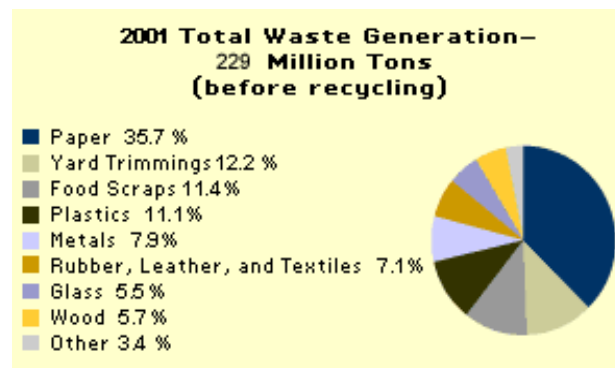


The Lowell Community Partnership for a Food Waste Composting Enterprise

Why Recycling?

It started back in early 1999. Like most successful endeavors, it started with vision and commitment. Julie Villareal, an assistant project manager at the UMASS-Lowell Center for Family, Work, and Community ([CFWC](#)) and a graduate student, cultivated ideas for developing local initiatives to reduce the wastestream and preserve the environment. Julie seized upon the fact that communities need to take steps to mitigate the impacts of the vast quantities of waste produced and processed, and in doing so, need to preserve and sustain a healthy environment.

She was well supported by the striking numbers on waste generation. In the year 2001, [EPA](#) reported that there was well over two hundred million tons of waste generated in the United States. This is approximately 4.4 pounds of waste per person per day, a substantial increase from the 2.7 pounds per person per day back in 1960. The breakdown of waste:



Thankfully, there has been a strong commitment to municipal recycling for many of the elements of the waste stream, for both ecological and financial reasons. Municipal recycling programs have been very successful in reducing our demand on our natural resources, and the amount of waste being recycled, presently at about 30%, continues to rise. Moreover, the recycling rates of much of the waste stream, such as yard waste and paper, is close to or in excess of 50%.

However, there is one element of the waste stream which has not been effectively managed: food waste. The recycling rate of food waste is dramatically lower than that of other wastes. Some of the facts (EPA):

- *Approximately 26 million tons of food waste is produced each year.*
- *This amounts to about 183 pounds of food waste for each person each year.*
- *\$1 billion is spent annually in the United States to dispose of food waste.*
- *Only 2.4% of food waste is recovered or recycled.*

Julie saw the need for pursuing recycling of food wastes in Lowell, and for enhancing overall recycling programs. However, bringing these initiatives to life would require a substantial effort, a *concerted* effort, and resources to match.

Resources/Partnerships 1



Julie approached then-Lowell City Manager Brian Martin to propose that the City partner with UMASS-Lowell and establish a recycling liaison to promote Recycling Based Community Economic Development. In these challenging fiscal times, the prospect of securing funds from the City for this endeavor did not seem promising. However, Julie persevered in her appeals and in July of 1999, the City Manager ultimately agreed to fund half of the costs to establish this position. The remainder of the funds were provided through a grant to Julie and Project Manager David Turcotte from the Center for Environmentally Appropriate Materials, a Center affiliated with UMASS-Lowell.

