⁶⁴ They may be able to assist in developing program content and engaging the construction community. The Metropolitan Washington Council of Governments has developed a construction and demolition reuse and recycling guidebook that may be particularly helpful in this process.⁶⁵

Pallets and Other Wood Waste

Urban wood waste, such as sawn lumber, stumps, pruned branches and other tree parts from street and park maintenance, typically accounts for 17% of the total waste received at municipal solid waste landfills. Yet, there is a market for recycled wood waste. Wood waste that is appropriate for composting has a variety of landscape and soil amendment applications. Wood waste that is not appropriate for composting can be chipped and is used biomass fuel, manufacturing feedstock, composite wood products, animal bedding, and pulp and paper products.

Wood pallets account for 4% of all solid waste in landfills. This may be a small portion of the solid waste stream, but pallets merit discussion as they are highly reusable or recyclable and easily diverted from the waste stream. Pallets in good or fair condition can be reused directly

⁶¹ For more information see: <http://www.iwastenotsystems.com/site/>, accessed February 5, 2008.

⁶² For more information see: <http://www.boneyardnw.com/>, accessed January 30, 2008.

⁶³ From <http://macredo.org/>, accessed February 4, 2008.

⁶⁴ For more information, contact the NAHB Research Center: <http://www.nahbrc.org/>.

⁶⁵ For more information see: <http://www.mwcog.org/buildersrecyclingguide/>, accessed February 4, 2008.

or with minor repair, while pallets too damaged for reuse can be recycled in a number of ways. These pallets can be ground into landscaping mulch, fireplace logs, or wood pellet fuel. In addition, some wood pallet recycling companies accepting used pallets are willing to purchase those in reusable condition. There are two such companies in the Baltimore region.

Recommendations:

- *No longer accept pallets or other wood waste at County landfills* – Pallets are easily reused or recycled. Not accepting these items at the landfill will encourage local businesses to develop reuse or recycle plans for their pallets.⁶⁶ If the idea of banning pallets from the landfill entirely is unpalatable, perhaps offering a reduced tipping fee for loads that separate out pallets making their collection and recycling less burdensome for the County would provide incentive to local businesses to do so. The County could then contract pick-up of the pallets with one of the collection agencies in the region or manage the processing of the pallets internally if the County chooses to build a wood waste recycling facility as a part of the new transfer station site or an expansion of the Western Branch Composting Facility.
- *Consider the feasibility of the County handling wood waste internally* – Although Prince George's County has an effective yard waste composting program at Western Branch from which Leafgro is created, this facility is unable to process other wood waste. Development of the new Transfer Station may offer the opportunity to incorporate a wood waste facility, or perhaps expanding the capacities of the Western Branch Composting Facility would be possible. The economic benefits are reduced landfill costs and revenue from the sale of recovered wood waste materials. Collaboration with a neighboring county to reduce costs or providing an incentive for local private business to create this type of facility may make economic sense as well.⁶⁷
- *Develop outreach materials on wood pallets* – Whether the County chooses to ban pallets from the landfill or to put a more voluntary program in place, outreach materials that explain what steps can be taken to reuse and recycle pallets, such as how to establish an in-house tracking, repair and reuse system or creating a pallet exchange network, would be useful for local businesses.

Carpet and Padding

The Carpet America Recovery Effort (CARE) is a joint industry-government initiative focused on increasing post-consumer carpet reuse and recycling. CARE estimates that as much as five billion pounds of carpet is discarded in the U.S. annually. However there are a number of recycling options available. Old and remnant carpet is used in making composite lumber, tile backer board, roofing shingles, railroad ties, automotive parts and more. In addition, recovery of the energy content of carpet is possible, since crude oil is one of the raw materials used. Although recycling carpet costs the average consumer anywhere from 5¢ to 25¢ per pound, every 100 yd² recycled saves 44 gallons of oil, 1 million BTU's, and 450 pounds in the landfill.⁶⁸

⁶⁶ It should be noted that programs that promote pallet reuse could garner the County addition Waste Diversion Rate credits.

⁶⁷ MDE allows properly permitted private entities to operate Natural Wood Waste Recycling Facilities. For more information see: <http://www.mde.state.md.us/assets/document/factsheets/woodwasterecy.pdf>.

