# AMP™

# Request for Information

## City of Philadelphia

Office of Clean & Green Initiatives
Department of Sanitation
Office of Sustainability

**SOLID WASTE MANAGEMENT**

Response Due Date:

Monday, July 21st 5pm EST

# Cover Letter

July 21, 2025

Scott McGrath
Office of Clean & Green Initiatives, Sanitation Department, & Office of Sustainability
City of Philadelphia
1401 John F. Kennedy Blvd.
Philadelphia, PA 19102

**Re: Request for Information on Solid Waste Management City of Philadelphia**

Dear Scott,

AMP Robotics Corporation ("AMP") is pleased to present this response to the City of Philadelphia's Request for Information on Solid Waste Management. We appreciate and commend the City's commitment to advancing sustainable alternatives to landfilling and incineration, and we are excited about the opportunity to partner with the City of Philadelphia to advance its waste diversion goals.

AMP designs, builds, and operates innovative AI-driven municipal solid waste ("MSW") processing and recycling facilities. Our systems recover recyclables and organics directly from mixed waste streams, reducing disposal volumes by more than 60% and offering a scalable, cost-effective alternative to traditional disposal methods. When deployed at existing transfer stations or within existing infrastructure, AMP's sortation systems can reduce the volume of waste destined for landfills and incinerators by 60+ percent.

AMP pairs high-performance recovery systems with continuous material characterization and real-time facility data. While AMP's primary focus is waste diversion, the data we generate offers cities a powerful tool for understanding waste composition and consumption patterns—enabling more informed investments in public health, equity, and quality of life across neighborhoods.

Please contact Sarah Daschbach at sarah.daschbach@ampsortation.com with any questions. We look forward to the opportunity to support the City of Philadelphia's vision for a more sustainable waste management future.

Sincerely,

Andrew Trump
VP, Commercial

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# 1. General Information

1.1 Organization/Respondent Name:     AMP Robotics Corporation
1.2 Street Address:                   1875 Taylor Avenue
1.3 City, State, Zip:                 Louisville, CO 80027
1.4 Primary Business:                 Waste management and recycling
1.5 Point of Contact Name:            Sarah Daschbach
1.6 Title:                            Senior Manager, Commercial Origination
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1.9 Organization Web Address:         [www.ampsortation.com](www.ampsortation.com)

# 2. Proposal Introduction

## 2.1 Company Profile

*Provide a profile of your company/organization's operations, including the number of years the company/organization has been in business; number of full-time employees; and brief description of the services or products offered. If your response represents collaboration, please describe the type of subcontractors or partners with whom you are responding. If you are an individual respondent with background or experience in any of the areas covered by this RFI, please summarize your relevant personal and professional experience. Resumes need not be included.*

### Company Overview

AMP designs, builds, operates, and services AI-powered sortation systems for municipal solid waste ("MSW") and recycling. AMP's material identification and advanced automation technology – with hundreds of deployments across North America, Asia, and Europe – enhances the safety and reliability of waste facilities while increasing recovery and landfill diversion.

Chief Technology Officer Matanya Horowitz founded AMP in 2014 after completing his PhD in controls and dynamical systems at Caltech, where he was inspired by emerging breakthroughs in deep learning. These developments, which are fueling breakthroughs in autonomous driving, artificial intelligence systems, and more, allowed machines to "see" as well as humans for the first time. Horowitz realized these developments in computer "vision" could help overcome issues that previously hindered the use of automation and robotics in recycling. The convergence of machine learning and robotics unlocked compelling opportunities to automate waste diversion tasks that were formerly labor intensive, hazardous, and costly, thus limiting the rate of recycling in the waste industry. By bringing digital intelligence to recycling, AMP is able to extract more value from waste than was previously possible.

