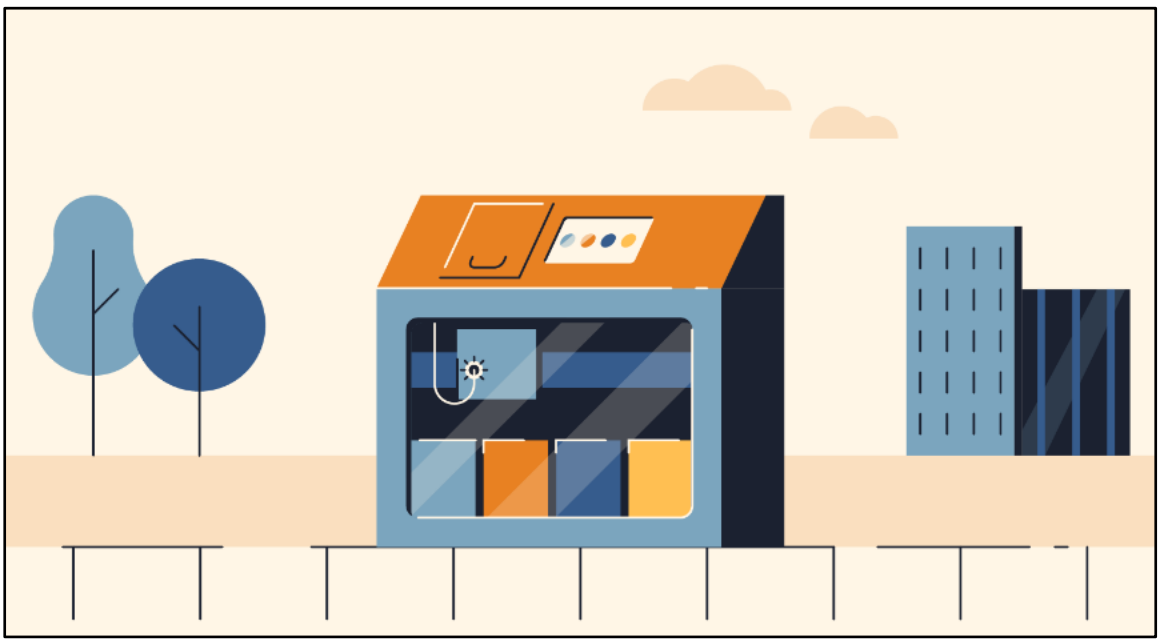
1. Smart Waste Bins

Illustrated smart waste bin

When left to their own devices, people dont always bother to sort their waste into the proper waste or recycling bins. To help reduce improper recycling sorting, Polish company Bin-e designed a smart waste bin that uses artificial intelligence-based object recognition to automatically sort recyclables into separate compartments. After sorting, the machine compresses the waste and monitors how full each bin is.

Smart waste bins take human error out of the initial sorting process, making material processing faster and easier for recycling facilities. This can lower waste management costs by as much as 80% and drastically improve employee efficiency.



2. Waste Level Sensors

Homes and businesses across the country rely on routine waste collection services to dispose of their trash. Weekly services have been around for decades, but they arent always the most efficient option.

To help minimize unnecessary trips to and from landfills, companies and communities can install waste level sensors in bins or dumpsters of any size. These devices collect and store data on fill levels, allowing collection services to predict how often bins need to be emptied. This also helps prevent public containers from overflowing and contaminating the surrounding area.

