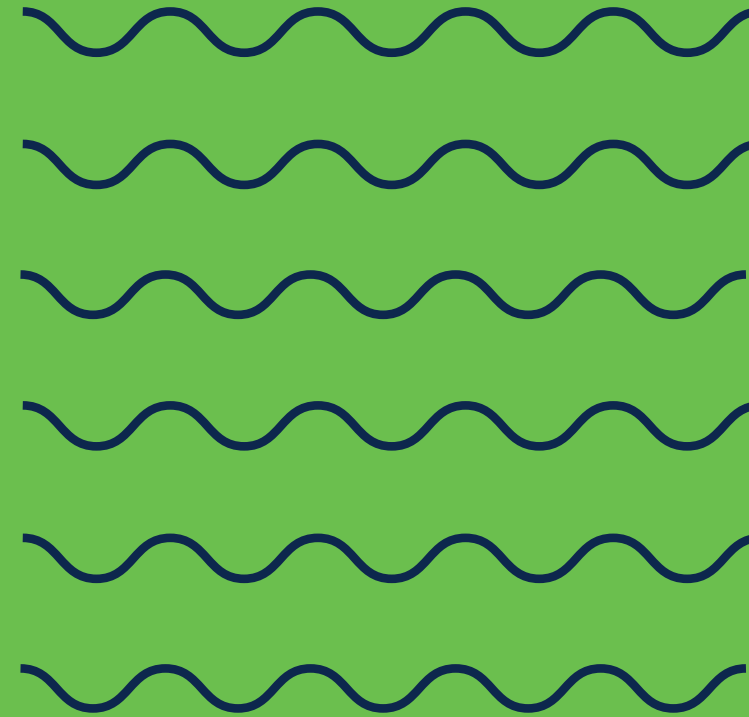




# Elastic Spaces for learning, teaching, working, enjoying:

how digital infrastructure enables high  
flexibility, lower Opex and keep options open  
for the future

Ceri Williams



Top-down, long range Estates Master Plans are and always will be needed.

But their content needs to re-focus in favour of flexible general-purpose and quickly reconfigurable spaces - both new-build and the existing estate.

Highly specialised spaces require the sort of certainty and predictability that are no longer available to us.

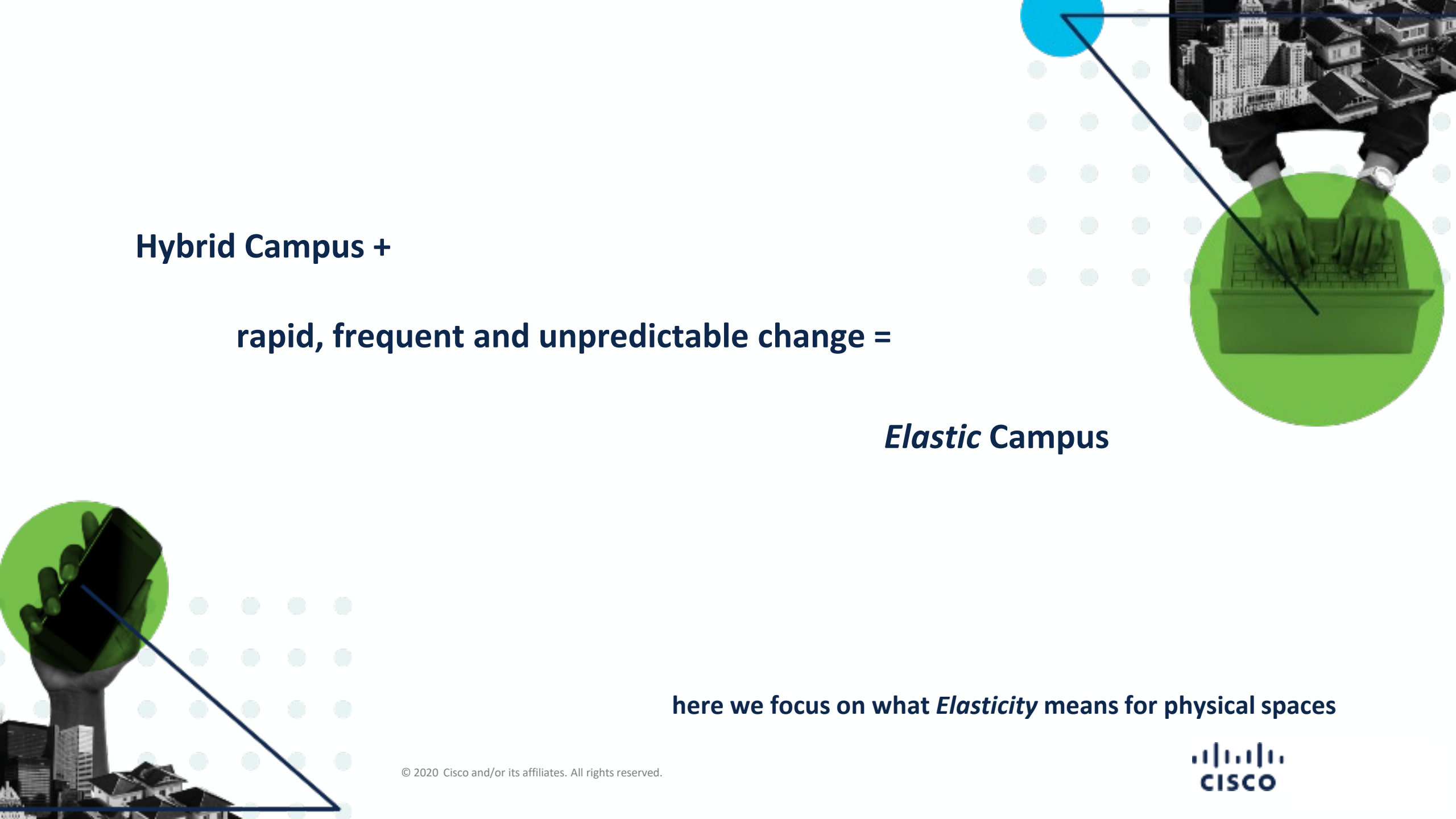
This talk identifies the implications for key space reconfigurations & repurposing and how digital infrastructure capabilities enable them to deliver greater stakeholder experience and operational efficiency.

