

Toward a Better Baltimore: Reducing Waste through Accessible Reverse Vending Machine Infrastructure

Recycletek's Response to NMWDA's Request for Information

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Company Overview

Our Story

After organizing a community beach cleanup on Rhode Island's shoreline, CEO Martin Naro found himself with 150 bags of waste and no good answer for where they would all end up. There was no verified recycling path, and a real possibility the waste would end up back in the same waterways the community had worked hard to clear. This led Martin to found Ocean Notion, where he worked with local businesses across Rhode Island who, it turned out, had little idea what their state and local recycling requirements were. This work confirmed what Martin already knew from the beach: people want to do the right thing, but the system just wasn't built to help them succeed.

Yoni Saltzman came to Recycletek as a spacecraft mechanisms engineer with a straightforward conviction: sustainable actions are only as effective as the system that services them. Traveling abroad, he saw communities doing everything right: near-universal participation, strong recycling culture, and genuine commitment. Still, though, collected plastic was being quietly outsourced to communities in the Global South. There, it met the same end as the plastic pulled from those Rhode Island beaches: incineration, landfills, and open burning...just in someone else's backyard.

Dr. Tobias Weis rounds out the founding team. Tobi's research in biologically inspired visual systems is built on the idea that the most resilient systems are the ones that continuously adapt to their environment. From automotive to robotics to finance, he has spent his career translating that research into real-world applications. At Recycletek, he's applying that to our technology.

Recycletek was built around a simple idea: sustainable systems should serve every community, not just the ones with the infrastructure already in place.

Our Approach

Recycletek is an established operator with the agility of a company that is still growing. We know our solution works, but we also know that every community is different. That balance is intentional. We are experienced enough to implement reliably, and early enough in our growth to listen, adapt, and build something that responds to local needs.

Social and economic equity sits at the center of how we operate. We are currently working with communities and operators across California and New York from urban centers like Los Angeles to small rural communities with no existing deposit value infrastructure. We are also actively expanding into new markets, supporting communities without deposit value programs and integrating with Extended Producer Responsibility (EPR) frameworks. We believe that sustainable systems should create opportunity in the communities they serve with local jobs, accessible infrastructure, and programs built with community input.

Recycletek Products and Services

Recycletek offers a flexible suite of **bulk vending solutions** designed to meet communities where they are, beyond traditional sites like large retailers.

Our hardware can be mobile or fixed, scaled from **individual bag-drop kiosks to high-capacity bulk processing units** capable of counting **up to 1,000 containers per minute**. Mobile units are particularly well-suited to rural and underserved communities, reducing the need to transport material long distances and lowering costs and emissions for all involved. **This range means we can serve dense urban centers and small rural communities within the same program framework.** With even just one open parking spot, you can operate a recycling center.

All our hardware is supported by an **end-to-end software platform** that handles incentive processing, compliance reporting, material tracking, and operational analytics. Powered by AI that continuously learns and adapts, the system is built to handle a range of materials and to evolve alongside the programs it supports. It is designed to be accessible to operators of any size, from large municipal programs to smaller community-based organizations.

Recommendations and Responses

Costs and Financial Considerations

1. What are the general costs and high-level budget considerations associated with implementing the reverse vending machine program?

Initial deployment of reverse vending machine (RVM) programs must include budgeting for up-front costs of hardware, software, installation, and software configuration. Any costs associated with the incentive basis must also be considered in this initial budgeting.

Yearly operating costs such as rent, employee compensation, insurance, permitting, accounting, video recording, and any transaction fees are also necessary to account for. We also recommend accounting for work supplies, cleaning supplies, as well as transportation and densification of materials.

In our experience, the most successful RVM program deployments have also included planning for communications, marketing, and public education and outreach.

2. Can you demonstrate any cost avoidance/savings for an organization that implements reverse vending machines?

The implementation of Reverse Vending Machines (RVMs) creates cost avoidance and new revenue streams in a few ways: improving material quality, capturing untapped legislative funds, and administrative oversight.

By isolating containers at the source, RVM programs produce a high-purity "A-grade" commodity that commands a premium market value compared to the lower-value "B-grade" materials typically recovered through standard commingled collection.

In addition, in areas where "Bottle Bill" legislation is adopted, the municipality or state can retain unredeemed container deposits; in other redemption areas, this has represented significant financial capture.

The City also generates immediate and recurring revenue through administrative oversight of the program, in particular through environmental site surveys and specialized permitting fees required for RVM deployment.

Accepted Materials

- 3. What types of beverage containers do the reverse vending machines accept? What types of containers do the reverse vending machines prohibit?**

Recycletek's reverse vending machine technology can accept PET1, PET2, bimetal, glass, and paper. Any size container, up to 2-liter bottles, can be accepted.