⁶⁸ Summarized from www.carpetrecovery.com, accessed January 30, 2008.

Some national carpet brands, such as Mohawk, are now facilitating the recycling of used carpets as a part of their customer service offerings. Through their ReCover program, Mowhawk arranges for the collection and recycling of post-consumer carpets made by any manufacturer.⁶⁹ Locally, there are two companies in the Baltimore-Washington region that recycle carpet and carpet padding. The Foam Recycle Center, with locations in Baltimore and Forestville in Maryland, and Alexandria, Virginia, provides clients with a separate dumpster for carpet padding, which they will haul away and arrange for the contents to be recycled. RM Brokerage in Alexandria, Virginia operates similarly but specializes in old and unused carpet. They provide a specialized collection container and will haul carpet away for recycling as well.⁷⁰

Recommendations:

- *Determine how much carpet and padding waste is generated* – As a first step, the County will need to quantify how much carpet and padding is landfilled in order to determine whether a diversion program is necessary. This will also provide a baseline against which future success can be measured.
- *No longer accept carpet and padding at the landfill* – There are a variety of products that carpets and padding can be recycled into. Not accepting these items at the landfill will encourage local businesses and carpet retailers to develop reuse or recycle plans for these items. If the idea of banning carpets and padding from the landfill entirely is not feasible, perhaps the County could work with the Foam Recycling Centers and/or RM Brokerage to arrange to have separate containers available for carpet and padding and charge a tipping fee that would cover the cost of having these companies recycle the materials.

Municipal Solid Waste Composting

Composting allows natural biological process to breakdown organic waste, such as food scraps and yard waste, into soil-like materials that can then be used in a variety of landscape and roadway applications. Composting municipal solid waste provides another alternative to disposing of garbage in landfills. According to the Environmental Protection Agency, nearly 60% of the municipal solid waste in the country is compostable materials.⁷¹

In the 1990s, Prince George's County considered building a municipal solid waste composting facility, but the technology was not advanced enough to warrant construction. With the technological advances that have taken place since that time, the concept may merit further exploration. Researchers at North Carolina State University, however, have indicated that producing compost from municipal solid waste costs approximately \$50 per ton. Investing in a solid waste composting facility may make economic sense if landfill costs per ton are significantly higher than the cost of compost production or mandated waste diversion goals must be met.⁷²

Recommendations:

⁶⁹ For more on this program see: <http://www.themohawkgroup.com/pages/PDFs/recover.pdf>, accessed February 6, 2008.

⁷⁰ For more on the Foam Recycle Center, see www.recyclefoam.com or call 1-800-787-3626. For more on RM Brokerage, see www.rmbrokerage.com or call 703-370-3638.

⁷¹ Including paper waste, found at <http://www.epa.gov/msw/compost.htm>, accessed December 11, 2007.

⁷² Renkow, M. and A. Robert Rubin. *Municipal Solid Waste Composting: Does It Make Economic Sense?* Applied Resource Economics and Policy Group, North Carolina State University. 1996. As found at <http://www.bae.ncsu.edu/programs/extension/publicat/arep/2arep963.html>, accessed on December 11, 2007.

- *Consider partnering with another county to build a MSW composting facility* –Constructing an MSW composting facility is an incredibly expensive endeavor, the economical feasibility of which for Prince George's County will depend on how the cost-per-ton of composting compares to that of landfilling or if waste diversion thresholds are made mandatory. If it is determined that a MSW composting facility does make good economic sense for the County in the long-term, sharing the construction costs and responsibilities with a neighboring county may make the effort more politically and economically palatable in the short term.

Scrap Tires

Nearly 5.6 million scrap tires are created in the state of Maryland annually. In addition to costing taxpayers and private property owners hundreds of thousands of dollars to clean-up each year, improperly disposed of tires can be the source of a variety of public health and environmental problems. They create breeding grounds for mosquitoes and rats, present a fire hazard, and emit hazardous oils and soot into local habitats when burned.

