New University of Peterborough

PETERBOROUGH
CITY COUNCIL

CAMBRIDGESHIRE
& PETERBOROUGH
COMBINED AUTHORITY

Contents

Introduction

''The University of Peterborough will be a high-quality employment-focused University for the city and region. It will acquire an international reputation for innovative technological approaches to face to face learning and in applied technology and science. It will be characterised by outstanding student satisfaction and response to local needs. The curriculum will be led by student and employer demand as well as developing opportunities in the technological, scientific and business areas. Its buildings will be architecturally leading, flexible and environmentally friendly. The curriculum, academic community and buildings will reflect a desire to be the greenest university possible".

The Strategic brief has been prepared to provide a broad introduction to the New University of Peterborough and to set out the principles of the aspirational, spatial and operational briefs for its academic buildings, both for the first phase project and its future expansion. In addition, the document includes concept briefs for the IT and AV strategy, Public Realm, Sustainability and details on cost and programme constraints.

The Strategic Brief has been used to inform the concept design of the first phase building and an indicative masterplan showing growth of the campus to 2030. It is recognised that this is not an exhaustive or definitive brief and it will, rightly, evolve in detail as part of an iterative consultation process to be undertaken as part of future design development.

The brief for the project has been developed ahead of the appointment of a Higher Education Partner(HEP) to achieve the timescales for the successful delivery of the New University of Peterborough, It is intended that the Strategic Brief will be used as a benchmark to progress evolution of the brief in the future, in particular with the selected HEP , and it is expected that a refined and developed brief, that clearly documents

key changes, will be presented as a holistic part of the delivery of RIBA Work Stage 3 and future work stages. This evolution of design and brief will emerge from a full stakeholder consultation process including senior management, end users and external partners including the local authority.

The Strategic Brief must be read in conjunction with other supporting information that has been prepared as part of the project including:

- Outline Business Case
- Shadow Curriculum
- Illustrative Masterplan
- Phase One - RIBA Stage 2 Concept Design
- Technical Reports (EG Flood risk, traffic assessment, ground investigation)

Vision

Aspirational Brief

Peterborough has been recognised for many years as a cold spot for Higher Education. Cambridgeshire and Peterborough Combined Authority (CPCA), working with Peterborough City Council (PCC), is committed to securing a new independent University for the City in readiness for the Academic Year 2022/23. The Combined Authority anticipates that the new University of Peterborough will have:

- substantial positive economic impact on Peterborough City and the surrounding region such that investment in the new University will generate direct, indirect and induced impacts across a wide range of industries, supply chains and the wider consumer economy;

- a positive regenerative effect to support the transformation of Peterborough itself into a regional centre improving the experience of all citizens and visitors to the area. We anticipate that this will include generating new opportunities for graduate-level employment and encouraging both local participation in HE and the local retention of graduates to benefit the wider economy;

- a transformational effect on the life-chances and well-being of its students and raise aspiration more broadly within Peterborough and the surrounding region. We anticipate that this will include:

  — Improving life-chances, health and well-being outcomes of students and, over time, the wider community;

  — Building confidence and capability among the graduates of the new university and potentially encouraging innovation and entrepreneurship;

  — Enhancing the capabilities of those graduates who continue to live and work in and around Peterborough to improve their productivity and earning potential;

  — Attracting and retaining investment locally to create more opportunities for the people of Peterborough and the surrounding region to benefit from higher education and contribute to the on-going success of the region.

A higher education experience is one of the most powerful and transformational investments which can be made both by individual students and by civic society more broadly. The Combined Authority is determined to make these investments, to encourage others to make such investments and to bring the positive benefits of higher education to the people of Peterborough and the surrounding region.

Project Objectives

- Increased economic growth through an increase in student numbers educated for the jobs in the local economy

- Increased productivity by job-ready degrees that support the local economy

- Increased Gross Value Added (GVA) through meeting business, student and employer aspirational needs.

- Increased variety of providers and funding sources.

- Improved effective progression for technical learning

- Improved reskilling and upskilling of the workforce.

'A high-quality employment-focused University'

Spatial Brief

The Curriculum Model is properly a matter for the subject specialist authorities of the new University and in the short-term, this function will be fulfilled by a Prospective Higher Education (HE) Partner.

In order to keep to the time-scale for opening the new University, certain decisions about the new University building(s) at the Embankment site in Peterborough must be taken before the HE Partner is appointed. Critical decisions about the overall scale and character of the facility must be made to enable an appropriate level of design development to be presented for consideration of a Planning Application. A shadow curriculum model is therefore a critical prerequisite to enable the Design Team to be given a reasonable level of briefing information on which to determine the initial concept design for the new facilities.

For the avoidance of doubt, the new University is not expected to develop any commercial functions e.g. Sport, Residential, Conferencing functions. Any commercial opportunities will be offered to commercial firms and investors in order to preserve the focus of the New University on its primary mission and in order to avoid diverting capital and working capital away from supporting core business and underpinning growth initiatives.

The Shadow Curriculum Model for the New University of Peterborough anticipates that the University will focus on a limited number of initial discipline choices to create a portfolio of courses which can achieve critical mass. This will ensure that:

■ Each discipline area is underpinned by a minimum scale staff team – this will avoid the challenge of having staff spread over too many disciplines and being too few in some disciplines to build a kernel of teaching and research capability.

■ Each discipline will be able to recruit a viable cohort of students such that steady state numbers (the numbers of students recruited when all years of provision are running) will be economically viable and capable of supporting an efficient staff: student ratio. As a principle, this approach is as much to do with providing a robust student experience as it is to do with the fundamental economics of running taught courses.

■ Each discipline is supported by the physical resources necessary to maintain the quality of the experience and to enable the University to establish a very clear funding model to underpin investment in, and maintenance of, its facilities

It is notable that the feedback on delivery models strongly suggests that the need for campus-based provision on a traditional model is immensely limited and that to be successful the new University will need to reach out and work extensively in employment settings. The precise nature and scope of the portfolio outside of the Embankment Site will be for the New University to determine but the Embankment Campus will need to provide the infrastructure to support a diverse range of delivery models.

Shadow Faculties

The organising structure for the SCM is based on cognate groupings of provision for planning purposes rather than precise numbers on individual courses. It is envisaged that there will be three faculties initially within the New University with working titles as follows:

■ Faculty of Business, Innovation and Entrepreneurship - embracing strategic management, marketing, innovation, entrepreneurship and leadership practice.

■ Faculty of Creative and Digital Arts and Sciences - embracing a cross-disciplinary approach to the interplay between technology and a range of creative disciplines

■ Faculty of Agriculture, Environment and Sustainability - embracing a spectrum of provision in environmental science, potentially engineering and agricultural, agri-tech solutions.

'An international reputation for innovative technological approaches'

Planning Principles
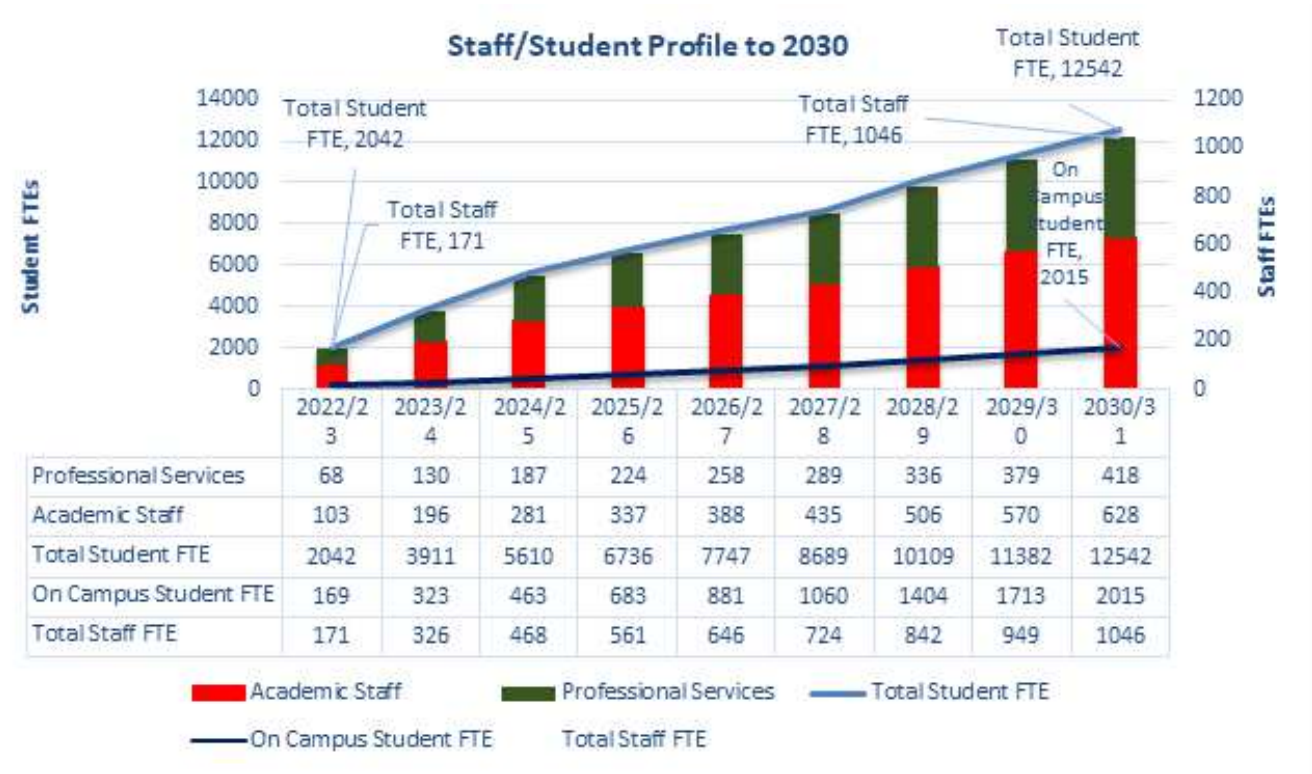
Preliminary forecast student numbers

Most students served by New University will be non-traditional, employed and in need of a specifically tailored offer and out-reach work. It is forecast that intake and growth figures on the expectation that approximately 92% of students will be served by New University off-campus.

The indicative forecasts based on FTE student numbers from academic year 2022/3 to 2030/1 are shown below by "Shadow Faculty".

Faculty/Site	2022/23 FTE	2023/24 FTE	2024/25 FTE	2025/26 FTE	2026/27 FTE	2027/28 FTE	2028/29 FTE	2029/30 FTE	2030/31 FTE
Embankment Total	**169**	**323**	**463**	**683**	**881**	**1060**	**1404**	**1713**	**2015**
Business, Innovation and Entrepreneurship	73	139	199	297	385	464	685	884	1063
Creative and Digital Arts and Sciences	96	184	264	386	496	596	719	829	952
Off-campus Total	**1873**	**3588**	**5147**	**6053**	**6866**	**7629**	**8705**	**9669**	**10527**
Business, Innovation and Entrepreneurship	624	1196	1716	2058	2366	2646	3064	3438	3778
Creative and Digital Arts and Sciences	816	1563	2242	2536	2799	3062	3477	3849	4169
Agriculture, Environment and Sustainability	433	829	1189	1459	1701	1921	2164	2382	2580
Grand Total	**2042**	**3911**	**5610**	**6736**	**7747**	**8689**	**10109**	**11382**	**12542**
Students on Campus	8.28%	8.26%	8.25%	10.14%	11.37%	12.20%	13.89%	15.05%	16.07%

Forecast staffing

Staff numbers have been derived directly from the profile of student growth using a simple student: staff ratio based on total student numbers. For Academic Staff the ratio is 20:1 and for Professional Services Staff the ratio is 30:1.
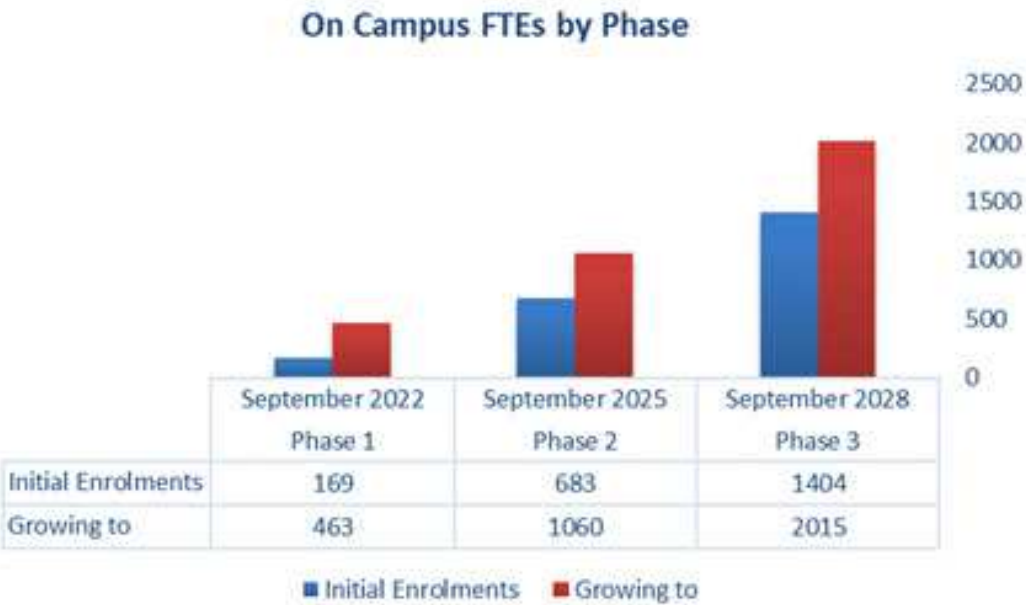

Staff/Student Profile to 2030

	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Professional Services	68	130	187	224	258	289	336	379	418
Academic Staff	103	196	281	337	388	435	506	570	628
Total Student FTE	2042	3911	5610	6736	7747	8689	10109	11382	12542
On Campus Student FTE	169	323	463	683	881	1060	1404	1713	2015
Total Staff FTE	171	326	468	561	646	724	842	949	1046

There will be a variety of factors to consider in determining the appropriate mix of staff and workforce plan including:

- The balance between campus-based staff and outreach/peripatetic staff serving a wider population of students. Currently this is based on 70:30 between on- and off-campus roles;

- The balance between professional services staff in front-facing roles with a physical presence and more virtual and remote services which could be provided by a remote and home-based workforce. Space has been allocated in the ratio: 40:30:10:20 for desk-bound, peripatetic, homeworking and hybrid working formats;

- The potential for more non-traditional para-academic roles which address more directly the outreach, advisory and guidance functions and which may span marketing, traditional student and academic services functions, pastoral care and so on;

- The physical FM needs of the campus and its day-to-day functioning (i.e. operatives who may not need office accommodation but who are physically present to manage and maintain the campus).

Further workforce planning will be a critical element of engagement with the HE Partner.

Preliminary space modelling

The forecasts of staff and student numbers gives us the following broad phases of development.

