Project R.O.O.T.

(Recycling Organic Outputs Together)

A Feasibility Study and Implementation Plan for a Student-Led Composting Initiative at the University of Reading

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Executive Summary

Introduction

This report presents a comprehensive feasibility study and implementation plan for Project R.O.O.T. (Recycling Organic Outputs Together), a proposed student-centric, circular economy initiative at the University of Reading. The project is designed to divert food waste generated by students in their residences from the conventional waste stream, transforming it into a valuable resource for the University and the local community. It aims to empower students, provide them with paid opportunities, and tangibly advance the University's ambitious sustainability goals.

The Problem

Food waste represents a significant environmental, economic, and social challenge both nationally and within the university sector.[1] While the University of Reading has established robust systems for managing its operational food waste, a critical gap remains: the significant volume of food waste generated by its large student population within their own kitchens and halls of residence. This waste stream is currently unmeasured and largely untreated, entering the general waste system and representing a lost resource, a financial cost, and a missed opportunity for student engagement and education.

The Solution

Project R.O.O.T. proposes an innovative, decentralised model to address this gap. The core concept involves incentivising students with direct financial payment to compost their food waste in their residences using the simple and effective Bokashi fermentation method. The resulting pre-compost will be collected by a team of paid student workers, matured at a central on-campus facility, and the final high-quality compost will be utilised by the University's Grounds Department and distributed to local community garden partners. This creates a closed-loop system entirely within the University and its immediate community.

Key Findings

- **Quantitative Impact:** A pilot program targeting the ~5,000 students in halls of residence could divert an estimated 44 to 87 tonnes of food waste from the general waste stream annually, depending on participation rates. This would produce approximately 14 to 29 tonnes of high-quality, nutrient-rich compost, equivalent to 29 to 58 cubic metres of soil conditioner.
- **Financial Viability:** The project presents a unique financial model. While the direct value of the compost produced offsets a portion of the operational costs, the primary financial flow involves redirecting funds that would otherwise be spent on external waste disposal contracts into direct payments for students. This transforms a waste liability into a strategic investment in student employment, skills development, and financial support. The model is highly attractive for external grant funding, which can ensure long-term cost neutrality.
- **Strategic Value:** The project directly aligns with and accelerates key institutional objectives. It embodies the circular economy principles of the University's Waste & Resource Use Strategy 2021-30, contributes to the Net Zero Carbon by 2030 target, and provides a powerful, innovative narrative that reinforces the University's national leadership in sustainability, as evidenced by its top-tier ranking in the People & Planet University League.[3]
- **EDI and Student Experience:** By offering paid, flexible roles, the project provides an equitable and accessible alternative to unpaid volunteering, directly addressing potential barriers for students from lower-income backgrounds. It creates a structured pathway for students to earn the prestigious RED Sustainable Action Award, enhancing their employability with practical "green skills" and project management experience.[5]

Primary Recommendations

This report concludes that Project R.O.O.T. is a strategically compelling and operationally feasible initiative. It is recommended that the University leadership approve the project in principle and support a phased implementation, beginning with a funded pilot program in select halls of residence for the 2025/26 academic year. This approach will allow for the model to be tested, refined, and scaled effectively, maximising its potential for positive impact.

Section 1: The Problem and Strategic Opportunity: Food Waste within the University Ecosystem

1.1 The National and University Context of Food Waste

Food waste is a pervasive issue with profound environmental, economic, and social consequences. In the United Kingdom, an estimated 10.7 million tonnes of food waste are generated each year.[1] Households are the single largest contributor to this figure, responsible for approximately 6.6 million tonnes, of which 70% was once edible food.[2] This equates to a financial loss of nearly £14 billion annually, or about £60 per month for an average household.[2] Within this context, university students represent a demographic of particular significance. Often living independently for the first time, students face unique challenges related to food purchasing, preparation for small households, and a lack of appropriate infrastructure for sustainable waste disposal in university accommodations.[2] Research indicates that the average university student wastes food worth approximately £5.25 per week, amounting to £273 over an academic year.[2] This highlights a specific and addressable challenge within the higher education sector.

The University of Reading, a leader in sustainability, has made significant strides in managing its *operational* waste. The most recent data from the 2023/24 academic year shows that the University processed 114,773 kg (114.8 tonnes) of food waste through Anaerobic Digestion (AD).[7] A more granular breakdown reveals that Campus Commerce outlets (including catering, cafes, and restaurants) were responsible for 106,444 kg (106.4 tonnes) of this food waste.[8] These figures demonstrate the University's well-established capability to segregate and manage large volumes of organic waste generated through its commercial operations.