In 1991, the Scrap Tire Recycling Act was passed by the Maryland General Assembly establishing a licensing procedure for the collection, hauling, recycling, and processing of scrap tires. This act also put an 80¢ per tire recycling fee on the initial sale of each new tire in the state. These proceeds support the Maryland Department of the Environment's (MDE) Scrap Tire Program and to provide funding for scrap tire recycling research and market development.

There are more than 3,000 scrap tire collection outlets in the state of Maryland, 395 of which are located in Prince George's County. Currently, the County has used tires hauled to the I-95 Energy Resource Recovery Facility, one of the largest waste-to-energy facilities in the country. This facility is operated by the Fairfax County Division of Solid Waste Disposal and Resource Recovery and is privately owned by Covanta Fairfax, Inc., a subsidiary of Covanta Energy.

Used tires have served as a supplement to conventional fossil fuels and biomass in this country since the early 1970s. Tires produce the same amount of energy as oil and 25% more energy than coal, making it a cheap and attractive fuel source. Tire-derived fuel (TDF) is appealing for industrial processes because it has a heating value range of 12,000 to 16,000 BTUs per pound, favorable emissions test results, lower moisture content and a cost that is typically cheaper in comparison to coal. TDF has been employed in a variety of industries including cement plants, pulp and paper mills, electric utilities, and industrial boilers, as well as dedicated tire-to-energy facilities. In 2001, the TDF market used more than 115 million scrap tires, accounting for 52% of the total scrap tire use nationally that year.⁷³ However, regulatory and initial investment considerations may make TDF in Prince George's County infeasible.

Recommendations:

⁷³ http://wasteage.com/mag/waste_tire_mire/ accessed on December 11, 2007.

- *Examine opportunities for scrap tire reuse for purposes that meet other County priorities such as fuel, playground material, sound absorptive material, or equestrian footing*⁷⁴ –
 - *Fuel Applications:* Development of a tire recycling facility would be undoubtedly expensive, even if the facility were to focus on shredded tire applications rather than TDF applications, and it should be noted that none of the 395 certified scrap tire collection outlets in the County possess “recycler” or “derived fuel” licenses. However, MDE has expressed an interest in facilitating closed-loop recycling systems, and the scrap tire market offers a number of opportunities for this, particularly in the realm of incorporating scrap tires into public playgrounds, highway sound absorption systems, and equestrian facilities.
 - *Recreational Applications:* Ground tires, or crumb rubber, can be incorporated into a number of poured-in-place surfaces and are used in running tracks, stadium playing surfaces and playground covers. This application has clear potential for the County’s parks, recreational areas, and schools. These surfaces are appealing because they tend to absorb impact that would otherwise be absorbed by the body, thereby reducing injuries and improving performance.⁷⁵ MDE, MES, and the State Department of Education work jointly on school playground renovation projects that feature scrap tire products. Approximately ten schools are selected for this program annually.
 - *Transportation and Infrastructure:* Fourteen states have used tire derived aggregates (TDA) as a subgrade or embankment fill in road construction, as well as for backfill for walls and bridge abutments. In addition, TDA has been used in Colorado and California to absorb the ground-level vibrations from rail and passenger cars that tend to reemerge as noise pollution.⁷⁶ In Maryland, MDE, the State Highway Administration and MES have created a sound wall barrier that incorporates rubber chips along I-95 in Baltimore County. Long-term monitoring of its effectiveness is underway.
 - *Equestrian Applications:* Perhaps, the most unique application of scrap tire product is in the equine industry. Horse arenas in Washington state and Virginia, as well as Canada and the United Kingdom, are turning to arena footing and equine matting materials created from crumb rubber and, according to a study at Penn State University, doing so at a price that is comparable to sand and stone dust surfaces.⁷⁷ These surfaces also offer reduced maintenance costs in comparison to other surfaces.

⁷⁴ The EFC recommends use of mat or poured-in-place products rather than loose rubber mulch which is likely to wash away and create additional waste issues.

⁷⁵ Data summarized from the Rubber Manufacturers Association’s *US Scrap Tire Markets 2005*, go to https://www.rma.org/publications/scrap_tires/index.cfm?PublicationID=11453&CFID=18742197&CFTOKEN=63388402 to download, accessed January 9, 2008.

⁷⁶ See note 7.