	Building Opens	Initial Enrolments	Growing to	Steady State (Year)
Phase 1	September 2022	169	463	2024/25
Phase 2	September 2025	683	1060	2027/28
Phase 3	September 2028	1404	2015	2030/31

On Campus FTEs by Phase

	September 2022 Phase 1	September 2025 Phase 2	September 2028 Phase 3
Initial Enrolments	169	683	1404
Growing to	463	1060	2015

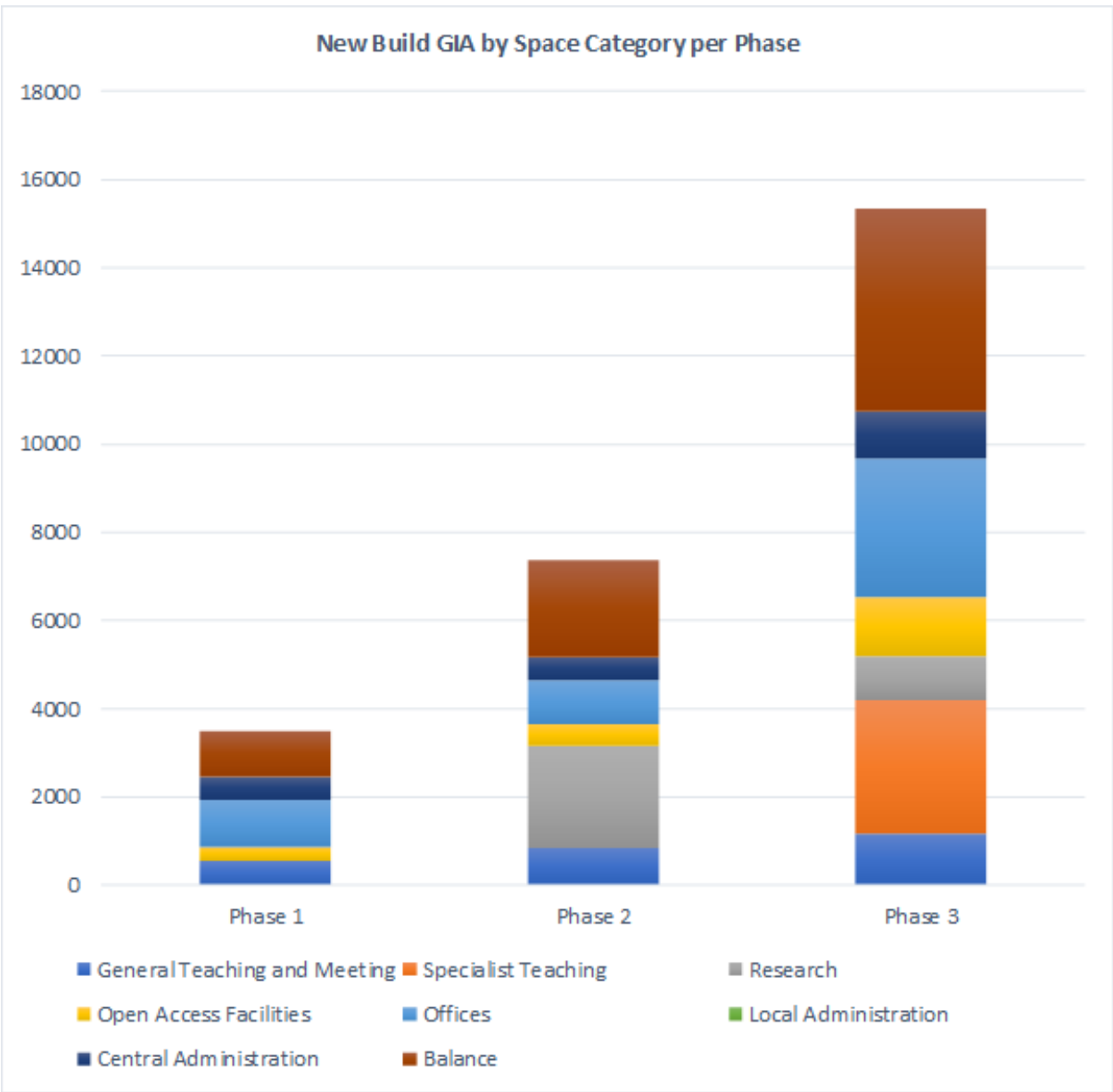■ Initial Enrolments ■ Growing to

Based on preliminary modelling parameters set out below, we forecast the three phases of development as follows:

	Phase 1	Phase 2	Phase 3	Campus Size at the end of Phase 3
General Teaching and Meeting	548	855	1162	2565
Specialist Teaching	0	0	3023	3023
Research	0	2310	998	3308
Open Access Student Facilities	324	495	1354	2173
Offices	1068	990	3133	5191
Professional Services	505	510	1063	2078
Balance	1048	2211	4599	7858
Estimated GIA	3493	7371	15332	26196

At Phase 1, only general-purpose teaching and learning spaces are provided alongside staff accommodation. There is no allowance for specialist teaching or research spaces as these would need to be driven directly by the needs of the curriculum. In practice, the general teaching spaces will be flexible spaces and, in the interests of cost-effectiveness, staff spaces will be planned on an activity-based working model to provide maximum flexibility during the formative and early developmental stages – spaces which encourage collaboration, communication and provide a degree of proximity between staff and students. The environment will be reflective of the needs of first generation HE students and be accessible and welcoming.

New Build GIA by Space Category per Phase

■ General Teaching and Meeting ■ Specialist Teaching ■ Research
■ Open Access Facilities ■ Offices ■ Local Administration
■ Central Administration ■ Balance

For practical purposes, the following assumptions have been made to determine the outline relationship between the student/staff population and the area of the estate necessary to support that population.

For Phase 1, net internal areas should be provided on the following basis:

Space Type	Allowances
General Purpose Learning and Meeting (based on all user numbers including all staff as well as all students)	At least 10 hours week of contact time (based on a 40-hour week and a target of 56% utilisation) Allow 2.5 m2 per workspace (not enough for labs or workshops)
Specialist Areas	Assume specialist spaces are excluded from Phase 1. Modelling assumptions beyond Phase 1 are not based on specific curriculum information and will need to be tested in detail.
Library, informal learning and resource space	0.7 m2 per FTE not including catering spaces and other commercial areas although the addition of a coffee shop in some form is probably de rigueur
Staff Office Accommodation (a balanced mix of accommodation including some cellular offices, adaptable/flexible working environments and a range of work settings from touchdown spaces to group working and informal meeting spaces). Phase 1 will need to allow for a variety of staff working types, such as desk-bound, peripatetic and homeworking.	Between 2.5-4 m2 per staff FTE for Phase 1 owing to budget constraints. 6-10 m2 per staff FTE depending on policy in future phases – use 8 m2 as reasonable average. As staff will be serving a student population located across the region, some flexibility will be needed, and the operating model will likely need to support flexible and remote working. Spaces to develop content and multi-media resources including studios will be necessary.
Research Space	Modest allowance for research students (who may follow the staff recruited to the University). Estimate equipment-dominated space to be not more than 20% of total research footprint.
Balance Space	Target 70:30 net:gross ratio

Anticipated occupancy levels

The occupancy levels outlined below are consistent with the Phase 1 Schedule of Areas (version 3) and with the forecast Student Numbers set out in the Shadow Curriculum Model (version 2c). It is important to recognise that students and staff are not likely to be on-site all at once. However, it is equally important to recognise that future use will deviate from initial planning assumptions and this could lead to much more intensive utilisation than initial numbers suggest.

Note that while only 8% of students are expected to be taught at the Embankment Site (Appendix 1), 78% of Staff are expected to use the site as a base during the working week. However, of those staff, a proportion will not be permanently based on-site and agile working in highly adaptable working environments is anticipated.

The Phase 1 Building has been sized to accommodate a user population of 762. We anticipate that the actual physical capacity of the space as briefed (SoA Version 3) will amount to some 673 seats/spaces. We anticipate that actual furniture and design solutions will provide scope for many more people to use the space.

Occupancy Design Standards

In order to deliver a flexible, futureproof and cost effective building the following design standards are employed:

■ Fire Strategy – designed to 100% of HE INTENSE Occupancy
■ MEP Systems – designed to 100% of HE INTENSE Occupancy
■ WC Provision – designed to 70% of HE INTENSE Occupancy
■ IT/AV – designed to 100% of HE INTENSE Occupancy for core provision and 100% of HE PLANNED Capacity for outlets at desk etc.
■ Loose Furniture and Equipment - designed to 100% of HE PLANNED CAPACITY
■ Car Parking - designed to 100% of HE INTENSE OCCUPANCY

Key Numbers	Phase 1	Phase 2	Phase 3
Total Students	5,610	8,689	12,542
Student Numbers On-Site Only	463	1,060	2,015
Total Staff	468	724	1,046
Staff Numbers On-Site Only [78%]	367	566	818
Staff Numbers – Weighted by Workstyle [64%]	299	462	667
Total User Population	**762**	**1,522**	**2,682**
HE Planned Capacity [Seats/Spaces]	**673**	**N/A**	**N/A**
HE INTENSE Occupancy	766	1,539	2,843
Max Commercial Occupancy	614	1,901	4,584

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Staff Workstyles and Weighting for Time On Campus

We have allocated academic and professional services staff space on the following ratios. For space planning purposes, we have also allocated staff working on site an FTE weighting

Staff Allocation	Academic	Professional Services	On Campus Weighting
Desk Bound	70%	40%	1.00 (5 days)
Peripatetic		30%	0.20 (1 day)
Hybrid		20%	0.40 (2 days)
Homeworker	30%	10%	0.00 (0 days)

Work Settings: Space Allowances

In respect of work settings, we have allocated space on the basis that cellular offices and workstations will be sized to accommodate one person in each case. For meeting pods and café style seating, we have allocated space on the basis that furniture solutions can be provided which increase the capacity. In the table below, a normal occupancy level has been provided based on a specific furniture solution and a peak capacity also identified. Maximum occupancy figures are based on peak capacities.

Setting	Notes	Workspace Area in m2	Normal Capacity	Peak Capacity
Office	Cellular office (can double as a meeting room)	8	1	1
Desk/Carrel	Standard workstation for single person use	5	1	1
Pod	Meeting pod for up to 4 people	6	2	4
Cabaret	Café style seating for up to 4 people	4	2	4

Phase 1 Building

This section relates to the Schedule of Accommodation (Version 3) set out in Appendix 1.

General purpose teaching / learning spaces

This section is a preliminary draft designed to capture the initial requirements.

Space Types

This section largely addresses the requirements of general-purpose learning spaces of varying size and configuration as set out in the schedule of accommodation. The specification would also be appropriate for a range of meeting spaces.

Access

The learning spaces should be open throughout the teaching day for use by students and staff. Unscheduled spaces should be bookable or available on an open access basis for ad hoc groups to form and work.

Size and Capacity

Eye contact is important and sight lines within the room will promote ease of interaction and engagement between lecturer and the group and between all group members.

Rooms will be specified to a comfortable standard with room to spread out books, laptops and other resources. Heating and ventilation will be controllable and attention given to the impact of wall and floor finishes will enhance and not detract from the quality of the teaching and learning experience.

New learning space will need to accommodate a variety of group sizes and may need to be adjustable to suit different teaching styles and group sizes over the course of the teaching week. The potential to refit a whole area on a periodic (3-5 year) basis will be a factor in the design as both technologies and pedagogic practices change.

Equipment and Facilities

Each General-Purpose Learning Space should be equipped as follows:

- **Furniture**: Flexible movable furniture for easy re-organisation of the room to achieve different learning formats (serried ranks, cabaret style, horse-shoe, etc, cleared floor area).
  - Desks and chairs will be stackable with ease of mobility.
  - Small tables are preferable [Chairs with tablets are not desirable and will not be provided].
  - Provision will be made to keep bags and coats organised to facilitate movement around the classroom.
- **Audio visual** provision is described in Section 6.3:
  - All rooms will have an appropriate level of sound insulation. Care will be taken to provide for both the quality of internal acoustics in each space and the mitigation of any impact on adjacent spaces.
  - Each teaching room will provide high-quality audio-visual facilities including a well-designed and integrated projection and sound system. Blackout will be achievable to facilitate film screenings and particular attention will be paid to the sound quality (including both in-room acoustics and sound-proofing to prevent distractions (intruding on, and emanating from, the room).
- **ICT**:
  - Rooms will be fully Wi-Fi enabled with enough bandwidth for extensive internet access throughout the teaching day
- **Power** will be available at multiple points and locations around the space to facilitate working with PCs, laptops and tablet devices.
- **Walls** will provide a mix of writeable surfaces including whiteboards, smartboards, flipchart holder and noticeboard. Writeable walls may be the most convenient method of achieving the greatest flexibility of surfaces (easily repainted). Whatever the format, the technology should also be provided to capture and circulate/publish the output of each learning session.
- **Storage**: A built-in lockable storage area will be

provided in, or adjacent to, classrooms.

- **Natural lighting** or simulated natural lighting will be provided in all rooms and audio-visual equipment will be positioned in order that lighting complements rather than conflicts with the presentation of information (lighting will be arranged in banks where necessary to enable ranks/rows to be controlled separately to avoid flooding projector screens with light). It will be important for the location of lighting, screens, projectors and movable partitions to be designed to make different configurations workable.

- **Heating** will be controllable either by thermostatic adjustment or by manual means (ability to open and close windows and vents).

- **Flooring** will be durable and hard-wearing, facilitate easy movement of furniture and be designed to enhance rather than detract from the acoustics of the rooms

Learning spaces and spaces for students

Workspaces for students will be provided on a variety of formal and flexible formats in a range from 2 to 5m2 per workspace and which may include formal library study spaces, informal, social learning spaces and some café style and catered formats. Provision will be distributed around the building rather than concentrated in and around formal library/learning resources space. A variety of settings will be provided using different furniture solutions to break up large volumes of space to serve different needs.

Learning and social spaces for students should be mature professional working environments promoting a range of study options including quiet private study, group working and discussion. Where provided catering provision adjacent to, or located within student learning areas, will be small scale and pop-up in configuration. The ability of students to use the space will not be compromised if they do not purchase from such outlets.

Learning resources

Space is at a premium during Phase 1 and it will only be possible to provide modest library bookstock facilities. A Library and Learning Resources zone will need to provide for a small collection and we anticipate that this will not exceed 3,000 items (books) unless roller racking can be accommodated. Learning resources will primarily be provided on a digital first/digital only basis.

A small reception point for enquiries and loan/ collections/returns will be needed including a small queuing area and this will be adjacent to a small back-office area where staff can work and manage incoming books and cataloguing. The back office should have views of reception and queue length to provide support at peak times.

Social Learning Space: Critical Adjacencies between Learning Resources and Other Facilities

Professional services

Administrative and professional services functions other the Learning Resources/Library Team will be centralised during Phase 1. It is anticipated that the University will not have achieved critical mass at Faculty levels to justify diversification in administrative processes and flexibility will be necessary to react to imbalances in recruitment during the formative period; the ability to switch resources and provide support on a flexible basis could be paramount.

The professional services suite will be modelled on the Flexible Accommodation Office Accommodation for Staff described over. It will contain:

- Space for senior managers;

- Space for administrative and support staff working closely with faculties;

- Space for professional services staff providing student facing services.

A service centre will be needed to field enquiries and student concerns. This should include the potential that some students will encounter difficulties, may be in crisis and need confidential support including counselling. The design of the Service Centre will therefore be sensitive to these diverse needs. The intended orientation should reflect a modern bank rather than a more traditional service counter approach. Triaging and sign-posting are vital as are proactive rather than reactive approaches. The student journey will need to be mapped with the HE Partner but initially it is anticipated that:

- Transactional and routine enquiries will be handled by phone, app and web without the need for on-site attendance or intervention;

- Physical requirements will orientate around the need for specific advice and guidance and some scope should exist for students making an enquiry to be seen quickly but not necessarily in a confidential setting;

- For students in crisis or with more complex enquiries access to a waiting area and a confidential meeting space will be important and staff should be on hand to help students in difficulties.