However, these statistics also illuminate a critical gap. The waste generated by over 27,000 students [9] in their own kitchens—within halls of residence and private accommodation—is not captured by these operational metrics. This student-generated household food waste currently enters the general waste stream, where it is either sent to an Energy from Waste (EfW) facility or, in the worst case, landfill.[10] This represents a significant untapped resource stream and a clear opportunity for the University to extend its sustainability leadership beyond its operational boundaries and directly into the student community. Project R.O.O.T. is designed specifically to target this unmeasured and undervalued waste stream, transforming it into a tangible asset.

1.2 Aligning with Institutional Ambition: Beyond Compliance to Leadership

The proposed initiative aligns seamlessly with the core tenets of the University of Reading's strategic vision for sustainability. The University's Waste & Resource Use Strategy 2021-30 is the guiding

document for this area, and its primary objective is to "move away from the inefficient linear model of 'take, make, use, throw' towards a circular economy".[7] The strategy explicitly prioritises waste prevention and moving materials "further up the Waste Hierarchy".[7] Project R.O.O.T. is a perfect embodiment of these principles. It moves beyond the current practice of sending food waste to AD—a form of recycling—to a higher-value circular process: creating a physical product (compost) that is reused directly on campus and in the local community, thereby closing the nutrient loop. This initiative supports the updated 2024 strategic target to increase the University's annual recycling rate (which includes composting) to a minimum of 65% by 2027.[7]

Furthermore, the University of Reading has cultivated a strong institutional identity as a global leader in environmental sustainability. This is not merely an operational goal but a core principle of its 2020-2026 Strategic Plan.[11] This leadership is externally validated by numerous accolades, including a consistent top-five ranking in the People & Planet University League, where it achieved 4th place in the UK for 2024/25 with top marks for its sustainable food programme.[3] The University's commitment to achieving Net Zero Carbon status by 2030 provides a powerful driver for innovative projects that reduce emissions associated with waste transport and disposal.[12]

Project R.O.O.T. offers an opportunity to build on this reputation with a highly visible, innovative, and student-led initiative. While other universities have implemented centralised composting systems, a decentralised, incentivised, in-residence model is novel and provides a compelling narrative of student empowerment and co-creation. The current waste management system, while efficient, operates largely behind the scenes. Food waste from catering is collected and sent for industrial processing via AD or to the re3 facility for hot composting.[7] For students, this is a passive, "black box" process that offers little opportunity for engagement or learning. This project fundamentally changes that dynamic. It transforms waste management from a back-end operational function into a visible, high-impact component of the student experience. By placing the tools of resource creation directly into students' hands, the University moves from a model of industrial waste *disposal* to one of active, educational resource *creation*. This is a far more profound contribution to sustainability, directly aligning with the University's core educational mission to equip students with the knowledge and skills to address global challenges.[12]

Section 2: Quantitative Analysis: From Student Plates to Campus Grounds

2.1 Estimating Student Household Food Waste Volume

To quantify the potential impact of Project R.O.O.T., a model was developed to estimate the volume of food waste generated by students in university-managed halls of residence. The University of Reading is home to a large and diverse student population of over 27,000, with a Full-Time Equivalent (FTE) count of 16,740 for the 2023/24 academic year.[9] A significant portion of these students, particularly first-years, reside in university-managed accommodation. There are currently 4,982 student bedrooms located in halls on or in close proximity to the main campus.[15] This cohort represents a well-defined, accessible, and logistically manageable population for the initial pilot phase of the project.

National data on household food waste provides a baseline for estimation. While studies show that UK students waste food valued at £273 annually [2], a more conservative and operationally useful metric is weight. Based on data from waste reduction charities like WRAP, average UK household food waste generation is approximately 1-1.5 kg per person per week. For this model, a conservative estimate of 1 kg of compostable food waste per student per week is used. This figure is applied over a 35-week period, accounting for the main academic terms and excluding major holiday periods when halls have lower occupancy.

The success of the program is contingent on student participation. Therefore, the model projects the potential waste diversion at three different participation rates: a conservative 10%, a realistic 25%, and an ambitious 50%.

The calculation is as follows:

$$Waste\ Diverted\ (kg) = [N_{students} \times R_{participation} \times W_{per\ student\ per\ week} \times N_{weeks}]$$

Where:

- $N_{students}$ = Number of students in halls
- $R_{participation}$ = Participation rate (as a decimal)
- $W_{per\ student\ per\ week}$ = Waste per student per week (kg)
- N_{weeks} = Number of weeks

As shown in Table 1, even with a modest 25% participation rate among students in halls, the project has the potential to divert approximately 43.6 tonnes of food waste from the general waste stream annually. At a 50% participation rate, this figure doubles to 87.2 tonnes. This demonstrates a substantial potential for impact within a contained pilot group.