**Hybrid Campus +**

**rapid, frequent and unpredictable change =**

***Elastic Campus***

**here we focus on what *Elasticity* means for physical spaces**

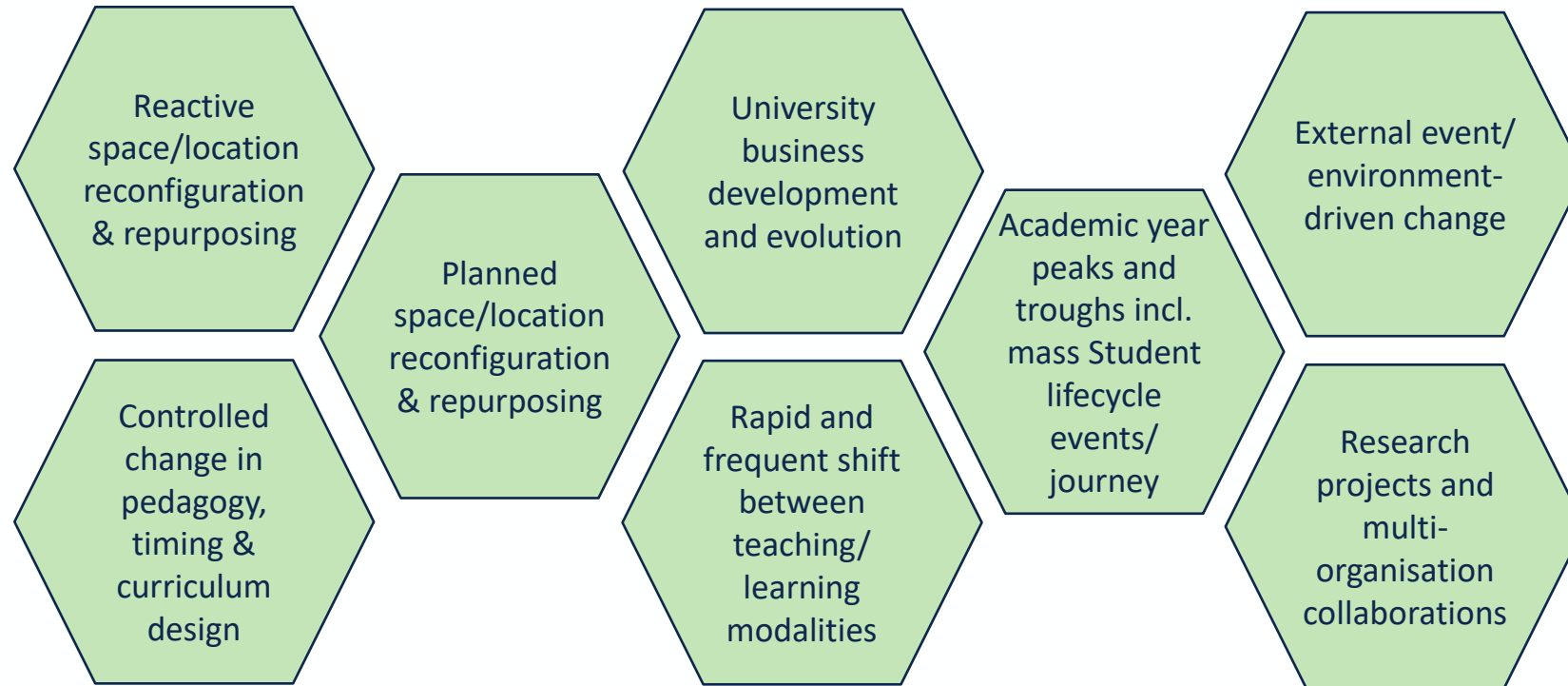


# Themes

- *Elastic Campus* scenarios
- Space elasticity scenarios
- Place as a Service
- Enabling digital capabilities

