Oxfordshire County Council

IT, Digital and Innovation Strategy

2019 – 2024

2022 Review

DRAFT

VERSION **0.3 (PRE-SCRUTINY)**

Distribution

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Approval

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IT, Digital and Customer Programme Board	Overall Governance	TBC

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1. Foreword

The Information Technology (IT), Digital and Innovation Strategy provides a guide to the future design, development, and delivery of IT services across Oxfordshire County Council and sets out how it provides a framework to support the Council's overall vision and goals as well as The Oxfordshire Fair Deal Alliance strategic objectives for the county.

Technology has become all pervasive in our work, home lives and our dependency on it is a fundamental part of everything we do. The various solutions are underpinning and enabling the Council to deliver for the residents and businesses in Oxfordshire.

The IT Strategy was published in 2019 and significant progress and improvements have been achieved, including:

- Redesigned IT Service delivery structure
- Full adoption of Cloud First principles
- Harmonisation and rationalisation of applications
- More resilient and secure IT landscape
- Adoption of Zero-Trust principles
- Adoption and embedding of industry best practice e.g. ITIL
- Refreshed data centre.

The new refreshed version of the Strategy is required to reflect progress made, changes in the Council and recent relevant technology developments. The revision outlines an update to the 5-year plan due to be completed in

2024. with the main overall aim to maintain and build upon the progress that has been made in recent years.

The updated version was developed with input from all areas of the IT Service including Customer Engagement which represents all customers and stakeholders.

2. Introduction

2.1 Purpose of the IT, Digital and Innovation Strategy

The Strategy has been designed to:

- Underpin and enable the Council vision and strategic priorities, integrating the core values of the Council into the IT Service and placing all customers at the heart of the way it operates.
- Transform the way the council utilises technology to improve service delivery, ensuring the best outcomes and value for money for residents.

ICT Enabling the Corporate Plan

Corporate Objectives

thriving people · thriving communities · thriving economy

we do the best we can for residents

we work together in a supportive and honest way

Technology is a critical part of our everyday personal and working lives

Without a significant change ICT will undermine the Council's future plan

Strategy Drives Change

ICT acts as the catalyst for change in almost everything we do

Digital engagement online cannot be delivered without ICT investment aligned to a strategic plan

ICT underpins and enables services and allows for adaptation in a changing world

we strive to find the best solutions

we are open to change and doing things differently

our values

2.2 The Wider Perspective

The IT Service will adopt the following approaches in relation to the wider landscape:

- Working in partnership to improve outcomes for residents, including with public, private, and voluntary sector partners. Particularly, the IT Service will explore and develop new models of working as the formal partnership with Cherwell District Council (CDC) comes to an end.
- Driving continuous improvement and efficiency in all services to achieve value for money.
- Taking all opportunities to deliver services digitally, while retaining a strong focus on security and accessibility.
- Supporting the delivery of agile working for staff across the organisation.
- Fostering innovation to react to changes and discover new opportunities.
- Recognising the IT Service should proactively support the Council's responsibilities regarding the environment and climate change.

2.3 Key Objectives

The Strategy has the following key objectives:

- Maintaining and developing further the customer centric approach, aligned to the transformation and strategic objectives of the Council. The IT Service will focus on delivering inclusive solutions that can be used by all.
- Developing further the IT delivery model including service framework/portfolio, organisational structure and governance to support current and future joint working and partnership arrangements.
- Identifying the IT related purchasing strategy which is pragmatic but robust in achieving value for money.
- Adopting new technology opportunities where appropriate to further develop the IT systems and services delivery, reducing costs and avoiding future obsolescence.
- Enabling the Council to continue to deliver existing and new services underpinned by technology to both staff and residents.
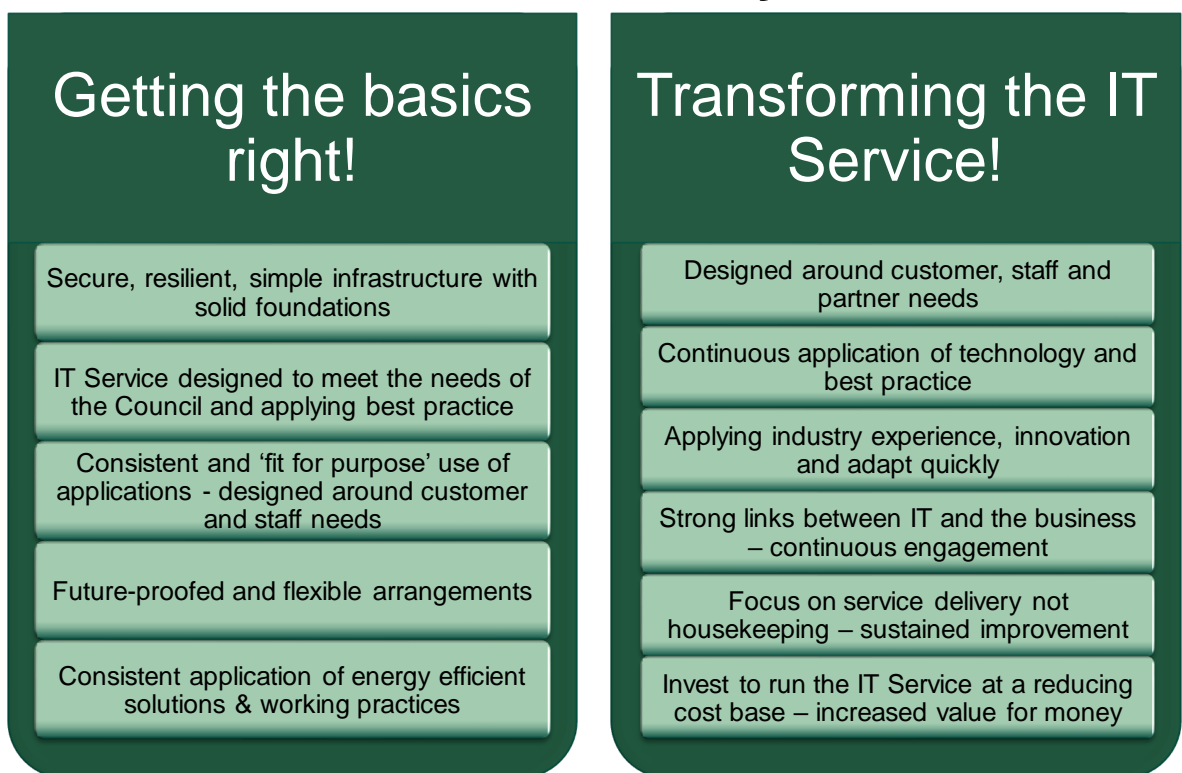
2.4 Key Outcomes

The Strategy will produce following key outcomes:

1. Improving IT services for all staff and customers which is tangible in the day to day use of technology and in how IT staff operate.
2. Providing IT that is more robust, resilient, less complex with reduced outages.