2.2 Compost Production Potential

The composting process transforms raw organic matter into a stable, nutrient-rich soil amendment. This transformation involves significant moisture loss and microbial decomposition, which reduces the overall weight and volume of the material. However, the process also involves the addition of carbon-rich materials (in the case of Bokashi, the bran; in the maturation phase, potentially woodchip or other green waste) which contributes to the final mass. Based on industry data and case studies, a blended conversion rate of 33% from raw food waste to finished compost by weight is a reliable estimate.[16]

Applying this conversion factor to the projected waste diversion volumes allows for a clear estimation of the project's primary output: finished compost.

The calculation is as follows:

$$Compost\ yield\ (tonnes) = [W_{diverted} \times Y_{compost}]$$

Where:

- $W_{diverted}$ = Waste diverted (tonnes)
- $Y_{compost}$ = compost conversion factor (0.33)

To translate this weight into a more practical volume for landscaping and horticultural use, a standard bulk density for mature compost of approximately 500 kg per cubic metre (m^3) is used.

As detailed in Table 1, a 25% participation rate would yield approximately 14.4 tonnes of compost, equivalent to nearly 29m^3. An ambitious 50% participation rate would generate 28.8 tonnes, or over 57m^3 of high-quality compost annually. This output is significant and represents a valuable resource. The quality of such compost is also noteworthy; a recent research partnership at the University of Reading demonstrated that homemade compost derived from kitchen and garden waste yielded superior results in plant growth compared to several commercial peat-free alternatives, exhibiting higher concentrations of essential micronutrients.[17] This provides a strong, evidence-based endorsement of the quality of the product this project would create.

Participation Rate	Number of Participating Students	Estimated Annual Food Waste Diverted (Tonnes)	Projected Annual Compost Yield (Tonnes)	Projected Annual Compost Yield (m3)
10%	498	17.4	5.7	11.5
25%	1,246	43.6	14.4	28.8
50%	2,491	87.2	28.8	57.6

Table 1: Estimated Annual Student Food Waste Generation and Compost Potential (Pilot Phase - 4,982 Hall Students)

2.3 Financial Modelling: A Circular Economic Case

A robust financial model is essential to demonstrate the project's long-term viability. The model for Project R.O.O.T. is built on a circular economic principle, considering both cost avoidance (which functions as a revenue stream) and operational costs.

Cost Avoidance (Revenue Stream)

The primary financial benefit to the University is the avoidance of costs associated with purchasing compost and soil conditioners for its extensive grounds. The University's Grounds Department is responsible for maintaining the award-winning Whiteknights campus, which requires significant horticultural inputs.[3] The compost generated by this project can directly substitute for commercially procured materials. Market prices for bulk compost vary, with prices for bulk bags (0.5-1m^3) ranging from £67 to over £113.[19] A local supplier in Reading offers loose tipped premium compost from £46.10 per cubic metre.[21] Using a conservative valuation of £50 per m^3, the compost generated through a 25% participation rate would have a value of £1,440, rising to £2,880 at 50% participation. This represents a direct and recurring saving for the Estates budget.

Program Costs

The operational costs of the project are broken down into three main categories:

1. **Student Payments:** This is the largest and most strategic expenditure. To ensure high participation and to recognise the value of students' contributions, a payment model is proposed. A rate of £0.50 per kilogram of correctly fermented Bokashi pre-compost is recommended. At a 25% participation rate (43.6 tonnes), this would amount to an annual cost of £21,800. This payment is the core incentive that drives the entire system.

2. **Starter Kits:** Each participating student will require a Bokashi starter kit, typically a twin-bin system to allow for continuous use. Retail prices for such kits range from £45 to £80.[22] Through a bulk procurement agreement for the pilot phase (e.g., 1,250 units), it is projected that the unit cost could be reduced to approximately £40, resulting in a one-time setup cost of £50,000 for a 25% participation rate.
3. **Operational Overheads:** These include the salary for a part-time student Project Coordinator (e.g., 10 hours/week), wages for a small team of student Compost Collectors, costs for collection equipment (e.g., an electric cargo bike), and maintenance of the maturation site. Based on operational models from other university composting programs, these costs are estimated at approximately £15,000 annually.[26]

Net Financial Impact

A simple comparison of direct cost avoidance against program costs reveals a net financial deficit. The value of the compost produced does not, on its own, cover the cost of student payments and operations. This finding is crucial, as it necessitates a more sophisticated understanding of the project's financial structure. The model should not be viewed as a simple cost-saving measure but as a strategic reallocation of University funds. Currently, the University incurs significant costs for waste disposal; in 2018/19, the net cost for general waste from Catering, RUSU, and Greenlands alone was £48,006.[7] A portion of the student food waste targeted by this project currently contributes to these general waste costs.