# Elasticity Scenarios

# Some scenarios are particularly demanding of *Elasticity*...

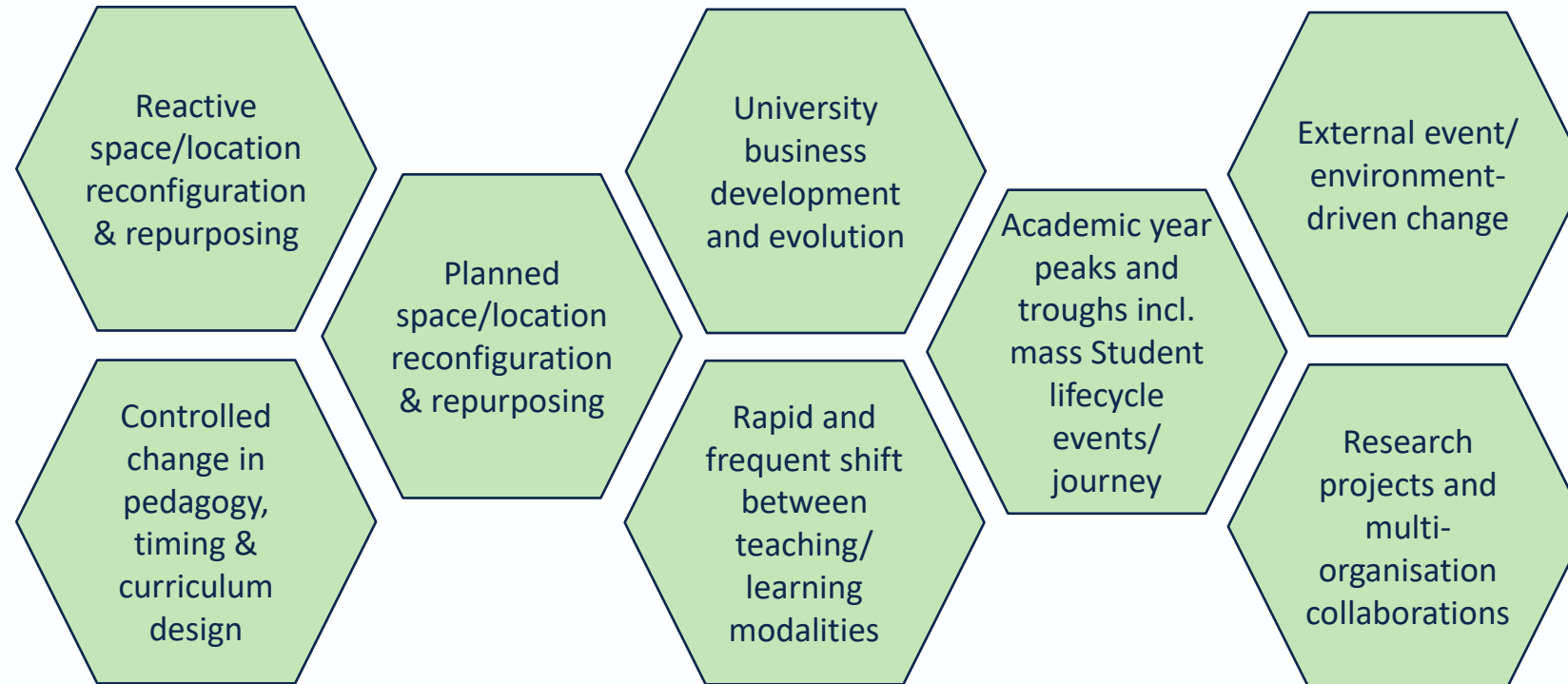


# ...and some very relevant for Estates:

- **Retrofitting spaces** that were not designed for their new purpose
- **Pop-up spaces** - e.g. 'local' satellite micro-campus or admin functions
- **Increase space utilisation** from (average) 25% to 50%

- **Merger/ acquisition/ divestment** with/of another HE Enterprise
- Virtual and blended physical **conferences** - e.g. for Open Days

- Rapid/reactive and planned change to **people density and proximity** limits
- Rapid/reactive and planned **change to behaviour and PPE** requirements (e.g. facemasks)



- **Major curriculum reconfiguration** adjusting in-person vs virtual attendance
- Need to **fragment large group assembly** into smaller (physical) units - e.g. lectures, events
- Scheduled rotation of courses through reconfigured spaces to enable a **blend of theory (remote), group/social (in-person) and practical/experiential** (e.g. STEM, Vocational) learning

# Space Elasticity Scenarios



# Our customers have noticed some frequently recurring space reconfiguration & re-purposing scenarios...

Driving non-university organisations and individuals to use university spaces for events is key for commercial income,

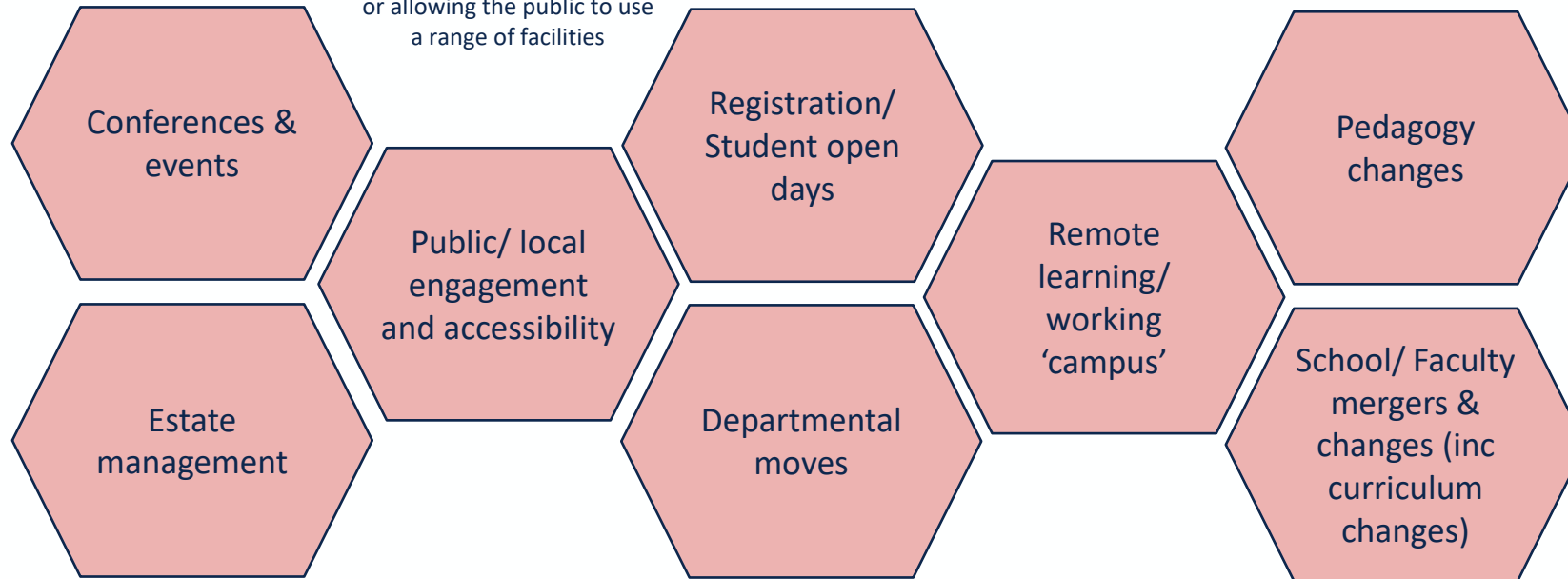
This demands the ability to change indoor and outdoor spaces to enable them.