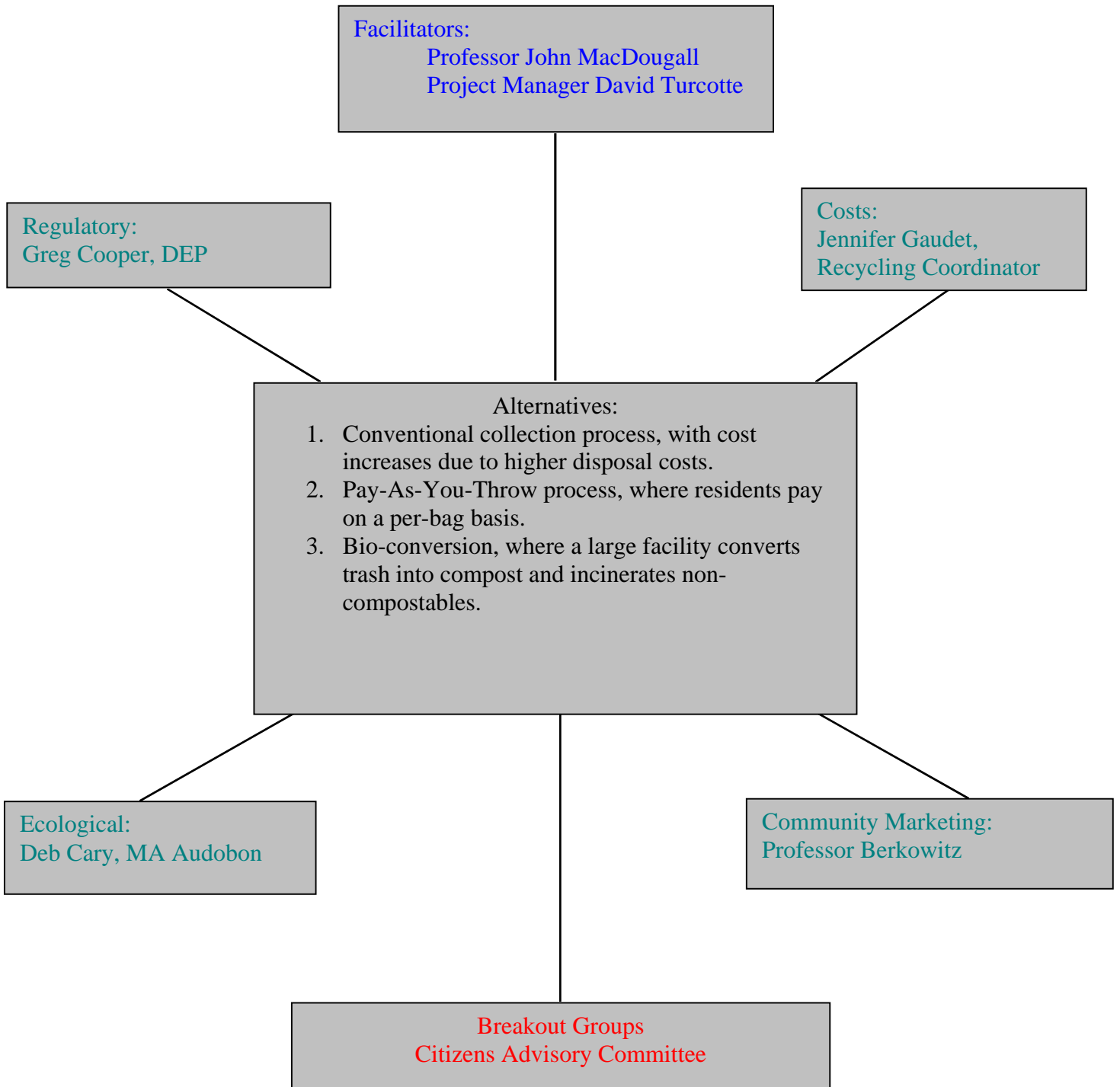
Julie began working as the recycling liaison and immediately forged a partnership with the City's recycling coordinator, Jennifer Gaudet. Julie and Jennifer reached out to stakeholder groups to get input on short and long-term strategies to deal with waste management in the City. Their work culminated in a major outreach event, a Community Recycling Forum held on April 26, 2000. The Forum was sponsored by a number of groups: the [Lowell Department of Public Works](#), [Merrimack Valley 2050](#) (a coalition which focuses on long-term and proactive approaches to sustainability), and the UMASS-Lowell Community Outreach Partnership Center (COPC). The Forum focused on the increasing costs of managing waste in the City and the alternatives for the future.

The Forum was facilitated by UMASS-Lowell staff, and featured speakers from many different perspectives (figure 1). Over 100 people attended the Forum, including members of three different youth groups. Translation of the materials into Khmer, Lao, and Spanish were also available. In order to foster deeper participation from the public, attendees were split into breakout groups to discuss the alternatives and their concerns in detail. A spokesperson from each breakout group addressed the attendees.