3. Enabling the IT Service to become more productive and effective in delivering IT services.
4. Improving information from IT to support better decision making.
5. Reducing the overall cost of IT to the Council whilst providing greater value for money.
6. Engaging more effectively with strategic partners through joint working and proactive strategic IT leadership.
7. Maintaining and enhancing the Council's digital capability through sustained investment, innovation and staff training/development.

Key Foundations

Getting the basics right!

Secure, resilient, simple infrastructure with solid foundations

IT Service designed to meet the needs of the Council and applying best practice

Consistent and 'fit for purpose' use of applications - designed around customer and staff needs

Future-proofed and flexible arrangements

Consistent application of energy efficient solutions & working practices

Transforming the IT Service!

Designed around customer, staff and partner needs

Continuous application of technology and best practice

Applying industry experience, innovation and adapt quickly

Strong links between IT and the business – continuous engagement

Focus on service delivery not housekeeping – sustained improvement

Invest to run the IT Service at a reducing cost base – increased value for money

The IT, Digital and Innovation Strategy is not a static document and a review will be undertaken at least annually given the speed of technology change. This will be managed by the IT, Digital and Customer Programme Board and Technical Design Authority (TDA).

2.5 Guiding Principles and Benefits

Many of these principles were established in 2019, however they remain relevant and have been refreshed as outlined below.

Culture & Values

- Collaborating with others, innovating and informing our approach to delivery.
- Being proactive, reliable, timely, and providing a great user experience.
- Remaining open-minded; supporting OCC's values.
- Setting realistic expectations in what we can deliver.
- Always being honest with the upmost integrity.
- Providing a supportive, no blame culture.

Standards & Practice

- Adopting standards, using industry best practice and being dynamic.
- Acknowledging problems and major issues and addressing them.
- Accepting mistakes and identify reasons for failure.
- Being open to suggestions and ideas from our customers.
- Drive efficiency and effectiveness.

Approach

- Putting forward a positive attitude and seeking new challenges.
- Focussing on value add in what is delivered.
- Communicating in plain English, avoiding technical jargon and keeping customers informed.
- Improving our ability to change.
- Evolving a consistent management vision.
- Recognising where excellent work is completed.

Solutions & Technology

- Simple to use IT, adding value and increasing efficiency.
- Leading on the interoperability and harmonisation of systems.
- Keeping up to date with what's available and current technologies.
- Select and implement solutions based on business need.
- Build in resilience, simplification and reliability.
- Apply innovation in technology and thinking.

Services

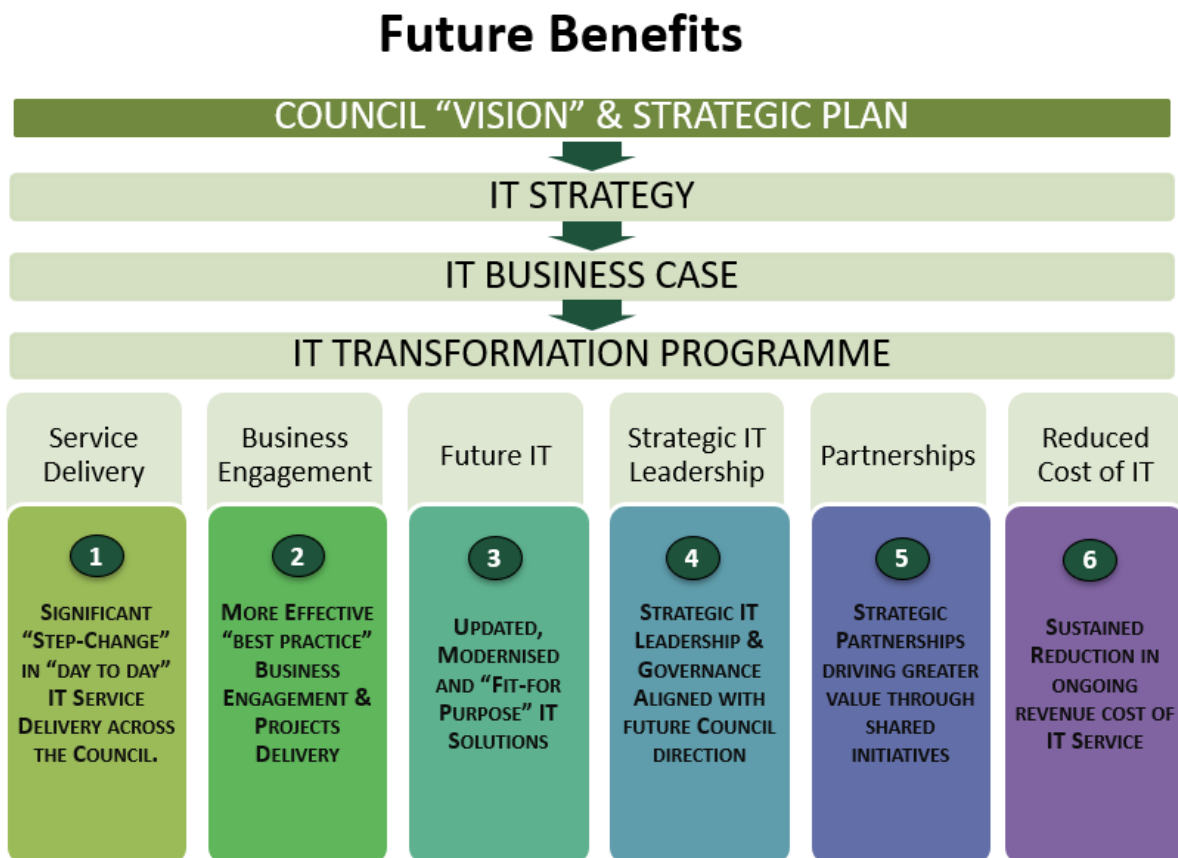- Adopting customer focused delivery, enabling and underpinning effective council services.
- Ensuring that the customer is always put first.
- Providing training for new systems and promote adoption.
- Proactively involving and engaging business and service areas when implementing new technology systems.
- Being available during longer hours to support services working extended hours.
- Engage proactively with partners.

