

CREATING THE FOUNDATION TODAY FOR A SMARTER TOMORROW

Your Journey to a **Smart Campus**

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Connecting to the world around us

Your institution plays a vital role in preparing today's students for tomorrow's workforce. Doing so effectively means leveraging emerging technologies and partnering with experts to not only educate, but also to create a safe, secure, and comfortable learning environment where students do their best learning, living, and exploring new opportunities. Every day, the Internet of Things (IoT), digitalization, automation, and vast amounts of available data bring us closer to creating an ideal learning environment – a truly Smart Campus – one that is digitally connected to the next generation, for the next generation.

Getting to that ideal learning, teaching and research environment, however, is a journey. Making investments in technology and smart infrastructure may seem out of reach; yet today – more than ever – leaders in higher education recognize the value in making campus infrastructure improvements that offer immediate efficiency and operational benefits, while enabling new technologies – especially those related to sustainability and resilience.

In this paper, we explore the ways in which higher education institutions can embark upon their Smart Campus journey and create the foundation today for a smarter tomorrow. It all starts with an understanding of current infrastructure and priorities and a clear vision for the future.



"...a recent survey found that parents and incoming students now rank campus cleanliness and IAQ third in importance when deciding which university to attend. Only quality of academics and affordability ranked higher."¹

¹ <u>https://www.facilitiesnet.com/iaq/tip/Campus-IAQ-Ranks-High-Among-Prospective-College-Students-Parents--48621</u>

Transform your campus

Implement you smart campus transformation plan in phases. Leverage the power of smart, integrated systems for continuous optimization, space and maintenance management. Address sustainability and resiliency goals through efficiency, clean energy supply, storage, transportation and electrification.

Enhance your status as university of choice

Bring technology into the classroom curriculum with living laboratories, certifications, and degree programs. Showcase research spaces and innovation centers. Become a climate and "education to workforce" leader.

Determine the best way to fund

Determine optimal financial and contractual vehicles, and consider federal relief funding and grants, including P3 as appropriate.

Asser infra digita

Assess current infrastructure and digital readiness

Engage facilities team to understand their needs and challenges. Perform a Smart Campus readiness assessment. Develop an implementation plan based upon energy and sustainability planning.

Build a Smart Campus foundation

Upgrade critical infrastructure. Implement metering and integrated control and management systems that enable performance-based management, leveraging KPIs and analytics.

Create a vision

Involve key stakeholders to create a vision for an ideal learning environment that advances your core mission. Incorporate smart infrastructure improvements and leverage clean energy technologies.

A roadmap for smart building infrastructure

Across North America, campuses are committed to...

- Ensuring student success through comprehensive and innovative curricula, instructional design, and living/ learning spaces
- Leveraging technology to enhance your reputation as a forward-thinking and innovative campus, attract students and faculty, and prepare graduates for the future of work
- Creating smart communities and public-private partnerships
- Developing a strategic vision that supports these missions with resilience, in addition to building a culture of diversity, equity, and inclusion and economic, social, and environmental responsibility

All of this happens against a dynamic educational landscape. The ongoing pandemic has exacerbated the need for – and focus on – infrastructure modernization, ventilation improvements, and indoor air quality (IAQ) for campuses. In fact, a recent survey¹ found that parents and incoming students now rank campus cleanliness and IAQ third in importance when deciding which university to attend. Only quality of academics and affordability ranked higher.



The challenges of aging infrastructure, laid bare by the pandemic, have complicated institutions' efforts to prepare students for the future of work. However, students, faculty, and staff deserve excellence from their institutions, including excellence within the campus facilities, from classrooms and research areas to dormitories and other shared spaces.

We know improving ventilation and IAQ isn't just important for learning in a pandemic; the association between "green building" environments and improved cognitive function have long been well-established². As employers, colleges and universities should be concerned with creating wellness-first workplaces for faculty and staff.

Today, IoT, digitalization, and virtual learning continue to reshape how, when, and where students learn, live, and explore. Campuses are now in a position to leverage this data, analytics, artificial intelligence (AI) and IoT in ways that can improve every aspect of the educational experience, while improving facilities and lowering lifecycle costs. In short, the need for creating a roadmap for smart building infrastructure has never been clearer: one that harnesses the power of smart buildings and more connected, efficient, and sustainable campuses – where comfort and lighting are automatically delivered, where ever and when needed, to the adaptation of renewables, energy storage and Electrical Vehicles (EV) charging via a microgrid that provides campus resilience and optimization.

² https://ehp.niehs.nih.gov/doi/10.1289/ehp.1510037

Today's Smart Campus is digitally connected to the next generation, for the next generation

By taking the right steps today, we can transform our educational infrastructure so that it's smarter, safer, more sustainable, and even more resilient – so that infrastructure supports top-notch academic programs and innovative research facilities. In turn, this translates into enhanced efficiency, improved comfort, and lower cost of operations.



1 Phase	Set the foundation	 Improve campus efficiency with energy-conservation measures and submetering Create a master energy and sustainability plan Enhance safety and security with modernized building, fire, and security platforms, and by addressing critical deferred maintenance
2 Phase	Modernize infrastructure	 Maximize energy savings by competitively sourcing energy supply Improve comfort and wellbeing through indoor air quality and comfort improvements Measure and monitor performance Performance supported by guaranteed energy and operational savings
3 Phase	Operate as a Smart Campus	 Continuously optimize building systems by leveraging AI and analytics via IoT Implement predictive maintenance program and continuously optimize systems for energy performance Establish KPIs as part of best practices energy management program
4 Phase	Leverage clean energy and innovation	 Implement renewable energy solutions, including: Combined heat and power Solar and geothermal with battery energy storage Electric vehicle transportation Microgrid for resiliency and reliability

We can work with you to create a roadmap for your campus environment: one that is safe, healthy, secure, and comfortable, while improving energy efficiency, sustainability, and overall resilience. New avenues of financing and contracting can reduce or eliminate upfront costs.

Siemens has long been a trusted partner to colleges and universities, and positively contribute to your strategic objectives and core priorities with a vision for the future. Our partnership programs adapt Siemens leading technologies into curriculum and create STEM pathways to employment. We help you tackle ongoing challenges so you can continue to deliver on your mission with confidence.



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