The facilitators prompted a vote on the preferred method of waste management for Lowell's future. The attendees overwhelmingly favored instituting a "Pay-As-You-Throw" program, where Lowell's residents would be charged on a per bag basis for collection and disposal of their trash. A main and appealing feature of this approach is that it establishes an economic incentive for the community to increase the rate of recycling, since that would diminish the amount of trash to be put out for pickup. It could also be instituted without the large expense associated with a city-owned trash processing facility. Attendees also perceived this to be the fairest choice, since those households producing the most waste would pay the most for collection and disposal.

The City is continuing to consider alternatives for waste management and the Forum provided public officials with valued input.

COMMUNITY MEETING ON TRASH AND RECYCLING
April 26, 2000



Focus on Food Waste

Julie took an interest in focusing the UMASS-Lowell/City partnership toward managing the large volume of the food waste being produced at UMASS Lowell and throughout the City. Composting, instead of incinerating or landfilling these wastes would preserve resources, save the community money, and potentially create a viable economic development opportunity.

During their outreach on recycling, Julie and David Turcotte met Bruce Fulford, a composting consultant with the City Soil and Greenhouse Company. Bruce helped Julie and David understand composting technology and the facilities needed to develop and run a successful composting operation. Julie and David also pursued additional funding for research on food waste management practices in the City of Lowell. They received a \$5,000 grant from the Center for Industrial Theory & Assessment (CITA) for this purpose.

Julie and CFWC staff conducted interviews with directors of food service at many of the large institutions in the City: supermarkets, educational institutions, hospitals, and nursing homes. While most of these institutions actively recycled elements of their waste stream, such as paper, none had any provisions for recycling of the considerable food waste that they generated. Many expressed interest in participating in a food waste recycling program, for both ecological and financial reasons, but they also harbored some doubts and concerns about physically separating out this waste stream, and the potential adverse impacts of managing the process.

Based on this information, Julie and David Turcotte, with help from Bruce, put together and submitted a grant proposal to create an innovative food waste processing program. The proposal included three main elements:

- i. A vermicomposting pilot project;
- ii. Research on a large-scale composting site; and
- iii. A business opportunity assessment plan.

These tasks were envisioned to be the building blocks toward establishing a City-wide food waste composting program. In May of 2000, based on the proposal by CFWC, the Chelsea Center for Recycling and Economic Development awarded a \$25,000 grant to fund this work. The City of Lowell also remained committed to the partnership with CFWC and the University, and appropriated \$5,000 in funding toward the design and construction of the vermicomposting facility.

With this funding in place, CFWC established a 20 member Advisory Committee, which included representatives from local, state, and federal government agencies, as well as local businesses, to help steer the effort. The Committee met on a monthly basis to hear updates and provide guidance.

Barriers

Early on in the project, Julie and David identified many barriers which would need to be overcome if the food waste recycling program was to be a success. The barriers, both real and perceived, included:

- **Costs/Time:** public feedback indicated that there is a concern that separating out and processing food waste would be more costly and time-consuming than present disposal methods.
- **Education/Training:** food service managers and employees would need to be trained on proper separation and processing techniques, as would managers of the composting operation.
- **Siting:** a suitable site for the pilot facility and more importantly, the larger composting facility would need to be found.
- **Sanitation:** if the process is not properly managed, public nuisances could occur such as odors, insect infestation, or rodents.
- **Attitude:** in the end, people's behavior on disposal of food waste will need to be altered, and a new mindset achieved.
- **Politics:** the decision-makers at the institutional and governmental level will ultimately need to support a food waste recycling program, with its attendant resource needs.

These barriers presented some considerable hurdles to achieving the goals of the proposal.

Outreach



Revelers at the Folk Festival hear about vermicomposting

The first phase of the project involved spreading the word about the scope of the waste problem, and the benefits of implementing a recycling program. Julie spearheaded an outreach effort that included nearly every media in the city. She also worked to promote recycling with organizers for many of the social and cultural events in the City Lowell, including: the Folk Festival, the Earth Day Festival, Household Hazardous Waste Day, Community Preservation Day, Southeast Asian Water Festival, and America Recycles Day.

