

MTSU Sustainable Campus Fee Funding Request Form

The Sustainable Campus Fee (SCF) supports projects that advance sustainability at MTSU. This form allows students, faculty, and staff to propose initiatives that contribute to a greener campus through energy efficiency upgrades, infrastructure improvements, education, research, and efforts to enhance campus biodiversity.

There are 5 sections to the application: Section I: Contact Information, Section II: Project Category, Section III: Project Description, Section IV: Project Cost, and Section V: Project Performance Information (For applicable projects).

The Sustainable Campus Fee is administered through a partnership with the Office of Student Affairs, the Center for Student Involvement & Leadership, and the Center for Energy and Sustainability (CES).

Date Tuesday, October 6, 2026

Request Number **SCFR27000102**

1. Name Ben Lynch

Email blynch@mtsu.edu

Phone Number (615) 898-2118

SECTION II: Project Category

Please note that all proposed projects will have to comply with MTSU campus guidelines and recommendations.

1. Select the category that best describes the project. (Select One - See Descriptions Below)

Waste Reduction

CATEGORY DESCRIPTIONS

Energy Conservation/Efficiency - (e.g. installing LED light bulbs, adding insulation to walls, replacing old appliances with energy-efficient models, installing programmable lighting, etc.)

Renewable Energy - (e.g. implementing projects to harness naturally replenishing sources like wind, water, and sunlight to generate electricity - like solar-powered picnic tables, etc.)

Sustainable Transportation - (e.g. installing covered bike racks, replacing fuel vehicles with electric vehicles, etc.)

Alternative Fuels - (e.g. setting up electric vehicle charging stations, implementing hybrid or electric vehicles, purchasing electric or propane power equipment, etc.)

Recycling - (e.g. purchasing recycling bins, improving signage, recycling difficult materials, etc.)

Waste Reduction - (e.g. establishing a reuseable to-go container program, reducing food waste, installing waterbottle filling stations, etc.)

Water Conservation - (e.g. purchasing rain barrels, creating a rain garden, switching to low-flow water fixtures, installing low-flow water valves, etc.)

Biodiversity - (e.g. planting pollinator garden, tree planting, installing bird boxes, etc.)

Education - (e.g. hosting a sustainability fair to raise awareness about green practices, hosting bike repair and/or safety workshops)

Research and Innovation - (e.g. researching the effects of microplastics, solar feasibility study, etc.)

SECTION III: Project Description

Please include as much detail as possible in this section. The more information you provide, the better equipped the adjudication committee will be to fully understand your request and make an informed decision.

To expand a text box, click and drag the two diagonal lines in the bottom-right corner. This allows you to adjust the size and view of your content as you type.

1. Project Title

Smart Waste Collection and Analytics for Campus Waste Reduction

2. Scope: Work to be accomplished

This project will deploy a Smart Waste Collection Pilot within MTSU Facilities Services to improve campus waste management through data collection, analytics, and operational efficiency.

The project includes the installation of a BinMaxx onboard scale system, Raspberry Pi edge-computing platform, RFID-based container identification system, GPS location tracking, and Wi-Fi data synchronization.

Fifty waste containers will be assigned unique identities through RFID tags. Each container will receive two RFID tags for redundancy and reliability. A front-end loader refuse truck will be equipped with a reader capable of identifying containers during service events.

When a container is serviced, the system will automatically collect:

- Container identification
- Weight of collected material
- Date and time of service
- GPS location
- Truck identification

Collected information will be stored locally and synchronized to a facilities database when the vehicle returns to campus Wi-Fi coverage.

The resulting data will provide actionable information regarding waste generation, collection frequency, container utilization, route optimization opportunities, and future sustainability initiatives.

3. Scope: Benefit Statement

This project supports the Waste Reduction category by providing accurate data regarding waste generation across campus facilities.

Currently, waste collection is largely based on predetermined schedules and visual observations. The proposed system will allow MTSU to measure actual waste volumes and identify opportunities to reduce unnecessary collections, optimize service schedules, right-size containers, and improve operational efficiency.

Benefits include:

- Reduced fuel consumption through route optimization

- Reduced labor associated with unnecessary collections
- Improved waste diversion analysis
- Better utilization of collection equipment and containers
- Data-driven planning for future recycling and sustainability initiatives
- Identification of high-waste and low-waste locations across campus
- Improved accountability and reporting capabilities

The project will establish a long-term platform for waste analytics that can guide future sustainability investments and support MTSU's campus sustainability goals.

4. Location of Project

MTSU Campus - Facilities Services Operations

The project will be deployed on a Facilities Services front-end loader refuse truck and utilized throughout the MTSU campus wherever university-owned waste containers are serviced.

Data collection will occur campus-wide with equipment installed and maintained by Facilities Services.

5. Participants and Roles

Facilities Services will serve as the primary department responsible for project implementation and operation.