Buildings get old, need refitting, re-purposing & disposing of.

New additional space is probably not going to be the answer in the future due to hybrid learning.

The estate that remains needs to flex & anticipate/respond to future requirements.

Most Universities have a remit in their strategies to engage and be relevant to the local area, whether that's offering facilities to local people to use for free or allowing the public to use a range of facilities



Includes the remote learning challenge. Covid accelerated a more general shift to more collaborative/team based learning rather than lecture based/ didactic.

Purpose-building includes risk – needs in 5 years time will be different. Specialist spaces (e.g. technology, media course) need to keep up with emerging industry trends.

Decoupling individuals from their physical environment - e.g. enabling admin staff to be mobile, reduction in physical space availability, parking etc.

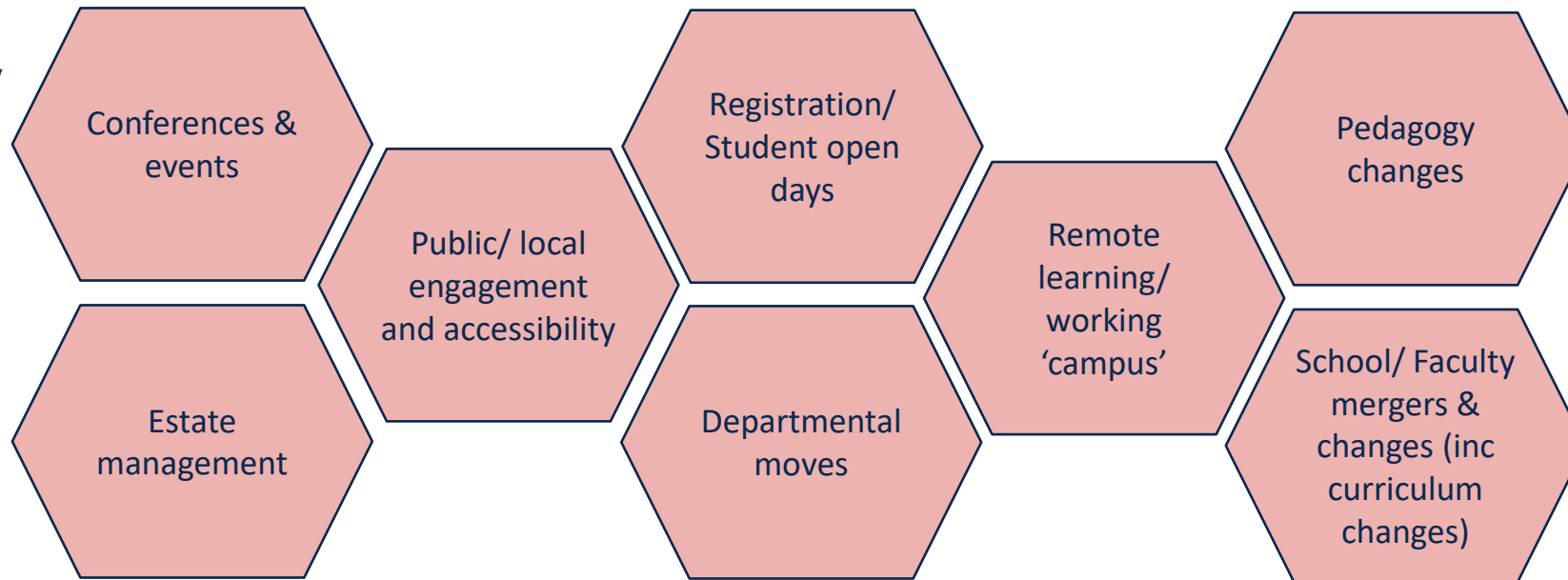
# And the implications...

- People flow and dwell time management
- Directing and monitoring flow, minimising congestion & visitor transit time
- Assembly management at a variety of scales (XS/S/M/L/XL) and settings (e.g. indoors, outdoors, mobile)
- Guest management – registration, guided access... zonal access, wayfinding
- Safety, emergency and well-being spaces.