Starting in 2017, AMP began deploying AI-powered robots at recycling facilities across North America, Europe, and Asia. Today, AMP has over 400 high-performance vision and sortation systems installed around the world. In 2020, AMP launched its first fully automated AMP facility - the AMP ONE™. The AMP ONE offers a modular design, capable of recovering over 90 percent of target materials utilizing AI-powered sortation technology. The AMP ONE transforms MSW, single-stream, and other feedstocks into saleable materials with minimal labor and cost. This next-generation materials recovery system enables communities to increase recycling effectiveness by lowering capital and operating cost barriers.

To fuel its growth and deliver on its mission, AMP is backed by a deep bench of top-tier strategic investors across venture capital, climate technology, asset management, and major corporations. This diverse group of investors reflects strong confidence in AMP's vision, leadership, and potential - collectively representing trillions of dollars in total investable assets under management ("AUM"). That confidence is reflected by AMP's significant Series D raise, which positions the company to scale rapidly, expand its market presence, and continue building its team of 150 employees.

## Technology Overview

The AMP ONE™ is a highly-automated, intelligent sorting system that facilitates the extraction of targeted commodities from a MSW or recycling stream. The key differentiating technologies of an AMP ONE™ are the AMP Vision™ and the AMP Jet™. These technologies are placed in proprietary system designs that draw from the novel capabilities of AI, complemented by more traditional equipment (such as conveyors and balers).

### AMP Vision™

AMP Vision is an AI-powered identification solution that uses high-resolution RGB cameras, with optional near-infrared (NIR) sensors, to detect and classify materials in real time. It identifies items based on resin, type, shape, color, brand, and contamination level. This enables precise, high-speed characterization and sortation of materials even in highly contaminated MSW and recycling streams.

### AMP Jet™

AMP Jet is a compact, high-throughput sorting unit engineered to replace traditional, inflexible legacy sortation equipment. Designed to withstand the harsh conditions of MSW streams, AMP Jet uses air jets triggered by AMP Vision's real time material recognition to sort recyclables and organics from mixed waste. The system is also highly adaptable, as it can be instantly reprogrammed to sort new materials and commodities as waste streams change. Unlike single-purpose legacy equipment, the AMP Jet will not be rendered obsolete or inefficient as waste streams evolve. It can be updated remotely to target new materials and can sort new commodity types without re-calibration. AMP Vision makes AMP Jets effective at sorting MSW despite the contamination and moisture that commonly impede recovery by NIR-based systems.
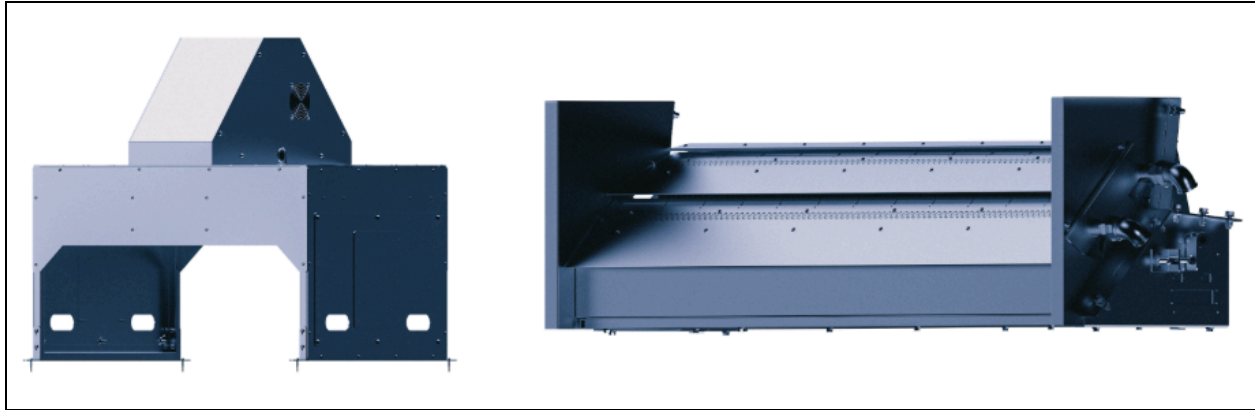
*Figure 1: Rendering of the AMP Vision system (left), which powers the AMP Jet (right), which is capable of processing high throughputs of various material streams via use of precision pneumatics to sort materials.*

AMP ONE™

AMP Vision and AMP Jet are the building blocks of AMP ONE – AMP's fully-integrated, facility-scale system offering. This patented system is highly automated. It combines data available from all system devices, the operation, and AMP Vision systems to offer a unique facility with monitoring and control capabilities more similar to advanced manufacturing than traditional waste processing.

