



# Next-Generation connected campus





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# Foreword

**Before the pandemic hit, blended learning and hybrid working were not part of the public consciousness, but now online working and online learning experiences are seen as the new normal.**

We are in the grip of fundamental **technological disruption** driven by a generational shift that without lockdown would have taken years!

The latest technology and rewarding new experiences have been the source of significant inspiration; but technology needs practical applications and tangible **returns-on-investment** to thrive. The pandemic brought many people together in new ways and became the enabler for new digital experiences, revolutionising how we work and learn.

In July 2019, Microsoft Teams had **13 million daily active users**. By March 2020 that number had increased to 30 million and again to 75 million by the end of April. Fast forward to April 2021 and Microsoft Teams had **145 million daily active users** (a 10-fold increase in 20 months). COVID-19 has brought forward the adoption of new technology by three years.

How easy is it to access this new technology? The pandemic made it clear that too many young people do not have adequate internet access – a point highlighted by the inventor of the web, Sir Tim Berners Lee. He noted that one-third of young people do not have any internet access at all and that for many more, the quality of connection negatively impacts the student experience.

The pursuit of higher education should be the mobiliser to address the **digital divide**, especially among younger generations.

University policy makers must be a driving force that encourages investors to apply non-financial metrics when analysing investment opportunities. They will need to ensure a fair, future-proof and **sustainable vision** for the next generation.

**"A Smart Campus is a network enabled environment with inter-connected buildings across a campus or metropolitan area with every current and future service connected and an ultra-fast connection for everyone." - Sean Lowry, Glide CTO**

# Summary

Glide is well known for providing best-in-class managed internet services for student accommodation but did you know that Glide is the only specialist student broadband provider with its own metropolitan fibre networks?

Now Glide can directly connect buildings on campus or across a city with fibre. This "last mile" connectivity brings benefits such as flexibility, unlimited capacity, additional resilience and future-proofing. This document will explore the real-world application of this technology.

# The Business Case for the Smart Campus

## Where does a typical university stand today?

At the start of the 2020/21 academic year 34% of students lived in university accommodation [1]. The remaining students lived in purpose-built private rented accommodation (PBSA) or were sharing houses of multiple occupation (HMOs). Students live an average of 21 minutes from the campus.

For all of these groups, the "interconnectedness" between accommodation and the university is only as good as the internet at each location. These connections may be good for university or PBSA residents, but not so good for those in HMOs reliant on standard residential broadband services.

This creates fragmentation of the university experiences for different student groups. Some will have excellent access to online lectures, others will not; some will find it easy to access university applications and resources, while others will struggle. This fragmentation extends to a broad spectrum of applications and services affecting the relationship between university and student.

## Dealing with fragmentation

Policy makers, planners and stakeholders must define a set of universal rules for the built environment. Within such a framework, public-sector funders and private-sector investors must collaborate to deliver the physical infrastructure needed for a smart campus and a smart city. According to former Head of User Experience at the University of Nottingham, Andrew Ward, an integration of the smart city and campus creates a completely seamless experience.

"A number of cities are trying to be smart. If you make both the city and the campus smart, it makes people's lives easier," Ward says.

## Building infrastructure

It is not sufficient to apply such principles only to the urban network; the same principles could also be applied to the infrastructure within **connected buildings**.

Building infrastructure across campus must be future proofed to meet the high and growing expectations of a modern student community in possession of more devices than ever before.

Simon Wilson, CTO UK & Ireland, at Aruba explains, "Students are coming into university with new laptops, tablets, phones and greater expectations than the year before. This puts increasing demands on the infrastructure.

"The number one thing students complain about is how poor the Wi-Fi is.

"The sad thing is that most of the time it isn't the Wi-Fi that's the issue, it's all the things around it that contribute to delivering the experience: IP addresses, the login process, internet links, and the server at the other end of the internet link, which needs to have the capacity to handle the demand.

"There's a wide range of things that can contribute to a poor experience. So, as well as having the technology, universities also need the tools in place to spot issues (ideally before anyone has noticed) and identify where the issue is within the infrastructure or elsewhere. The faster they can identify that and make that information available to students, the happier they'll be."