- It should not be necessary to provide complex queuing systems and the triaging process should help align resources to needs.
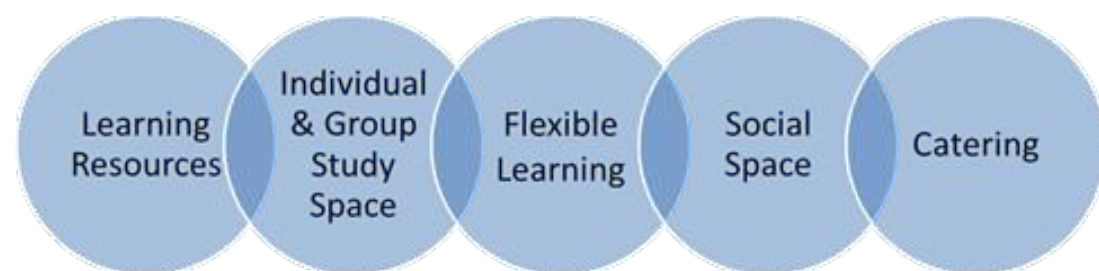
Specific facilities required will include:

- Reception/waiting space, with appropriate soft seating and table/chair space – these spaces should be welcoming and designed on a flexible basis to cope with fluctuating volumes (we should avoid have a counter with a limited number of access points)

- Flexible back office staff areas should be adjacent to reception with the ability to call up additional staff from the triage point;

- Storage and photocopy areas;

- At least 4 confidential interview rooms opening off the waiting area should be provided and the waiting area should be secluded to meet the needs of students in distress.

Space must be allowed for coursework receiving and collection (drop-off/return boxes); although it is recognised that the need for this type of space is diminishing due to the increase in electronic methods of assessment.

The Service Centre should be capable of operating from 8am to 8pm.

Support spaces – services

The diverse nature of the student population means that provision needs to be made for the production of course content for MOOCs and for distance/remote/ blended learning formats. Small studio spaces with one-touch equipment are essential. Rooms of up to 10m2 will be sufficient and up to 6 will be provided adjacent to staff working areas.

Staff accommodation

Staff require a suite of spaces and proximity between facilities is vitally important. Forward planning cannot anticipate precise patterns of use by staff need physical accommodation. For this reason, flexible and adaptable formats of staff accommodation are essential.

Suites and zones help create a sense of identity for faculties and departments. While teaching spaces should be centrally managed their adjacency to offices and student working spaces can encourage a stronger sense of course identity and team spirit.
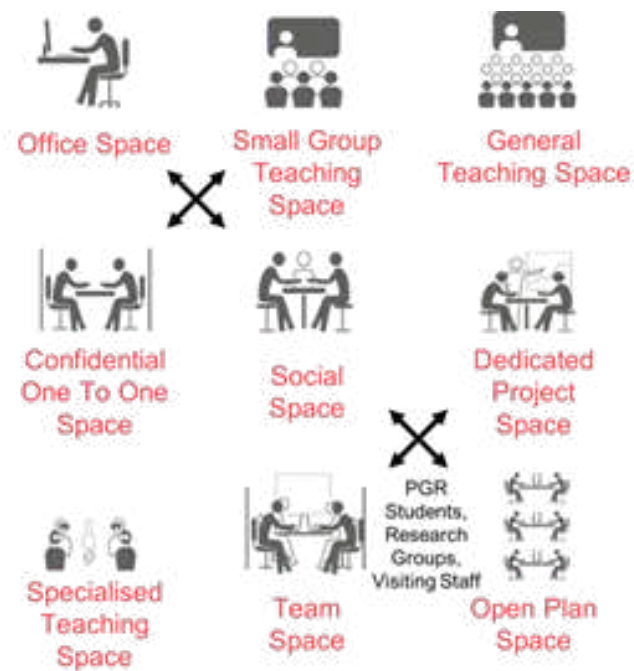
The core faculty/departmental space must serve a variety of users including:

- Academic staff working both on permanent attachment to the campus;

- Academic staff working occasionally on the campus but more commonly around the region with employers and in industrial/local settings;

- Para-academic and support staff who are fulfilling a variety of advisory and service (including administrative) roles;

- Associate Tutors (ATs) who are predominantly employed for teaching and who need access to private meeting space to see students (in some cases ATs will also be Research Students).

In later phases, adaptable and flexible accommodation will be needed to support:

- Visiting academic staff who need to be housed temporarily within the department;

- Post-doctoral research assistants and contract researchers who may be associated with individual projects or working individually with a member of academic staff;

- Postgraduate Research (PGR) students who are at varying stages of their early career and whose needs for space may vary considerably.

The following characteristics will be borne in mind:

- Fully open plan solutions (i.e. small seried ranks of workstations in a large open setting) are not considered desirable and the expectation is that a suite of spaces and work settings will need to be provided including some touch-down spaces, shared workstations, shared offices, project rooms, meeting space and associated common room/'lounge' facilities;

- Shared workstations will be provided on a 3:2 ratio, i.e. 3 users to 2 workstations to avoid permanent 'nesting'. These arrangements will be managed locally;

- Adjacent small meeting rooms to 1:1 and small group discussions (c 4-5m2) and meeting/seminar spaces for regularly held research seminars will be provided;

- All enclosed office spaces and meeting rooms will be based on a standard module of not more than 10 m2. This footprint for cellular accommodation should facilitate changes in use and prevent rooms being colonised as traditional cellular offices. For example, to conflate multiple modules into larger more useful spaces. Conversely, for shared offices, project rooms and, where possible, larger meeting spaces, these will also be designed in multiples of 10m2 to allow these spaces to be subsequently cellularised should needs change. It is vitally important that random change is not encouraged but the ability to reconfigure the Phase 1 building for multiple future uses is an important consideration given that the precise needs of the staff and students will not be defined for some time yet and in any case will inevitably evolve over the next decade;

- All users of flexible working areas will need good quality secure storage and this should be arranged in shared offices and project rooms and adjacent to all other spaces to promote flexibility and avoid 'nesting'.
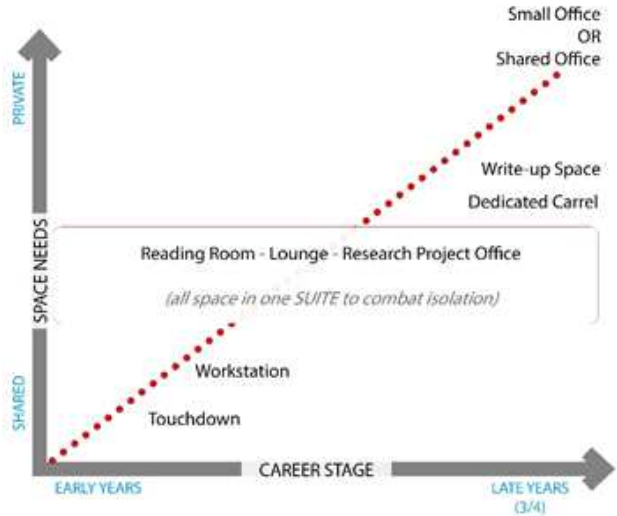
Masterplan

Specialist teaching space

Specialist spaces will need to be considered with the selected HE provider during the planning for Phase 2 and phases beyond.

Research space

Research Space is inextricably linked to the needs of specific research groups.

A range of spaces in a research suite and/or graduate centre may be most appropriate reflecting a logical progression through the student's experience and increasingly 'privileged' facilities as the student approaches completion of their doctoral programme. Again, one-size fits all solution for research students may fall into disuse in a very short period (e.g. serried ranks of workstations with fixed position PCs). Facilities for PGR students need to be attractive and competitive and the expectation is that the facilities will provide a focal point for PGR students to combat the isolation and promote the development of a thriving academic community within which PGR students feel an integral part of their department.

It is important to recognise that proximity to the core academic community is critical for PGR students to benefit from being part of a professional research environment. It is also important to recognise that research is not conducted exclusively at a desk and that students cannot write continually. A suite of spaces is therefore critical to providing a balance of facilities that will be useful throughout their PhD programmes.

Benchspace in Labs and Workshops

Research spaces will need to be considered with the selected HE provider during the planning for Phase 2 and phases beyond.

Equipment-Dominated Space

For planning purposes, 20% of research space is expected to be "equipment-dominated" and could be large scale requiring double-height spaces with significant services including gases, extract and controlled environments. For Phase 2 allow up to 500 m2; for Phase 3 allow up to 200 m2. Potentially some specialist teaching space could generate similar requirements e.g. in engineering workshops and science labs. A further 600 m2 may be necessary at this point. Up to Phase 3, a total provision in this sub-category could amount to 1,300 m2 in total.

Masterplan opportunities

Catering / Retail / Commercial

For the avoidance of doubt, the new University is not expected to develop any commercial functions e.g. Residential or Conferencing functions, in order to preserve the focus of the New University on its primary mission and in order to avoid diverting capital and working capital away from supporting core business and underpinning growth initiatives.

Commercial opportunities may form part of the discussions with the contractor/developer of the Embankment site for future phases. These spaces will not form part of the CPCA brief and will not be supported or delivered by the HE Partner. Only a genuinely commercial offer from the contractor/developer will create a need for additional space and this will be addressed later in the design process. It is a working assumption (key principle) that the integrity of the Phase 1 New University building will not be affected by such proposals.

Sports

The new University is not expected to develop any Sports functions and will look to integrate the existing sports facilities on the site into a cohesive campus masterplan. See Section 09

Off campus

No formal allowances are being made for off-campus provision at this point. During Phase 1, it is anticipated that the HE Partner will work with local businesses and other organisations to identify both their needs and potential locations to support course delivery. It is anticipated that employment settings and business locations as well as community settings will be hired or provided pro bono as part of course delivery agreements and service level agreements which will be negotiated by the incoming HE Partner.

Please note the anticipated occupancy levels of the Campus do not anticipate levels of use by off-campus students and that the off-campus experience will be distinctive from the focus of the Embankment site.

Environmental and Sustainability

General

The Climate Change Act 2008 is the basis for the UK's approach to tackling and responding to climate change and sets legally binding targets to reduce emissions for carbon dioxide (CO_2) and other greenhouse gases by at least 80% by 2050, from 1990 levels. This was amended in Jun 2019 to 100% reduction by 2050.

Peterborough City Council (PCC) has declared a Climate Change Emergency and has agreed to adopt a far more challenging target than that being proposed by government; which is to make the Council's activities net-zero carbon by 2030.

The National Planning Policy Framework (NPPF) was published in 2012 and sets out the overarching policies for development in England. The NPPF supports the reduction in greenhouse gas emissions and the delivery of renewable and low carbon energy.

In July 2019, PCC released its new adopted Local Plan, LP31 which covers renewable and low carbon energy. This policy encourages developments to adopt a sustainable and responsible approach to energy consumption, carbon emissions and renewable energy production.

In response to the foregoing, this New University of Peterborough campus development should:-

• Incorporate energy efficiency measures and best practice design to reduce the inherent energy demand and associated CO_2 emissions of the development.

• Incorporate Low and Zero Carbon (LZC) technology solutions to decarbonise the energy supply and provide further CO_2 reduction with a roadmap to zero carbon.

• Incorporate recycled materials and materials with low embodied energy impact.

• Incorporate water efficiency measures and Sustainable Drainage Systems (SuDS).

• Incorporate measures to reduce waste.

• Incorporate measures to encourage sustainable transport.

• Incorporate measure to mitigate the affects of Climate Change

'Architecturally leading, flexible and environmentally friendly'

Energy

The new campus energy consumption will broadly be split into two types, regulated and un-regulated. Unregulated energy is generally the energy from processes within the buildings such as catering, IT equipment and plug in appliances. Regulated energy is the energy that is consumed by the building and its systems such as lighting, heating, cooling, mechanical ventilation etc.

In order to meet the PCC LP31 policy and the Council's aspiration to be zero carbon by 2030, the energy strategy must be carefully considered. The energy strategy for the new campus should be developed based on the following principles (listed in order of priority):-

a. Meet energy demands of the new campus initially (phase 1) and be suitable for expansion / addition for future phases (2-3.)

b. Minimise energy consumption as far as can be achieved in a cost effective manner.

c. Maintain a pathway to adopt future low and / or zero carbon technologies where these can be reasonably predicted.

d. Meet Building Control and planning energy requirements for the development.

e. Provide systems that will give the lowest cost of ownership, taking into account:-

- Capital cost
- Fuel costs
- Maintenance costs

f. Improve resilience of systems where this can be achieved cost effectively.

g. Minimise carbon emissions for the initial phase and installations.

h. Consider connecting to the local heat from waste (EFW) scheme and assess any cost / carbon advantages this is likely to offer.

The above seeks to achieve a balanced approach to the energy strategy, if the emphasis were to change to capital cost or zero carbon being the critical factor, then the resultant solution would be significantly different.

The energy strategy should also take account of the reducing carbon factor for the national electrical grid.

An options appraisal will be provided to consider the possible energy strategy for the campus, this will be ranked and presented with recommendations for the preferred solution(s).

Options should include:

1. Individual boilers and power supplies to each building

2. Individual heat pumps and power to each building

3. Central energy centre with boilers, CHP and / or biomass boiler

4. Central energy centre with electrically driven heat pumps (air or ground source)

5. Integration of energy from waste into systems

Energy Requirements

The likely peak demand and energy consumption for the proposed campus is not known at present, at this stage the estimates should be based on a 'typical' University Campus energy consumption with the main emphasis on support / teaching accommodation.

The energy requirement shall be developed based on the following assumptions:

1. There will be minimal research / science facilities on campus (<5%).

2. There will be no residential accommodation.

3. There will be no catering, retail or commercial requirements (for phase 1)

Operating hours will be typically 8am to 8pm Monday to Friday

The majority of IT server infrastructure will be cloud based and there will be a minimal requirement for high energy consuming IT hardware and associated resilient cooling systems. An allowance will be developed and agreed during the next stage of design.

Health and Wellbeing

The new buildings should promote good health and wellbeing of the staff, students and visitors. Providing an internal environment that is fresh, naturally lit and meets best practice comfort conditions for fresh air and temperature is essential. The environmental systems should respond to the external ambient conditions and the density of occupation to ensure that building remains a pleasant space to be in, while also supporting the teaching and learning experience. The Chartered Institute of Building Services Engineers (CIBSE) guidance should be adopted to develop the building's internal environmental strategy.

Water Conservation

In order to reduce the environmental impact on water resources as a result of the development, all toilets will be low water capacity, taps should be push button type where appropriate and water consumption will be tightly monitored. Sanitary supply shut-off control, which automatically detects and responds to leaks should also be considered into the design.

Consideration will be given to rainwater harvesting to reduce mains water demand by supplying the toilets. Rainwater harvesting does provide a means of conserving water and is a recognised SuDS measure to provide for the disposal of surface water.

A green roof will also be considered, but it is not advisable to incorporate this as well as with a rainwater harvesting system, so care must be taken in terms of the location.

Permeable surface treatments to the car park and service areas will be encouraged to facilitate attenuation within the sub-structure; leading to an increase in the time of entry for the overflow into the carrier network. Infiltration techniques will be highly dependent upon the soil characteristics and the level of the water table. The flow and run-off from soft landscaped areas can be reduced through strategic planting of locally occurring species of bushes and trees.

Materials of Construction

Locally sourced A and A+ rated construction materials (as defined by the Green Guide to Specification), should be incorporated wherever possible, with associated low embodied carbon impact. Timber should be from certified and renewable FSC approved sources.

Construction product efficiency (off-site pre-fabrication) should be promoted along with the utilisation of a local workforce to reduce the environmental impact over the construction life cycle.

Opportunities to mitigate embodied carbon emissions on new build projects will concentrate on appropriate selection of materials of construction, not least for the concrete substructure that can account for over 40% of the total 'cradle-to-grave' emissions. The design will allow for the specification of concrete with up to 30 - 40% Pulverised Fuel Ash (PFA) or Ground Granulated Blast Furnace Slag (GGBS) content which can reduce the embodied carbon impact of concrete by as much as 80% when compared to that containing 100% Portland Cement.