The AMP ONE system comes equipped with significant capabilities, such as:

- **Anomaly and Jam Detection** – Detects issues with changes in purity, recovery, air pressure, motor behavior, and more, enabling real time alerts when performance is problematic.

- **Predictive Maintenance** – Tracks equipment cycles and monitors performance against target behaviors, enabling accurate and predictive maintenance when issues occur.

- **Continuous Reporting** – Provides reporting on inbound material composition, recovery and purity by commodity, and overall plant performance.

- **Reconfigurability and Customization** – Can be reconfigured with the click of a button, making it easy to customize the process flow and maximize recovery economics.

- **Redundancy** – Since AMP ONE relies predominantly on AMP Jets, AMP systems feature internal redundancy. Any AMP Jet can be reconfigured to sort any commodity, enabling multiple ways to stay up and operating at high capacity, even when experiencing issues with a given piece of equipment.

Together, these features deliver high-performance waste diversion while reducing technical and operational risk.

## 2.2 Company Experience

*Describe your company/organization's relevant experience (and that of partners, when applicable) in Philadelphia and/or elsewhere.*

AMP has built and operated facility-scale processing systems in Colorado, Georgia, Ohio, and Virginia. AMP is currently building a facility-scale processing system for Waste Connections in Colorado, and will begin operating it in 2026. AMP has deployed advanced robotic sortation systems and vision technologies in over 100 facilities across North America, Asia, and Europe.

# 3. Proposal Body

## 3.2 Capacity

*Information about the capacity and availability of large-scale residential waste management providers to meet the City's ongoing residential waste management needs without compromising high service levels, including potential opportunities and challenges to expand and diversify service delivery.*

### 3.2.1 Large Provider Capacity

*Please provide information about your existing capacity as a large-scale waste disposal or recycling provider and your readiness to provide services to the City consistent with the Parker administration's Safe, Clean and Green goals.*

AMP's sortation systems are designed for large-scale municipal deployment, with modular and easily scalable configurations capable of processing between 15 and 150 tons per hour across a wide variety of feedstocks. Facilities can be scaled further through parallel-line design, enabling the processing of millions of tons annually at a single site. This flexible, high-throughput capacity positions AMP to serve cities of Philadelphia's size and complexity while supporting long-term waste reduction and diversion goals.

AMP operates and maintains all of its systems, drawing on our direct experience managing facilities. Our integrated approach—combining proprietary AI software, optimized system design, and a skilled team of operators—ensures delivery of consistent throughput, material quality, and system uptime. This reliability and operational excellence align with the Parker administration's Safe, Clean and Green goals by advancing scalable, sustainable alternatives to landfilling and incineration, leading to more material recovery and neighborhood cleanliness.

## 3.2.2. Environmental & Health Impacts

*Environmental and health impacts: Beyond meeting baseline permitting requirements, please describe how your company addresses the environmental and health impacts of your operations and seeks to reduce these impacts over time (e.g., air quality, water quality, etc.).*

The environmental benefits of a project led by AMP will be determined by a number of factors. Diversion of waste from the landfill, the associated reduction in greenhouse gas emissions (or the requirement for recapture equipment), and a reduction of long-haul trucks or route trucks traveling to the final disposal location contribute to the environmental benefits of AMP's MSW-processing solutions. The sortation system itself produces minimal emissions and can be deployed with dust and odor mitigation measures. Noise is not a significant emission from the system.