Julie continues to host a radio show on the University radio station, WUML, entitled “Environmental Corner”, and she uses this forum to educate the public about environmental issues and the need to sustain our resources by recycling. There are also other activities which continue to be important elements of the outreach program including:

- § Educational Workshops
- § WCAP radio appearances and public service announcements
- § Press releases to the Lowell Sun and to bilingual newspapers in the City
- § Open houses at the composting sites
- § Joint initiatives with the City’s present recycling coordinator, Tina Klein

Pilot Facility

The two main challenges for establishing the Pilot Food Waste Composting Facility were (1) to secure a site for the facility and (2) to solicit local restaurants to participate in the project.

To explore possible sites at the University, Julie and David met with key UMASS-Lowell staff to determine if any UMASS owned locations would be suitable. She met with and forged relationships with the Superintendent of Grounds, the Director of the Physical Plant, the Special Assistant for Economic Development, the Director of Food Services on campus, and the Director of Environmental Health and Safety.

It was determined that there was in fact an appropriate location to house a pilot vermicomposting facility. A small enclosed room on the third floor of Olney Hall on North Campus was determined to have a unique set of features which would be most valuable for the composting operation. Bruce Fulford designed and constructed wooden composting bins inside the room.



Julie and David in the Pilot Composting Facility in Olney Hall

Julie and Dave sought out restaurants in the City to participate in the pilot program. Five restaurants committed to participate: Khemara Restaurant, Park Café, Cobblestones, Sugar Shack, and Aramark Cafeteria at Olney Hall. Staff at the restaurants agreed to separate out the “pre-consumer” food waste generated, i.e. the waste generated prior to being served to patrons. However, there were still more resource needs to make the project viable. Student volunteers from CFWC were recruited to pickup the buckets of food waste and University staff, working with Julie, were recruited to help with tasks such as turning the piles over and watering the piles, to ensure the proper operation of the units.

In the end, it took collaboration of all these parties - Julie, David, Bruce, the City, UMASS staff, restaurant owners, and student volunteers - to make the project a reality.

Vermicomposting 101

[Vermicomposting](#) is basically composting done using worms to enhance the processing of organic wastes. For the Pilot facility, the process involved depositing the food waste initially into a bin with yard waste and shredded paper, where the composting process starts, and, after two to four weeks, transferring the waste to a separate compost pile, where “red wiggler” worms were plentiful and consume the organic waste. Typically, 2 pounds of worms (about 2000) can recycle approximately 1 pound of organic waste in 24 hours. If conditions are ideal, each worm can recycle their own weight in waste every 24 hours. The worm bin for the Pilot facility was estimated to have as many as 75,000 worms.



The compost produced from vermicomposting tends to be much more nutrient-rich than that from conventional composting operations. Hence, as a task of the Chelsea Center grant, CFWC is producing a business opportunity assessment report and a business plan. With the vast numbers of food waste-producing restaurants and institutions, there is great potential for expanding the recycling program, and producing large volumes of this nutrient rich compost, which will be an attractive alternative to chemical fertilizers for farmers, city grounds staff, and garden centers. CFWC is proposing to launch a business venture as Lowell Loam Ltd., which will market and sell the compost as well as worm-composting kits.

Julie and CFWC staff took full advantage of the successful siting and operation of the Pilot Compost facility in their outreach program, and numerous stories have appeared in the Lowell Sun touting its arrival. Various politicians, including Mayor Rita Mercier, were photographed and quoted promoting the benefits of the Pilot facility and the need to pursue such technology on a larger scale to creatively manage Lowell’s waste in the future.....

Thinking Bigger

Another critical element of the grant work involved researching potential sites in the City of Lowell for large-scale vermicomposting operations. Julie and David worked closely with staff from the City’s Planning Department and the Advisory Committee to explore

which sites would be suitable. A major barrier was the negative public perception of such a facility, based on fears of odors and unsanitary conditions, which could result in substantial neighborhood opposition. The siting process also needed to consider ways to maximize use of resources, and identify costs for these facilities.