Therefore, the financial case for Project R.O.O.T. is not about generating a profit, but about transforming a waste cost centre into a student investment hub. Funds that would otherwise be paid to an external waste management contractor for disposal are instead redirected internally to provide paid employment, skills development, and direct financial support to the student body. This reframes the project from a "waste management" expense to a "student experience and employment" initiative funded through operational efficiencies and strategic alignment. This is a far more compelling proposition for a higher education institution. Furthermore, the clear social and environmental benefits make the project an exceptionally strong candidate for external grants, which could cover the initial setup costs and a significant portion of the ongoing operational budget, moving the project towards long-term cost neutrality for the University.

Financial Year	**Year 1 (Pilot)**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Revenue (Cost Avoidance)	£1,440	£1,440	£2,160	£2,880	£2,880
Participation Rate Assumption	*25%*	*25%*	*37.5%*	*50%*	*50%*
Costs					
Student Payments	(£21,800)	(£21,800)	(£32,700)	(£43,600)	(£43,600)
Starter Kits (One-time)	(£50,000)	(£0)	(£25,000)	(£16,600)	(£0)
Operational Overheads	(£15,000)	(£15,000)	(£18,000)	(£20,000)	(£20,000)
Total Costs	(£86,800)	(£36,800)	(£75,700)	(£80,200)	(£63,600)
Net Financial Position	**(£85,360)**	**(£35,360)**	**(£73,540)**	**(£77,320)**	**(£60,720)**
Cumulative Net Position	**(£85,360)**	**(£120,720)**	**(£194,260)**	**(£271,580)**	**(£332,300)**

Table 2: Projected 5-Year Financial Impact of Project R.O.O.T. (without external grant funding)

Section 3: The Value Proposition: Cultivating More Than Just Compost

The true value of Project R.O.O.T. extends far beyond its physical outputs and financial metrics. The initiative is designed to generate significant, multifaceted benefits that align with the University's core mission, enhancing the student experience, strengthening community ties, promoting inclusivity, and bolstering its reputation for innovative sustainability.

3.1 Enhancing the Student Experience and Employability

Project R.O.O.T. offers a direct and structured pathway for students to gain valuable skills and experiences that are highly sought after by employers. The University's Reading Experience and Development (RED) Awards program is a key mechanism for this. The RED Sustainable Action Award, in particular, challenges students to engage with the UN Sustainable Development Goals (SDGs) and develop their employability skills through practical action.[4] This project can be formally integrated into the RED Award framework. Participation in the composting scheme, and especially taking on paid roles such as "Compost Champion" or "Compost Collector," can be designed to meet the award's requirements for earning points and completing an advocacy component.[6] This provides an immediate, tangible benefit for students, linking their co-curricular activities directly to their academic record and professional development.

The skills gained are both practical and transferable. Participants develop an understanding of circular economy principles, waste management logistics, and sustainable living practices. Those in paid roles acquire experience in peer-to-peer education, project management, data collection and analysis (weighing and recording waste), and stakeholder communication. These "green skills" are increasingly critical in a job market that values sustainability literacy.[29] The RED Award program has a proven track record of enhancing students' confidence, communication, and teamwork skills, all of which add significant value to their CVs and support their career development.[5]

3.2 Strengthening Community Partnerships and Local Impact

The project creates a powerful bridge between the University and the vibrant network of community organisations in Reading. The compost produced is a valuable resource for local gardening and food-growing initiatives. The user has already identified several potential partners, including Green Health Thames Valley and the University's own Secret Garden Society. Further research reveals a rich ecosystem of potential collaborators, such as the Erleigh Road Community Garden, the therapeutic horticulture charity Thrive, the Food4Families network, and environmental groups like Caversham GLOBE.[30]

For these organisations, access to a consistent supply of high-quality, peat-free compost can be a significant benefit, as it is often a costly input for their operations.[37] This creates a symbiotic relationship. In exchange for the compost, these community gardens can serve as valuable partners,

offering opportunities for student volunteering. These placements can also contribute to students' RED Award requirements, creating a virtuous cycle of engagement. This strengthens the University's civic mission and demonstrates its commitment to being a positive force in the local community, a key strategic goal for leading institutions.[29] A tiered partnership model can be developed to manage these relationships effectively, ranging from simple compost recipients to fully collaborative partners for workshops, events, and joint funding applications.