⁷⁷ From <http://www.das.psu.edu/user/publications/pdf/ub038.pdf>, accessed January 9, 2008.

The Maryland horse industry has a \$1.5 billion economic impact, a good portion of which is tied to Prince George's County, home to one of the state's premiere equestrian facility – the Show Place Arena and Prince George's County Equestrian Center in Upper Marlboro. A 2002 census conducted by the USDA indicated that the horse industry in Maryland exceeds that of both Kentucky and Virginia.⁷⁸ With Maryland's horses valued at \$680 million, it would seem that there would be support for the use of a product designed to minimize discomfort and injury to the animal.⁷⁹ In Maryland, scrap tire applications have been used in horse arenas at the Fair Hill Equestrian Park in Cecil County and the Maryland State Fairground in Baltimore County. Perhaps a manufacturer of these products would be willing to donate, or create at a reduced cost, a demonstration site at the Equestrian Center in an effort to break into this market.

- *Explore opportunities to work in partnership with MDE on scrap tire reuse issues* – MDE has expressed their dedication to creating markets for recycled products in an effort to close the recycling loop. Their joint efforts with MES and various state agencies to incorporate scrap tire products into transportation, playground, and equestrian applications in the state are documented above. In addition, MDE has worked in conjunction with MES and the Maryland Department of Natural Resources to create ten scrap tire playgrounds in nine Maryland counties.⁸⁰ Locating some of these projects in Prince George's County would be a natural extension of these efforts.

Stormwater

Stormwater is one of the most daunting issues currently facing municipalities, particularly in urban areas. Stormwater presents an issue not just from the standpoint of the sediment and nutrient loading of waterways but also because it sweeps hundreds of thousands of pounds of trash into tributaries which ultimately washes down to the Chesapeake Bay.

Prince George's County has taken some important first steps in better managing the debris associated with stormwater. A pilot project has placed trash traps in some of the storm drains leading to the Anacostia. These traps, which were paid for through a grant from the EPA, capture trash washing off the streets during storm events and are the first of their kind in the Washington D.C. area.

Recommendations:

- *Expand the debris capture pilot program* – Based on the success of this initial installment of storm drain capture systems, the County should consider the lessons learned and identify additional locations where these devices would be appropriate.

⁷⁸ See note 10.

⁷⁹ From <http://www.marylandhorseindustry.org/pdf/CensusBrochure.pdf>, accessed January 9, 2008.

⁸⁰ http://www.mde.state.md.us/Programs/LandPrograms/Solid_Waste/ScrapTire/playgrounds.asp, accessed January 9, 2008.

- *Explore additional partnerships* – The Anacostia Watershed Society (AWS) has expressed an interest in installing a larger-scale capture device, called a Bandalong floating litter trap, in the tributaries of the Anacostia. Bandalong traps are anchored-in-place floating debris traps with collection booms that direct floating waste into the trap. Each costs approximately \$40,000.⁸¹ Perhaps there is an opportunity for the County to partner with the AWS to seek grant support to pilot these devices in the Prince George's County portion of the watershed.
- *Consider the role of pollution control in any discussion of stormwater fees* – Should the County ever consider developing a stormwater fee, pollution control must be included in the discussion. Traditionally, stormwater fees have been used to pay for upgrades to hard infrastructure, and are currently being expanded to address green infrastructure practices; however, there is a role for pollution control efforts as well. Some cities incorporated waste management policies into their stormwater programs. After a waste audit indicated that nearly all of the pollution tied to their NPDES permit came from solid waste, the City of Poway in California believed that trash generation, rather than water usage, would be a better indicator of a residence's contribution to stormwater pollution. Subsequently, on January 1, 2008, residential water customers will now have their bi-monthly stormwater fee charged as a part of their trash bill rather than their water bill, and a portion of the fee will be tied to the volume and frequency of their trash service. An incentive program, whereby businesses can lower their fee through recycling is in place as well.⁸²

Global Climate Change

Rising levels of greenhouse gases such as methane and carbon dioxide in the Earth's atmosphere have the potential to cause changes in our climate. Some of the emissions increases leading to global climate change can be traced directly to solid waste. Solid waste landfills are the single largest man-made source of methane gas in the United States. When organic materials buried in landfills decompose without oxygen, methane is produced.

