**Project Title:** Dumpster Sensors to Improve Efficiency

**Project Description:** Develop sensors for the University’s waste receptacles that signal when a container is full.

**Background:** Various cities, groups, and institutions have deployed sensors for their waste receptacles. The motivation for these sensors has been to alert waste managers when a dumpster needs to be emptied only when they are full. This allows collectors to optimize their routes and makes sure that bags are full before sent to a landfill. It also can serve an important role in decreasing pollution, as keeping the waste receptacles empty incentivizes the proper discarding of waste. Similarly, it may also help with the issue of recycling contamination; if a trash bin is overflowing, someone might choose the next closest receptacle to discard their non-recyclable material in a recycling receptacle. Or, if the recycling bin is overflowing, someone may make the casual decision to place their otherwise recyclable material into the trash.

There are several variables to consider in the development of this project. How many sensors can you develop? Would the sensors simply flash green/red empty/full, or would there be a way for collectors to check this information remotely? Were you to expand this out into a network to test their effectiveness, where on campus would you place the sensors? Why? How would you test performance? How would you measure their effectiveness in optimizing collection routes and improving disposal practices?

**Desired Outcomes:**

* Develop a sensor(s) that indicates whether waste is ready for collection. If possible, develop a sensor that “remotely reports” into a system accessible by collectors. In a report, determine where the preliminary network of bins would be and explain why (did you choose a single building, a network of outdoor bins, or different bins across different buildings, etc.). If permitted, install the sensors in their appropriate places. In the report, also describe how performance will be analyzed, and what metrics will be used to see if the sensors helped optimize collection processes and improved disposal behaviors.

**Possible Collaborators/Stakeholders:**

* Office of Sustainability and the Environment
* Facilities Management
* City of Iowa City (some waste bins have sensors in Ped Mall, etc.)

**Evaluation:**

* Based upon how effectively the “Desired Outcomes” deliverables are carried out.

**Course Relevance:**

* CBE 4410: Sustainable Systems
* Engineering