- Design for flex – define ‘flex’
- Clarity over space types
- Space ‘architecture’
- Matching use, capacity and design
- Work with ‘Capability’ rather than physical space
- Identify common requirements and space solutions

- Access control (Physical and Digital)
- Booking, renting, returning, billing/charging
- Same spaces & resources – different User groups
  - Teach, learn, work, play, enjoy...
    - Individuals and groups
- Organisations ‘powered by’ host Uni

- From 1-many didactic to small scale collaborative workshops
  - Component-based lecture spaces – decomposable
    - Huddle and study pods
- Team-based collaboration – continuity over time and space
  - In-person and remote
  - Multi-faculty common shared spaces
  - Mobility of specialised equipment



- Satellites (persistent & pop-up space)
- Kit & equipment to make space useful
  - Use-case profiles and patterns
    - Self-contained and hosted
    - Transport & Access
- Decant and temporary ‘holding’ moves

We're seeing the idea of 'as a Service' being extended to Space – but it's limited to rent/buy and focused on office-based workers.

We're extending this emerging concept to be inclusive of People and their experience – *Place as a Service*.

- Space is only valuable and useful if it is fit for a specific purpose, where needed and when needed to deliver on the Stakeholders experience requirements
- This means matching the 'supply' of the built environment + equipment + space operation (staff and automation) with the 'demand' by stakeholders...
- ...where needed, when needed and at a tolerable cost.
- We view Space as a *Capability* (People, Activity, Technology) and want to enhance the quality of *Flexibility & Adaptability* with a greater frequency and range of reconfiguration.

# How Digital Capabilities enable these types of flexibility and help deliver *Place as a Service...*

...and be planned in to anticipate  
them.

# For example, these areas of flexibility...

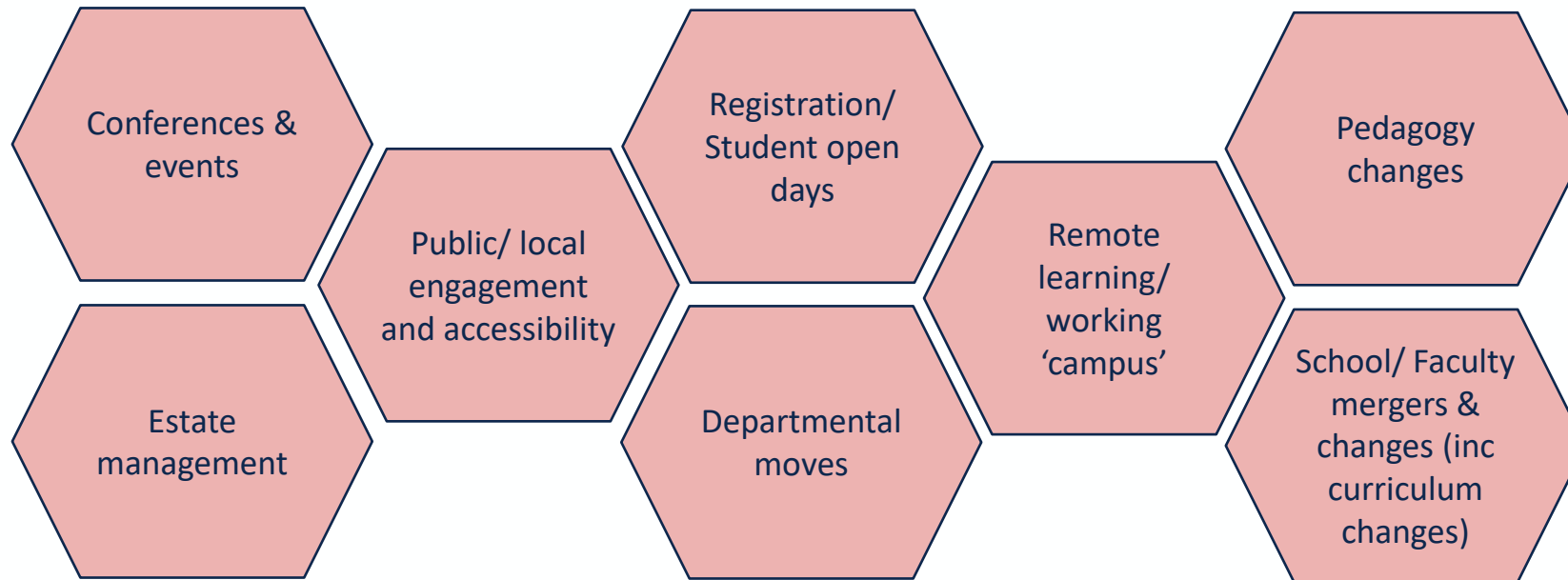
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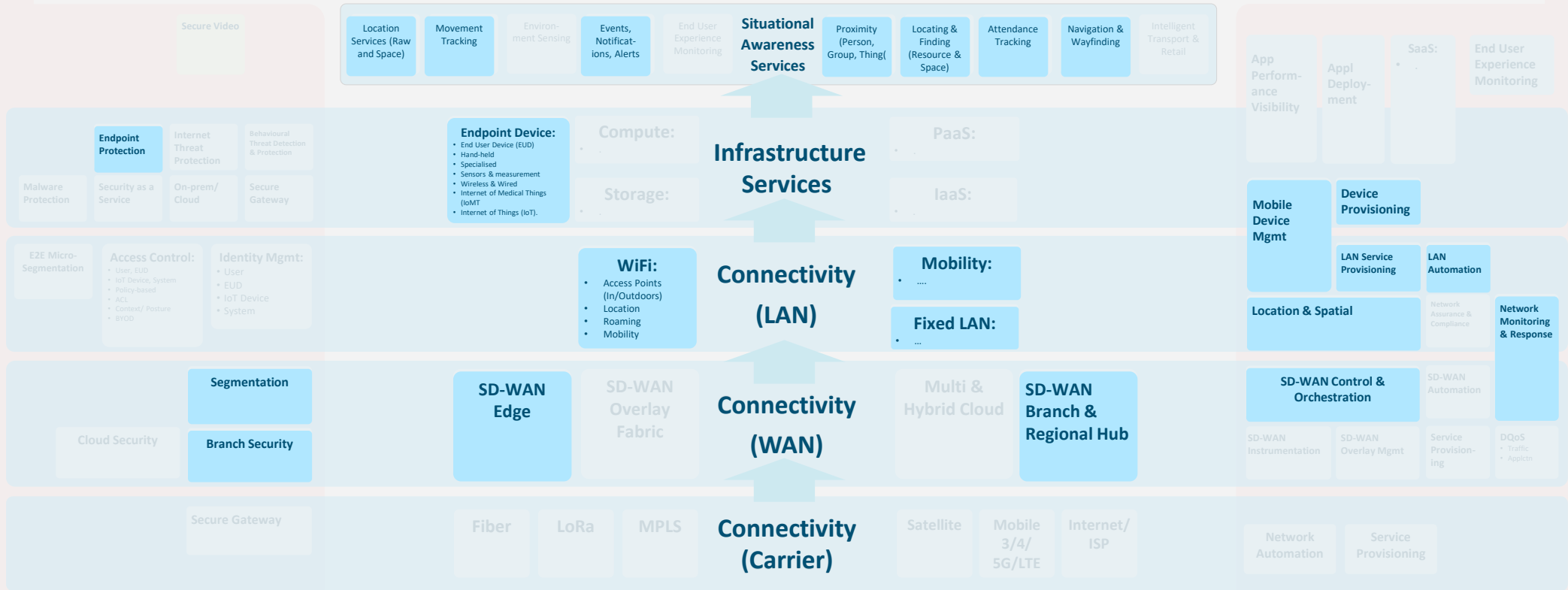
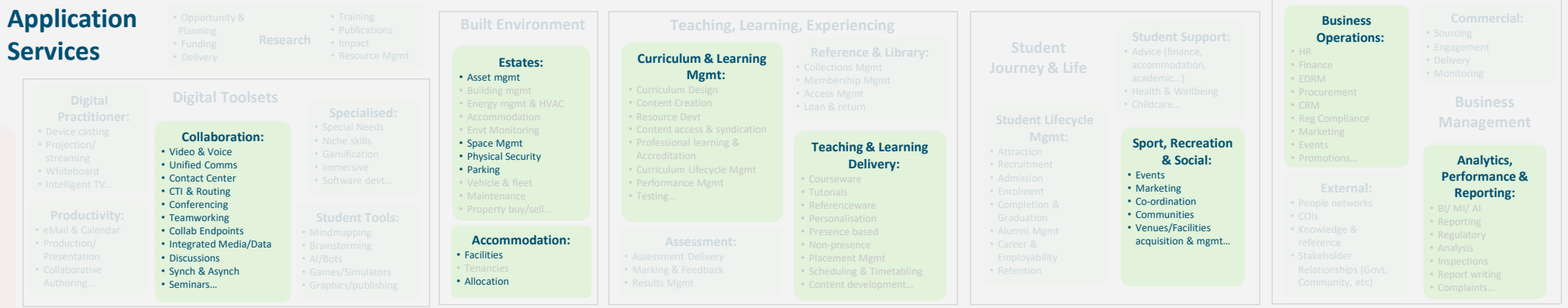
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# ...depend on these digital capabilities:

smartphone, tablet, laptop, BYOD, managed endpoints... **User experience channels** ...specialised endpoint, signage, push/pull...



Sorry for the Digital/IT-speak...

...but these are areas where close(r) working of Estates and IT is critical. This involves sharing each-others language.

Without it, spaces will remain special-purpose and utilisation will stick at current levels and costs (23% and £2044/sq m/pa on average according to HESA)

And...the impact on student, worker and researcher experience will result in fewer students, workers and research projects.

# Having worked through few examples – most involve *Situational Awareness*

smartphone, tablet, laptop, BYOD, managed endpoints... **User experience channels** ...specialised endpoint, signage, push/pull...

## Application Services

**Research**

- Opportunity & Planning
- Funding
- Delivery

**Training**

- Publications
- Impact
- Resource Mgmt

**Digital Practitioner:**

- Device casting
- Projection/streaming
- Whiteboard
- Intelligent TV...

**Digital Toolsets**

**Collaboration:**

- Video & Voice
- Unified Comms
- Contact Center
- CTI & Routing
- Conferencing
- Teamworking
- Colab Endpoints
- Integrated Media/Data
- Discussions
- Synch & Asynch
- Seminars...

**Specialised:**

- Special Needs
- Niche skills
- Gamification
- Immersive
- Software devt...

**Productivity:**

- eMail & Calendar
- Production/ Presentation
- Collaborative Authoring...

**Student Tools:**

- Mindmapping
- Brainstorming
- AI/Bots
- Games/Simulators
- Graphics/publishing

## Built Environment

**Estates:**

- Asset mgmt
- Building mgmt
- Energy mgmt & HVAC
- Accommodation
- Evt Monitoring
- Space Mgmt
- Physical Security
- Parking
- Vehicle & fleet
- Maintenance
- Property buy/sell...