Anticipated participants include:

- Facilities Services Administration – Project oversight and reporting
- Facilities Services Operations – Vehicle operation and field testing
- Facilities Services Technical Services – Equipment installation, configuration, and support
- Information Technology Division – Network and infrastructure support as needed
- Center for Energy and Sustainability – Sustainability reporting and performance evaluation
- Student representatives and sustainability stakeholders may participate in project review and future data analysis efforts

6. Student Participation in the project and/or Student Benefit from the project

Students will benefit from improved campus sustainability practices supported by data-driven decision making.

The project will provide opportunities for student engagement with sustainability analytics, waste reduction initiatives, operational research, and emerging technologies including RFID, IoT devices, GPS systems, and data visualization.

Data generated by the system may be used to support classroom projects, sustainability studies, operational efficiency research, and future student-led initiatives involving recycling, waste reduction, and environmental stewardship.

7. Future Operating and/or Maintenance Requirements

Facilities Services will maintain the installed equipment and RFID inventory.

Future requirements include:

- Replacement of damaged RFID tags
- Periodic inspection of reader and antenna hardware
- Software updates to the Raspberry Pi platform
- Database maintenance and reporting enhancements
- GPS and communication system verification

- Expansion to additional vehicles or containers if successful

Annual maintenance costs are expected to be minimal and primarily limited to replacement tags, hardware inspection, and software support.

8. Additional Comments or Information Pertinent to the Proposed Project

This project represents a foundational step toward developing a Campus Smart Waste Management Platform.

The proposed pilot is intentionally scalable and designed to support future enhancements including recycling analytics, contamination tracking, route optimization, vehicle telemetry, computer vision technologies, and expanded sustainability reporting.

The project will provide MTSU with one of the first data-driven waste collection systems of its kind within campus operations and create measurable sustainability metrics that can support future planning, grant opportunities, and campus sustainability initiatives.

Any supporting documents or attachments will be on the pages following the SCF Request.

Note, all projects are expected to be completed by December 31, 2026.

SECTION IV: Project Costs

1. Project Cost Estimate 15500

2. Source of Estimate

Estimate based on vendor-provided pricing for the BinMaxx onboard scale system, published manufacturer pricing for Raspberry Pi hardware, RFID equipment, GPS hardware, networking components, installation materials, and contingency allowances.

Sources include Air-Weigh, Raspberry Pi authorized distributors, RFID equipment suppliers, industrial electronics vendors, and Facilities Services cost planning estimates developed for the Smart Waste Collection Pilot project.

3. Has previous funding from this source been awarded?

No

If Yes, please explain how this request differs from previous funding request.

SECTION V: Project Performance Information

If your project is expected to reduce energy consumption (e.g. through lighting upgrades or HVAC improvements etc.), please provide an estimate of potential savings. Feel free to contact the Center for Energy and Sustainability for help making these calculations at ces@mtsu.edu.

1. Estimated Annual Energy Savings (Estimated in kW, kWh, Btu, etc.)

This project is not expected to generate direct measurable electrical energy savings. The primary purpose of the project is waste reduction, operational efficiency, route optimization, and sustainability analytics.

Indirect energy savings may be realized through reduced collection frequency, elimination of unnecessary truck trips, improved route planning, and optimized container utilization. These values will be measured during the pilot phase and may be quantified after sufficient operational data has been collected.

2. Annual Energy COST Savings (\$)

Direct annual energy cost savings cannot be accurately quantified prior to implementation because current waste collection volumes, route efficiencies, and service frequencies are not tracked at the level required for analysis.

The project will create the data necessary to establish baseline waste collection metrics and identify future energy and fuel savings opportunities.

3. Annual Operating Cost Savings or Other Cost Savings. Specify in dollar amount, if applicable. (\$)

The project is expected to provide operational cost savings through improved collection scheduling, route optimization, labor efficiency, reduced unnecessary service events, and better utilization of waste containers.

Potential savings areas include:

- Reduced fuel consumption
- Reduced vehicle wear and maintenance
- Reduced labor associated with unnecessary collections
- Improved container placement and sizing decisions
- Reduced administrative reporting effort through automated data collection

Specific annual cost savings will be established during the pilot as baseline collection and weight data are collected and analyzed.

4. Matching or Supplementary Funding (Identify and explain, if applicable)

Facilities Services will provide project management, vehicle access, installation labor, technical support, system configuration, testing, and ongoing maintenance support as in-kind contributions to the project.

Additional opportunities for future expansion may be pursued through Facilities Services operational budgets, sustainability initiatives, grant opportunities, and collaboration with the Center for Energy and Sustainability.

Acknowledgment

I acknowledge that a project summary and photo must be submitted, if I am awarded funding and upon completion of the project.

Supporting Documentation or Attachments if provided.