A further environmental benefit of using PFA or GGBS is that they are both derived from waste streams and readily available in the UK at little or no cost uplift.

Waste

The campus will be designed and the University will be encouraged to provide dedicated storage facilities for the building's operational related recyclable waste streams, so that waste can be diverted from landfill or incineration. The waste management strategy will be dependent on the user's activities, but may include for example compactors or balers to deal with large amounts of packaging, or vessels for composting suitable organic waste. Facilities should be clearly labelled to assist with the segregation, storage and collection of the recyclable waste streams.

Building Systems and Internal Environment

The mechanical and electrical (M&E) systems necessary to serve the campus will be carefully considered to ensure the buildings exhibit best practice in terms of energy and carbon performance but also provide a comfortable and healthy internal environment, which will enrich the learning and teaching experience. The M&E systems should be designed to meet the following criteria:-

Provide a comfortable environment for staff and students. A sensible approach should be adopted to allow buildings to overheat slightly during peak summer ambient conditions. The CIBSE's Technical Memoranda (TM52) should be adopted to predict the buildings' potential to overheat and then adopt a combination of passive and active measures to mitigate this. The solution should assume that occupants will adapt to elevated internal temperatures during peak summer periods. The systems should also be capable of responding to global warming so they can adapt to higher summer ambient temperature in the future without wholesale system replacement.

Passive cooling strategies should be adopted where possible to reduce the energy consumption associated with mechanical cooling systems. The buildings' form, orientation and glazing elements will be carefully developed to ensure an acceptable balance between site constraints, aesthetics, views, people flow and energy consumption. The buildings will utilise exposed thermal mass where possible. Ideally this will be provided using a heavyweight material for the ceilings. Providing heavyweight exposed internal envelope allows building heat gains to be absorbed during the day and this heat can then purged at night using cooler night-

time air. This effect is a well proven method of providing low energy cooling to buildings.

In some rooms, passive cooling may not be enough to supress internal heat gains. In this case mechanical systems should be adopted but only to meet the overheating criteria set out in TM52. Mechanical systems will be designed to industry best practice guidance, to minimise energy consumption and operational costs. Systems should also consider minimising the quantity of refrigerant and utilise refrigerants with a low global warming potential.

The buildings' heating demand should be minimised through the responsible design of the thermal envelope. Useful solar gain should be harnessed during the winter and heat loss should be minimised by adopting very low U-values and air permeability. The design should also seek to design out thermal bridging elements where possible. Heating systems employed should be suitable for the future connection to a low carbon district heating network. A potential future heat network, emanating from a local Energy from Waste (EfW) plant is currently being investigated. The EfW plant incinerates domestic (black bag) waste and the resulting heat is used to generate steam which then drives a steam turbine generator set. Electricity is produced in the process which is fed into the grid. The residual low-pressure steam is then condensed to begin the process again. Waste heat from this steam condenser is currently rejected to atmosphere. A government funded feasibility study is currently underway to determine the viability of directing this waste heat to a district heating system. This new university campus would be a significant heat load opportunity and should be considered during the feasibility study for the EfW district heating system.

Should the EfW district heating system be built in the future, it is essential that the university buildings can connect to it with minimal enabling works. Although up to 5MW of heat is potentially available, the grade of this heat is low, operating at around 30oC. District heating systems traditionally operate at temperatures greater than 80oC. Although it is possible to boost the heat at source to a higher temperature, this will result in a reduction of the electricity generated. This is because

some of the steam would be used to raise the district heating temperature rather than drive the turbine. The feasibility study should conclude what temperature the district heating should operate at. As this is not currently known, the buildings should be designed to utilise wet heating systems where possible and utilising a low temperature flow and return. This will then allow the buildings to benefit from a lower temperature district heating system, operating at c30oC or higher at 80oC. It is also understood that the EfW plant is shut down for maintenance in the summer for 2 weeks. Unless an alternative arrangement is made, this would result in the district heating system also being shut down over the same period.

The buildings' heating systems will need to be designed to accept the EfW district heat by adopting the following principles:

• Use wet heating systems where possible utilising flow temperature ≤ 50oC. This can be achieved using a combination of underfloor heating, radiators and air handling plant.

• Provide/reserve future plant space to locate heat exchanger plant and metering equipment.

• Provide/reserve future plant space for heat pump installation to boost the temperature from say 30oC to 50oC

• Take advantage of the looming reduction in the carbon factor of grid electricity to a similar level to gas. And the future reduction in carbon as the electricity grid is continually decarbonised by the introduction of renewable energy sources. This will favour the use of heat pumps in lieu of gas boilers.

• A constraint free route from the site's northern

boundary to allow the installation of below ground district heating pipework.

Ventilation plays a significant role in ensuring the buildings provide a comfortable and healthy environment for occupants. Buildings will be designed with ventilation systems that meet or exceed best practice guidance, particularly during times when the external ambient temperature is ≥ to the internal temperature. To minimise energy consumption, buildings would adopt a mixed mode strategy. They would utilise mechanical ventilation with heat recovery during the heating season and a combination of natural and mechanical ventilation outside the heating season. The ventilation systems will be designed to automatically optimise ventilation levels while minimising the energy consumption. The building envelope should be designed to allow occupants to control their own ventilation where possible, using natural ventilators and opening windows in summer. Where possible these should have simple manual controls that also consider the need to maintain security. The most effective way to provide mechanical ventilation is using the displacement principle. Air is delivered at low level and at low velocity, immersing occupants in a refreshing sea of fresh air. The air also provides a 'free' cooling opportunity during periods of the year when the outdoor temperature is below the target room space temperature requirement. This can amount to free cooling for more than 70% of the year. Where possible and appropriate, displacement ventilation will be adopted where possible.

Electrical Infrastructure

The most ideal and cost-effective arrangement for the incoming low voltage (LV) electrical services for Phase 1 would be from the existing DNO transformer adjacent to the proposed building. Should there be insufficient capacity, the transformer will either be upgraded to a larger capacity transformer or a new transformer will be provided near the north boundary of the site or adjacent to the existing transformer. For future phases, additional buildings could then either be served from additional DNO transformers or should the University wish, via a high voltage (HV) connection and the subsequent HV & LV infrastructure would be owned and operated by the University. The latter being more suitable for the future connection of a private wire HV supply emanating from the EfW plant, should it be implemented.

The electrical supply will be sized to incorporate 25% spare capacity to cater for future growth of the building.

Electrical Distribution

The general strategy will be for each building to

be provided with a main low voltage distribution switchboard from which all supplies shall emanate. From the switchboard, supplies shall distribute throughout the building to serve sub main / final circuit distribution switchgear at each floor level. As with the electrical supply to the building, all switchgear will have sufficient spare capacity (typically 25%) in terms of its inherent spare load capacity and unused outgoing ways to cater for future growth.

A combination of dedicated lighting, power and split way (lighting and power) distribution boards will be used. Metering / energy monitoring facilities will be provided for ease of maintenance and feedback to the overall metering / energy management monitoring system.

Phase 1 building will be provided with Electric Vehicle Points to cater for 8 vehicles. Cable ducting will be provided local to the adjacent parking bays to facilitate the implementation of future additional points. It is assumed that the electrical consumption of any future additional points will form part of the 25% spare electrical load capacity.

Daylight Strategy

With the advent of technological approaches to targeting zero or very low carbon and in response to PCC's new adopted Local Plan, passive measures are a major focus.

This has led to much effort in designing buildings with high fabric performance to prevent heat loss, enable solar gains where required and provide better occupant comfort.

It is of paramount importance to also ensure that window design allows as much daylight as possible to penetrate strategically. This will ensure that daylight can be harvested and allows internal artificial lighting to be gradually dimmed or switched off for maximum energy saving.

In the past, window sizes have reduced to assist in reducing heat loss. However, with modern high performance and low U-Values, window sizes can be determined for optimum daylight penetration.

Where possible, secondary availability of daylight should be designed in. This could take the form of rooflights, high level clerestory glazing and atria with some internal rooms having internal glazing for borrowed light.

Lighting Strategy

With the majority of mechanical and electrical services within buildings being driven down in energy use,

lighting has grown as a key area of concern for energy consumption due to the reduction of other services.

It is important to provide the lighting levels required for each task requirement, whilst allowing the architectural language demands to be achieved. Product selection and application along with efficient and effective control systems are therefore imperative coupled with a flexible approach for future adaptations. It is important to adopt lighting schemes that recognise the multi-use nature of modern buildings and potential changes of use with curriculum.

Lighting levels need to be carefully chosen in accordance with the relevant codes for lighting which incorporate the essence of the British Standards. These guidelines allow the designer to provide the right lighting to the right lighting power density. This is key to achieving a low EPC and passing the Part L compliance modelling.

The implementation of LED technology coupled with high-efficiency, low-energy control gear supports the scheme's low-energy requirement.

Lighting Control

Lighting controls will play a key role in determining the success of the lighting system in terms of energy conservation. Users tend to complain of various issues with stand-alone sensors which switch lights off even when the person is present leading to arm waving for re-detection. Such is the annoyance that in many cases the sensors end up being over ridden or taken out.

So, the correct lighting control systems is important with internal memories so that when power outages or interruptions occur the lighting systems recall their status and perform as commissioned.

To achieve the best energy saving, a totally integrated DALI system is likely to be the best way forward. This enables integration with BMS systems if required but even analysis by energy managers via web browsers from anywhere over IP so that the clients can monitor and adapt lighting use to meet energy goals and cut waste.

DALI systems enable full flexibility of each space and switching. Should room changes occur which includes use and structural modification, then it is a simple task to modify the circuitry by software alone and no rewiring to the light fittings themselves. All lighting switches are connected onto the DALI system and not to the light fittings. Maintenance and adaptation is therefore much simpler.

External Lighting

External lighting has many functions from safe passage

of persons, orientation & direction, landscaping and outdoor use.

The lighting strategy to be developed would need to conform to the approach by the Institute of Lighting Professionals (ILP) and any planning requirements to minimise the spill light and light pollution. Lighting levels are generally based on the lighting classes from BS 13201 which relate to roadways and amenity areas. Measures will be implemented to control night time pollution, this will be in the form of time-switch and photocell controls.

LED light sources will be utilised as they offer low energy consumption and reduced maintenance. LED also offers good colour rendition and has no UV or IR output and therefore does not impact as heavily as other light sources on wildlife and birdlife. The use of LED light sources will benefit from operating in cooler conditions and extend the product life whilst allowing them to be dimmed to suit the external lighting strategy for light levels and energy conservation.

The products will additionally be DALI controlled within the time scheduling which can be set to allow them to be at say 100% output until 11pm and then dropping down to 20% overnight. Any other light level or off is possible to suit client requirements and the needs of the CCTV coverage for security.

In some areas feature lighting may be required and here the brightness will need to be controlled to avoid glare and pollution.

Automatic Controls

The building services will be controlled utilising the latest fully integrated Building Energy Management System (BEMS) to achieve key fundamental objectives including:

- Optimise energy consumption and inform conservation strategies

- Provide meaningful, practical close control of the academic environment to enhance the student and staff experience

- To reduce the need for manual intervention by FM staff in maintaining acceptable internal environments

- To provide 'real time' data and historic logging of usage patterns, operational trends, consumption data, fault and critical alarm monitoring of building systems.

- To allow remote diagnostics and remediation of failed systems and plant.

- To optimise plant and equipment usage.

- To inform planned maintenance activities for plant and services.

- Where practical to accommodate interfaces with other primary systems thus providing a common point of reference for fault signalling and analysis.

The system will be expansible such that as the Campus and its associated systems evolve, then the system may also evolve in relation.

Metering

It is envisaged that a full CIBSE TM39 compliant metering strategy is adopted throughout this project to capture energy usage and equipment operating patterns. This strategy will enable the FM provider to monitor and drive further efficiencies out of the system. As the system will record occupancy trends, it will provide historic logging of data upon which the fine tuning and optimisation of environmental control can be based. This is particularly important for continuous improvement in energy management.

Security Systems

Security systems will be provided along with other measures to ensure a safe and secure environment. It is our intention to further develop the outline proposals with the Client, its advisors and in particular the Police Architectural Liaison Officer. The anticipated risks will be assessed, and the appropriate design solutions developed for final incorporation into the project.

Land use and ecology

Both land use and ecology will be important considerations in the project's spatial planning, delivery and operation in addition to the character and identity of the University whether it be Phase 1 or subsequent development phases. Both have enormous potential to provide meaningful and lasting benefit through several measures.

These measures include best use of land, the creation of multi-functional landscapes and added value by the symbiotic juxtaposition of land uses. In terms of sustainability, land use and its spatial planning will aim to input positively to the three core precepts of sustainability – environmental, social and economic. Environmentally, through a good understanding of existing conditions and their adaption in ways that are appropriate and low impact. Socially, by creating places for people that encourage access for all and

facilitate social inclusion. Economically, by helping to underpin the success of the fledgling university and its subsequent growth.

Ecology will make a major contribution through a strategy of conserving, enhancing and creating habitat based on a good understanding of the baseline conditions, site opportunities and local aspirations. This strategy will be aligned with local and national policy and will be connected to other existing and proposed ecological provision in the vicinity, especially downstream. Success will be measured through accepted indicators, species counts and overall biodiversity enhancement, and by a shift in public perception of the site and its ecological value. It will achieve this through physical change and changes in management of existing ecological assets.

Surface water

The NPPF and good practice guidance document requires a 'betterment' principal for all new developments on brownfield sites, comprising a reduction in peak surface water flow rates compared to the existing situation. Peterborough City Council have identified that this must be to green-field run-off rates. This is to provide greater capacity within the local drainage infrastructure and reduce the risk of downstream flooding. This is to be achieved using a sustainable drainage system (SuDS) in accordance with CIRIA document C753, 2015, Peterborough City Council Sustainable Drainage Design and Evaluation Guide, and the Association of SuDS Authorities design guidance.

Consideration will be given to the capture and storage of rainwater falling onto the site for subsequent re-use in order to reduce the demand for potable water. This may be for uses such as WC flushing and irrigation for external planting areas.

The SuDS system should comprise 'above ground' attenuation storage which is well integrated into the hard and soft landscape design. The use of below ground tanked solutions should only be used as a last resort to augment the 'green' surface water storage elements.

The results of the Ground Engineering desk study indicate that the site is at high risk of contamination on the site. A detailed intrusive investigation should be undertaken and considered alongside the surface water drainage strategy to ensure any infiltration elements do not lead to the mobilisation of contaminants.

Transport

The traffic and transport impacts of the proposals will be assessed through a Transport Assessment (TA), which has been discussed and scoped with the Local Highway Authority, Peterborough City Council. To support the delivery of a sustainable and accessible development, the TA will also be accompanied by a Staff/Student Travel Plan and Car Parking Management Plan, which will set out the proposed strategy for encouraging staff/students to access the site sustainably and assist in managing the car parking asset effectively. Measures to encourage sustainable travel will include, both physical and behavioral measures, with the former likely to comprise extensive cycle parking facilities, changing/shower/locker facilities, new bus stops and electric vehicle charging bays, with the latter likely to comprise a comprehensive marketing and communication campaign, which will promote the health benefits of active travel and may include incentives as well as events.

In terms of vehicle access, the Phase 1 site and wider masterplan will be served via the existing Wirrina Car Park access from Bishop's Road, with the potential for minor junction modifications to improve accessibility for pedestrians and cyclists. The junction will be designed with consideration of the full buildout, to ensure it will continue to be 'fit for purpose'.