**Accommodation:**

- Facilities
- Tenancies
- Allocation
- Servicing
- Arrival
- Departure

## Teaching, Learning, Experiencing

**Curriculum & Learning Mgmt:**

- Curriculum Design
- Content Creation
- Resource Devt
- Content access & syndication
- Professional learning & Accreditation
- Curriculum Lifecycle Mgmt
- Performance Mgmt
- Testing...

**Reference & Library:**

- Collections Mgmt
- Membership Mgmt
- Access Mgmt
- Loan & return

**Teaching & Learning Delivery:**

- Courseware
- Tutorials
- Referenceware
- Personalisation
- Presence based
- Non-presence
- Placement Mgmt
- Scheduling & Timetabling
- Content development...

**Assessment:**

- Assessment Delivery
- Marking & Feedback
- Results Mgmt

## Student Journey & Life

**Student Lifecycle Mgmt:**

- Attraction
- Recruitment
- Admission
- Enrolment
- Completion & Graduation
- Alumni Mgmt
- Career & Employability
- Retention

**Student Support:**

- Advice (finance, accommodation, academic...)
- Health & Wellbeing
- Childcare...

**Sport, Recreation & Social:**

- Events
- Marketing
- Co-ordination
- Communities
- Venues/Facilities acquisition & mgmt...

**Business Operations:**

- HR
- Finance
- EDRM
- Procurement
- CRM
- Reg Compliance
- Marketing
- Events
- Promotions...

**Commercial:**

- Sourcing
- Engagement
- Delivery
- Monitoring

**Business Management**

**Analytics, Performance & Reporting:**

- BI/ MI/ AI
- Reporting
- Regulatory
- Analysis
- Inspections
- Report writing
- Complaints...

**External:**

- People networks
- COIs
- Knowledge & reference
- Stakeholder Relationships (Govt, Community, etc)

## Service Delivery

**Lifecycle Mgmt:**

- Strategy, design, transition, CSI

**Operations Mgmt:**

- Incident, request, capacity, quality...

**Consumption:**

- Cloud/ XaaS
- On-prem
- Centralised

**Control & Automation:**

- Policy Mgmt
- Process Automation

**Analytics:**

- NI/MI/AI
- Real time
- ...

**Service Mgmt Systems:**

- Provisioning
- Ticketing
- ...

## Security

**Operations Mgmt:**

- Event/Incident
- Alerts
- Governance...

**Visibility:**

- Audit
- Event logging
- Correlation/AI
- Threat detection
- Reporting

**Threat Protection:**

- IDS/ IPS
- Encryption
- Malware detect, neutralize, isolate
- Investigation...

**Access Control:**

- RBAC
- ACL
- Situational/ Context
- ...

**Identity Mgmt:**

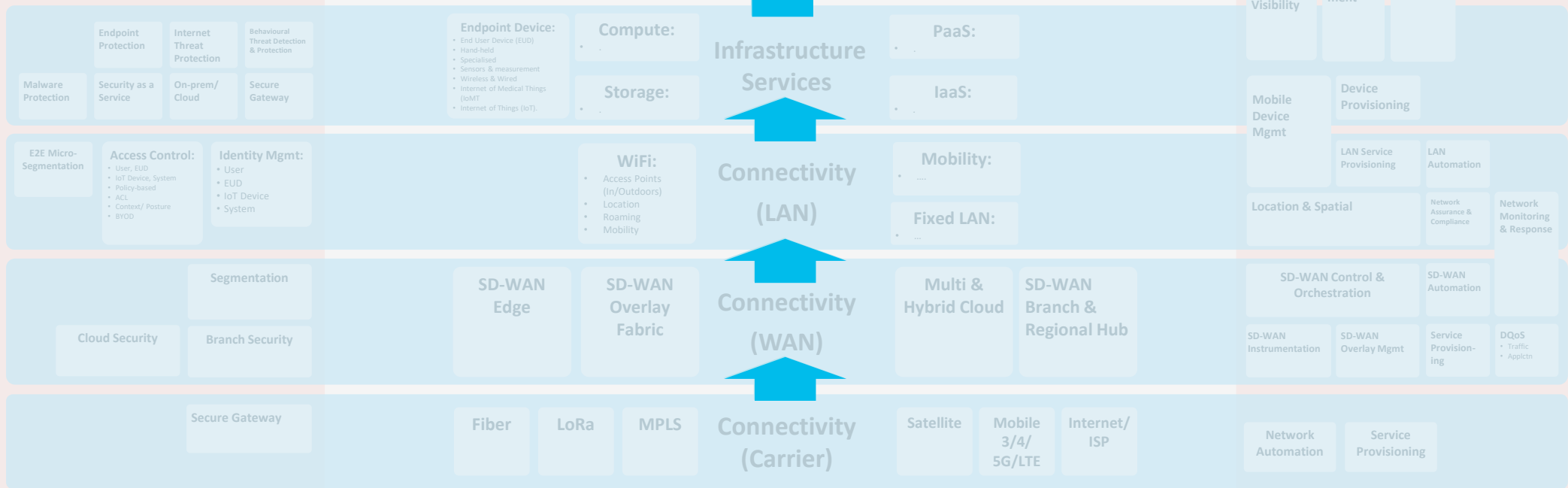
- User Authentication
- Multi-factor Auth
- Node
- Biometrics
- Device...