3.3 Advancing Equality, Diversity, and Inclusion (EDI)

A core and defining feature of Project R.O.O.T. is its commitment to paying students for their participation. This is a fundamental aspect of its design and a powerful tool for advancing the University's Equality, Diversity, and Inclusion (EDI) objectives. The University of Reading is home to a diverse student body, including 29% international students, and is actively committed to creating an inclusive environment and addressing attainment gaps for students from all backgrounds.[38]

Unpaid volunteering, while valuable, can inadvertently create barriers for students from lower-income backgrounds or those who need to work part-time to support their studies. By offering paid, flexible, on-campus employment, Project R.O.O.T. makes participation in a high-impact sustainability initiative accessible to all students, regardless of their financial circumstances. It formally values their time and labour, fostering a sense of respect and partnership. The roles created, such as Compost Collector, can be designed to be low barrier, requiring enthusiasm and reliability rather than extensive prior experience. The flexible hours can be structured to fit around academic timetables and other commitments. This approach directly contributes to a more equitable campus culture where all students have the opportunity to engage in, lead, and benefit from sustainability work.

This project also serves as a practical tool for social integration and fostering a sense of belonging. University life can be an isolating experience for some, particularly for first-year students adjusting to a new environment or for the large international student cohort navigating a new culture.[38] The University has programs designed to foster belonging and support these students.[39] Research and experience show that shared, practical activities like community gardening are highly effective at building social connections, creating a sense of place, and improving overall wellbeing.[41] Project R.O.O.T. functions as a powerful engine for this kind of community building. The shared goal of composting, the regular interactions with student Compost Champions, and the tangible connection to the campus grounds and local gardens create multiple, low-pressure touchpoints for students to connect with their peers and the wider Reading community. It transforms an individual, domestic action into a collective, community-focused experience, helping to combat loneliness and build a stronger, more integrated student body.

3.4 Bolstering University Reputation as a "Living Lab"

The concept of the "Living Lab" is gaining significant traction in higher education. It involves using the university campus and its operations as a real-world environment for teaching, research, and student-led problem-solving.[29] The University of Reading, with its world-leading research strengths in climate,

agriculture, food, and nutrition, is perfectly positioned to leverage this model.[12]

Project R.O.O.T. is a flagship Living Lab initiative. It creates a direct, tangible link between the University's operational sustainability goals and its academic mission. The project will generate a wealth of data—on participation rates, contamination levels, waste volumes, compost quality, and the effectiveness of different engagement strategies. This data can be made available for student dissertations, coursework projects, and academic research across a range of disciplines, including Environmental Science, Agriculture, Sociology, Marketing, and Business. This creates a powerful feedback loop where academic inquiry informs and improves the operational project, which in turn provides richer data for further study. This approach not only enhances the educational value of the project but also amplifies the University's reputation for innovation, demonstrating how it integrates research and practice to tackle real-world sustainability challenges.

Section 4: Implementation Framework: A Phased Approach to On-Campus Composting

4.1 The Operational Model: Recommending the Right Tools

The success of a decentralised composting program in a student residential setting hinges on selecting a method that is simple, effective, and minimises potential issues like pests and odours. A comparative analysis of the two most viable indoor methods, Bokashi and vermicomposting, was conducted to determine the optimal approach for this project.

- **Vermicomposting (Worm Composting):** This method uses specific species of worms to break down organic matter. While it produces excellent quality compost, it has several limitations for this context. It cannot process meat, dairy, citrus, onions, or oily foods, which are common components of household food waste. The system requires careful management of moisture, temperature, and food inputs to maintain the health of the worm colony, making it less suitable for a large, diverse user group with varying levels of commitment.[45]
- **Bokashi Composting:** This is an anaerobic fermentation process originating in Japan.[47] It uses a sealed, airtight bin and a bran inoculated with effective microorganisms (EM) to "pickle" the food waste. Its key advantages are its versatility—it can handle all food scraps including cooked food, meat, fish, and dairy—and its speed, with the initial fermentation stage taking only two weeks. When managed correctly by keeping the bin sealed, the process is odour-free and does not attract pests, making it ideal for indoor use in kitchens and shared living spaces.[47]

Feature	Bokashi Composting	Vermicomposting
Suitable Food Inputs	All food waste, including meat, dairy, cooked food, citrus, and oils.	Primarily raw fruit and vegetable scraps. No meat, dairy, citrus, or oily foods.
Space Requirement	Small, compact bin (15-20L), suitable for under-sink storage.	Varies, but typically a tiered bin system requiring more floor space.
Odour/Pest Risk	Very low when sealed correctly. The smell is a mild, pickled odour.	Low if managed well, but can attract pests or create odours if mismanaged.
Speed	Fast initial stage (2 weeks fermentation), followed by maturation.	Slower, continuous process (3-5 months for first harvest).
Ease of Use	Very simple: layer waste with bran, seal lid, drain liquid.	Requires more user knowledge to maintain worm health (moisture, food balance).
Cost per Kit (Twin Pack)	Approx. £45 - £80 (retail).[22, 23, 24]	Approx. £70 - £160 (for a full wormery kit).[50, 51]
Suitability for Pilot	**Excellent.** Robust, versatile, and low-risk for a diverse, non-expert user base.	**Moderate.** Higher risk of user error leading to failure, pests, or odours.