The most significant input with respect to local and global environmental benefits will be selection of the ultimate organics processing pathway. AMP ONE is designed to integrate with a range of organics management systems, and additional details can be made available to the City of Philadelphia upon request.

## 3.2.3 Data Collection & Reporting Capabilities

*Data collection methods and reporting capabilities: Please provide information around your firm's current data collection. The City is interesting in learning what data potential respondents to future RFPs collect currently.*

AMP systems are deployed across North America, Europe, and Asia, currently identifying more than 50 billion objects annually. This expansive deployment enables AMP to generate granular insights into waste streams across a breadth of geographies. AMP's solutions leverage proprietary AI technologies, including AMP Vision™, which can identify material based on form factor, color, item type, resin classification, brand, food-grade status, and contamination indicators. Continuous data improvements lead to more accurate sortation and efficient system operations, creating a network effect that optimizes performance across all facilities in the AMP ecosystem.

At the facility level, AMP solutions include continuous characterization of inbound waste and outbound materials, including sorted commodities and residuals. This continuous monitoring generates comprehensive, real-time data that can provide the City with actionable insights into the volumes and composition of waste generated by neighborhood, contamination levels in recycling streams, diversion rates, and waste stream changes across seasons and over longer time periods. These data capabilities are built into each AMP system at no additional cost. In contrast to traditional waste audits, which rely on small samples, AMP's technology provides an all-inclusive view into a city's waste stream.

AMP's use of data provides value far beyond reporting; it enables the system's reliability, high performance and low cost. The continuous AI-driven characterization of material throughout the facility directly informs AMP's integrated control and management systems, including a custom-designed Programmable Logic Controller (PLC) and a proprietary Manufacturing Execution System (MES). Together, these systems enable real-time decision-making and comprehensive operational oversight. The PLC captures critical data on equipment status and utilization, while the MES aggregates and manages detailed operational information across the facility. This includes maintenance scheduling and execution, downtime events and their root causes, inbound and outbound truck scale data, and freight-related sales and purchase orders. By unifying material characterization with equipment and operations data, AMP delivers an unprecedented level of visibility into facility operations, resulting in improved performance and 90% or greater uptime.

## 3.2.4 Diversion Methods

*Please describe your approach to maximize waste diversion including the necessary infrastructure for implementation. Please note if you have engaged in partnerships to improve diversion rates.*

### Diversion Approach

AMP maximizes diversion through a modular system designed to recover recyclables and organics directly from mixed municipal solid waste. Two types of AMP ONE systems—the AMP ONE MSW Module and the AMP ONE Recyclables Module— can be deployed independently or in combination, depending on site constraints and material flows.

AMP ONE SPOKE™ ("MSW Module"): Our standard MSW Module designs process 25 or 50 tons of MSW per hour, and can be customized to accommodate customer-specific needs (e.g., higher volumes). The MSW Module quickly removes non-recoverable residue and extracts ferrous materials, generating a blend of mixed recyclables for downstream separation. The 2" minus fraction of material (where most of the organics are typically located) is separated from the mixed recyclables stream. We do this by pairing our proprietary sorting technology with traditional screens, magnets and hazard identification and removal where appropriate. We invite the City to observe an AMP ONE SPOKE in operation in Portsmouth, Virginia, where it has been processing MSW since late 2023.

AMP ONE HUB™ ("Recyclables Module"): Each Recyclables Module is capable of processing up to 25 tons of mixed recyclables per hour, which it separates into streams of individual commodities for sale. We invite the City to observe an AMP ONE HUB in operation at AMP's Cleveland facility, where it has been processing mixed recyclables for over three years.

An AMP solution for the City could incorporate multiple MSW Modules within existing infrastructure (e.g., transfer stations). Commingled recyclables extracted by the MSW Modules could then be transported to an AMP-operated Recyclables Module or a third-party material recovery facility (e.g., WM Philadelphia Recycling Facility).