To support effective, fit for purpose customer delivery the IT Service will continue to develop:
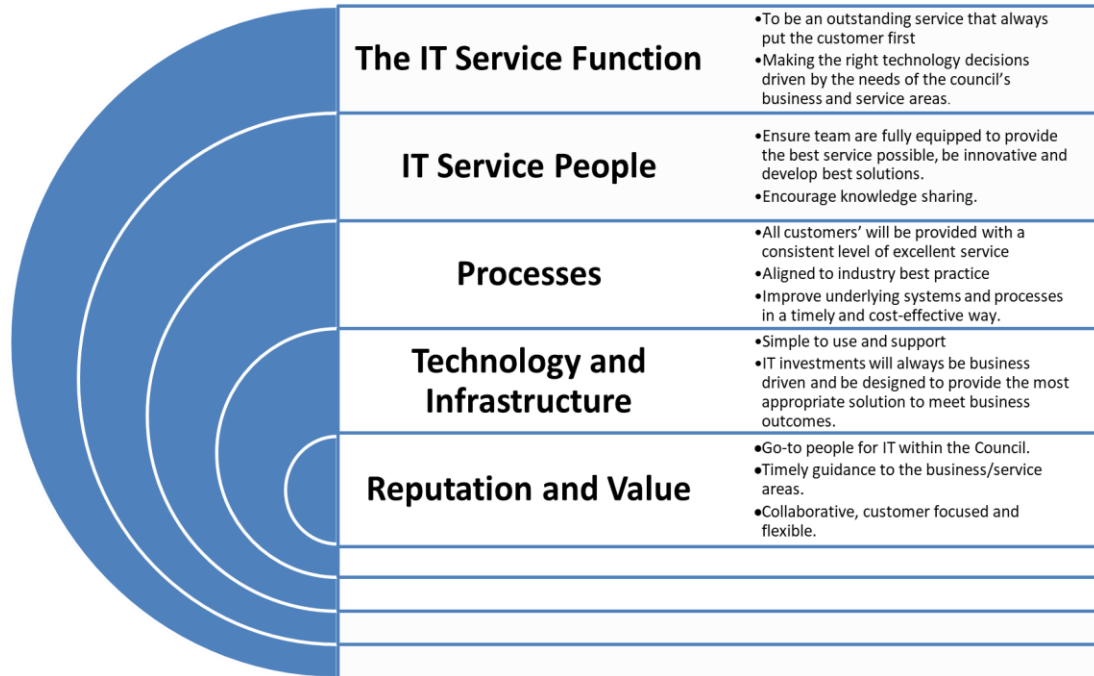
1. Understanding the customer perspective.
2. Learning from experiences, do it right do it once.
3. Maintaining contact, being realistic and managing expectations.
4. Taking ownership and working together.
5. Identifying areas for improvement and innovation.

The Strategy encompasses the principle of continuous improvement to deliver sustained benefits to the customer through the areas described in the diagram below. The annual work programme for the IT Service will be defined to include the key areas of change within the IT Service, Projects to be delivered and benefits to be realised.

Future Benefits

COUNCIL "VISION" & STRATEGIC PLAN

IT STRATEGY

IT BUSINESS CASE

IT TRANSFORMATION PROGRAMME

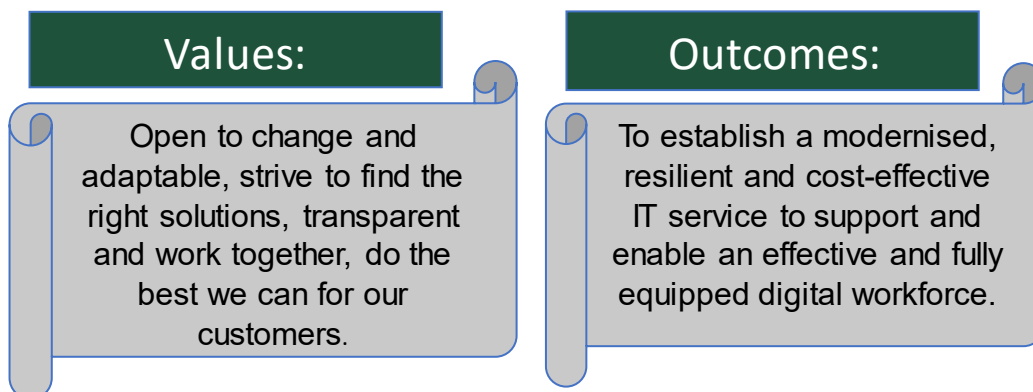| Service Delivery	Business Engagement	Future IT	Strategic IT Leadership	Partnerships	Reduced Cost of IT
1	**2**	**3**	**4**	**5**	**6**
SIGNIFICANT "STEP-CHANGE" IN "DAY TO DAY" IT SERVICE DELIVERY ACROSS THE COUNCIL.	MORE EFFECTIVE "BEST PRACTICE" BUSINESS ENGAGEMENT & PROJECTS DELIVERY	UPDATED, MODERNISED AND "FIT-FOR-PURPOSE" IT SOLUTIONS	STRATEGIC IT LEADERSHIP & GOVERNANCE ALIGNED WITH FUTURE COUNCIL DIRECTION	STRATEGIC PARTNERSHIPS DRIVING GREATER VALUE THROUGH SHARED INITIATIVES	SUSTAINED REDUCTION IN ONGOING REVENUE COST OF IT SERVICE

2.6 IT Service Standards

During the IT, Digital and Innovation Strategy development, the IT Service were engaged in activities to develop shared standards. The diagram below summarises their input.