Methane (CH₄) is a powerful greenhouse gas that is 23 times more effective at trapping heat in the atmosphere than the most prevalent greenhouse gas, carbon dioxide (CO₂). One ton of municipal solid waste landfilled produces 123 pounds of methane. According to EPA, 36% of human caused methane releases come from municipal solid waste landfills. The combustion of waste in incinerators also contributes to greenhouse gas emissions. EPA also reports that an average municipal solid waste-fired generation plant in the U.S. emits 2,988 pounds of CO₂ per megawatt hours of electricity produced.

Anything that uses energy – such as the procurement and consumption of goods and services – produces greenhouse gases directly or indirectly. Waste reduction has significant potential for decreasing greenhouse gas emissions. EPA estimates that simply increasing our national recycling rate from its current level of 30% to 35% would reduce greenhouse gas emissions by another 10 million tons of carbon equivalent (MTCE). That amount is equal to the average annual emissions from the electricity consumed by roughly 4.6 million households. By recycling all of its paper, plastic, and corrugated cardboard waste generated in one year, an office building

⁸¹ To contact the Anacostia Watershed Society, contact President, Robert Boone at 301-699-6204 or robert@anacostiaws.org. For more on the Bandalong System, see <http://www.stormwatersystems.com/>, accessed June 21, 2007 or <http://www.bandalong.com.au/products.htm>, accessed February 12, 2008.

⁸² For more information see <http://www.poway.org/index.aspx?page=297>, accessed February 6, 2008.

of 7,000 workers could reduce greenhouse gas emissions by 2,287 MTCE. This amount is equivalent to taking about 1,677 cars off the road that year. If just one household generated 5% less waste—including newspapers, aluminum, steel cans, and plastic containers—and then recycled what remained, it could reduce 367 pounds of carbon equivalent.

Local governments can play a key role in reducing CO₂ and methane because they directly influence and control many of the activities that produce these emissions, such as burning fossil fuels and managing landfill methane emissions. Local decisions regarding land use and development, investments in public transit, energy-efficient building codes, waste reduction, and recycling programs affect local air quality and living standards as well as global climate, not to mention the impact to water quality and health of the Chesapeake Bay.

Recommendations:

- *Consider a Greenhouse Gas Inventory* – The County should consider conducting a Greenhouse Gas Inventory to assess baseline conditions, from which emission reduction goals can be set. The Cities for Climate Protection program can help the County complete an inventory, adopt appropriate goals, and develop and implement policies. Another option may be to work with the Problem-Solving unit of the University of Maryland's Sustainable Development and Conservation Biology graduate program. The Problem-Solvers conduct studies of this nature free-of-charge, working on a select few projects each fall semester.⁸³
- *Consider methane emissions in plans for the closure of the Brown Station Road facility* – Methane emissions at the Brown Station Road Landfill are currently captured and used to power a correctional facility, however, the landfill is scheduled for closure in 2011. The County will want to take steps to ensure that the continuing methane emissions are managed appropriately.

Brown Station Landfill

The Brown Station Road Landfill is slated for closure in 2011, when it is expected to have reached its permitted capacity. With development and growing populations expanding urban areas and chewing up available land, many communities are reclaiming their landfill lands for public use following their closure. Former landfills are being used as green space, parks, playing fields, and nature trails – sometimes even generating revenue for the surrounding community.

Orange County California plans to create a county regional park when their 565 acre Olinda Alpha landfill facility closes in 2021,⁸⁴ and similar efforts are underway in Nashua, New Hampshire, Champaign, Illinois, and other cities and towns across the nation. The Town of Yarmouth, Massachusetts was able to use a no-interest loan from the State Revolving Loan Fund and various grants to cap their landfill and create a 9-hole golf course and mixed-use park. User fees from the golf course help offset the long-term monitoring and maintenance costs of the landfill.⁸⁵ Clever engineers just south of Saskatoon, Saskatchewan were able to create a 45-meter high man-made mountain on a landfill pile for the 1971 Canadian Winter Games. Mount

⁸³ For more information on the CONS program's problem-solving course see <http://www.life.umd.edu/cons/problem.html>. Program co-chairs, Dr. David Inouye and Dr. Jim Dietz can be reached at inouye@umd.edu or jmdietz@umd.edu. Either can explain the project application process or answer any additional questions.