- 4. Could reverse vending machines accept beverage containers/packaging that are cartons, pouches, aseptic or gable top containers?**

Yes, Recycletek's RVM machines will accept beverage containers and packaging that are cartons, pouches, aseptic, or gable top containers.

Program Design & Rollout

5. Would you recommend that the project/program start with a pilot or a subset/subgroup and build over time? What would an ideal roll-out of the program look like?

Yes. A pilot gives the City a low-risk opportunity build something that works for Baltimore, as well as the flexibility to evolve alongside the state legislative landscape as it develops. A scalable pilot program in Baltimore could look like this:

Phase 1: Pilot

We recommend beginning with a limited deployment of stationary and mobile units on City-owned land. Short-term leases and modular equipment keep the program agile. Leases, as opposed to outright purchase, allow the program room to evolve. Sites can be added, relocated, or scaled back based on what the data and community feedback show. Partnerships with libraries, community centers, schools, and other public hubs provide a natural network to build from.

The pilot could be structured through public-private partnerships and grant funding; organizations focused on environmental justice, waste reduction, and community development are natural fits, and this model distributes both the investment and the accountability across stakeholders rather than placing it squarely on the City. The City is best positioned to identify partner organizations it already has relationships with; Recycletek brings experience structuring these arrangements and identifying relevant grant opportunities.

Staffed collection points should be considered from the outset. Local employment at redemption sites serves the program operationally and connects it to the community.

The General Assembly's pending legislation outlines redemption incentives of \$0.10 per container under 24 oz and \$0.15 for larger containers. We recommend offering and maintaining this rate, either as monetary incentive or in the form of local vouchers and credits redeemable at Baltimore businesses, keeping the value in the City. This model does not require technical integrations with third-party systems to get started, and positions the program to transition smoothly if and when state legislation passes.

Phase 2: Evaluate and Expand

Pilot data is evaluated with the goal of informing the continuation and expansion of the RVM program in Baltimore. This is also the phase where the program's relationship to Maryland EPR legislation comes into sharper focus. A functioning pilot with real data

makes the case for integrating producer responsibility fees as a funding mechanism when the legislative landscape matures.

Phase 3: Citywide Program

The RVM program operates as a self-sustaining local system, operated through a combination of City oversight and public-private partnerships, with a funding structure that is not dependent on a single source.

6. What staffing needs would need to be considered when implementing and servicing the reverse vending machine?

Recycletek believes in the value of local employment, as local employees know best how to support their communities. As such, we would expect most jobs created by the RVM program to be held by local workers. In addition to operational staff to operate recycling sites and Recycletek systems, at least two staff members dedicated to learning and operating Recycletek's technology would be beneficial. These employees would be managing communications related to the RVM program and engineering responsibilities including electrical and software maintenance, permitting, and identifying sites for technology deployment.

7. What support would be needed from the City, either up front or on an ongoing basis?

Recycletek would look to the City for introduction and support establishing the necessary relationships to serve the policy, management, and operational needs for implementing an RVM program in Baltimore. This includes leveraging the City's institutional knowledge of Baltimore's neighborhoods, waste infrastructure, and existing recycling efforts.

This could include public and private recycling stakeholders in Baltimore City and Baltimore County, nonprofit or public organizations to share in operation of the RVM program. We also would look to the City to connect with local workforce partners for RVM operation, maintenance, and community engagement roles. If at all feasible, we would also like to partner with higher education and research institutions in Baltimore to invest in R&D to further improve our products and business model.

Additionally, Recycletek would depend on the City for support in identifying suitable real estate for both RVM operation and hardware storage. Public-facing municipal properties such as schools, libraries, government buildings, and other civic spaces create natural, convenient opportunities for recycling. For storage of units not actively deployed, City-managed lots such as vehicle staging areas and maintenance yards would provide practical, cost-effective storage options.

Incentives

8. What potential incentives would be provided in exchange for the returned beverage containers? Please provide examples from your experience, if applicable.

The simplest form of incentives offered by the City could be vouchers or local currency accepted by participating Baltimore businesses, redeemable for public services, or exchangeable for rewards with local sports teams, venues, or for events. This would be a low-cost solution, keep redemption value in Baltimore, and would not require API integration with City infrastructure.

A more traditional solution would be hard cash, including via PayPal, Venmo, or other online platforms. Though this would require identifying funding sources for the incentive structure, costs could be distributed through public-private partnerships and recovered from the sale of deposited materials and revenue from administrative fees. It is likely the most universally accessible incentive format and may drive the highest participation rates.

Recycletek works with many non-profits, providing community members with opportunities to donate deposit value to meaningful causes in the community. Donations work best as one option among several. Community members who prefer to direct their deposit to a local cause can do so, without creating a barrier for those who prefer the direct incentive value.