The IT Service Function	• To be an outstanding service that always put the customer first • Making the right technology decisions driven by the needs of the council's business and service areas.
IT Service People	• Ensure team are fully equipped to provide the best service possible, be innovative and develop best solutions. • Encourage knowledge sharing.
Processes	• All customers' will be provided with a consistent level of excellent service • Aligned to industry best practice • Improve underlying systems and processes in a timely and cost-effective way.
Technology and Infrastructure	• Simple to use and support • IT investments will always be business driven and be designed to provide the most appropriate solution to meet business outcomes.
Reputation and Value	• Go-to people for IT within the Council. • Timely guidance to the business/service areas. • Collaborative, customer focused and flexible.

IT Services Delivery Vision

…To employ technology which enables the cost effective, efficient and adaptable delivery of Council services, placing the customer at the heart of what we do, and ultimately enhancing the agenda for thriving communities across Oxfordshire…

Values:

Open to change and adaptable, strive to find the right solutions, transparent and work together, do the best we can for our customers.

Outcomes:

To establish a modernised, resilient and cost-effective IT service to support and enable an effective and fully equipped digital workforce.

3. Key Themes

3.1 Key Theme 1: Customer Centric IT, Digital and Innovation Strategy

The IT Service will adopt and develop further a customer centric IT, Digital and Innovation Strategy designed to realise IT alignment with the transformation and strategic objectives of the council.

The following are key areas of strategic transformation, and cultural shifts to potentially assist with future developments.

The Strategy aligns with the wider organisation, and includes:
- Focussed developments aligned to the agreed IT Strategy.
- Continued programme of work to transform the IT Service.
- Better understanding of challenges to the business and service areas.
- Alignment with the council's overall strategy in a safe, secure and sensible way.

The IT Service will adopt the following approach for customer care:
- Keeping track of customers' needs and requirements through on-going engagement.
- Providing services that fulfil different customer needs.
- Ensuring a professional and customer focussed service.
- Sharing knowledge with customers to assist with implementing new services and tempering expectations.
- Identifying areas where customers are reluctant to change.
- Managing customer expectations.
- Developing self-support processes for customers.

The IT Service will adopt the following approach to communications:
- Providing timely communication regarding service status and changes both internally within the IT Service, and externally to customers, partners and suppliers.
- Engaging within the organisation to provide consistent updates regarding successes and failures within the IT Service.
- Using digital communication tools to support knowledge sharing (i.e. Sharepoint).
- Providing regular, timely feedback to customers and stakeholders.
- Improving stakeholder engagement.
- Using appropriate language and provide digestible chunks of information. Always avoiding the use of technical jargon.

The IT Service will adopt the following approach to ensure equipment is fit for purpose:

- Evolving equipment standards to match that of a constantly developing environment.
- Supporting agile working and equality of experience whether in the office or working remotely.
- Enabling flexible working in open environments.
- Investigating the use of breakout areas to suit individuals/departments.
- Providing the ability to work remotely effectively.
- Ensuring the relevance of new kit to specific staff roles.

The IT Service will adopt the following approach to improve staff learning and knowledge sharing:

- Organising relevant team building exercises.
- Introducing improvements to training and mentoring processes.
- Facilitating cross team working and knowledge sharing through learning from experience.
- Providing defined support for personal development.
- Organising cross team training opportunities to retain knowledge and identify single points of failures.
- Ensuring all staff, regardless of department, are provided with an IT induction including how to customise for accessibility.
- Developing a Business & IT Technologists Community:
  - To provide a safe environment and be able to answer 'how-do-I?' questions for developing 'no-code' solutions using SharePoint, PowerPlatform, Bookings, Forms etc.
  - To engage champions as well as IT specialists.
  - To focus on configuration, communication, roadshows, to empower and enable the champions and the wider business.
  - To enable the business to self-help in developing solutions in the same way that they would for an Excel spreadsheet. Provide the ability to do more; advice and guidance on how to configure the solutions available.
  - To facilitate improvements in digital literacy for the business and service areas.
- Developing a new starter induction process.
- Maximising use of lessons learnt and peer review. Ensuring knowledge is shared and replicating the good experiences.

The IT Service will improve the OCC IT forward planning as follows:

- Establishing clear understanding of future council/directorate plans to align the Strategy by working collaboratively on requirements in Workshops.

- Producing outline IT roadmap and associated schedule planning.
- Seeking long-term version over short-term wins.
- Appointing dedicated Project Management, to lead the full life cycle.
- Utilising trend analysis and analytics.
- Managing expectations regarding what's possible within resource, time, money and constraints.
- Measuring and tracking benefits realisation.
- Ensuring clear objectives from stakeholders and a better definition of scope.
- Prioritising to reduce the amount of change at any one time.

3.1.1 Oxfordshire Councillors

The IT Service is committed to providing Councillors with fit for purpose IT equipment, applications, and support:

- Suitability of equipment.
- Applications required to carry out their role.
- Rollout of equipment and the training provided.
- On-going support available to members.

To ensure the service provided is at the required level, regular reviews will be undertaken with a sample of Councillors.

3.1.2 External Partners

The IT Service will continue to work closely with partners in Oxfordshire to identify areas for alignment and to identify benefits, financial and non-financial.

3.2 Key Theme 2: Transformation and Modernisation

The following improvements will be made to transform and modernise the IT Service:

- Reducing or aligning Shadow IT (including identification of current IT processes and systems being completed elsewhere).
- Enabling more self-service capability through the supported platforms.
- Reviewing current processes to remove unnecessary steps and implement overarching rules rather than processes where possible.
- Developing release management, including handover and support documentation.
- Simplifying processes where possible utilising technology e.g. automation.
- Further developing the following processes:
  - Knowledge management.
  - Incident management.
  - Risk management.
  - Governance and Change Management.
- Aiming to resolve issues immediately when they arise, moving to a proactive environment rather than a reactive one.
- Removing the barriers for interaction with the IT Service.
- Identifying and removing single points of failure.
- Ensuring that all processes are signed off with respective business/service owners being assigned.
- Implementing a more thorough benefits realisation process (particularly in the longer term).
- Supporting the democratisation of IT within a compliant and safe environment.

The IT Service will further develop the IT Service Management (ITSM) system. This will improve, service consistency, cost-efficiency, and effectiveness by:

- Increasing visibility and understanding of service processes.
- Establishing clearly defined roles and responsibilities.
- Reducing IT incidents, preventing reoccurrence and reducing the impact on the business/service areas.
- Providing higher service availability, improving availability and performance, increasing productivity.
- Supporting management of technology improvements without disruption to service.
- Producing analytics to measure and improve performance.
- Reducing risk by supporting compliance with regulations.
- Supporting the wider transforming of the relationship between IT and the business and service areas, therefore improving the understanding of what is required and why.