It has been established that car parking will only be made available to serve the operational requirements of the University, as well as less abled users. At present, parking provision has been based on provision at similar higher education facilities, which offer circa 0.12 spaces per staff member and 15% of total spaces being made available to disabled users. Based on this level of provision, Phase 1 would accommodate up to 393 on-site staff, which equates to 47 spaces (inclusive of 7 disabled bays). For full buildout, the site would accommodate up to 846 on-site staff, which equates to 102 spaces (inclusive of 15 disabled bays). The precise parking provision will be discussed with the LHA as the TA work progresses and is therefore subject to change.

Accessibility

In general the building will be designed to meet all current legislative requirements and follow good practice guidance. The building and associated external works will be designed to facilitate access for all throughout, with the exception of plant room spaces, including the provision of accessible parking spaces and access to areas of amentity landscape. Accessible parking spaces will be provided within the main car park areas in closest proximity to the building entrance.

At this stage egress for those less abled will provide through management and operational processes. Dedicated and secure refuge positions will be provided within protected cores.

Building, technology or management measures will be implemented to support the learning and working needs of those less able, including people with hearing or sight impairments. Accessible and gender neutral facilities, including toilet, and shower provision will be provided.

Public Realm

The University's public realm will have enormous impact on the public's opinion of the new University. Most visitors to the campus whether from Peterborough or further afield will not actually enter the University buildings. Their opinion will be formed by the appearance of the buildings and the public realm that surrounds them. The landscape will create positive reactions, repeat visits and expression of the university brand through positive place-making and the creation of spaces that are attractive, accessible and safe.

This will be achieved through a thorough and candid appraisal of the site and its context – its assets and detractors, both physical and psychological – and its many substantial opportunities. Key opportunities include the ability to relate the campus visually with the cathedral and heritage core, to have physical and visual access to the adjacent large open spaces and riverside, and to substantially increase the level of activity on the site. Key issues will include balancing the visual connections of the university without incurring visual intrusion, successfully countering road noise, and achieving a balanced manipulation of existing woodland. The latter is a prime indicator of the site's current status – a framework of woodland of similar age apparently planted to screen-built development, but mainly unmanaged and over-dense to the detriment of individual trees and biodiversity. This woodland currently contributes to a character that is arguably claustrophobic and possibly unwelcoming. Such a balanced solution of selective thinning and positive management is both achievable and essential.

Whilst the character of the public realm will undoubtedly spring from the site and its assets, the design will also provide place-making that will be unique and appropriate to the new university, its brand and its position in the HE sector. This will involve an understanding of evolving ideas on brand and identifying uniqueness that can be expressed through the public realm and the setting of its buildings.

Public realm should play an important part in a positive student experience providing neutral space designed for social mixing. These outdoor facilities will work in tandem with interior spaces to provide break out spaces with attention to micro-climate to extend use. Best practice urban design principles will be used to create a hierarchy of spaces and connecting routes appropriately scaled and ergo dynamically designed with through routes, and eddy spaces for social mixing. Routes will have good lines of sight and implicit waymarking. Where appropriate public through routes (cycle and pedestrian) will be routed through the campus to increase activity levels and integrate 'town and gown'.

Student safety (actual and perceived) will be a key consideration and designs will ensure the creative of active routes and places with good overlooking and natural surveillance.

Operational requirements will be established as part of the briefing process and fed into the emerging designs. Generally, these will use movement corridors under managed conditions rather than have separate routes.

Public realm will be designed to encourage short and longer term 'meanwhile' uses such as pop-up facilities, markets, seasonal stalls and kiosks, and outdoor exhibitions and performance. These will be enabled by the provision of external power and other appropriate support. Longer term uses will include shorter term landscape solutions for future development plots. The intention will be to have a campus that is fully operational, attractive and accessible at each development stage.

Ecology is seen as a major contributor to the public realm and its character and public realm, landscape and ecology will be considered as one throughout. Wherever appropriate, ecology will be a design driver - not only to avoid or mitigate damage - but more importantly to create an external environment that is ecologically rich and sustainable. This will contribute to the overall campus character, deliver planning gain and positively impact on the student experience.

Public realm will deliver objectives under the Council's declared Climate Emergency.

'Outstanding student satisfaction and response to local needs'

Phase 1

The brief for Phase 1 will be progressively developed but currently includes the following:

- Car parking: approximately 47 regular spaces for visitors and authorised staff, including 8 blue badge spaces

- Spaces for up to 3 short stay delivery vehicles (provisionally LGV)

- 8 charging points for electric vehicles plus ducts for future expansion.

- Approximately 120 cycle stands including approximately 60% covered stands

- Motorcycle parking for 2 bikes

- Fully accessible access from both drop off point east of building and connection to Bishops Road to the west, both with clear lines of sight

- Principal building entrance at west end of building with paved forecourt and carefully framed exposure to eastward views along Bishop's Road. This will require sensitive removal of selected existing trees without opening up inter-visibility between the new building and the cathedral.

- Forecourt to be provide milling space and appropriate setting to the main entrance

- Break out space to immediate south of building making best use of aspect, shelter and retained mature ash tree. Space to incorporate seating, external power and a variety of paved and soft surfaces to enable use as a multi-functional space

- Sustainable Urban Drainage Systems (SuDS) to attenuate surface water discharge will be integrated into the landscape and public realm design. Building run-off should look at the feasibility of using the loose surfaced car park for percolation purposes.

Territory and security: the design process will establish the extent of the building's domain, how this should be marked. The levels of security currently assumed (at the vehicle entrance, domain edge and building façade) will seek to minimise the risk of vehicle strike. Detailed consultation with the Police Architectural Liaison Officer will inform the development of this strategy in greater detail. Personal safety issues (actual and perceived) will be also important particularly given the building's relatively remote location, the extensive tree cover and current patterns of use of parts of the site and its wider context.

Style, Character and Materials

The public realm to phase 1 will anticipate the look and feel of the campus, setting standards, design idioms and a materials palette that informs the masterplan as a whole.

Information and Communications Technology

A separate report - 'New University of Peterborough – Interim ICT Strategy' based on the stated vision and aspirations for the University - sets out the ICT Guiding Principles that inform the requirement for the core applications and the ICT User environment that will be necessary for establishing and operating the University, and specifically the ICT Infrastructure necessary to support these services. A copy of the current version of this report in included in Appendix 2 fr ease of reference. In summary, the key ICT guiding principles that influence the Phase 1 building design and campus masterplan are set out below.

Guiding Principles

• Student Centred

The Student ICT experience should be consistent throughout the University independent of location, thereby supporting the vision for a University with an ambition of innovative technological approaches to face to face learning and outstanding student satisfaction.

• Device Agnostic & Mobile First

To ensure access and usability of all applications through Bring Your Own Device (BYOD) and University provided equipment, all services will be optimised for smart phone/tablet/laptop, Android/Apple/Windows devices, enhancing both the on-site and remote learning experience. The approach of Mobile First will be underpinned by being 'Wireless First' for students, with reliable, performant and ubiquitous coverage.

• Cloud First

As a new University, the approach to sourcing applications and computing facilities will be 'cloud first', with Software as a Service (SaaS) and Platform as a Service (PaaS) being the preferred solutions. These would ensure timely deployment of systems and an 'infrastructure free' environment which should mitigate a large capital outlay, whilst being environmentally sustainable and economic with use of the proposed real estate. Cloud services will be scalable in line with the University population and allow costs to be controlled based on capacity/consumption and support the University's readiness for independence.

• Application Architecture

Applications will be Commercial Off The Shelf (COTS) solutions, making use of open standards and Application Programming Interfaces (APIs). Bespoke customisation of solutions should be avoided. This will enable ease of deployment and operation together with the opportunity for application integration. Use of such products and services will also facilitate a smooth transition from being HEP dependant to independent over the proposed 5 year period.

• Secure & Compliant

The University will adopt best practice information security in the design, implementation and operation of its information systems and services. Using a risk-based approach it should develop an information security policy, along with appropriate standards, processes and controls to protect the University, its staff and students. Consideration will be given to emerging distributed ledger technologies (blockchain) for validating identity and academic credentials.

Phase 1 - ICT Infrastructure

Communications Equipment Rooms (CER)

Provision will be made for two CERs to support the requirement for resilient external connections.

The CERs will be used to host the active network infrastructure (switches, routers and firewalls) and the central distribution for ICT cabling. The CERs will also house any centralised multimedia and physical security equipment along with a minimum level of ICT Server/ Storage equipment to support necessary local services. The CERs will be provided with a minimum of 4 hours of Uninterrupted Power Supply (UPS).

In line with the ICT strategy no space will be provided in the Phase 1 building for a significant on-campus Data Centre. Should the prospective Higher Education Partner (HEP) recommend an alternative to off-campus provision of ICT academic and business systems, then increased allocation of identified plant space will be required for ICT.

'Curriculum will be led by student and employer demand'

ICT Service Risers

A minimum of two physically separated IT service risers will be provided to ensure the provision of a robust and resilient network and cable infrastructure.

External Connectivity

A minimum of two separate building entries and diversely routed external telecommunication/data network duct connections will be provided.

ICT Cabling

A wired infrastructure will be provided to support connectivity for the wireless access points, CCTV cameras and static end user devices such as, fixed telephones, printers and workstations. The horizontal cabling will conform to the Category 6A standard and will be shielded twisted pair.

Fibre Optic backbone cabling will be provided to connect the communication equipment rooms and external connection points.

Network Infrastructure

- Wired Network

A robust, secure and resilient, network infrastructure will be provided to support the teaching, learning and enterprise environment including connectivity for the wireless infrastructure, access control, CCTV, building and facilities management services and more generally the Internet of Things (IoT). The network will be designed to support 1Gbit/s connections for users and a high-speed backbone at 10Gbit/s upgradable to 40Gbit/s.

- Wireless Network

In line with the 'wireless first' guiding principle, a pervasive wireless network infrastructure will be provided based on Wi-Fi 6 access points. Wi-Fi 6, based on the IEEE 802.11ax standard provides the capacity, efficiency, coverage and performance required by University.

- 4G/5G Mobile Extension

Optional provision will be considered for enhancing mobile network coverage (4G/5G signals) within the Phase 1 building.

Server and Storage Infrastructure

In line with the Interim ICT Strategy the Phase 1 building will be a 'Thin Building' with only minimum provision made for on-site enterprise computing and storage. This provision will be limited to support essential on-site requirements.

Digital and Audio Visual (AV) Systems

Audio visual equipment: AV equipment will be flexible to allow presentation on to any wall within the room (the rooms should not have a single fixed presenter's position). AV equipment should be enough to facilitate the filming of activities and playback of films and other media.

A control panel or console for AV facilities should be provided to facilitate multi-user access to rooms and to provide security for specific items of equipment.

It will be possible for even a new user of the rooms to plug a laptop device into the AV system and present with only a few moments of non-technical set-up time.

Lecture' capture systems will be available in all teaching spaces and a small number of spaces will be equipped to broadcast/stream classes.

All rooms will have a good level of sound insulation. Care will be taken to provide for both the quality of internal acoustics in each space and the mitigation of any impact on adjacent spaces.

Each teaching room will provide high-quality audio-visual facilities including a well-designed and integrated projection and sound system. Blackout should be achievable to facilitate film screenings and particular attention should be paid to the sound quality (including both in-room acoustics and sound-proofing to prevent distractions (intruding on, and emanating from, the room).

ICT

Rooms should be fully Wi-Fi enabled with enough bandwidth for extensive internet access throughout the teaching day

Power will be available at multiple points and locations around the space to facilitate working with PCs, laptops and tablet devices.

Classrooms

AV systems including presentation screens, wireless presentation and enhanced audio/speakers will be provided. AV systems will be flexible to allow for a variety of options for presentation and display.

Provision will be made for simple connectivity of a laptop to the AV system such that presentation material can be delivered quickly and with minimal technical intervention.

Provision will be made for lecture capture storage and re-play of lecture material.

Optional consideration will be given to the provision of AV equipment to facilitate the filming of activities and playback of films and other media

Immersive Classroom

Optional consideration will be given to technologies that provide a capability for interactive attendance at campus-based lectures for remote non-campus students.

Production Facility

Provision will be made for a simple "One-touch" self-operated recording studio for the production of teaching and lecture material.

Meeting Rooms

AV systems including presentation screens, wireless presentation and enhanced audio/speakers and conferencing capability will be provided. In large meeting room spaces AV systems will be provided to allow the space to be divisible into smaller rooms.

Digital Workplace Technology

- Room Booking

Room booking software will be provided integrated with email and calendar systems. Lecture/Classrooms and meeting rooms will be provided with local room booking panels and status (free/busy) indication.

- Space Management

Optional consideration will be given to the provision of a workplace management system along with room and desk level sensors to provide an 'agile' and flexible workspace enabling booking and visual awareness of free/busy rooms and desk spaces.

- Digital Signage and Content Distribution

Digital signage screens will be provided in common areas and other key locations to support general information, TV broadcast (subject to suitable licensing), guidance and wayfinding. A content distribution system will be provided to enable centralised information to be provided to specific or multiple digital signage screens.

Campus Masterplan

Provision will be made for a resilient on-site communications duct network to link the Phase 1 building to others as they are developed. The duct network should be developed to provide dual connections to each building.

The core ICT infrastructure arrangements for the Phase 1 building will be replicated in each additional building except for the core network switches and server/storage infrastructure which is only required initially. Consideration should be given during the campus development to relocate one half of the core network to another building to further enhance ICT network resilience.

Operational

Introduction

The separate report 'FM strategy Version 4' sets out the FM strategy for the new University of Peterborough (UoP). The FM strategy uses the Vision for the University to guide the Strategic direction of the FM services. This document is intended to be a guide for the operator of the campus and its built environment to work when developing the delivery of their FM services. It is not a set of mandatory requirements, but the operator will need to expand on the key strategies and demonstrate their methodology and approach to FM service delivery.

The scope of the FM services is yet to be determined. It is important that FM are involved and able to influence the scope of the FM services during the design stage (and beyond) of each phase of the University's development.

There are some services that cut across hard and soft services such as security – the equipment and systems tend to be hard, but the guarding is soft services – It is recommended this is bundled under soft services to avoid complications and split responsibilities.

The scope of FM services is wide and varied and could include some of the scope items outlined in table at the end of this section.

It is recommended that any procurement exercise follows the Good Practice Guide for Procurement as developed by the Institute of Workplace and Facilities (IWFM). This is a generally accepted industry standard.

The PropCo will be providing 'hard' FM services and the UniCo will be responsible for delivering 'soft' FM services. It should be noted that this does not necessarily mean the procurement of separate providers

There are several options available for the delivery model for FM services:

1. Place a single contract with one provider for a Total Facilities Management (TFM) solution. This will mean the cost and reporting of the services would need to be split between the PropCo and the UniCo.

2. Place separate contracts for the PropCo hard services and the UniCo soft services. There are however, some cross-over services and these would need to be allocated to one or other provider to deliver

3. Place the services under a Managing Agent model – this would involve the PropCo and UniCo placing separate contracts for each service line with all of the service providers being managed by one FM Company as a Managing Agent.

There are other delivery models that could be considered including self-delivery of services, but those noted above are the most common form of FM delivery models.

The decision on which route to follow will depend on a number of factors, including:

- Risk allocation – Managing Agent role puts more risk on the Client

- Management costs – a split delivery model would suggest a greater degree of management input will be required to manage two contracts

- Cost of service delivery – bundling services together tends to allow for economies of scale and reduced management costs

Flexibility – changes to the future scope of the FM services will be easier to manage with fewer providers

'Developing opportunities in the technological, scientific and business areas'

Safety and security

A fully integrated security system will ensure a welcoming yet safe and secure campus environment. The provision of the security system should be based on a Threat and Risk Assessment (TARA) which will consider future expansion plans to ensure any systems are capable of being expanded in future phases

A CCTV system is to be provided, based on the findings of the TARA. The system should be capable of full colour, 24/7 use and have a 7-day recording facility. The system should be capable of off-site monitoring. At this stage allowance has been made for external coverage to main pedestrian and vehicle entrances and approaches, car park, cycle storage and the general building perimeter. Internally allowance has been made to cover the main reception, access and egress doors and other areas considered as special risk.