[1] The National Student Accommodation Survey 2021 / [www.savethestudent.org](http://www.savethestudent.org)



A unifying framework

Smart City, Smart Campus and Smart Building technology often adds complexity where it should create simplicity. Technologies operate independently despite the inevitable goal being their integration. The role of Smart Campus is to provide the unifying framework.

Sustainability

A third of students agree that they would not apply to a university that has a poor track record on climate change. Furthermore, 63% of students think it should be compulsory for their student accommodation provider or landlord to help them live in an environmentally friendly manner. [2]

Investors are increasingly applying non-financial factors as part of their analysis to identify growth opportunities (ESG - Environmental, Social, and Governance). To facilitate this, building infrastructure must be designed to enable the deployment of smart technology.

By deploying sustainable fibre, institutions can reduce energy waste through space-efficient infrastructure, which enables submetering, managed thermostats and environment sensors. This, in turn, creates sustainable living environments that can be controlled by students through cutting-edge technology.

This brings into sharp focus the role of the Smart Campus in delivering real sustainability benefits to all stakeholders - taking a data-driven approach that students would appreciate.

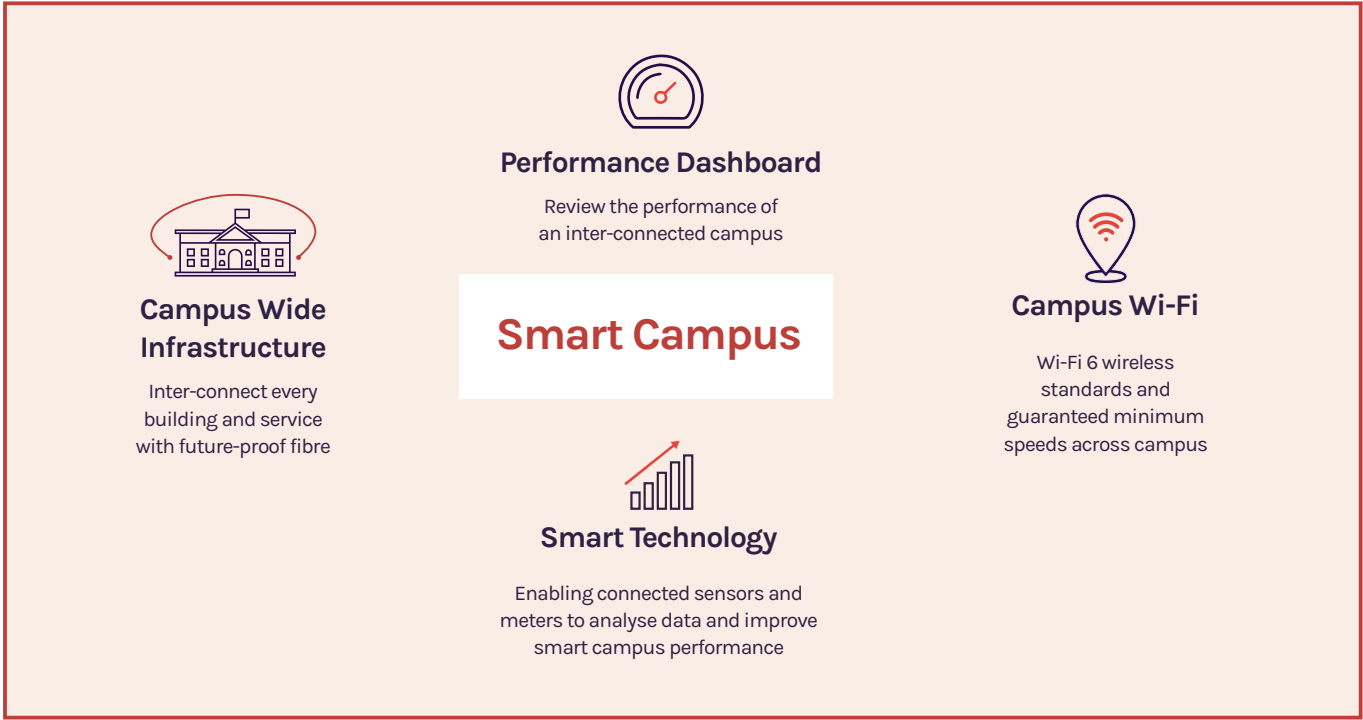
"A smart campus uses data to understand behaviours. It's understanding where usage and wastage is.