⁸⁴ From http://www.oilandfills.com/landfill_olinda.asp, accessed January 30, 2008.

⁸⁵ From http://www.cdm.com/knowledge_center/case_studies/yarmouth_landfill_closure_and_reuse.htm, accessed January 31, 2008.

Blackstrap is now a part of Blackstrap Provincial Park and still used as a recreational ski area managed by Saskatchewan's Ministry of Tourism, Parks, Culture and Sports.⁸⁶ In some cases, Environmental Impact Assessments of landfill properties indicate that they are actually suitable for redevelopment, into office or retail space, or adjacent development, so that office or retail space may surround the open or public space created over top of the landfill. In these cases, the additional tax revenue and jobs generated can serve as a significant economic boon to the community.⁸⁷

Recommendations:

- *Consider how best to maximize the potential for the Brown Station Road facility following closure* – Although an Environmental Impact Assessment will determine to what extent the post-closure Brown Station Road site can be used by the public, there are a variety of reuse opportunities for the land. The time to begin investigating the possibilities is now. A decision-making process that allows for ample public input and outreach will allow for consensus building and community support.

⁸⁶ Summarized from http://en.wikipedia.org/wiki/Blackstrap_Ski_Hill and www.skiblackstrap.com, accessed January 31, 2008.

⁸⁷ For examples from New Jersey and Ohio, see www.nemw.org/Brownfield%20local%20financing%20tools.pdf, accessed January 30, 2008, and <http://www.cdfa.net/cdfa/cdfaweb.nsf/pages/valuerecovery.html>, accessed January 30, 2008.

Next Steps

The EFC's analysis was designed to provide Prince George's County the information necessary to develop short- and long-term goals in each of the categories of waste management discussed here. Many of these recommendations are potentially "low hanging fruit" for the County and could be quickly acted upon with a minimal input of resources and may make the most logical first step. Ultimately, the EFC's overarching recommendation would be to focus attention on the waste management areas that offer the greatest potential amount of waste diversion – areas such as construction and demolition waste, food waste composting, and electronic waste, as well as improving recycling efforts at County schools, businesses, and multi-family dwelling facilities.

Regardless of what suite of waste management recommendations the County ultimately chooses to implement, the first step that needs to be taken is a waste composition study that will identify exactly how much of the County's waste streams are accounted for by each category discussed here and establish baselines against which program progress and success can be measured. The EPA's WasteWise program, which both IKEA and the City of Hyattsville participate in, may be a good starting point. This program is designed to help communities identify opportunities for waste prevention, recycling, and buying recycled. The program provides technical assistance and national publicity as well as an annual awards program that enables communities to spread the word about their waste management achievements.⁸⁸

Also, there is no question that the success of any municipal undertaking such as this requires a carefully planned outreach and public education program. While suggestions related to specific waste management topic areas are addressed in the various sections of this report, considering how these play into a more overarching public outreach strategy will ensure both a cohesive presentation and an improved understanding and participation from the general public. Connecting with a multitude of audiences through outlets like a website that is a one-stop shop for waste reduction, reuse and recycling information, webinars that have broad-scale reach and flexibility, and annual community events with a zero-waste goals in mind will become invaluable tools for the County in making sure the waste management message is clear and engaging.⁸⁹

The recommendations contained in this report represent a myriad of opportunities for Prince George's County to create efficiencies and develop markets within the County's waste management program – some needing minimal effort for an almost immediate payoff, while others will need significantly more resource input, but will result in longer-range benefits that meet multiple community priorities. With a strategic and sustainable implementation strategy, the County will be able to take the lead on waste management issues in the Mid-Atlantic region and have a very real and measurable impact on the economic and environmental health of the community and the region.

⁸⁸ More information is available at www.epa.gov/wastewise.

⁸⁹ Excellent examples of such sites can be found at <http://www.nyc.gov/html/nycwasteless/html/home/home.shtml>, accessed January 30, 2008 and <http://www.ciwmb.ca.gov/>, accessed January 30, 2008.

