



## A SMARTER CAMPUS: MORGAN STATE UNIVERSITY

# Creating a smarter campus today and tomorrow

Working closely with Siemens and the Maryland Clean Energy Center, Morgan State University (MSU) leaders created a vision and plan to transform their campus through hard work, partnership and innovation via a phased approach.

### Background

Founded in 1867, a Historically Black College and University (HBCU) in Baltimore, MD, MSU has a long-standing reputation for excellence serving a multiethnic, multiracial, multinational student body and offering more than 140 academic programs. Designated a National Treasure, the expansive 185-acre campus features a range of facilities geared toward innovative teaching and learning and offers a safe and inviting learning environment with easy access to the city's culture and employment.

MSU's leadership had a vision to be elevated to Carnegie R1 research status. However, like many institutions, they were challenged with an expansive campus with facilities and buildings at different stages of their lifecycle. Much needed modernizations of HVAC, plumbing, electrical and buildings, along with deferred maintenance made managing the infrastructure even more difficult. According to APPA, the collective backlog of deferred maintenance for higher education as a whole in the U.S. amounts to \$112 billion. With these core challenges, understanding where to start and how to fund this effort for MSU's vision was overwhelming.

## Phase 1 | Establishing the foundation

Update critical infrastructure and address deferred maintenance:

- Start energy conservation measures for improved efficiency and operational savings
- Upgrade building automation, fire and security systems to modernize life safety and update lighting on all campus pathways for safety
- Install submetering for better energy measurement and management
- Address critical deferred maintenance to improve key infrastructure on campus
- Establish a master energy and sustainability plan



**311**  
Climate and air quality improvements



**7,500**  
Smart campus devices and 187 meters installed



**119**  
Fire systems inspected, tested and maintained to create a safer environment



**LED**  
lighting campus-wide for improved safety

## Phase 2 | Modernize infrastructure and technology

Focus on infrastructure and improving indoor air quality (IAQ), lighting and comfort for living and learning environments, while implementing a master energy and sustainability plan:

- Improve lighting and comfort in academic buildings and residential dormitories
- Update lighting in athletic facilities to NCAA National Broadcast standards with **400% improvement**
- Fund improvements through energy and operational savings



**1,085**  
Student dorm room ventilation upgrades

**\$4.6M**  
Guaranteed savings over 15 years

**21.5%**  
Utility savings

**\$330K**  
Rebates and incentives



### Developing workforce + more

To educate MSU students on the latest technology, Siemens provided the curriculum support, living labs and workforce opportunities:

- 1st Mechatronics Certificate offered as part of an HBCU engineering program **(Watch now)**

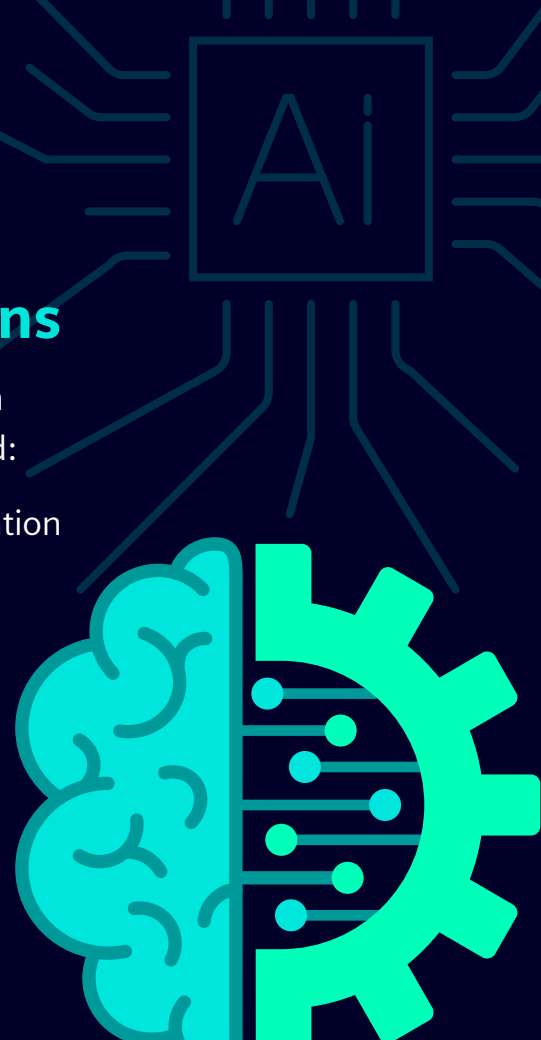
- Siemens software and automation training for future manufacturing engineers
- Connect students with high-tech employers for students-to-jobs initiatives
- Create smart communities in research spaces and innovation centers