"This is data-driven information. It's not just the recommendation of someone who thinks it's a good thing to do - there's real data behind it that actively shows students the positive impacts that they can have. If you save two or three hours of heating costs a day, that's clearly financially beneficial, but it's extremely environmentally friendly."

[2] <https://www.unite-group.co.uk/articles/students-call-for-stronger-action-on-climate-change-09-june-2021>



# What is the Glide Smart Campus Vision?



Glide’s Smart Campus framework provides the foundation for a campus to thrive, enabling UK universities not only to define world-class student, lecturer and support staff experiences but also to set the standard for world-leading smart, sustainable infrastructure.

Glide can plan, install and maintain each of the building blocks within the Glide Smart Campus framework. Whether it be a metropolitan fibre backbone, resilient fibre loops, in-building passive infrastructure or campus-wide Wi-Fi 6, everything is available from a single provider, combining seamlessly to create a sustainable and inter-connected Smart Campus platform.

- A Smart Campus should hide complexity, leaving the simple benefits such as speed, interoperability and reliability.
- A Smart Campus should be future-proof, with Campus-wide infrastructure capable of inter-connecting every building and service for 20 years or more.
- A Smart Campus should be flexible. The infrastructure should be scalable to support growth whilst also capable of evolving to support new technologies without disruption.
- A Smart Campus should look beyond standard smart-device deployment, such as lighting, energy management, HVAC & security, and be the foundation for achieving world-class sustainability.
- A Smart Campus should enable rigorous performance management from a single control centre with onsite or offsite data centres and robust cloud connections.

# Smart Campus Building Blocks

		Definition	Work with Glide
Block 6	Software	A network that enables a single, uniform software platform and the APIs to support them.	<ul style="list-style-type: none"><li>• Integrated building systems</li><li>• Robust data, better information</li><li>• Easily add and remove new devices</li><li>• Support evolution of technology</li><li>• Identify cost savings and efficiency</li></ul>
Block 5	Smart Enabled	Separate wired, Wi-Fi 6 and low frequency network to deploy segregated and networked IoT devices.	<ul style="list-style-type: none"><li>• Freedom to choose appropriate partners to meet smart objectives</li></ul>
Block 4	Local Area Network (LAN) Wireless LAN (WLAN)	Network switches, wireless access points, routers and firewalls. Campus-wide roaming for a seamless experience with fast, reliable broadband and pervasive Wi-Fi 6 and Wi-Fi 6E.	<ul style="list-style-type: none"><li>• 30 year record of success</li><li>• 100,000+ access points</li><li>• 20,000+ switches</li></ul>
Block 3	Passive Infrastructure SFI (Smart Fibre Infrastructure)	Structured data cabling from comms cabinets to patch panels.	<ul style="list-style-type: none"><li>• Seamless smart fibre network</li><li>• Connecting every building service</li><li>• Less infrastructure and scalable fibre infrastructure</li></ul>
Block 2	Fibre City Loop	Resilient Fibre Loop and inter-connected buildings around campus or metropolitan area.	<ul style="list-style-type: none"><li>• Ultrafast campus broadband up to 10Gbit/s</li><li>• Scalable network to 100Gbit/s</li><li>• Reduced infrastructure</li><li>• Future-proof and scalable fibre infrastructure</li></ul>
Block 1	Fibre Backbone Wide Area Network (WAN)	Principal data routes connecting universities to specialist data centres, the cloud and the rest of the world.	<ul style="list-style-type: none"><li>• Limitless capacity and enhanced resilience</li><li>• Significantly shorter lead times</li><li>• UK wide coverage</li></ul>