The relationships forged in the process of constructing and operating the Pilot facility paid off dearly as a site at UMASS-Lowell adjacent to the South Campus Parking Lot turned out to be suitable for construction of a larger scale facility. CFWC pursued and received a grant for \$30,000 in funds from the MA [Executive Office of Environmental Affairs](#) State Sustainability Program for the design and construction work.

CFWC again contracted the City Soils and Greenhouse Company to design and construct the facility, and Bruce Fulford provided the services. UMASS staff and equipment provided critical support to prepare and maintain the site, and Aramark agreed to provide the food waste stream from its large facility on South Campus. The facility opened with great fanfare in October 2003. The facility was dubbed the “Wormcycler.”



Julie and Dave watch as a crowd appreciates the opening of the *Wormcycler* on South Campus

Again, the opening of the Wormcycler was the culmination of a concerted effort by a wide array of individuals and groups:

- David and Julie, who tirelessly promoted the benefits of vermicomposting to the City, business owners, UMASS faculty and students, politicians, and the public.
- City of Lowell, which continued to voice support for the project.
- UMASS employees from various departments, who continue to be instrumental in staffing and maintaining the facility.
- Aramark personnel, who have trained staff to separate the pre-consumer food waste and provide the waste stream.
- Bruce Fulford, who contributed design services for Wormcycler.
- EOE, which provided funding for the project.
- The John Coppinger Company, who donated plant materials and services.

Resources/Partnerships 2

The food waste composting project was successful on many levels: education of the general public on the need to recycle to promote beneficial reuse of waste; education of institutional food service managers on the viability of the process; the formation of strong partnerships with local officials and University staff; and ultimately construction and operation of a large-scale composting facility, which may in turn provide an opportunity to explore business potential of marketing nutrient-rich, chemical-free compost.

This success was due in large measure to the ability of the project managers, David Turcotte and Julie Villareal, to bring groups together and to maximize the use of scarce resources. In the end, people were the most important resource, and eliciting their interest and support was key to making the project work.

The composting operation continues, but challenges still remain. There remains a need to get a steady commitment of staff and equipment to maintain the operation of the facilities. There is also the challenge of creating a viable business operation to market the compost and recover some or all of the costs of production. And, of course, there is the vision for something larger.....food waste composting on an even larger scale, with partnering of a local farm or other facility which will provide a suitable site for larger volumes of waste and compost. It's all about sustainability and Lowell's future.

The Lowell Community Partnership for a Food Waste Composting Enterprise

Partnering for Success

Advisory Committee

Project Managers:
David Turcotte, CFWC
Julie Villareal, CFWC

Grants:

- \$25,000 – Chelsea Center
- \$5,000 – City of Lowell
- \$30,000 – EOE A State Sustainability Fund
- \$5,000 – CITA Research Grant
- City Soil & Greenhouse (in-kind services)
- Coppinger Company (in-kind services)
- DEP funds for waste audit

Staff and Equipment:

- UMASS Lowell equipment and staff
- UMASS Lowell student volunteers
- 5 local restaurants
- Lowell DPW staff
- Lowell Recycling Coordinator
- City Soil & Greenhouse Co.
- Aramark Food Services

Consultant:

Bruce Fulford, City Soil & Greenhouse Co.



Links:

Recycling/Sustainability:

[Center for Family, Work, and Community](#)
[MA Executive Office of Environmental Affairs](#)
[MA Department of Environmental Protection](#)
[Environmental Protection Agency](#)
[U.S Department of Energy](#)
[Sustainable Communities Network](#)

Vermicomposting:

[The Compost Resource Page](#)
[College of Agriculture and Home Economics](#)
[WormWoman.Com](#)

Partnering:

[Community Toolbox](#)
[Community Toolbox2](#)
[Eisenhower National Clearinghouse:](#)