**1st**  
**Mechatronics Certificate**  
offered as part of an HBCU engineering program

## Phase 3 | Activate smart campus operations

MSU will reach its goal of operating as a smarter campus with better visibility into building data and take real strides forward:

- Leverage analytics, AI, IoT for continuous systems optimization
- Establish Key Performance Indicator (KPIs) as part of the best practices energy management program
- Continue utility system upgrades for energy optimization
- Initiate predictive maintenance program
- Measure and monitor sustainability to achieve sustainability goals of:



**5,277**  
tons of GHG reduced through master energy and sustainability plan

**443**  
Carbon reduction equivalent to 443 vehicles driven per year

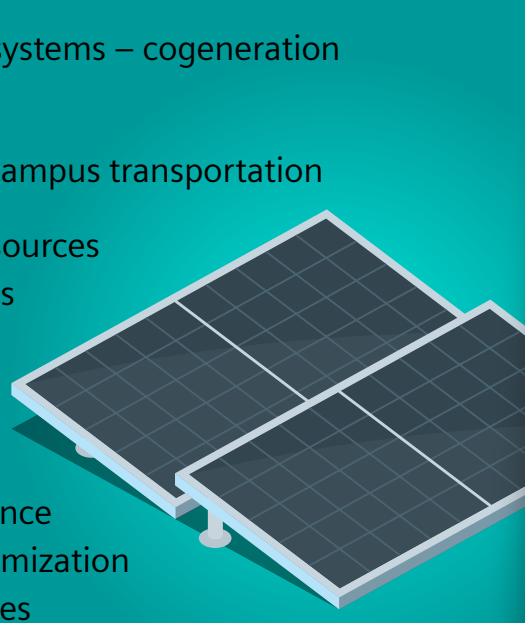
**2,498**  
acres of U.S. forests saved



## Phase 4 | Clean energy and innovative technologies

By producing and storing its own clean energy, MSU can become a more sustainable, resilient campus with:

- Distributed energy systems – cogeneration and CHP generators
- Microgrid-enabled campus transportation
- Renewable energy sources and grid connections to help ensure resiliency and GHG reduction
- Predictive maintenance and continuous optimization for greater efficiencies



### Becoming a more efficient and smarter campus for a more sustainable future

“Siemens brings much needed expertise and resources for the execution of our overall vision, which includes but is not limited to, a significant reduction of our carbon footprint, enhanced energy conservation measures, renewable energy generation, a substantial decrease in deferred maintenance, infrastructure improvements, and a practical curriculum with hand-on experiences for select School of Engineering students.”

**Sidney Evans,**  
Former Executive Vice President Finance and Administration

### Financing

Siemens helped MSU achieve its vision using a unique approaches such as:

- Leveraging Federal funding + grants, including Public-Private Partnerships
- Alternative financing
- Funding facilities upgrades and energy efficiency through energy savings
- Federal tax credits and accelerated depreciation to implement renewable energy systems
- Invest in Energy as a Service (EaaS) to shift financial and operational risk

Learn more about how Siemens is helping its higher education partners achieve their vision.

**SIEMENS**