Table 3: Comparison of In-Home Composting Methods for Student Residences

Based on this analysis, **Bokashi is the recommended method** for Project R.O.O.T. Its robustness and ability to handle all food types make it the most practical and user-friendly option, maximising the potential for successful adoption among students.

The operational model will be a **two-stage process**. This design is critical as it de-risks the project by separating the simple, user-facing task from the more skilled management task.

- **Stage 1 (Decentralised Fermentation):** Students use the Bokashi bins in their kitchens. This is a straightforward process of layering food scraps with the inoculated bran and keeping the airtight lid sealed. This produces a stable, fermented "pre-compost."
- **Stage 2 (Centralised Maturation):** The fermented pre-compost is collected from students and transported to a designated on-campus site. Here, it is mixed with other carbon-rich materials (such as woodchip or green waste from the Grounds Department) in larger compost bays or windrows. This secondary aerobic decomposition phase allows the material to fully break down into a finished, high-quality compost, ready for use. This ensures a safe, consistent, and valuable final product while placing the simplest part of the process in the hands of the wider student body.

4.2 Phase 1: Pilot Program (Academic Year 2025/26)

A phased implementation, starting with a controlled pilot, is essential for testing logistics, gauging student interest, and refining the operational model before a campus-wide rollout.

- **Scope:** The pilot will target 2-3 specific halls of residence, encompassing a population of 500-1,000 students. This creates a manageable test environment with a concentrated user base.
- **Recruitment and Onboarding:** A communications campaign will be launched at the beginning of the academic year through welcome week events, social media, and hall communications. Students will be invited to sign up for the program, receiving a free twin-bin Bokashi starter kit upon registration. A mandatory, brief in-person or online training session will be provided to ensure users understand the process and the payment system.
- **Logistics:**
    - **Kit Distribution:** A central distribution event or "pop-up" stall will be held at the start of term for registered students to collect their kits and meet the student "Compost Champions."
    - **Collection System:** A dedicated, clearly marked collection point will be established at each participating hall. Once a week, at a set time, students will bring their full, sealed Bokashi buckets to this point. The material will be weighed by a Compost Champion, and the weight recorded against the student's ID to calculate payment. The pre-compost will be emptied into larger, sealed transport containers.
    - **Maturation Site:** A suitable, secure, and accessible area on campus must be designated for the secondary maturation heaps. This site should ideally be located near the Grounds Department facilities to facilitate co-management and use of machinery. The site must be managed in accordance with best practices for community composting, including proper aeration, moisture control, and temperature monitoring to ensure pathogen reduction.[52]

4.3 Student Roles, Payment, and Management

The project is designed to be student-led and student-run, creating paid employment opportunities.

- **Roles:**
  - **Participants:** The general body of students who sign up to compost their food waste.
  - **Compost Champions (Paid, Part-Time):** Students recruited from within the participating halls. Their responsibilities include promoting the scheme, providing peer-to-peer support and troubleshooting, and managing the weekly collection point (weighing and recording).
  - **Compost Collectors (Paid, Part-Time):** A small team of students responsible for the physical logistics. They will collect the bulk pre-compost from the hall collection points using an electric cargo bike or similar vehicle, transport it to the central maturation site, and perform the physical work of building and turning the compost piles under the guidance of the Project Coordinator and Grounds staff.
- **Payment Structure:** A payment of **£0.50 per kilogram** of correctly fermented pre-compost is proposed. This direct financial incentive is key to driving participation and ensuring quality. Payments could be processed monthly and credited directly to students' university accounts or paid through the campus jobs system.
- **Management:** The overall program will be overseen by a part-time **Project Coordinator**. This could be a postgraduate student placement or a dedicated role within the University's Sustainability Team. This individual will be responsible for overall logistics, managing the student teams, financial tracking, data analysis for reporting, and liaising with university departments and community partners.

4.4 Health, Safety, and Quality Control

Maintaining high standards of health, safety, and hygiene is paramount to the project's success and acceptability.

- **Student Training:** Every starter kit will include clear, simple, visual instructions on how to use the Bokashi system correctly, emphasising the importance of keeping the bin sealed to prevent odours and pests.
- **Collection and Transport:** The larger containers used for collection and transport will be sealed and regularly cleaned to maintain hygiene.
- **Maturation Site Management:** The central composting site will be managed according to established environmental health and safety guidelines.[52] This includes:
  - Maintaining the correct carbon-to-nitrogen ratio to ensure the piles heat up to temperatures sufficient to kill pathogens and weed seeds (typically 55-65°C).
  - Regularly turning the piles to ensure proper aeration and prevent anaerobic conditions that can cause odours.
  - Managing the site to prevent runoff and ensure it does not attract pests.