3. AI Recycling Robots

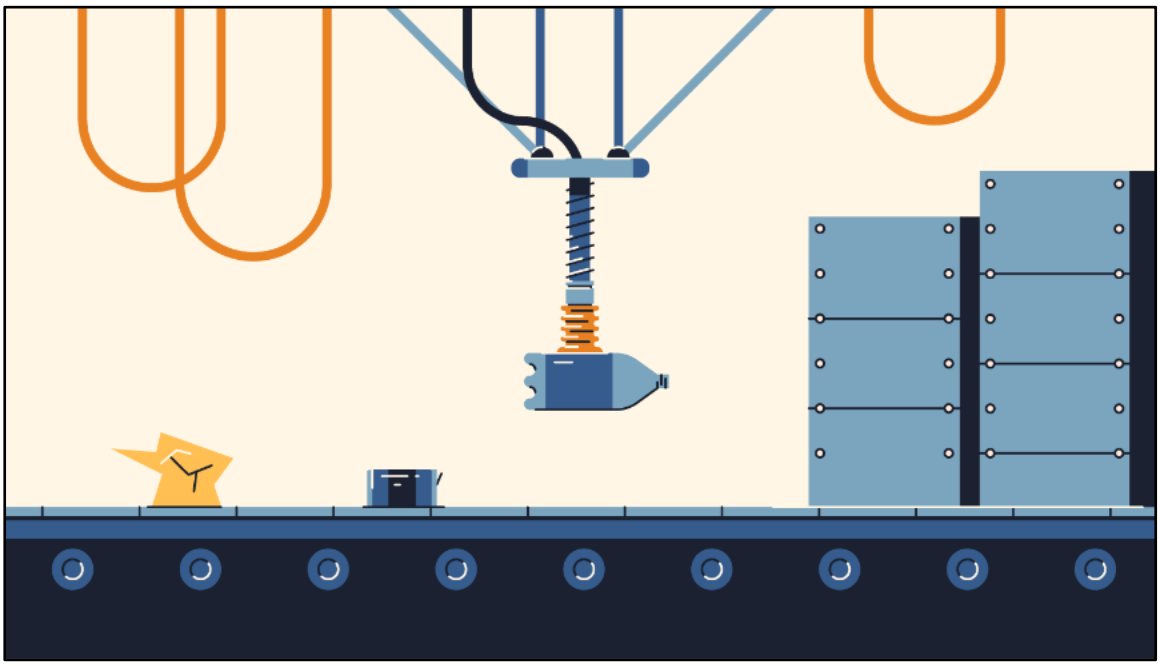


Illustration of recycling robot

Recycling centers play a crucial role in reducing the amount of trash that ends up in landfills and waterways each year. However, a reduced workforce during the COVID-19 pandemic has left many centers struggling to keep up with demand. Fortunately, recycling robots powered by artificial intelligence (AI) can help pick up some of the slack.

These robots are designed to accurately identify and sort recyclable materials, increasing efficiency and reducing the need for human workers. This not only saves recycling centers money over time, but also helps divert materials that would otherwise end up in landfills.

4. Garbage Truck Weighing Mechanisms

Like waste level sensors, weighing mechanisms installed in garbage trucks can help predict fill levels and reduce collection trips. They do this by measuring and storing the weight of waste containers, then using the data to predict fill levels over time. Cities can use this technology to more accurately predict how often they need to send their trucks out and reduce annual collection costs.