# The Fibre Loop

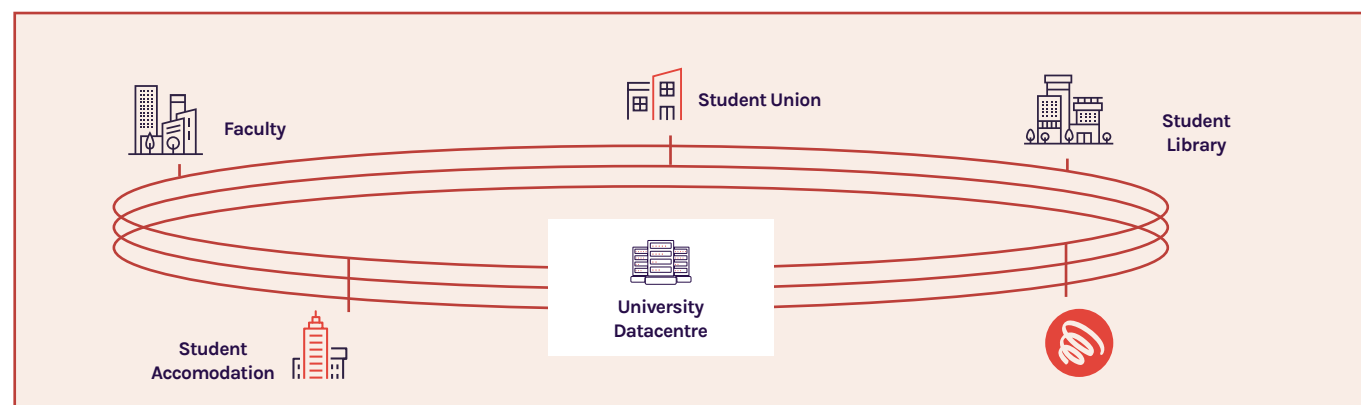
Fibre delivers next generation multi-gigabit connectivity across university campuses. Dark Fibre networks can be used to **link** university buildings and the broader estate, including student blocks and HMOs, through a long-term model that provides the lowest total cost of ownership.

Demand for internet connectivity, higher speeds and greater capacity have increased year-on-year. As more services are run over one network, universities have quickly found themselves running out of **bandwidth**. While this has the potential to become a significant problem for universities the issue wouldn't exist in a smart campus.

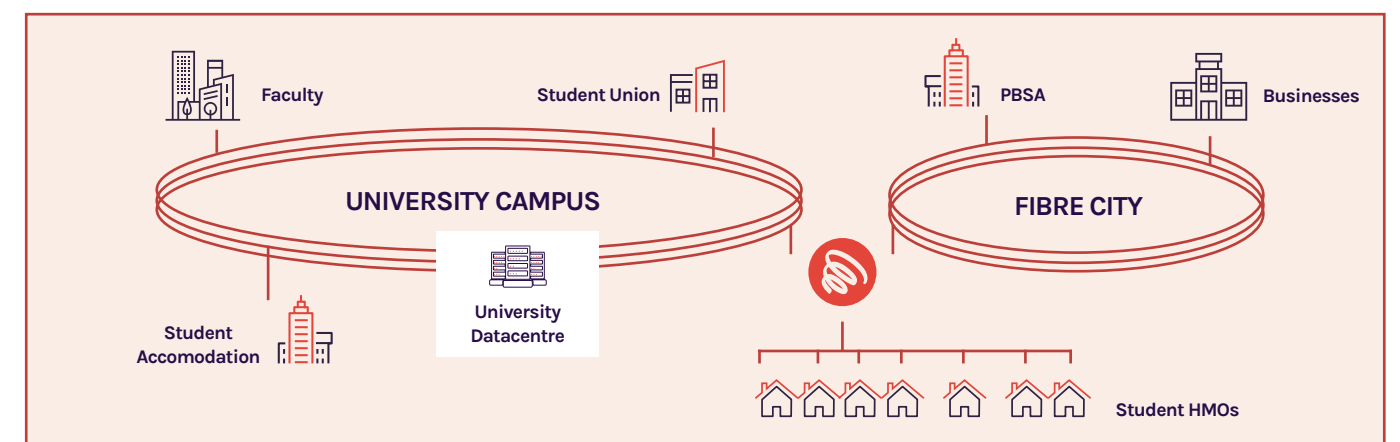
"Scalability is critical. With a smart campus, it shouldn't be a challenge as long as the right foundations are in place."

Glide can deliver ultra-fast fibre services with far greater flexibility to install next generation smart and IoT technology.

Fibre optic networks are a highly cost-effective way of providing great flexibility. As networks continue to grow across multiple sites, so too do bandwidth requirements. By introducing fibre optic connectivity, the university organisation can help its institutions and broader stakeholders to scale their networks up to 100Gbit/s and beyond.



