

Abstract

The elderly and disabled community struggle to push or pull heavy waste bins. This problem is magnified even further if their driveways are sloped, uneven, or become slick due to rain. The Robotic Trash Cart (RTC) removes the hassle of taking heavy waste bins to the curb for waste pick up. The RTC consists of a 2x6 foot aluminum frame with a fiberglass base for holding the trash and recycling bins. The RTC is driven by two motorized wheels in the middle of the frame, with two caster wheels for additional support. This allows us to do zero point turning. Homeowners use a Bluetooth controller to direct the RTC to the curb for waste removal. The Americans with Disabilities Act of 1990 requires wheelchair ramps for businesses and schools to have a maximum incline of 5-degrees. We designed the RTC to carry a 250 pound load up a 5-degree incline, because our users may have wheelchair ramps installed in their homes. The maximum speed of the RTC is limited to increase stability and battery life. A gate is built into the frame of the RTC to provide waste engineers easy access to the bins for quick trash removal.

A potential commercial application of the RTC is for locales with dense foot traffic, such as amusement parks, shopping centers, and transportation hubs. As a future goal of this technology, there is growth to develop multiple self-navigating RTCs. These machines will sense when they are full, take themselves to a central waste site to be emptied, and return to their original location. This design will make navigation to avoid hitting a person an important detail. We hold safety in high regards.