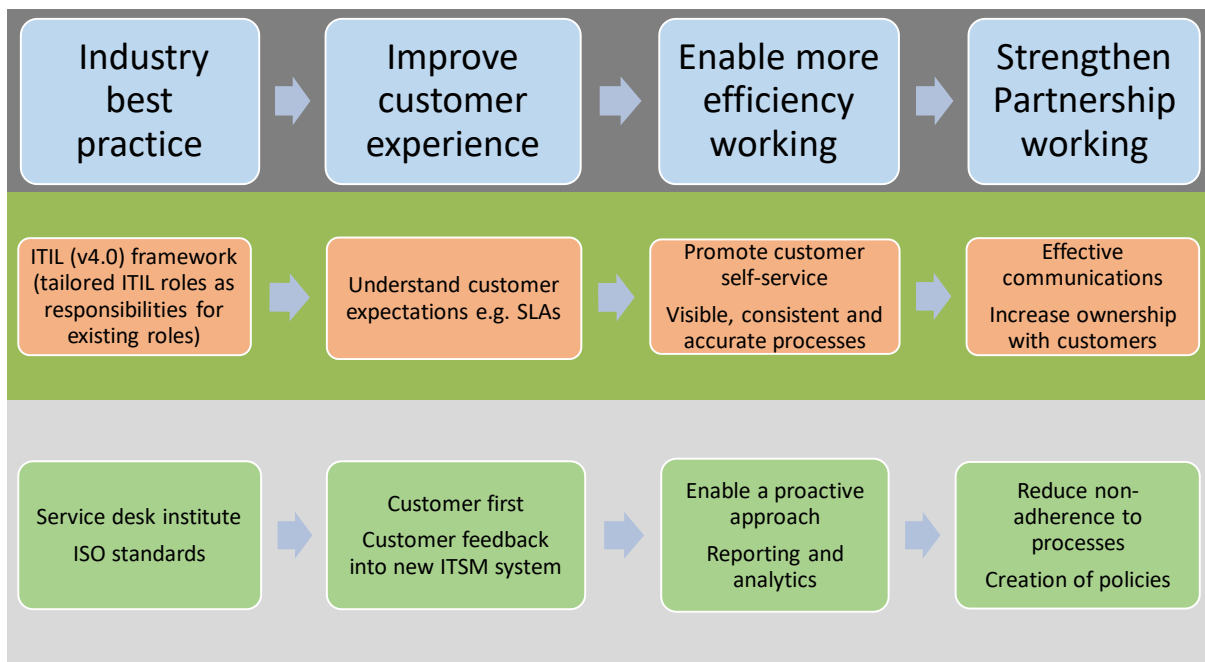- Reducing time between detecting incidents and resolving them.

The ITSM system will support the customer centric relationship with customers transforming the IT service as an IT provider, not just as another department in the council.

The IT Service will focus on developing the relationship between IT and customers, adopting appropriate elements of ITIL. This should be reviewed and agreed by the team considering:
- Service Management
- Service providers and consumers
- Services and products
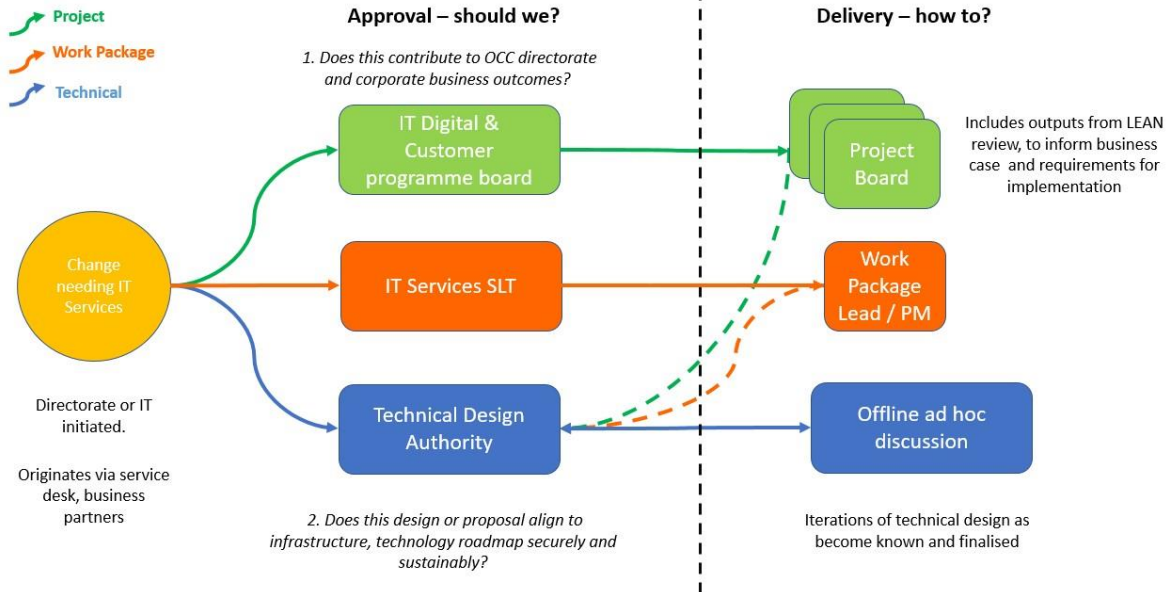- Service relationships
- Utility and warrants
- Value

The IT Service organisational structure will be regularly reviewed to ensure alignment with future service delivery plans and objectives, with best practice such as ITIL and IT management principles. This will enable process reengineering to deliver faster, easier and more cost-effective service delivery.

HIGH LEVEL TO-BE: OCC IT SERVICE DESK VISION

Industry best practice	Improve customer experience	Enable more efficiency working	Strengthen Partnership working
ITIL (v4.0) framework (tailored ITIL roles as responsibilities for existing roles)	Understand customer expectations e.g. SLAs	Promote customer self-service Visible, consistent and accurate processes	Effective communications Increase ownership with customers
Service desk institute ISO standards	Customer first Customer feedback into new ITSM system	Enable a proactive approach Reporting and analytics	Reduce non-adherence to processes Creation of policies

High level project and technical governance model

IT Services Project and Technical Governance Model

Project

Work Package

Technical

Approval – should we?