- **Quality Control:** The final, mature compost will be periodically tested to ensure it meets quality standards for use in landscaping and food growing, ensuring it is safe and beneficial for the University grounds and community gardens.

4.5 Phase 2: Campus-Wide Expansion and Integration

Following a successful pilot and evaluation at the end of the 2025/26 academic year, a phased expansion plan will be developed.

- **Roadmap:** The program can be rolled out to all University-managed halls of residence over the subsequent 2-3 years. The experience from the pilot will inform logistical scaling, budget requirements, and communication strategies.
- **Off-Campus Students:** A model for engaging students in private rented accommodation will be explored. This could involve partnering with local community gardens or allotment associations to act as neighbourhood-level collection hubs, reducing the need for centralised collection from disparate locations.
- **Academic Integration:** Formal partnerships will be established with academic departments to embed Project R.O.O.T. as a recurring case study, data source, and "Living Lab" for teaching and research, following best practice from other successful university sustainability programs.[41]

Phase	Timeline	Key Activities	Lead Responsibility	Success Metrics
1. Planning & Setup	Q3 2024 - Q2 2025	Secure funding, recruit Project Coordinator, procure kits, finalise pilot halls, establish maturation site, develop comms plan.	Sustainability Team	Funding secured, Coordinator in post, 500+ kits procured.
2. Pilot Launch	Q3 2025 (Start of AY 25/26)	Launch recruitment campaign, distribute kits, begin weekly	Project Coordinator	10%+ participation rate achieved in pilot halls within first term.

		collections, establish student teams.		
3. Pilot Operation & Monitoring	AY 2025/26	Maintain regular collections, manage maturation site, track data (weight, participation, costs), gather feedback.	Project Coordinator, Student Teams	Consistent weekly collections, >15 tonnes diverted, positive student feedback.
4. Evaluation & Expansion Plan	Q3 2026	Analyse pilot data, produce full evaluation report, develop a 3-year campus-wide expansion plan and budget.	Project Coordinator, Steering Committee	Report submitted to leadership, expansion plan approved.
5. Phased Expansion	AY 2026/27 onwards	Roll out to additional halls each year, establish off-campus model, formalise academic and community partnerships.	Sustainability Team	Year-on-year increase in waste diversion, number of halls, and community partners.

Table 4: Phased Implementation Timeline and Key Milestones

Section 5: Strategic Alignment and Future Opportunities

Project R.O.O.T. is not merely an operational improvement but a strategic enabler that can catalyse broader sustainability initiatives across the University. Its implementation creates infrastructure, expertise, and momentum that can be leveraged for future opportunities, particularly in relation to procurement policies and long-term resource management.

5.1 The 2026 Vending and Coffee Policy Review

A significant strategic opportunity arises in mid-2026 with the scheduled review of the University's vending and coffee procurement policies. The University's Hospitality and catering services already operate under a highly progressive Sustainable Food Policy, which includes ambitious targets for waste reduction, phasing out problematic materials like palm oil, and prioritising local, ethical, and sustainable sourcing.[8] The policy also mandates a reduction in disposable packaging, aiming for it to constitute only 1.5% of total spend by 2028.[55]

A renewed vending and coffee policy in 2026 will almost certainly intensify this focus on sustainability, likely leading to an increase in compostable packaging and a greater volume of organic waste, such as coffee grounds, from these outlets. Project R.O.O.T. serves as a timely and powerful proof-of-concept for managing such organic waste streams at a granular, on-campus level. The logistical framework, student-led workforce, and central maturation facility established for the project can be readily expanded to accommodate these new commercial waste streams.

It is therefore recommended that the comprehensive evaluation report from the 2025/26 pilot program be formally submitted as evidence to the committee overseeing the 2026 policy review. This will demonstrate a proven, in-house, and cost-effective solution for managing the organic waste that a more sustainable vending policy will inevitably generate, strengthening the business case for adopting more ambitious sustainability standards.

5.2 Securing External Funding and Partnerships

The financial model presented in Section 2.3 indicates that while the project offers immense strategic value, its operational costs, particularly student payments, are not fully covered by direct cost savings from compost production. This makes the project an ideal candidate for a blended funding model, leveraging external grants to supplement internal investment.