Environmental Impact & Materials Outcomes

9. What happens to the collected materials? Who are the downstream vendors (if any) and what is their recycling process?

In the short term, all collected materials would be routed through a municipal MRF for primary sorting and preparation for market. To ensure consistent movement, we partner with high-volume commodity firms that possess the specialized infrastructure required to aggregate and sell industrial-scale loads. These partners act as strategic intermediaries, leveraging their market scale to secure reliable downstream vendors and verified end-users. Our downstream network utilizes advanced mechanical or chemical recycling processes to transform sorted commodities into high-quality recycled feedstock. This model ensures that even during market shifts, Baltimore's materials maintain access to stable, high-capacity recycling streams.

Longer-term workflows would be defined in collaboration with the City and other stakeholders.

10. How much waste (in tons) can be reduced/diverted by each machine per year?

Processing 25k-50k units on average per day, one of Recycletek's bulk RVM machines can process 3/4 of a ton per day of operation. Allowing 5 operating days per week, a single Recycletek bulk RVM machine can divert ~196 tons of waste per year. Mobile units can accommodate up to two bulk RVM machines, thus doubling the collected waste per site.

11. Are there other environmental benefits that can be quantified?

A few years ago, Recycletek conducted a Life Cycle Assessment (LCA) in New York. A container recycled through Recycletek's DRS equipment vs. traditional landfill saves on average 0.19g CO₂e of emissions. We expect that results could be similar in Baltimore; emission savings can be calculated with updated data for the City.

RVMs intercept beverage containers before they enter the waste stream, reducing litter, plastic load to local waterways, and microplastic precursors from container fragmentation. In addition to diverted waste and carbon emissions, these outcomes can be quantified through litter audits and stormwater monitoring before and after deployment.

Program Integrity

12. Are there any barriers that could impact the implementation of your recommended program?

We've identified the following barriers, along with a path forward for each:

Market Entry. Recycletek does not currently operate in Maryland. Entering Baltimore's waste management ecosystem would require building relationships with local stakeholders including municipal agencies, haulers, downstream processors, and community partners. With support from the City and introductions to the appropriate stakeholders, deploying an RVM program in Baltimore would be a collaborative process.

Financing. The costs of launching an RVM program, including procurement, installation, permitting, public outreach, and ongoing operations are real. However, public-private partnerships, nonprofit co-investment, and EPR-linked funding mechanisms represent viable alternatives.

Public Expectations Around RVM Design. A commonly overlooked barrier is preconceived notions about what a redemption program looks like. Single-feed machines are most familiar to consumers; Recycletek's high-throughput model processes materials faster and serves more users than conventional RVM systems. Proactive public communications would be essential to setting accurate expectations about how this program works, and could lay groundwork for broader public support for DRS in Maryland.

Transportation and Environmental Considerations. The carbon footprint of material transport is a legitimate consideration in any DRS program. However, it is not a net-new impact: this waste is already being collected for waste disposal or ending up in Baltimore's waterways and landscape. Optimized routing, load maximization, and transition to lower-emission vehicles can make a Recycletek-supported program better than current collection operations on this metric.

13. How does the reverse vending machine system protect against fraud?

Many existing deposit return schemes, such as those Recycletek supports in California and New York, control materials by restricting redemption to containers bearing specific logos or deposit codes on packaging. Implementing that kind of system in Baltimore would be a significant lift, and could create friction for Baltimore's integration into a larger state DRS program, should the Bottle Bill pass the General Assembly.

ID verification tied to residency is another approach sometimes proposed to limit fraud. Recycletek does not recommend this. Restricting participation by ID or geography would discourage and exclude the communities that already recycle the least. This stands in direct conflict to our shared goal: to expand recycling participation and serve Baltimore communities, not entrench existing patterns of exclusion.

The better path is incentives that can be spent locally, open to anyone. In addition to being a simple and low-cost incentive structure, local vouchers or currency keep value in Baltimore. This addresses both concerns at once: there is limited motivation to import containers from elsewhere if the reward can only be used in Baltimore, and no one is turned away at the machine.

Regarding fraud with the containers, our machinery has a 99% effectiveness rate, and human operators are there for a final check. Once a container has been counted by a Recycletek machine, the downstream chain ensures that the same container cannot be used to redeem an incentive a second time.

Conclusion

Implementing a localized RVM program in Baltimore would bring the City meaningfully closer to the waste reduction and recycling goals and objectives laid out in *Less Waste, Better Baltimore*, without waiting on the state to pass deposit redemption legislation. Recycletek recommends a tailored program built around mobile RVM units, local incentives, and public-private partnership: one that can be deployed incrementally, adapted over time, and designed from the start to serve all Baltimore communities.

Please do not hesitate to reach out with any further questions, and we look forward to hearing NMWDA's plans in April.