The EFC Project Team

EFC Staff

Joanne Throwe, Assistant Director

Joanne Throwe, Assistant Director of the Environmental Finance Center. Prior to becoming Assistant Director in 2007, Ms. Throwe was the Agriculture Program Leader for EFC. She recently completed an 18-month assignment working with USDA/CSREES as shared faculty to assist in the coordination of special agriculture projects. Ms. Throwe works with communities in the Mid-Atlantic region implementing innovative financing solutions for environmental protection. Her work experience includes extensive knowledge about agriculture, green infrastructure, biofuels, ecosystem services and solid waste management. She assisted with developing a "Women in Agriculture" Symposium for the University of Maryland, a national conference for USDA on "Water Reuse Applications in Agriculture" and a Sustainable Infrastructure for Water and Wastewater conference for EPA Region 3 and Region 4. Ms. Throwe currently participates in several committees, including Mid-Atlantic Water Quality Advisory Committee for Region 3; USDA Ecosystem Services Group; and the Shenandoah Valley Waste Solutions Forum. Prior to joining the EFC, Ms. Throwe spent several years as a Development Resource Specialist at USDA's Foreign Agriculture Service and two years as an Agriculture Extension Agent for Peace Corps in the South Pacific. She holds a M.A. in Public Policy and Private Enterprise from the University of Maryland. She also received intensive agriculture training from the Hawaii Loa College and the East West Center in Hawaii.

jthrowe@umd.edu

Jennifer Cotting, Program Manager

Jennifer Cotting joined the EFC in 2004 to manage an EPA funded program designed to help communities and organizations in Region 3 overcome barriers to implementing and financing their watershed protection efforts. Now she coordinates a number of the EFC's core programs, with a particular focus on urban greening, tree canopy, and green infrastructure issues. Prior to joining the EFC, Ms. Cotting worked as an independent consultant developing and implementing environmentally based education and outreach programs for nonprofit organizations and government agencies. She received her M.S. in Sustainable Development and Conservation Biology from the University of Maryland and her B.A. in Communications from Marymount University. Ms. Cotting is also co-editor of Urban Wildlife News, the biannual newsletter of the Urban Wildlife Working Group of The Wildlife Society.

jcotting@umd.edu

Gretchen Sweeney, Coordinator

Gretchen Sweeney joined the Environmental Finance Center in 2007 after three years in the Capital Markets department at Friedman, Billings, Ramsey & Co, Inc. She manages all office activities at the EFC as well as provides support to all project work. Ms. Sweeney recently developed an Action Plan for the City of Staunton, Virginia, to help the city implement and fund a greenway and trail network. In addition, she created an online resource guide for greenway funding for Virginia's Shenandoah Valley. She also provides assistance on stormwater management and Low Impact Development (LID) programs at EFC. Ms. Sweeney received a Bachelor's degree in Classics and Politics from Mount Holyoke College in South Hadley, MA.

gsweeney@umd.edu

Elizabeth Skane, Graduate Student Assistant

Elizabeth Skane joined the Environmental Finance Center as a graduate research assistant earlier this year. Ms. Skane is currently pursuing a Master of Public Policy and a Master of Science in Sustainable Development & Conservation Biology at the University of Maryland. Before returning to graduate school, she spent four years as a consultant writing air emissions inventories, environmental assessments, and a guide for program managers, among other projects, on several military installations, and was a Science Assistant in the Biological Sciences Directorate at the National Science Foundation. Last summer she interned at Resources for the Future researching the extent to which restoration activities can positively affect ecosystem benefits and services. Ms. Skane earned her Bachelor's degree in Environmental Sciences at the University of Virginia.

eskane@umd.edu

Nora Somogyi , Student Researcher

Nora Somogyi is a undergraduate at the University of Maryland earning her degree in Environmental Science and Policy with a concentration on Land Use. Ms. Somogyi joined the EFC in the fall of 2007 and is responsible for research activities on a number of EFC projects, including this report. Ms. Somogyi is fluent in French and Hungarian and is currently furthering her studies with a semester in Turkey.

nsomogyi@umd.edu