5. Pneumatic Waste Pipes

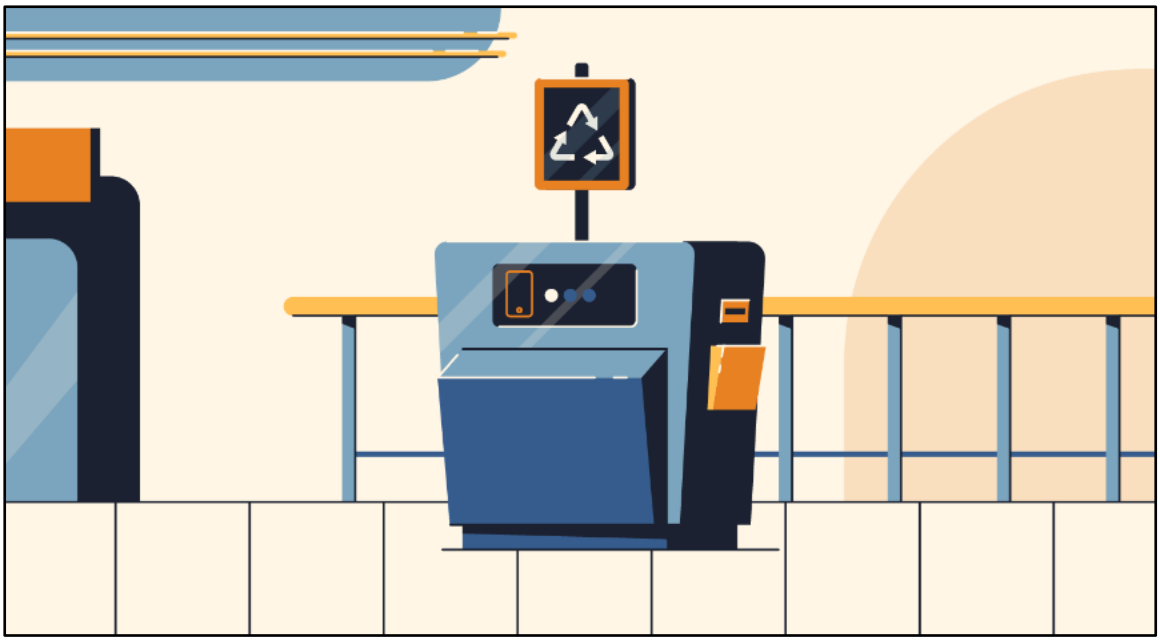
Illustrated pneumatic trash tubes

As populations grow in urban areas, so does the need for waste management solutions that can accommodate increasing amounts of trash. Some cities are taking on this challenge by installing pneumatic waste disposal bins that connect to a series of underground pipes. Trash travels through the pipes to a waste collection plant where it can be sorted or hauled away. This system eliminates the need for traditional waste collection, reduces energy costs and increases overall efficiency.

6. Solar-Powered Trash Compactors

In an effort to increase collection efficiency and reduce trips to and from the dump, manufacturer Ecube Labs created a solar-powered trash compactor that can hold up to five times more than traditional trash bins. These machines compress trash as it accumulates to increase bin capacity, and they collect and transmit data on fill and collection times to help streamline the collection process.

7. E-Waste Kiosks



Illustrated e-waste kiosk

Electronic waste that is improperly disposed of can be harmful to both humans and the environment. Fortunately, many companies and organizations have started e-waste recycling programs that will accept — and even reimburse you for — old electronic devices.

ecoATM, a smart recycling company, took this idea one step further by creating a line of e-waste recycling kiosks that allow you to exchange your electronics for cash on the spot. While they wont always offer cash for devices that are broken or destroyed, they accept phones, tablets and MP3 players in any condition and ensure that they are recycled properly.

8. Recycling Apps

Sorting through contaminated waste is one of the biggest challenges for recycling centers. In an effort to limit unrecyclable materials entering these centers, organizations have released apps like RecycleNation and iRecycle that make recycling easier for individuals. These apps provide users with information on recycling rates and center locations, and their comprehensive lists of materials help users determine which items can be recycled.

Futuristic Cities Implementing Smart Waste solutions

Cities across the globe are implementing smart waste management solutions to help save money and reduce their environmental impact. The following smart cities provide leading examples of these technologies in action.

San Francisco, California

Recycling machine operator

San Francisco diverts about 80% of its waste from landfills every year, and it boasts one of the highest recycling rates in the U.S. The city achieved this in part through its partnership with Recology, a waste collection company. Recology invested $20 million into upgrading its facilities and installed a fleet of sorting robots to quickly and accurately sort recyclables.

These robots perform a series of tasks, including sorting out contaminates, recovering recyclable materials missed by traditional sorters and sorting black plastics that optical sorters cant identify into mixed-plastic bales. This not only ensures that more of San Franciscos materials are properly recycled, but also increases the quality and saleability of plastic bales.

Songdo, South Korea

Waterway in Songdo, South Korea

Songdo, South Korea was one of the first cities to implement a truck-free waste management system. It achieved this by installing bins connected to a series of underground pneumatic waste pipes that transport trash to a waste processing facility, where waste is automatically sorted and either recycled, buried or burned for energy.

Songdos system was the first to eliminate the need for collection trucks by connecting every building in the city to the underground pipe system. This not only cut down on carbon emissions but also saved the city money. By 2014, the system only required seven workers to operate.

Amsterdam, Netherlands

Houses along a canal in Amsterdam