**Segmentation**

- Network
- Compute/ storage
- Endpoint/device

**Situational Awareness Services**

- Location Services (Raw and Space)
- Movement Tracking
- Environment Sensing
- Events, Notifications, Alerts
- End User Experience Monitoring
- Proximity (Person, Group, Thing)
- Locating & Finding (Resource & Space)
- Attendance Tracking
- Navigation & Wayfinding
- Intelligent Transport & Retail



**App Performance Visibility**

**Appl Deployment**

**SaaS:**

**End User Experience Monitoring**

**Mobile Device Mgmt**

**Device Provisioning**

**Location & Spatial**

**Network Assurance & Compliance**

**Network Monitoring & Response**

**SD-WAN Control & Orchestration**

**SD-WAN Automation**

**SD-WAN Instrumentation**

**SD-WAN Overlay Mgmt**

**Service Provisioning**

**DQoS**

- Traffic
- Applctn

**Network Automation**

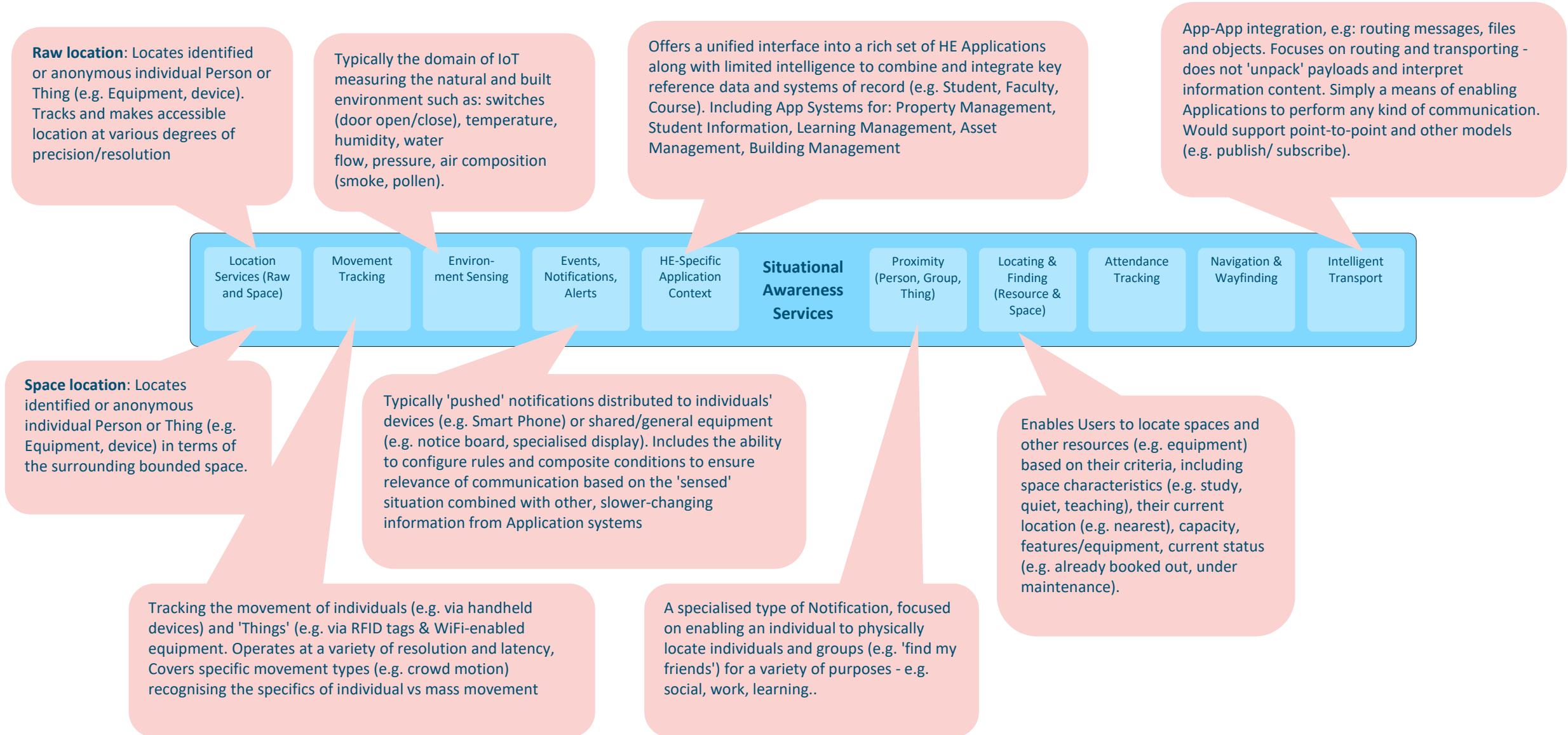
**Service Provisioning**



# *Situational Awareness* provides the link between Applications, the Built Environment, Digital Infrastructure and space Users



# Too much detail for now – but Cisco and its partners have developed and integrated the technologies to deliver *Situational Awareness*:



We'd be grateful for some help in...

- Identifying the high priority & most frequently occurring space repurposing scenarios
- Being more specific about what 'flexibility' means
- Developing response patterns in terms of space design & use
- Working through the digital capabilities that enable them – new build or retrofit.

Thank you.



# The *Elastic* Campus: What *Elasticity* means for stakeholders, scenarios, capabilities and digital

Ceri Williams

Ensuring continuity of learning, teaching, researching and working,  
wherever, whenever, however...