AMP's technology can enable, and is compatible with, various organics solutions (e.g., anaerobic digestion, gasification, biochar). For example, by efficiently sorting and cleaning organic waste before processing, AMP's MSW Module in Virginia ensures a high-quality feedstock for biochar production, which is our municipal customer's preferred organics management process.

### Necessary Infrastructure

AMP's goal is to leverage our technology's flexibility to use as much existing infrastructure as possible, ranging from transfer stations to existing offtake processing sites. For a project capable of accommodating the City of Philadelphia's MSW volumes, we anticipate deploying multiple processing systems co-located on one site, or distributed across multiple sites, to reduce hauling requirements and optimize the transfer of material between sites. The specific infrastructure requirements will depend on the ultimate solution, or combination of solutions, that the City would like AMP to deploy.

### Partnerships

In addition to AMP's operating collaborations with its public sector and private sector customers, AMP has negotiated long-term offtake contracts with national materials buyers and downstream processors. These contracts reduce the risk associated with volatile commodity markets, by ensuring that AMP and its customers have reliable offtake and predictable revenue streams to support each project and its diversion targets.

## 3.2.5 Recycling Recommendations

*The Department's residential recycling goal for FY26 is 15%. What approaches or initiatives could be implemented to substantially improve this percentage and stay on target with the goal of 90% waste diversion by 2045?*

In order to improve the residential recycling rate and hit the City's goal of 90% diversion by 2045, AMP recommends that the City processes its waste with AMP ONE MSW Modules and Recyclables Modules, as described in our response to Section 3.2.4. AMP would welcome the opportunity to work with the City to identify the optimal distribution of systems for Philadelphia.

## 3.2.6. Potential Barriers to Success

*Barriers to increased capacity, service delivery, data collection and partnership development. Please share feedback on roadblocks and barriers to expanded service delivery that the City could address as it develops its municipal waste plans.*

If the City opts to issue an RFP for diversion solutions, AMP recommends that the City consider how certain threshold qualification criteria will affect the responses it receives.

AMP has built transformational technology based on more than a decade's worth of waste characterization data. Because AMP launched its first facility-scale solution in 2020, however,

any threshold operating history requirement that exceeds five years could present a challenge for AMP and other advanced technology providers.

Large bonding requirements, if made a threshold requirement for bid submission, would pose a somewhat similar challenge for advanced technology solutions providers like AMP. Such requirements are just as effective, and far easier to manage for providers, when incorporated during the contracting stage rather than as a precursor to the bid submission stage.

To ensure the City has a broad array of viable MSW management solutions to consider, we would discourage inclusion of the above as threshold bid submission qualifications.

## 3.3 Recommendations for Solutions

*Recommendations for solutions that will assist the Department in developing new approaches, innovations, and initiatives to minimize the City's waste streams, including practices that will help the City advance its Safe, Clean & Green mission and Zero Waste goals.*

### 3.3.3 General Information on Zero Waste Strategies

*Please share information and long-term strategies and/or holistic approaches for the City to nearly eliminate waste sent to landfills and incinerators. Sharing knowledge of practices or programs in other jurisdictions is also encouraged. Please cite resources and studies where possible.*

AMP proposes a proven solution described in our response to Section 3.2.4

## 3.4 Other Information

### 3.4.1 Recommendations

*Please use this section to include information or recommendations that have not been addressed elsewhere in your response. Respondents are also encouraged to present any options or approaches that may not have been prompted by the questions proposed in this RFI.*

We recommend issuing a single RFP addressing the design, build, operation, and maintenance of an MSW processing solution. By soliciting a single bid for all of these components, the City stands to benefit from proposals strengthened by bidder familiarity with and ownership of all phases of procurement, implementation, and performance. This drives efficiencies as well as accountability more directly than a model in which equipment vendors and re-sellers design and build a system, only to hand it off to a separate and distinct staffing agency less familiar with optimal operation and maintenance practices for that system. This model serves to enhance performance, reduce operational disruptions, and maximize the effectiveness of the entire solution.