Access control measures will be installed, including pass gates, barriers and doors based on the findings of the TARA. Some form of access control cards will be used, and these may also be used for cash-less vending. At this stage allowance has been made for Comms Rooms, barriers at main entrances and any IT rich spaces.

Intruder alarms will provide for out of hours of periods and any high-risk areas such as IT / server rooms and as alert for unauthorised access via egress doors during operating hours.

Passive security measures such as bollards, fencing etc may be included on review of the TARA and insurance requirements. At this stage allowance has been made to protect the building campus perimeter from the threat of vehicle attack or traveller access using a mixture of landscape features, bollards and barriers to vehicle access points. The latter will be designed to a reasonable anti-ram standard.

The provider is to confirm how the Security Services are to be provided to ensure conflicts between systems are minimised.

Building maintenance

The provider should validate and maintain a full asset register for all maintainable assets.   (The asset register will be produced by the building provider.)

An annual maintenance plan will need to be developed to ensure that all assets are maintained periodically in line with Service and Facilities Group SFG 20 as a minimum, and programme all Statutory Inspections ensuring that compliance throughout. Should the provider prefer to move to a condition-based monitoring system of maintenance, they should set out how this will be managed. The provider must maintain full maintenance and statutory compliance records.

The provision of a Life Cycle Replacement (LCR) programme and Forward Maintenance Register (FMR) should be developed to ensure accurate budgeting information is available through the life of the asset and that unnecessary downtime due to age related failures is reduced.

Grounds maintenance

A comprehensive Grounds Maintenance service shall be provided at the premises to ensure all open and public realm areas are maintained to ensure healthy and vigorous plants with a tidy weed free appearance. Planting shall be a mix of existing mature planting and trees with a combination of newly planted areas with a mixture of trees, shrubs, ground cover, grasses etc

All trees shall be maintained to BS3998:2010 'Tree Work – Recommendations', with tree works completed by trained tree surgeons working to BS3998. Annual tree surveys shall be undertaken by a competent arboriculturist with a minimum level 3 Arboricultural Association Technician Membership. Where possible the use of pesticides and artificial fertilisers shall be minimised, by switching to natural methods of controlling weeds, insects and fungi. Preference shall be given to the use of organic wastes such as compost, manure, leaf mould, bark chippings and coir.

At this stage no allowance has been made for on campus storage or other associated facilities.

Waste management

All waste shall be collected and disposed of in an appropriately secure and environmentally preferable manner taking in to account statutory Duty of Care requirements and government targets on waste. Detailed management information will be available to enable reporting and management of waste targets. As much waste as possible will be recycled or used for energy recovery, rather than sent to landfill. At this stage allowance has been made for a waste collection area on the perimeter of the site near the vehicle to accommodate up to 4 number 1100 litre Eurobins.

Post and telecoms

A streamlined mailroom service shall be provided which will include special delivery, overseas mail services, conventional mail and courier / parcel services. The dispatch of outgoing mail shall be via a central dispatch area which shall house all mailroom equipment.

Incoming telephone calls shall be handled by a central switchboard ensuring that all calls are dealt with promptly, accurately and politely. Incoming calls will be routed to the appropriate member of staff or department. At this stage allowance has been made to house these facilities in a small FM space behind main reception.

	Hard Services (PropCo)	Soft Services (UniCo)
Site-wide Elements		
Security Installations and security guarding		✓
Waste management and recycling		✓
Environmental management		✓
Pest control		✓
Signage, external and internal	✓	
Traffic management including public access and car park management		✓
Travel plan		✓
Emergency response procedures and business continuity		✓
10-year Future Maintenance Registers, condition surveys	✓	
Maintain asset registers, Statutory Inspection records, Insurance Inspections, Fire safety log books, water management records, O&M manuals etc	✓	
Project works, moves and churn	✓	✓
Space management		✓
QHSE, Control of works / permit to work systems	✓	
Risk management	✓	✓
Equality and accessibility		✓
Statutory / compliance surveys	✓	
Fire warden and first aid first responders		✓
Facilities Management Helpdesk and CAFM	✓	
Buildings		
Housekeeping / cleaning including glass		✓
Reception / Front of House, room booking, switchboard		✓
Events management		✓
Post & porterage		✓
Catering / vending		✓
Feminine hygiene and vending		✓
Structure and Fabric maintenance	✓	
MEP installations, planned and reactive maintenance, repair and replacement	✓	
Life safety systems, fire alarms, extinguishers etc	✓	
Fixtures, fittings and equipment, furniture	✓	
Reprographics		✓
Stationery Supplies		✓
Journals, magazines and newspapers		✓
ICT installations, including ITC cabling, wireless network, digital and AV systems, network switches, routers, firewalls, local servers and storage	✓	
End user devices, MFD's, PC's		✓
Academic and business software solutions and licences		✓
External ICT connectivity: internet, JANET		✓
Faculty Equipment		✓
Accommodation		✓
External Elements		
Highways and Paths maintenance	✓	
Winter maintenance, gritting, snow clearance		✓
Landscaping services including tree maintenance		✓
River bank including life safety equipment		✓
Sports facilities and pitches		✓
External hard landscaping	✓	
Any offsite buildings and equipment	✓	✓

Building loads

Floor live loads

Building loads shall be taken from BS EN 1991-1-1. The list below is not exhaustive but shows a selection of building live loads that may be considered. Consideration will be given to using generic floor plate loads to allow future change in use. Over-design will be avoided.

Area	Floor live load	Comment
Offices at ground floor	3.0kN/m2 2.7kN	B2 offices
Offices above ground floor	2.5kN/m2 2.7kN	B1 offices
General teaching space	3.0kN/m2 3.0kN	C13 classrooms
Café and dining	2.0kN/m2 3.0kN	C11 public, institutional and communal dining rooms, café and restaurants
Assembly space	4.0kN/m2 3.6kN	C21 Assembly areas w/fixed seating
Assembly space	5.0kN/m2 3.6kN	C51 assembly areas without fixed seating C41 dance halls and studios
Industrial use (laboratories)*	3.0kN/m2 4.5kN	E2 *Note: E2 loads quoted above are minimum to be provided and it is likely that these will need to be exceeded in the workshop and lab spaces. A more detailed load assessment will be required.
Industrial use (workshops)*	5.0kN/m2 4.5kN	E2 *Note: E2 loads quoted above are minimum to be provided and it is likely that these will need to be exceeded in the workshop and lab spaces. A more detailed load assessment will be required.
Storage	4.8kN/m2 7.0kN	E13 general storage at 2.4kN/m2 per m height of storage
Residential space	1.5kN/m2 (rooms) 2.0kN 3kN/m2 (common areas) 4.5kN	A1 for student bedrooms C31 common areas and corridors
Landscaped space on suspended. slabs	5.0kN/m2 9.0kN (subject to review of proposed maintenance equipment and construction plant)	G traffic areas vehicle weight potentially greater than 3t but less than 16t
Car park	2.5N/m2 9.0kN	F traffic areas vehicle weight less than 3t
Plant space	7.5kN/m2 4.5kN	E213 subject to review of equipment loads

Roof (plant)	7.5kN/m2 4.5kN	Subject to review of equipment loads
Roof (non-plant)	0.6kN/m2 0.9kN	H roof only accessible for maintenance

At this stage there is no specific requirement for incorporating activities or equipment that would need heavy loads to be accommodated in the new buildings (i.e. such as high-density racking storage etc.).

Partition loads

Allowance for partition loading will be considered in the design.

Horizontal loads (parapets)

In accordance with NA to BS EN 1991-1-1, acting at a max height of 1.2m on a parapet or partition wall.

Wind Load

In accordance with NA to BS EN 1991-1-4.

Snow Load

In accordance with NA to BS EN 1991-1-3.

Design Life

In accordance with BS EN 1990 a 50-year design working life category 4 is proposed.

A design life of 50 years is current industry standard. For a well-maintained building where the structure is protected by the building envelope this 50-year design life is likely to be exceeded by many years and should not cause concern to the University which may have much longer-term aspirations for the development. There are however certain elements of the building where it may be necessary to advise the University further if a design life of longer than 50 years is required (and maintenance, replacement or visual inspection is not possible). This includes items such as foundations, cladding fixings and new construction products such as cross laminated timber.

Foul Water Drainage

The proximity of Anglian Water infrastructure adjacent to the site means that foul water will be disposed of into the adopted sewerage system. Where feasible all foul water should discharge into the Anglian Water sewerage system under gravity. As assessment of the invert level of adjacent sewers indicates that this is likely to achievable. All below ground foul water drainage systems will be designed to Building Regulations Approved Document Part H, BS EN 752:2008 Drain and Sewer Systems Outside Building, and Sewers for Adoption 7th Edition.

Future proofing

The opportunity to adapt buildings in the future to accommodate changes in the University use of space will be explored as the building designs develop. The buildings must ensure flexibility (short term) and adaptability (longer term) are maximised. Efficient Stair / Lift / WC cores are paramount to deliver a simple 'flexible' floor plate that can be adapted to suit changing needs and requirements.

Building systems, including the fire strategy, MEP etc, are designed to the Maximum Building Occupant capacity. This is in excess of the anticipated number enabling additional people to be accommodated in the building should this be a requirement in the future - see Section 3 Spatial Brief.

The external environment will accommodate future-proofing in a number of ways – through the provision of expansion plots and access corridors; through infrastructure related to climate change such as the provision of attenuation and protection against overland flooding in extreme events; an inbuilt adaptability of movement corridors and car parks; choice of plant material; and attention to costs in use and durability of materials throughout. External spaces will be designed so that loose fit elements can be provided (and removed) as 'fit out' elements so that they can adapt to changes in teaching models, student numbers and needs.

All drainage systems should be designed to ensure no flooding up to the 1:100-year event (1% AEP) inclusive of a 40% climate change allowance.

Framed structures with non-loadbearing partitions is be preferred over a loadbearing structure. Floor live loads that can accommodate change of use albeit the potential to over-specify loads should be avoided. The building structure should also be designed to maximise the opportunity for end of life re-use and where possible adopted design for de-construction (DfD) principles.

'Desire to be the greenest university possible'

Budget and Milestones

Project budget

The current project funding position is outlined in the table below, with project funds generated from a combination of CPCA funding and local grant funding. It is understood that the site land acquisition has been donated by the Local Authority with an approximate value of £400k per acre. The capital expenditure for the construction project (inclusive of VAT) is to be capped at £20m with the remaining funding utilised for negotiation of a deal with the Higher Education Provider. The below table demonstrates how the £20m capital spend will be utilised.

The Client identified budget of £26,400,000 is to be expended for Phase 1 of the new University of Peterborough as follows:

Funding Source	Amount (£)
CPCA	£ 12,300,000
LGF Grant Funding	£ 12,500,000
Land Acquisition (gifted)	£ 1,600,000
Total Budget	£ 26,400,000
Construction Works (Phase 1)	£ 20,000,000
Financial deal secured with HEP	£ 4,800,000
Total Expenditure	£ 24,800,000
Balance (Land acquisition)	£ 1,600,000

Order of Cost Estimate — University of Peterborough - Phase 1 Development

Project Summary — 27 November 2019

Elem Ref			Cost Target £	£ / m² GIFA
0	Facilitating Works		110,000	31
1-10	Building Works		11,835,610	3,382
	Works Cost Estimate £		11,945,610	3,413
11	Fees & Surveys		1,160,000	331
12	Client Project Costs		1,543,400	441
13	Risk	10%	1,427,656	408
	Cost Limit (Excluding Construction Inflation) £		16,076,666	4,593
14	Inflation; to 4Q21 (applied to 0-10 and 12)	4.4%	590,000	169
	Cost Limit (Including Construction Inflation) £		16,666,666	4,762
	VAT Assessment (applied at the prevailing rate)	20%	3,330,000	951
	Estimated Outturn Costs £		19,996,700	5,713
	"Say"		20,000,000	

GIFA 3,500 m2

Benchmarking

The design proposals are based upon a 3500m2 Gross Internal Area multi-use educational facility suitable for a mixed used of working, learning, teaching, and eating and collaborative space for the proposed new campus. The building will include associated external landscaping and infrastructure, all delivered within a £20m cost envelope. The current order of cost demonstrates in an elemental breakdown how this will be affordable and achieved and is supported by internal benchmark data of similar educational buildings. An elemental summary of how the £20m budget (Inc VAT) is built up is shown below.

The current benchmarking information indicates that an average build cost (£Nett/m2) is approximately £3,229/m2 (excluding site facilitating costs), and the average cost of buildings under 5000m2 GIFA being approximately £3390/m2. The initial elemental cost estimate undertaken by Mace estimates a cost of £3382/m2 for the proposed Phase 1 building. This supports our understanding that the proposed Phase 1 building can be delivered to a suitable standard within the current budget, and within typical cost parameters for a HE building.

Programme

Cambridge and Peterborough Combined Authority (CPCA) require phase 1 of the New University of Peterborough to be open for Academic Year 2022/2022 (September 2022)

To get to this milestone CPCA require certain milestones to be achieved; this has been done by decoupling of the procurement of the academic partner from the development of the design of the phase 1 building

The Critical path runs through the procurement of the academic partner in parallel with the development of the design and submission and determination of planning for end of Q1 2020. From then development and sign off of the FBC Design and procurement of the contractor and start on site in Q3 2020.
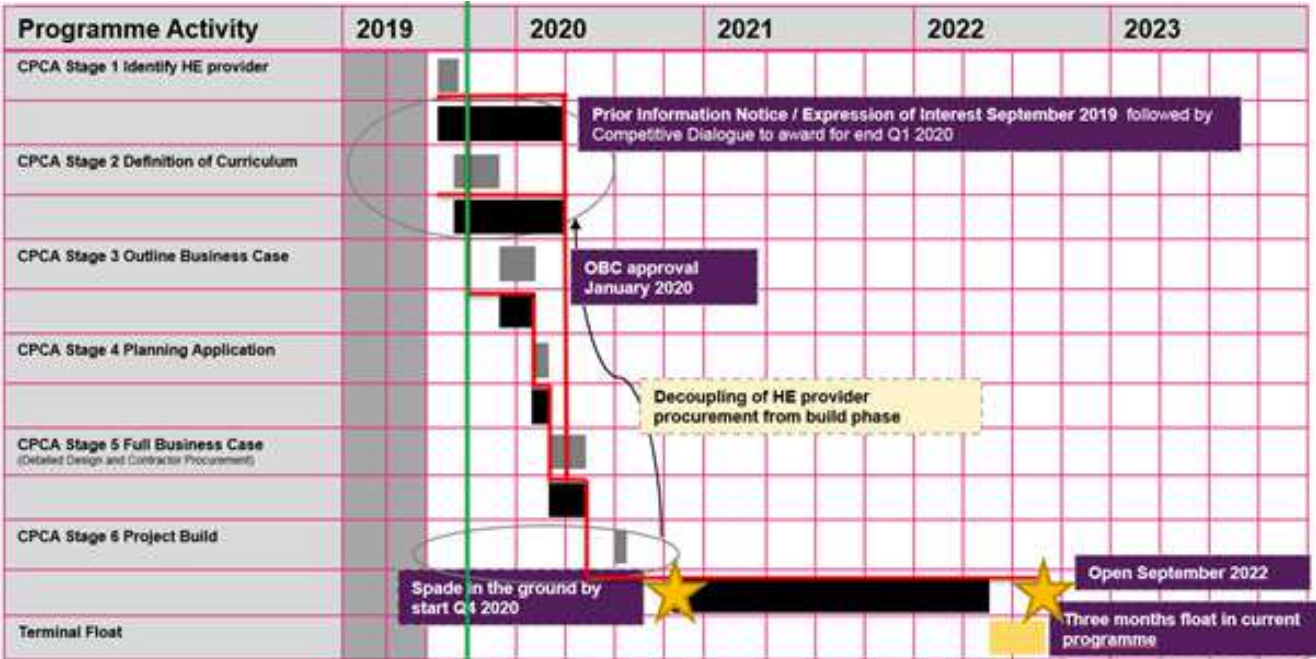
Order of Cost Estimate — University of Peterborough - Phase 1 Development

