



# Technical Infrastructure

## Collection of Data:

EcoBin uses two sensing technologies to collect data about discarded materials. The first determines the type of material discarded and the second measures capacity. The sensors used to determine the type of material discarded are modeled after sensors used by the recycling sorting company TOMRA and are composed of the following technologies: Color Recognition, Near Infrared, X-Ray Transmission, Electromagnetic Sensor, Visual Spectrometry, and X-ray Fluorescence Technology. The sensors used to measure the interior capacity consist of ultrasonic sonar sensors. Both sensors will be outfitted to the interior of each EcoBin compartment enabling the compartments to sense their discarded materials separately. The sensors will collect data at the point material enters the EcoBin.

## Journey of Data:

The data gathered through EcoBin's sensing technologies will be transferred to two locations: a digital interface attached to the top of the EcoBin and an application accessible by mobile device. The data will be transferred from sensor to Wi-Fi to cloud. This transfer of data through wireless frequency based connections adheres to the IEEE 802.11 protocol for wireless local area networks. The data will be stored in a cloud-based database programmed to automatically transfer data to the digital interface and application upon receipt.

## Use of Data:

EcoBin's digital interface displays the type of discarded material and the capacity of the bin. For detailed data analytics, pro-tips, and social connection; the user will access the application. The detailed analytics can be summarized in macro or micro terms and will be accompanied by charts and graphs for a visual representation of discarding behavior. Additional detailed analytics will be offered through a menu categorized by material and subcategorized by date.

Pro-tips are generated based on the metrics gathered. Pro-tips can be accessed through the application menu as well as through pop-up notifications. An example of a pro-tip will read, "One water pitcher filter can effectively replace as much as 300 standard 16.9-ounce bottles. So you can get great-tasting water without so much waste." This pro-tip would be dispatched when metrics show high amounts of plastic bottles being discarded. It gently encourages a change in behavior without explicitly shaming the user.

The presence of the social connection feature is based on research showing "the effectiveness of mass communications to change public behavior." Based on the algorithmic output charting app usage, users will be privy to a spectrum of user habits that either align with or challenge their own. You can interact with other users in the form of praise, friendly chiding, and encouragement. APIs linked to Facebook and Twitter will also be offered.