1. Does this contribute to OCC directorate and corporate business outcomes?

Delivery – how to?

Change needing IT Services

IT Digital & Customer programme board

Project Board

Includes outputs from LEAN review, to inform business case and requirements for implementation

IT Services SLT

Work Package Lead / PM

Technical Design Authority

Offline ad hoc discussion

Directorate or IT initiated.

Originates via service desk, business partners

2. Does this design or proposal align to infrastructure, technology roadmap securely and sustainably?

Iterations of technical design as become known and finalised

3.3 Key Theme 3: Technology Roadmap

The IT, Digital and Innovation Strategy and technical roadmap provides the IT Service with the direction to effectively underpin business as usual operations and the future vision by providing:

- Future proofed technical infrastructure which can adapt to change.
- Fit for purpose, day-to-day IT support services.
- Resilient, reliable systems and infrastructure, enabling Council services to provide a consistent excellent customer experience.
- IT business solutions and systems to support and sustain the future business.
- Supporting innovation for transformational opportunities.
- Modern technology in support of agile working.

Security and Monitoring

Security and monitoring are holistic considerations across all workstreams and need to be a part of the fundamental design of all aspects of the IT architecture. Any attempt to overlay security on top of an existing design where it has not been considered from the outset will not be effective.

The security aspect focuses on organisation-wide security policies and services that enable global security views and incident responses.

Modern security design is user-centric, based on identity and device type, rather than the traditional network border-based 'fortress' approach.

Cyber threats have significantly increased during the pandemic, requiring greater monitoring and automation. New processes and tools will be investigated to protect services, such as;

- Vulnerability detection including day zero notifications.
- Automated patch management.
- Honeypots/decoys.

Responsibility for security is wider than the IT Service. We will continue to focus on training and education for all staff and members to ensure knowledge of personal responsibilities regarding security.

Security policies will be reviewed at least annually.

Business Continuity

Business continuity is not solely an IT issue and should be considered at board level within an organisation. The IT Service can be an enabler to the organisation's business continuity strategy by ensuring that services provided are highly available and can be quickly made available to users in the event of

a major disaster. This may involve the recovery of IT services to an alternate datacentre or the provision of services to alternate sites or home workers.

Business continuity requirements will be met through the following design principles:

- High availability will be built into all levels of design ensuring no single point of failure in any service wherever practical.

- Capability to provide disaster recovery from a major datacentre outage will be included for all services. The solution will strive to provide the required flexibility in the disaster recovery technologies used to enable IT to meet the organisational business continuity requirements at the best value.

- The provision of virtual desktop functionality to enable IT services to be delivered flexibly to alternate sites or remote workers where no corporate device is available.

Technical Strategy Principles

The IT technical strategy has been created in line with a core set of principles that must:

- Provide value for money. - Provide simplicity. - Meet the needs of the business and service areas. - Align and support digital services (Web / Customer Relationship Management (CRM)). - Put residents / citizens first.	- Provide internal sustainability. - Be considered best practise. - Enable scalability. - Consider cloud-first where appropriate. - Be modern and up to date. - Provide flexibility. - Be safe and secure.

Cloud First

OCC are embracing a cloud first strategy that is now becoming the accepted norm in both public and private sector organisations. Utilising public cloud services for Software as a Service (SaaS) like Office 365 has been common practice now for many years. Other public cloud services such as Platform as a Service (PaaS) e.g. a SQL Server or Web Server as a Service, and Infrastructure as a Service (IaaS) e.g. virtual machine servers, networks and storage, have reached a maturity level and cost point where they are frequently used in preference to on-premise managed hardware solutions as they can provide:

- Cost savings over the life of a service if new hardware needs to be provisioned.

- Flexibility to scale up to meet service requirements and unexpected demands without having to over-specify or scale down to achieve further savings.
- Faster time to implementation.
- Improved security and governance controls.
- Carbon-neutral data centres.

OCC have made significant investments in the Microsoft Cloud for productivity, communication, collaboration and identity solutions. The Microsoft Cloud is closely aligned to the OCC IT technology stack from endpoint management to datacentre services and will be used as the preferred cloud provider.

Cloud Service Types and Responsibilities

There are three main types of cloud services all of which will be considered and assessed for suitability within the ongoing IT Strategy evolution:

- **SaaS** (Software-as-a-Service) – cloud provider hosts the complete application or service used by the customer and end users access the application over the internet. (Consume).
- **PaaS** (Platform-as-a-Service) – cloud provider hosts components that a customer can use to build an application, e.g. database, web server, etc. (Build on).
- **IaaS** (Infrastructure-as-a-Service) – cloud provider hosts an infrastructure type service such as a hypervisor environment that a customer can run virtual machines on. (Migrate to).

Cloud Service Preference

SaaS is the preferred cloud service type in all cases where a suitable offering exists as these generally provide the best value and lowest management overhead.

If no suitable SaaS offering is available, then OCC will look to use IaaS or PaaS in the Microsoft Cloud to deliver the service. PaaS typically requires some architectural changes or, at the minimum, support from the application vendor so may not be applicable where OCC do not control the development of the application or service.

Software as a Service

If a Microsoft SaaS solution meets the requirements for OCC services, then it should be considered as the initial preferred solution. However, it should always be compared against other third-party SaaS solutions in the same space to ensure that if offers a comparable feature set and value for money in the marketplace.

If a non-Microsoft SaaS solution is chosen there is no preference as to the location or platform the service runs from as long as it meets all data governance and security requirements.

Platform as a Service

Platform as a Service will be considered for all OCC in-house developed applications and services. Even where OCC are implementing Commercial off-the-Shelf packages it may be possible to use PaaS for some aspects like database providing this is supported by the vendor.

Infrastructure as a Service

Where there is no suitable SaaS offering and PaaS is not applicable OCC will look to use virtual machines running on an IaaS to host applications and services.

Virtual Datacentre

IaaS and PaaS solutions will be hosted in OCC Virtual Datacentres (VDC) running in approved Microsoft Azure regions. OCC will invest in the deployment of two virtual datacentres running in separate Azure paired regions for native DR and replication. These will contain the core infrastructure, hybrid networking and security and governance controls to ensure the virtual datacentres are aligned with the IT Strategy principles.