Elemental Summary — 27 November 2019

			Cost Target £	£/m2
0	Facilitating Works		110,000	31
1	Substructure		536,030	153
2	Superstructure		3,517,346	1,005
3	Internal Finishes		699,573	200
4	Fittings, Furniture & Equipment		332,500	95
5	Services		2,835,840	810
6	Prefabricated Buildings & Building Units		N/A	-
7	Works to Existing Buildings		N/A	-
8	External Works		1,184,320	338
				-
	Sub-Total		9,215,610	2,633
9	Main Contractor's Prelims	13%	1,200,000	343
10a	Main Contractor's OH&P	5%	520,000	149
10b	Main Contractor's Risk	3%	330,000	94
10c	Detailed Design (RIBA Stages 3-7)	6%	680,000	194
	Construction Total (Exc. Inflation)		11,945,610	3,413
11a	Project / Design Team Fees - CPCA Stages 1-4		450,000	129
11b	Project / Design Team Fees - CPCA Stages 5-6 (monitoring role only)	3.4%	410,000	117
11c	Surveys, Statutory and Additional Services		300,000	86
12	Client Project Costs		1,543,400	441
13	Risk	9.7%	1,427,656	408
14	Inflation; to 4Q21 (applied to 0-10 and 12)	4.4%	590,000	169
	Total (Exc. VAT)		16,666,666	4,762

Existing Facilities

The spatial brief for the New University of Peterborough has focussed on the provision of learning, teaching, research and associated academic and professional staff workspace. The location for the New University, offers the potential to link existing community sporting and cultural facilities located on the site into an integrated masterplan with benefits for both the University in offering facilities 'on campus' for prospective staff and students and in the additional potential clientele and footfall for the sporting and cultural facilities.

'On site' Facilities

Several sporting facilities currently exist on the site and include:

- Regional Swimming Pool
- The Embankment Sports and Athletics Arena
- Multi-use games areas (MUGAs)

The Regional Swimming and Fitness Centre was built in 1977 and is managed on behalf of Peterborough City Council by a 'not-for-profit' charitable organisation, Vivacity. The centre offers fitness suites, a 25m pool, cafeteria and associated facilities.

The Athletics Arena and adjacent pitches are mainly used from 5pm - 9pm Monday to Thursday with light use on Friday night and at weekends. The Track is home to two well established athletic clubs; the Nene Valley Harriers and Peterborough Athletics Club as well as Fenland Clarion Cycling Club. The arena is the only competitive outdoor track and field complex in Peterborough and boasts a completely resurfaced track. During the Athletics season there are regional events held on weekends at the track, but the football pitch has very little use as it is not 3G and out-dated.

The southern half of the site – the Embankment - is an open space and many events are held here throughout the year, including the Peterborough Festival, Peterborough Beer Festival, river festivals, open air concerts and circuses. The Embankment has overnight mooring facilities and public conveniences

A small children's' play park is located off Bishops Road on the northern boundary of the site.

'Off Site' Facilities

In addition to the 'on site' facilities the Key Theatre and Peterborough Lido Outdoor Swimming Pool offer additional facilities near the western boundary of the New University site.

The Key Theatre is operated by Vivacity on behalf of PCC and sits close to the River Nene. The Key Theatre hosts over 300 plays, screenings, comedy nights and music events every year, as well as Peterborough's longest running traditional family pantomime (since 1973). The theatre has a restaurant, bar, multiple rehearsal and conference rooms and two auditoriums - a 360 seat main house and a 112 seat 'black box' studio theatre.

Peterborough's Lido offers 3 heated outdoor pools and associated café.

The key issues that are to be addressed include:

- Reviewing the constraints of currently leases and operating structures
- The capacity of the Regional Pool to accommodate additional footfall and its ability to expand / build new if required
- The 'end of life' condition of MUGAs
- Provision of dedicated parking, coach drop off, maintenance etc to serve Regional Pool and sporting facilities alongside meeting University requirements
- The integration of a children's play space into a wider publicly accessible campus
- The enhancement of on-site and off-site pedestrian and cycle routes to create an open publicly welcoming 'campus' that seamlessly integrates University, Sporting and Cultural facilities.

Appendix 1
Schedule of Accommodation

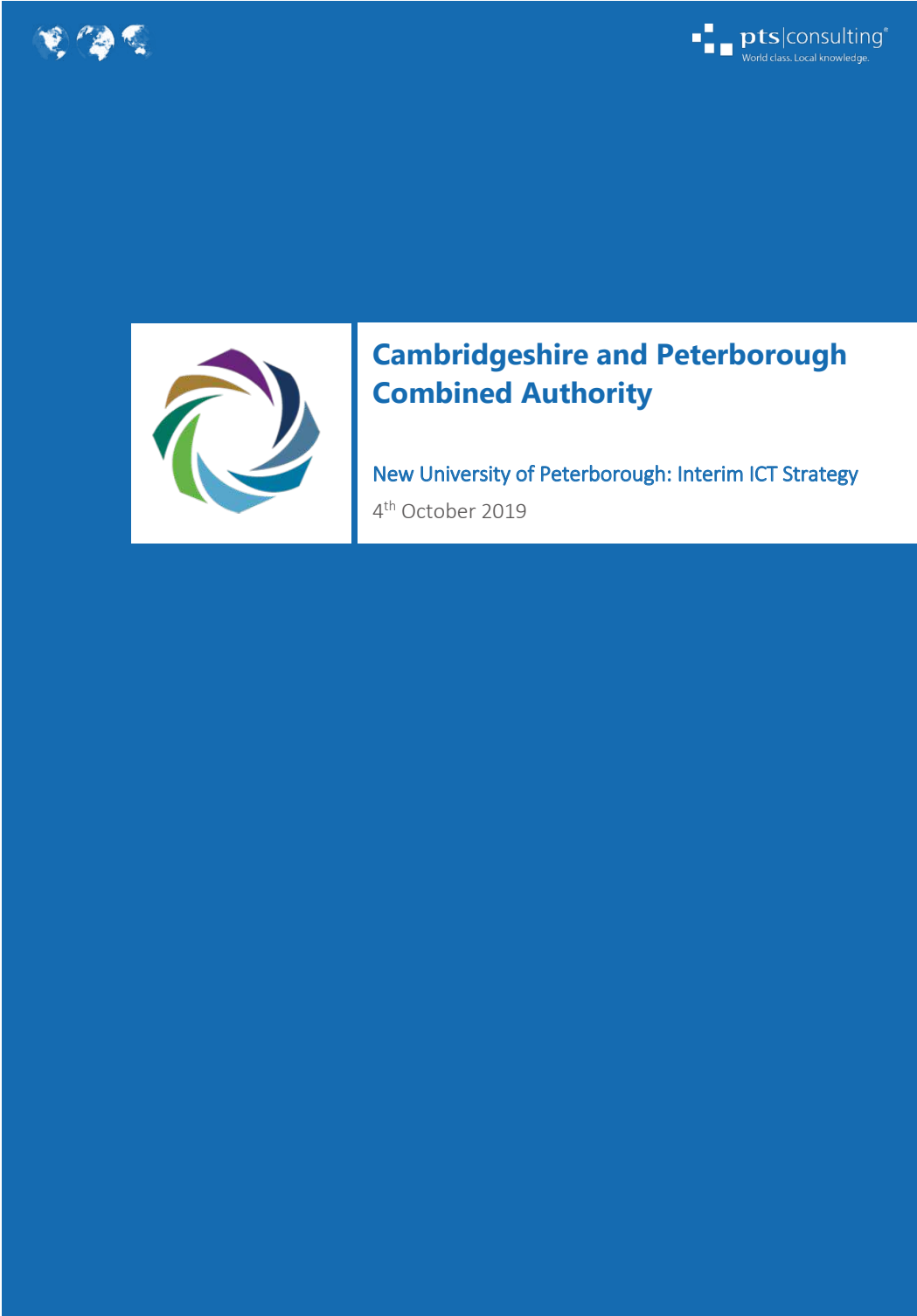University of Peterborough Development: Phase 1 Building

Draft Schedule of Areas

Summary | | | | **Version 3**

Zone				Zone	Area (m²)	Capacity	Occupancy
A	Senior Team & Central Professional Services			A	484.0	102.0	116.0
B	Business Innovation and Entrepreneurship			B	368.0	69.0	95.0
C	Creative & Digital Arts and Science			C	487.0	91.0	123.0
D	Agriculture, Environment and Sustainability			D	231.0	43.0	59.0
E	General Purpose Learning Spaces			E	550.0	241.0	248.0
F	Learning Resources			F	324.0	127.0	125.0
X	Storage Space			X	0.0		
NET			70% of GFA	NET	2444.0	673.0	766.0
Y	Ancillary	} Balance Spaces @30%	21.4% of net	Y	524.0		
Z	Services		21.4% of net	Z	524.0		
GROSS				GROSS	3492.0		
NET	OK			NET	2444		
GROSS	OK			GROSS	3492.0		

Intense HE Occupancy Level

Group	Ref.	Zone and Room Description	Space Type	Capacity	Workspace Area per person (m²)	Area (m²)	Notes	Expected Occupancy	Exclude from SoA	Occupancy @ rate relative to planned capacity
A	A	**Senior Team & Central Professional Services**		102.0		484.0		116.0		
	A1	Professional Service Centre	Desk/Carrel	52	5.0	260.0		34		65%
	A2	Professional Service Centre	Meeting Pods	12	6.0	72.0		32		260%
	A3	Professional Service Centre	Staff Lounge (Café/Cabaret style)	38	4.0	152.0		50		130%
	A4	Professional Service Centre	Meeting Room	0	2.2	0.0		0	Y	65%
B	B	**Business Innovation and Entrepreneurship**		69.0		368.0		95.0		
	B1	Academic Community	Cellular Office/Meeting Room	11	8.0	88.0		8		65%
	B2	Academic Community	Desk / Carrel (Staff Library)	14	5.0	70.0		10		65%
	B3	Academic Community	Meeting Pods	15	6.0	90.0		39		260%
	B4	Academic Community	Common Room	28	4.0	112.0		37		130%
	B5	Professional Services	Faculty Office	1	8.0	8.0		1		65%
C	C	**Creative & Digital Arts and Science**		91.0		487.0		123.0		
	C1	Academic Community	Cellular Office/Meeting Room	15	8.0	120.0		10		65%
	C2	Academic Community	Desk / Carrel (Staff Library)	19	5.0	95.0		13		65%
	C3	Academic Community	Meeting Pods	20	6.0	120.0		52		260%
	C4	Academic Community	Common Room	36	4.0	144.0		47		130%
	C5	Professional Services	Faculty Office	1	8.0	8.0		1		65%
	C6					0.0		0		
D	D	**Agriculture, Environment and Sustainability**		43.0		231.0		59.0		
	D1	Academic Community	Cellular Office/Meeting Room	7	8.0	56.0		5		65%
	D2	Academic Community	Desk / Carrel (Staff Library)	9	5.0	45.0		6		65%
	D3	Academic Community	Meeting Pods	9	6.0	54.0		24		260%
	D4	Academic Community	Common Room	17	4.0	68.0		23		130%
	D5	Professional Services	Faculty Office	1	8.0	8.0		1		65%
E	E	**General Purpose Learning Spaces**		241.0		550.0		248.0		
	E1	GPLS	Seminar Space	24	2.25	54.0		25		100%
	E2	GPLS	Seminar Space	24	2.25	54.0		25		100%
	E3	GPLS	Seminar Space	24	2.25	54.0		25		100%
	E4	GPLS	Seminar Space	24	2.25	54.0		25		100%
	E5	GPLS	Seminar Space	24	2.25	54.0		25		100%
	E6	GPLS	Flexible Learning Space (Flat floored)	48	2.25	108.0		49		100%
	E7	GPLS	Lecture & Large Group Space	72	2.25	162.0		73		100%
	E8	Content Studio	One-Touch Production Facility	1	10.0	10.0		1		80%
	E9	Content Studio	One-Touch Production Facility	0	10.0	0.0		0	Y	80%
F	F	**Learning Resources**		127.0		324.0		125.0		
	F1	Reception/Front Desk (Including waiting area)		1	20.0	20.0		1		
	F2	Back Office views to reception		3	8.0	24.0		2		
	F3	Study Space (Mix of settings)	formal study, groups and social learning	122	2.0	244.0		122		100%
	F4	Collections	Bookstock and resources	1	36.0	36.0		0		
X	X	**Storage Space**				0.0		0.0		
	X1	storage	storage			0.0			Y	
	X2	storage	storage			0.0			Y	
	X3	storage	storage			0.0			Y	
Y	Y	**Ancillary**				524.0		0.0		
	Y-01	Circulation				incl.				
	Y-02	Toilet facilities	incl accessible WCs and gender neutral			incl.				
	Y-03	First Aid Room				incl.				
	Y-04	Reception/FM Office	Including Security base			incl.				
	Y-05	Beverage Bays (in all zones)	tea/coffee point for staff use			incl.				
	Y-06	Cleaners Stores				incl.				
		Ancillary Sub Total		21.5% of NET		524.0				
Z	Z	**Services**				524				
	Z-01	Plant				incl.				
	Z-02	Service risers				incl.				
	Z-03	Communications room	IT			incl.				
		Services Sub Total		21.5% of NET		524.0				
NET						2444.0				
GROSS						3492.0		393.0		

Appendix 2
ICT Strategy

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Cambridgeshire and Peterborough Combined Authority

New University of Peterborough: Interim ICT Strategy

4th October 2019

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Contents

Document Control

Version	Date Issued	Status	Description	Approved By
0.1	22nd September 2019	Draft	Issued to PTS internal for comment	
0.2 to 0.5	24th September 2019	Draft	Working drafts (DT/NH/LM)	
0.6	26th September 2019	Draft	Issued to PTS (GJ/SR) for review	
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0.9	1st October 2019	Draft	Issued to MACE/CPB	Dave Tilley
1.0	4th October 2019	Final	Issued to CPCA and Project Team	Dave Tilley

1 BACKGROUND AND BUSINESS CONTEXT

This interim Information and Communications Technology (ICT) strategy has been written for Cambridgeshire and Peterborough Combined Authority (CPCA) with regard to the proposed New University of Peterborough (NUP). Under normal circumstances the approach to developing the ICT strategy would require significant stakeholder engagement to gain an understanding of both pedagogy and business strategy and, critically, operational approach. Given the current status of the project and the in-flight appointment of a Higher Education Provider (HEP), who will have a significant input to any final ICT strategy, PTS has based the interim strategy on the high level aspirations of CPCA along with an acknowledgment of the work and reports produced by CPB Projects on the 'Detailed Criteria for HE Provider for EOI stage' and 'UOP Shadow Curriculum model'.

The interim ICT strategy has been prepared to support two key activities; firstly to set the minimum ICT requirements for the HEP procurement, and secondly to inform the Building and ICT design requirements for the Phase 1 building on the Embankment site.