# Inter-connected Campus



The future of Wi-Fi is managed Pervasive Wi-Fi 6, an approach that guarantees coverage. A new philosophy with **futuristic experiences** for students and practical benefits for the operation that covers every inch of a Smart Campus. Pervasive Wi-Fi is invisible, on all of the time, offering significant benefits without sacrificing privacy and security.

Wireless performance should be insisted upon by each stakeholder at the outset of Smart Campus planning. A Smart Campus wireless standard is available and designed to streamline Wi-Fi deployment on large scale deployments. Based on real-world experience deploying complex technology into complex environments.

Ward agrees with the notion of an inter-connected campus, but explains how this could potentially be taken even further, similar to how Janet, a high-speed network for the UK research and education community provided by Jisc, operates.

"A connected campus is about the ability to interconnect and swap out elements as appropriate for the individuals. It's the ability to switch in and out of different capabilities. The thinking could even go from studying at a single university, to studying at a network of campuses or sites."



# Why Glide?

Reliability, speed and network capacity built on flexible campus-wide infrastructure.



**20**

fibre cities

**400,000+**

active users

**100,000+**

access points

**1,000,000+**

concurrent devices

**2000km+**

fibre network

**20,000+**

switches

**100,000**

premises passed

**24/7/365**

support desk

**Unbeatable**

high performing managed service

**81%**

of calls answered in under 15 seconds

**80%**

of our contacts resolved on first assignment





## Off-Campus Housing

In many cases, consumer demand for new technology will have already outgrown the bandwidth available to a private student landlord and a house full of students. This future-proof and flexible campus-wide infrastructure can be expanded either from the edge to meet other smart city initiatives or to add gigabit connectivity to a HMO portfolio.

Reducing the widening digital divide should be a key objective for any Smart Campus. The same reliable Wi-Fi for those on and off campus, whatever the student accommodation. A potentially tough challenge to address, but Aruba's Wilson offers advice on how universities can help to bridge the digital divide for students with poor connections.

"If a student has a slow broadband link at home, it may reduce the experience of tuning into lectures. Having alternate low-bandwidth codecs will allow students to attend from areas with poor connectivity and finding a more efficient way to upload and download data would also benefit

them greatly, creating easier access and reducing the risk of missing deadlines."

Accessing the same resources at the same speeds with hybrid learning without being constrained by the quality of the connection means students are empowered to study where they like and extract as much return-on-investment from tuition fees as possible.

Whether universities have their own portfolio or work with approved landlords, responsibility to delivery secure and reliable Wi-Fi remains. Broadband should be included in pre-determined quality checks like gas, electricity and living conditions. Student experience now extends beyond the campus with equal opportunity to study effectively.

## Conclusion

As universities continue to plan for a more connected and socially mobile future, the increased demands of students and staff must be taken into account. The COVID-19 pandemic changed the way that society approaches day-to-day working life. The blended learning and flexible working experience has rapidly gone from a nice to have, to a necessity for many.

As technology progresses, universities provide a significantly superior user experience with the smart campus that seamlessly caters to these increased post-pandemic expectations. However, perhaps more importantly, the smart campus delivers a scalable, long-term solution for universities. The smart campus removes fragmentation, delivers and simplifies interconnectivity, and provides a wide range of ESG growth opportunities.

Through Glide, universities can plan, install and maintain all the necessary building blocks required for a truly smart environment that encapsulates the entire university network, reaching out to HMOs to provide equal opportunities for all students. Each building block combines seamlessly to create a sustainable and completely inter-connected Smart Campus platform.



By pushing the boundaries of innovation, universities can provide their students with the best platforms and opportunities to thrive in their future careers. The Glide Smart Campus delivers the foundations upon which universities can deliver the ultimate learning experience.





**We hope you've enjoyed this document.  
What's next?**

Get in touch with a member of our Glide team to  
find out about our next-generation connected campus.

**Call us on 03333 800 800**

**Drop us an email at [gigabit@glide.co.uk](mailto:gigabit@glide.co.uk)**

**Visit [www.glidegroup.co.uk](http://www.glidegroup.co.uk)**