The long-term goal is for all OCC services to be migrated from the current physical SCC datacentres to the Azure virtual datacentres.

OCC will consider the deployment of IaaS and PaaS services in other public or private clouds where it can be demonstrated that the service cannot be delivered from the standard OCC Azure VDCs.

Identity

The Microsoft Cloud Azure Active Directory (AAD) will be used as the primary identity source for collaboration and integration with all partners and third-party solutions, including SaaS services.

OCC will integrate the identity management platform (AAD) with other systems wherever possible to allow the automation of user provisioning. A key system integration that has been identified is between AD and the Human Resources (HR) system joiners and leavers process to trigger appropriate Information Technology Service Management (ITSM) workflows to enable automated AD user provisioning with approvals and ticket creation for leavers.

The target architecture utilises existing and new investments in Microsoft and Zscaler cloud tools to enable OCC to continue delivering services based on the Zero Trust model.

Governance and Security

OCC will look to utilise available Microsoft Cloud platform SaaS and PaaS security, management and monitoring tools where they are appropriate, therefore meeting OCC requirements and providing value.

Automation

Automation can also be heavily deployed for management of cloud solutions including not only monitoring and patching, but also automated scale out and for capacity management and cost controls.

OCC will use an automation first approach to cloud deployments and operational management of cloud resources. However, where a specific deployment or management task is a unique one-time event or not repeatable, it may not be cost effective to develop automation for it. In this case either a partially or fully manual approach can be considered.

Safe

The Strategy principle of 'Safe' relates to all services and components being inherently secure, robust and available by design against both malicious and accidental actions.

A key part of enabling this is the adoption of a Zero Trust model for security and access.

Zero Trust Model

The concept of Zero Trust is centred on the belief that organisations should not automatically trust anything, either inside or outside its perimeters, and instead must verify anything and everything trying to connect to its systems before granting access. The Zero Trust security model has developed out of the recognition that the more traditional approaches to security will not suffice for the increasingly complex needs of cybersecurity within a more fluid and diverse working environment.

Migration to a full Zero Trust security model will be long-term, multi-phase commitment, but the goal of Zero Trust will be used to drive the IT technical strategy and roadmap across all workstreams.

The OCC IT Strategy is to move to a Zero Trust identity model where a user's identity is the security boundary irrespective of network location. Azure AD will be used as the primary source of identity for Zero Trust secured applications and service.

Business Needs

The strategy must support the functional requirements of the business and service areas but also ensure that all solutions enable an excellent user experience and excellent level of service. This requirement is across all areas of the strategy from datacentre to desktop.

The requirement to provide positive customer outcomes to the OCC business and service areas is a key driver for the Strategy. The user's experience and user stories must be at the forefront of all technical decisions. Whilst there is a

balance to be struck between security, operational effectiveness, cost and the user experience, the user experience must be considered as important as any other factor.

Enterprise Architecture Building Blocks

OCC will develop a set of preferred technology solutions that will be used to fulfil specific functionality across all new systems. This standard set of building blocks and reference architectures or blueprints will include:

- **Database** – Microsoft SQL as the preferred relational database solution.
- **Web** – Open Source Drupal and Azure App Services PaaS platform or Windows IIS on IaaS / VM deployments will be the preferred web server platform.
- **Goss iCM** – for forms and workflow
- **ESRI ArcGIS** - for digital mapping
- **Capita Pay360** - for payments management

Further standard building blocks will be developed and added over time.

Technical Design Principles

The following design principles and global high-level design decisions will be used to guide the final and transition architectures across all workstreams:

- Microsoft Windows Server 2019 will be used for all new Windows servers unless specific application or licensing constraints dictate the use of older operating systems.

- Maximising the current investment of the Microsoft 365 licensing to utilise all available features where they provide a clear benefit to OCC in terms of security, access, productivity and collaboration.

- All solutions that require any uptime Service Level Agreements (SLAs) will be deployed in a highly available architecture with no single point of failure. The solution must be able to accept the sudden loss or restart of at least one compute node (server, VM, container, etc) without incurring any service issues or downtime.

Monitoring and operational management systems and processes will be a required part of any technical design both in this roadmap and for any future new systems deployment. OCC will develop a standard baseline for IaaS and PaaS monitoring and management that will be applied to all systems unless otherwise specified.

Identity and Access Management

The primary identity source for all OCC users is the on-premise Active Directory Domain Services (ADDS). The ADDS identities are synchronised to

AzureAD which is used as the authentication and authorisation source for cloud-based services and federation with third parties.

Multi-Factor Authentication (MFA)

OCC use Azure MFA cloud triggered via Conditional Access for everything. Applications that are changed to used AzureAD for authentication will benefit from this layer of security.

Remote Access

Access to all applications and services will be delivered using the Zero-Trust Network Access (ZTNA) broker capability provided by Zscaler Private Access.

Web Access

Zscaler Internet Access is currently being used as the primary method of secure internet access. Work continues on the removal of legacy Microsoft Threat Management Gateway (TMG) and Trend Micro IWSVA proxy services (InterScan Web Security Virtual Appliance) hosted in the OCC CV1 and Lyndon Place (LP) datacentres for secure Internet access.

Application Access

AzureAD Application Proxy is used as the ZTNA broker for publishing internal web applications and supports access for partners. Non-web applications will be published using Zscaler Private Access. This approach removes the dependency on a private Wide Area Network.

Policies

All IT policies will continue to be reviewed and managed through the IT Governance Board.

Password policies will continue to follow current recommendations: 12 characters, enforced complexity and no password expiry.

End User Compute (EUC)

More automated approaches to the configuration and delivery of mobile telephony and laptops/workstations will continue to be developed, with a focus on direct to consumer Auto-Pilot deployments. This model will reduce delivery times and provide a switch on and go experience. More attention will be given to ensuring that awareness is provided on individual customisation opportunities for accessibility and improved productivity, including a catalogue of pre-approved accessibility tools.

EUC Capital Refresh Budget

The detail and table below outline the ongoing investment that is required to ensure that devices are fit for purpose both in terms of functionality, usability and security.

