

Last year all of us at the FMFC were trying to think of ways we could make a meaningful contribution to what is becoming increasingly important to our economy, in a word, sustainability. Initially our thinking was focused on residential furniture, wondering if there were ways to facilitate the effective recycling of furniture, an activity that only happens in a haphazard fashion if it happens at all. Do you realize that in the category of durable goods, home furnishings are the #1 contributor to the waste stream entering landfills across America? That's right, we're #1! In 2007, that totaled 9.3 million tons of waste across the country. We smelled an opportunity (pun intended), and decided to see what we could do.

Under the guidance of Dr. Russell King two ISE graduate students, James Lavin and Shawn Richardson, started gathering information about current practices regarding the recycling of furniture, both locally and nationwide. Eventually their activities lead to a meeting with two solid waste facility managers for Wake County, North Carolina, Environmental Services, Johnny Beal and Lowell Shaw. These are the folks that manage Wake County's landfills. In the very first meeting, held at the North Wake Landfill (now closed as a landfill but open as a park!), we broadly discussed what we were looking at regarding the recycling of furniture. The first words out of Johnny and Lowell were, "can you do something about mattresses?" We didn't know it at the time, but it turns out we can.

The meeting described above took place in November, 2009. For the next several months, James and Shawn worked diligently collecting information on mattress recycling practices nationwide. The reason mattresses are a challenge for landfills is the fact that, relative to their weight and area, they take up too much space. They also don't biodegrade very well. Accordingly, James and Shawn were looking for possible solutions to this problem that others had identified. They managed to dig up quite a bit of information, but somewhat surprisingly there have not been as many efforts to solve this problem as you might think. That's especially true as it relates to a land fill the size of Wake County's, meaning a large one serving a large population. Most of the meaningful work has been done in relatively small communities where the number of mattresses is comparatively small. The Raleigh/Wake County challenge is dealing with the volume of waste mattresses created by a population base that exceeds one million people.

The problem, in pictures:



When you start to take apart a mattress like the one above, you wind up with:



a set of springs, which may be usable as is or ground up into scrap metal, and:



a pile of foam, padding, batting, and miscellaneous fabric for which there is not a clearly defined market.

From a business point of view, there were a lot of unknowns. For instance, how much does it cost to go from a full mattress to the disassembled piles shown above? How much can you sell scrap for, in its various forms? Is there a market for used mattresses? These, and many other questions, needed to be answered in a reasonable way to see if there was a viable alternative to just dumping used mattresses in the landfill. Naturally, our N.C. State graduate Industrial and Systems Engineers were well qualified to make intelligent costs estimates. As they did, it became increasingly clear that there were good possibilities for recycling to work if the volume could be managed. Then we had a breakthrough. we learned about Cause for Paws.

Cause for Paws is a non profit organization that operates 3 thrift shops in the greater Raleigh area. Their fundraising purpose is to support humane animal shelters. One of the services they provide is to collect used mattresses that are in good condition, sanitize them through a heat treatment process, and sell the mattresses in their stores. When we realized that there was an existing market for used mattresses and a process for treating them, we realized that there was a much better chance of managing the volume of used mattresses that could be generated. More importantly, we were able to make the case for doing so, effectively, with the Wake County Solid Waste Management Division.

To shorten a long (but interesting) story, Wake County and Cause for Paws are going to partner together to start a mattress recycling pilot program that will operate out of an existing building adjacent to the South Wake County Landfill. We have provided them with a series of layouts for the facility, and have identified numerous potential

customers for the recyclable materials. We have identified potential equipment purchases that can be made to improve/increase productivity once the pilot program gets going. All of this has been done by N.C. State engineering students under the watchful eye of Dr. King, including a just completed Senior Design project that developed a detailed plan for making the whole thing work. There are still a few t's to be crossed and i's to be dotted between Wake County and Cause for Paws, but things should be operational in a few weeks.

We intend to stay fully involved with this project in the future; there is plenty of potential for additional Senior Design projects down the road, and undoubtedly a Masters thesis or two on logistics and scheduling. More importantly, if all of the above works as well as we all hope, the plan can be passed along to other communities throughout North Carolina, and the United States, for that matter. This could be really good.

All involved here owe a big thanks to Johnny Beal and Lowell Shaw, who have both been helpful and encouraging throughout. It's hard to overstate how important it is whenever we're working on a project with a company or organization to have their full cooperation. When we get good cooperation, we routinely help folks find good solutions to problems. When we don't get good cooperation, for whatever reasons, we usually just waste everybody's time. This time we got great cooperation. We're hopeful for a great result.

Now, if we can just figure out what to do with sofas. That'll be next.

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