1.1 Scope

This interim ICT Strategy provides guidance and direction for CPCA and the prospective HEP to ensure the correct ICT foundations are established for a successful University.

The strategy focuses on:
- University Vision, timelines and capabilities
- Application strategies and core application sets
- Technology to support staff and student teaching and learning
- Core and building infrastructure
- Remote learning

1.2 Vision and Aspirations

CPCA has stated the following with regard to its working vision for the University:

The University of Peterborough will be a high-quality employment focused University for the city and region. It will acquire an international reputation for innovative technological approaches to face to face learning and in applied technology and science. It will be characterised by outstanding student satisfaction and response to local needs. The curriculum will be led by student and employer demand as well as developing opportunities in the technological, scientific and business areas. Its buildings will be architecturally leading, flexible and environmentally friendly. The curriculum, academic community and buildings will reflect a desire to be the greenest university possible. [1]

It is proposed that the University will open for the academic year 2022/23 with capacity to support 2,000 students, with a view of the student population increasing to 5,600 by 2024/25 and to 12,500 by 2030/31. The expectation is that initially 8% of the student population will be campus based at the proposed Embankment site rising to 16% by 2030. This equates to a campus based student population of circa 170 (460 in 2024/25) rising to 2,000 by 2030/31.

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[1] Quotation from Detailed Criteria for HE Provider for EOI Stage

Initially the University will require the support of a HEP but the expectation is to be self-sufficient and independent of the HEP within 5 to 10 years from 2022/23 and hence the facilitation of this goal is captured in the ICT strategy.

The University will be physically located in Peterborough but will have a significant focus on remote learning, initially 90% of prospective students will be 'off-campus' but within the local CPCA area. The business strategy is to complement rather than compete with existing higher education institutions and to attract new local students who may otherwise not seek higher education in the traditional 'away from home' model.

The University will be employment focused with an emphasis on industry relevant academic courses requiring strong relationships with local businesses and employers.

The University will require innovative approaches to 'face to face' learning and consequently teaching and learning spaces will need to be equipped to support students on campus, as well as providing an inclusive learning environment for remote learners.

Remote learners may consist of:
- Individuals at home
- Individuals or groups joining from defined 'outreach' centres
- Working students joining from their workplace individually or in groups

The University will focus on the education of students in:
- Business, Innovation and Entrepreneurship
- Creative and Digital Arts and Sciences
- Agriculture, Environment and Sustainability

1.3 Assumptions

PTS has made the following assumptions based on its understanding of the underlying intent of the vision and business aspirations:
- A clear NUP identity is required and should be evident in the ICT applications implemented
- Future independence from the selected HEP is highly weighted in this strategy
- The strategy is cognisant of the changes in the ICT industry and the mainstream adoption of 'cloud' based solutions
- Financial constraints will require investment in ICT to be geared more towards operational expenditure rather than significant 'up-front' capital expenditure
- The University will have its own staff and management from opening, albeit operating under guidance and the governance of the selected HEP
- There is to be minimum use of the Phase 1 building for ICT infrastructure other than that required for the building itself, i.e. establishing a 'thin building'
- Ownership of marketing and student data will sit with NUP
- There is no requirement for High Performance Computing (HPC) or specialist computing environments in Phase 1 of the University's development
- Procurement of services should utilise Government/academic framework contracts such as G-Cloud, NEUPC and JISC

2 GUIDING PRINCIPLES

The following principles are proposed as guidelines for the ICT strategy. These are driven by the business objectives – vision and aspirations – and aligned to industry best practice principles such as Government Digital Services, The Open Group Architecture Framework (TOGAF) and the UK Government's Technology Code of Practice.

- **Student Centred**

  The Student ICT experience should be consistent throughout the University independent of location, thereby supporting the vision for a University with an ambition of innovative technological approaches to face to face learning and outstanding student satisfaction.

- **Device Agnostic & Mobile First**

  To ensure access and usability of all applications through Bring Your Own Device (BYOD) and University provided equipment, all services should be optimised for smart phone/tablet/laptop, Android/Apple/Windows devices, enhancing both the on-site and remote learning experience. The approach of Mobile First will be underpinned by being "Wireless First" for students, with reliable, performant and ubiquitous coverage.

- **Cloud First**

  As a new University, the approach to sourcing applications and computing facilities should be 'cloud first', with Software as a Service (SaaS) and Platform as a Service (PaaS) being the preferred solutions. These would ensure timely deployment of systems and an 'infrastructure free' environment which should mitigate a large capital outlay, whilst being environmentally sustainable and economic with use of the proposed real estate.

  Cloud services will be scalable in line with the University population, and allow costs to be controlled based on capacity/consumption, and support the University's readiness for independence.

- **Application Architecture**

  Applications should be Commercial Off The Shelf (COTS) solutions making use of open standards and Application Programming Interfaces (APIs). Bespoke customisation of solutions should be avoided. This will enable ease of deployment and operation together with the opportunity for application integration. Use of such products and services will also facilitate a smooth transition from being HEP dependant to independent over the proposed 5 year period.

- **Secure & Compliant**

  The University should adopt best practice information security in the design, implementation and operation of its information systems and services. Using a risk based approach it should develop an information security policy, along with appropriate standards, processes and controls to protect the University, its staff and students. Consideration should be given to emerging distributed ledger technologies (blockchain) for validating identity and academic credentials.

- **Economic Viability**

  To support the success of the University, appropriate levels of systems should be sought. Solutions should be driven by the Total Cost of Ownership model with adoption of an enterprise-wide view of technology, supporting business capabilities rather than specific systems. The

academic community has access to significant and preferential discounts for services such as Microsoft Office365 and Google G-Suite, and NUP should seek to leverage these in the fullest.

- **Scalable & Flexible**

  With a growth model that sees the University student population evolve from approx. 2,000 to 12,500 students over the course of 8 years, it is crucial that scalable solutions are deployed from the outset.

  To ensure that the solution remains commercially viable as demand increases, it must also be flexible, preferably with a 'pay as you grow' model allowing capacity to be purchased or withdrawn incrementally as required.

3   SERVICES AND INFRASTRUCTURE

This section provides an overview of the key services and infrastructure that will be required to support the teaching, learning and administration of the University.

3.1   End User Device

The approach to University systems should be a device agnostic one as far as is practical, offering connectivity to both Choose Your own Device (CYoD) for staff and Bring Your own Device (BYoD) for staff and students.

Staff should be provided with a limited choice of standard devices to minimise ongoing support. Options should be:

- Performance Laptop – high spec workstation standard machine only for use if role requires additional compute/graphics power
- Laptop – Mac or Windows option, small light and performant
- Tablet – Professional quality tablet e.g. MS Surface or iPad Pro

Students should be provided with the means to access all required systems from as wide a choice of devices as possible. Whilst the University would not be expected to provide devices it is possible that an assisted purchase or leasing scheme may be desirable for some students. This should be negotiated with a 3rd party and not be subsidised by the University.

3.2   Digital Delivery

The aim of the new University is to create a dynamic, agile teaching and learning environment that will meet the needs of the modern workforce and educate learners in ways the modern workplace will expect, through digital literacy, flexible learning environments and a holistic approach to education.

The University should implement technologies that will support immersive classrooms and digital teaching delivering an engaging, collaborative and interactive learning space that will support both remote and on campus based teaching, together with live and non-live streaming, while respecting data privacy legislation.

This will be achieved through provision of a multimedia platform that is able to digitally blend the curriculum delivery to encourage innovation and engagement, empowering students on their individual learning journey.

The University should implement an integrated approach to multimedia including services such as digital signage, unified communications and collaboration tools such as Virtual Learning Environments, thus enabling all devices to be utilised as part of the teaching toolset.

In keeping with the network strategy, all multimedia devices, both teaching and non-teaching, should be wireless enabled and delivered over the single University network.

3.3   Networking

3.3.1   Network Infrastructure

The University should implement a single network infrastructure, which will not only support the teaching, learning and enterprise environment, but also the ever-increasing types of devices that are being networked together to produce a smart eco system or what is more commonly known as the Internet of Things (IoT). Any network infrastructure should ideally be Software Defined Networking (SDN) ready.

PTS recommends a wireless first network infrastructure. To meet the demands for a high performance, always available and pervasive wireless service, in an environment such as a University, the use of the latest high performance, high capacity wireless technology should be used, specifically wireless solutions based on Wi-Fi 6 access points. Wi-Fi 6, based on the IEEE 802.11ax standard provides the capacity, efficiency, coverage and performance required by University users today.

Key benefits of Wi-Fi 6 technology include:

- Higher data rates
- Increased capacity
- Performance in environments with many connected devices
- Improved power efficiency for end user devices

A Wi-Fi 6 solution including appropriate models of access points, antenna and Radio Frequency (RF) designed for high capacity areas will ensure learners and academics have a wireless service that meets and exceeds their expectation. For example, ensuring that high levels of performance is provided in large teaching and conference areas.

The wireless network will support Eduroam, as is expected across the higher education community.

Advanced capabilities to support the digital strategy should also be considered, such as the ability to integrate advanced location services, way-finding and space utilisation.

This will be underpinned by a robust, agile, secure and scalable campus network, capable of supporting an access layer that delivers:

- 100/1000Mbps RJ45 Ethernet connectivity
- 802.3af/at PoE/PoE+ Power-over-Ethernet support
- Resilient internal power supplies
- Redundant system management
- Multiple 10Gbps fibre optic uplink capability

In the network core, the design will employ resilient IP routing to enable data flows between virtual LANs and virtual routing and forward instances which will be subject to appropriate network controls, as defined by security policies. The core network will deliver:

- 10/40/100Gbps SFP+/QSFP+/QSFP28 Ethernet connectivity
- Resilient internal power supplies
- Redundant system management
- Multiple 10/40Gbps fibre downlinks for connectivity to distribution layer devices

3.3.2 Remote Access

To facilitate the requirement for access to campus based learning materials, a Virtual Private Network (VPN) solution will be required.

3.3.3 Network Security

To provide the University with a fully integrated, feature rich LAN, WLAN and security architecture, PTS recommends key security components working in tandem, specifically:

- Network Segmentation through the use of logical constructs such as VLANs and VRFs which will allow ease and consistent access for users across the network.
- Next Generation Firewalls (NGFW): at both the perimeter of the University network (to protect against external threats such as Internet based attacks) and internally (to provide security policy enforcement between different segments of the internal network).

3.3.4 Network Management

To meet the requirement for managing and maintaining the network with as little overhead as possible, the University should implement an enterprise grade feature rich toolset that simplifies management of the network while providing an end-to-end view of network performance through appropriate monitoring and alerting and also offering enhanced network troubleshooting capabilities.

3.3.5 External Connectivity

Internet connectivity will be provided through resilient connections to the Janet network. The University should implement its own Janet connection to support its future independence.

3.3.6 Unified Communications

Telephony, presence, messaging and conference/meeting services (including video enabled) will be provided through an appropriate cloud based unified communications solution, noting the aforementioned need to integrate with the multimedia learning environment.

3.3.7 Building ICT Infrastructure

3.3.7.1 Equipment Rooms

Space will not be required for a significant on-campus Data Centre. There will be a requirement for a minimum of two communication rooms to support the requirement for resilient external connections. These rooms will also be used to host the network infrastructure and any central multimedia equipment. As part of the campus masterplan, these rooms should be provided with physical connectivity to all future buildings on the embankment site. Environmental controls should be provided in these rooms along with adequate security provision.

The core communications equipment should be provided with a minimum of 4 hours of Uninterrupted Power Supply (UPS). Wider consideration of UPS needs to be given should the cloud first guiding principle be breached and enterprise systems are located in University buildings.

3.3.7.2 ICT Cabling

Whilst recognising the wireless first approach, a significant wired infrastructure will still be required. This will be a mix of horizontal cabling for connectivity to user devices and services such as wireless access points, CCTV cameras, and backbone cabling to connect the communication equipment rooms. The horizontal cabling will confirm to the Category 6A standard and be shielded twisted pair. Backbone cabling shall consist of twisted pair copper and fibre optic cables.

3.4 Storage and Backup

As key decisions are made on applications, appropriate storage and backup will need to be included, for example either as part of the application suite, or stand-alone within a Platform as a Service model.

3.5 Core Applications

In line with the guiding principles, core applications should be provided as cloud based services, however should the HEP recommend provision via its existing systems, clear statements need to be provided by the HEP as to how this approach will meet the underlying intent of the guiding principles, particularly around economic viability, NUP identity, future independence and ownership of data records.

An illustrative list of potential software applications that will be required to run the University is provided below. Other applications may be identified through the development process, these should be integrated and align to the strategic guiding principles.

3.5.1 Academic Applications

- **Customer Relationship Management (CRM)**

  The University should implement a CRM solution at the earliest possible opportunity to manage the marketing and acquisition of students and to track relationships with local business partners. This application should be a University owned and managed solution. Social media will form a fundamental part of student acquisition and retention, and alumni management. Consequently, the social media channels should be integrated with the CRM.

- **Virtual Learning Environment (VLE)**

  Given the University's need for inclusive, off-site learning, this system will be the most critical. It will need to be widely integrated with other applications and will provide the hub of all learning resources.

- **Student Information System/Student Management System (SIS)**

  The University should require the student records information system to be integrated with the CRM system and VLE.

- **Timetabling**

  The University will require a suitable timetabling system which will need to interface with other systems including VLE, SIS, room booking and Estates/Facilities Management system.

3.5.2 Productivity & Collaboration

This should be provided for both staff and students by utilising one of the main, fully integrated sets of applications:

- Office 365 from Microsoft
- G Suite for Education from Google

Consideration should be given to the best integration with the wider learning environment to provide the best user experience, as well as the cost of the solution.

3.5.3 Support and Operational Systems

As a minimum the following operational and support systems will be required:

- Human Resources
- Finance
- Estates/Facilities Management
- Space Utilisation and Room Booking

3.6 Information Security

The University should produce a business driven information security policy with supporting standards and processes to ensure the Confidentiality, Integrity and Availability of all information, applications and services. In support of this, the University should carry out continuous risk assessment and strive to secure the Cyber Essentials Plus cyber security certification.

Key elements of this policy will cover:

- Security and Risk Management
- Communications and Network Security
- Security Operations
- Identity and Access Management

Identity and Access Management (IAM) should be implemented by the University to deliver the following:

- A single source of trust for identity
- Single sign on for all applications regardless of platform
- Security controls applied appropriate to the risk
- Support for collaboration with business and other partners
- Self-service as the first option in all cases
- Visibility to service users and their managers of their access rights and assigned roles

4 CONCLUSION AND NEXT STEPS

The ICT strategy is a work in progress and includes sufficient detail to inform the design of the ICT for the new University, including the Phase 1 building, together with providing ICT benchmarking for the selection of the HEP.

While not typically aspects of the ICT strategy, the following items should be considered for early action:

- Sourcing of a Chief Information Officer resource with responsibility for Technology and Security
- Development of a social media strategy which should be an integral element of the University's marketing and student acquisition plan
- Discussion with JISC regarding the acquisition of a suitable 'ac.uk' domain to reflect the Peterborough focus of the University along with discussion around Janet connectivity via the EastMAN network
- The University should explore the opportunity for technology sponsorship from global organisations from within the Technology an Media sector
- Development of an approach to support the implementation and ongoing support of ICT for the University
- Undertake an ICT impact assessment upon the appointment of the HEP

Issue

Revision 01   06th December 2019   FInal Draft for Comment

Project Team

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Mechanical and electrical engineering	CPW
Civil and structural engineering	SAW
Landscape	LUC
ICT engineering	PTS
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