A wide array of funding opportunities exists for projects focused on the environment, waste reduction, circular economy, and community engagement. Grant-making bodies in the UK include government-affiliated organisations like DEFRA and Innovate UK, as well as charities and NGOs such as WRAP and The National Lottery Community Fund.[56] Many universities have also successfully established internal "Green Grants" or "Sustainability Project Funds," often supported by alumni donations, to provide seed funding for student and staff-led initiatives.[61]

Project R.O.O.T.'s unique combination of environmental impact (waste diversion, GHG reduction), social benefit (paid student employment, community partnerships), and educational value (Living Lab, RED Award integration) makes it a highly competitive and attractive proposal for such funds. A strategic approach to funding is recommended:

1. **Internal Seed Funding:** Secure initial seed funding from an internal University source (e.g., an alumni fund, the central sustainability budget, or the Estates department) to cover the one-time setup costs of the pilot phase, primarily the procurement of Bokashi kits.
2. **External Grant Application:** Concurrently, prepare and submit a comprehensive application to a major external funding body to secure a multi-year grant. This grant would be targeted to cover the ongoing operational costs of the program, including student wages and coordination, thereby ensuring its long-term financial sustainability and minimising the burden on the University's core budget.

This project is not an isolated initiative but can be positioned as the foundational step in a much larger, more ambitious vision for a campus-wide circular bioeconomy. The initial focus on student food waste establishes the core infrastructure, operational expertise, and student engagement model. Once proven, this system can be systematically scaled to integrate all of the University's organic waste streams. This includes commercial food waste from catering and vending (as discussed with the 2026 policy review), green and landscape waste from the Grounds Department, and potentially even agricultural by-products from the University's own farms, which are a key part of its research and identity.[44]

The creation of a centralised, large-scale composting facility capable of processing these diverse feedstocks would be a transformative step. The high volume of quality-controlled compost and soil conditioners produced could not only make the entire campus self-sufficient in horticultural inputs but could also be used to support large-scale research trials in the University's world-renowned agriculture and soil science departments. Excess compost could even be packaged and sold as a branded "Reading University Compost," creating a new revenue stream and further enhancing the University's public profile as a leader in applied sustainability. This long-term vision positions Project R.O.O.T. not as a simple waste project, but as a strategic, long-term investment in institutional resilience, research capacity, and educational innovation.

Section 6: Conclusion and Key Recommendations

6.1 Final Assessment

Based on the comprehensive analysis conducted in this report, Project R.O.O.T. is an exceptionally strong and strategically aligned initiative for the University of Reading.

It is **financially viable** through a forward-thinking model that re-invests waste management expenditure into student employment and skills development, with a clear pathway to long-term sustainability through external grant funding.

It is **strategically valuable**, directly supporting the University's Waste & Resource Use Strategy, its Net Zero 2030 commitment, and its prestigious reputation as a national leader in sustainability. It transforms a passive operational function into an active, educational "Living Lab" that leverages the University's core strengths in research and teaching.

It is **impactful for students**, offering an equitable, paid opportunity for engagement that enhances employability through the RED Awards, builds practical green skills, and fosters a stronger sense of community and belonging on campus.

The operational risks are identifiable and manageable, particularly through the recommended two-stage operational model and the phased, pilot-first implementation approach. The project moves the University beyond simple compliance and incremental improvements, offering a truly innovative, student-centric model that can serve as a benchmark for the higher education sector. It is an investment not just in waste reduction, but in students, community, and the University's future as a leader in applied sustainability.

6.2 Summary of Actionable Recommendations

To translate this opportunity into action, the following clear, sequential recommendations are proposed for consideration by the University's leadership:

1. **Approve in Principle:** The University's senior leadership, including the Sustainability Committee and Estates Management, should grant approval in principle for the concept of Project R.O.O.T., endorsing its strategic alignment with institutional goals.
2. **Allocate Seed Funding:** A modest seed funding budget should be allocated from an appropriate internal source (e.g., Sustainability budget, alumni donations) for the 2024/25 financial year. This will fund the recruitment of a part-time Project Coordinator and the bulk procurement of Bokashi starter kits required for the pilot phase.
3. **Establish a Steering Committee:** A cross-departmental Steering Committee should be formed by Q1 2025 to oversee the project's development and implementation. This committee should include representatives from Sustainability Services, Estates (Grounds Department), Finance, Campus Commerce, the Reading University Students' Union (RUSU), and the Careers team.

4. **Launch Pilot Program:** The pilot program should be officially launched in 2-3 selected halls of residence at the start of the 2025/26 academic year, following the operational plan detailed in Section 4.
5. **Develop Community Partnerships:** The Project Coordinator, supported by the Sustainability Team, should initiate formal conversations with the local gardens and community groups identified in this report to establish agreements for compost donation and student volunteering opportunities.
6. **Integrate with RED Award:** The Careers team, in collaboration with the Project Coordinator, should work to formalise the project's roles and activities as an approved pathway for students to complete the RED Sustainable Action Award.
7. **Submit for Strategic Review:** The Steering Committee should mandate that the full evaluation report from the pilot project's first year is submitted as a key evidence document to the committee responsible for the 2026 Vending and Sustainable Food Policy review, ensuring the project's potential is leveraged for broader campus strategy.

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