

Azure IoT Hub

Azure IoT Hub can be used to collect data from various IoT devices installed in waste bins, trucks, and sorting facilities. This data might include waste levels in bins, truck location and fuel consumption data, and data from AI-powered sorting facilities.

Azure Stream Analytics

This service can be used to process the incoming real-time data from IoT Hub. This can include cleaning the data, transforming it, and then forwarding it on to other services for further processing or storage.

Azure Cognitive Services

Azure Cognitive Services can be used for multiple tasks in this system:

1. **Computer Vision API** can be used to identify and categorize waste in real-time, sorting it into categories like recyclables, compost, and landfill waste.
2. **Language Understanding (LUIS) service** can be used to understand and analyze customer complaints or queries about waste management, and provide automated responses or route the query to the correct department.

Azure Machine Learning

Azure Machine Learning can be used to train and deploy machine learning models for predictive tasks such as forecasting waste generation and optimizing waste collection routes.

Azure SQL Database / Azure Cosmos DB

Processed data can be stored in an Azure SQL Database or Azure Cosmos DB for further analysis, long-term storage, and access by other services.

Power BI

Power BI can be used to create interactive reports and dashboards that visualize the data and provide insights. These can be used by decision-makers to improve waste management services. Power BI can connect directly to the Azure SQL Database or Azure Cosmos DB to access the data.

Azure Function / Logic App

Azure Function or Logic App can be used to automate tasks such as sending alerts when waste bins are full, triggering waste collection when optimal routes are identified, and more.