- Throughout the pandemic, equipment refreshes have continued as far as possible whilst impacted by supply-chain issues.
- In support of the agile working, 2500 monitors are being purchased to replace the old inefficient monitors.

- All Windows mobile phones have now been replaced for Android devices and the planned investment will remain to keep devices within support for the duration of this strategy.

End User Computing Investment Profile							
	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	Total
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	
Budget Requirement							
Mobile Phones		£440k	£192k	£192k	£192k	£250k	£1,265k
Monitors		£22k	£22k	£22k	£22k	£22k	£109k
Laptops/Workstations & Tablets		£655k	£590k	£590k	£590k	£600k	£3,027k
Total IT Service Costs	£0k	£1,117k	£804k	£804k	£804k	£872k	£4,401k

Removal of Citrix environments

A major requirement for EUC is to remove the Citrix XenApp environment and associated management, infrastructure and licensing costs. The majority of internal users can be transitioned to standard SCCM delivered local applications that align with the modern desktop and Office 365 / cloud application paradigm.

There remains a requirement for publishing a limited set of remote desktops and applications using VMWare Horizon where there is a requirement for close-to-data processing. Other lighter-weight solutions such as Remote Desktop Services (RDS) or publishing via AzureAD Application Proxy will be further utilised.

Application Acceptance Policy

A revised set of Technical Requirements for use during procurement have been developed and are now used to ensure that new applications are aligned with the Strategy. This will continue to be reviewed throughout the delivery of the Strategy to ensure alignment with the OCC enterprise architecture building blocks and core technologies.

Browser

OCC has made the chromium-based version of Microsoft Edge the default browser with automatic security updates.

In-line with this the Zscaler Client Connector is fully deployed across OCC managed devices to replace the existing internal web proxy servers.

Device Models

To support a fully mobile working model future device models should be 5G capable when the technology becomes available within standard business model laptops. This will allow fully mobile working without the need for users to use corporate mobile phones to enable connectivity when suitable Wi-Fi is unavailable.

There will be a selection of standard devices that can be deployed to meet the needs of OCC staff from a basic model that provides a good Office 365 productivity experience to powerful models for heavy GIS mapping or CAD users.

There will be a built-in continuous refresh cycle for end user devices throughout the lifetime of the strategy. This will be a general rolling refresh of a percentage of devices annually.

Bring your own Device (BYOD)

Should the decision be made to fully enable BYOD functionality, suitable policies could be put in place to enable effective support and maintenance of the devices.

OCC are not considering 'choose your own device' (CYOD) as the current selection of IT supplied devices is meeting the requirements of the business areas.

Security Stack

The endpoint security stack will be built from cloud services that allow the devices to be secured and managed from any location. The security stack aligns with the Identity and Access component stack and wider global security solutions. The technologies employed make full use of existing licensing, but to provide full end to end protection with anti-phishing and sandboxing of links and attachments additional Advanced Security and Compliance: Identity and Threat protection M365 E3 add-on licensing is required.

- Zscaler Internet Access secure web gateway.
- Zscaler NSS subscription for integrated logging into MCAS and SIEM.
- QualysGuard for vulnerability and patch management.
- Office 365 ATP – sandbox for safe links and safe attachments, Anti-phishing, reporting, tracking, simulation, automated investigation and response (add-on license).

Remote desktop

Windows 365 will be considered for future cloud-based remote desktop capability for OCC. For on-premises heavy applications such as GIS or CAD, the use of VMWare Horizon will provide this close-to-data processing.

Deployment and Management

The current OCC SCCM solution will continue to be used for the deployment and management of domain joined endpoints. Co-management with Intune and SCCM Cloud Management Gateway connectivity will allow continued management of machines even when they are fully remote.

Within the five-year timeframe of this roadmap it is expected that OCC will transition from an image-based deployment of Windows 10 to an Autopilot based deployment. However, full equivalent functionality and vendor support are not yet present so an immediate transition to Autopilot deployment would be premature.

Printing

A full review of printing requirements has been undertaken and Xerox Workplace Cloud has been implemented. This solution will be developed further with the supplier to enable the use of this in buildings that are Internet connected only.

Telephony and Unified Communications

Telephony services are provided via a mix of Microsoft Teams (Direct Routing) and 8x8 for Contact Centre capabilities.

Microsoft Teams is the primary Unified Communications tool enabling calls and collaboration. Some rooms have been enabled with Microsoft Teams Room Devices to support hybrid meetings and will be expanded to support the need for agile working.

E-mail

There is a desire to move away from Egress as a secure file sharing tool, both due to the licensing costs and the complexity of use. OCC are considering Office 365 Office Message Encryption (OME) as a replacement however a full requirement review and assessment needs to take place.

File Services

All internal user file share services should be transitioned to SharePoint Online. The benefits of migration to SharePoint Online include:

- Take advantage of large SharePoint Online storage allocation included in existing M365 licensing.
- Improved document control, metadata and versioning.
- Improved collaboration and multi-user editing with Office 365.
- Enable secure Internet based HTTPS access to support the Zero Trust model.

OCC will classify all unstructured file data for retention and DLP. Data labelling and classification needs to be owned by the business and service areas. Engagement from the business and service areas will allow an element of automation, along with consideration of specialised tools to help with the initial identification.

Database Services

There is a requirement to consolidate the disparate database estate to align with the Strategy and preferred enterprise architecture. This will include:

- Replace Oracle databases with SQL Server by replacing or upgrading of Oracle based applications.
- Review Platform as a Service (PaaS) SQL Database services for future delivery.

Cloud Services

Replace third party cloud service data hooks and integration over VPNs with a secure authenticated HTTPS API based solution over the Internet (Goss).

Applications should adhere to a set of baseline architecture requirements to enable modern working and identity:

- Applications should be web based.
- Applications must use modern authentication methods – Security Assertion Mark-up Language (SAML), Open ID Connect (OIDC), Web Services Federation (WSfed), etc.
- Application procurement requirements.

Datacentre Infrastructure

The current OCC datacentre infrastructure was refreshed in 2019/20. This hardware will be used throughout the duration of this Strategy to support existing systems during the move to cloud-first.

Interim Transitional Architecture

OCC will migrate all current datacentre services to a cloud platform, either as SaaS such as Microsoft Office 365, or IaaS and Paas in Microsoft Azure.

However, constraints imposed by the current IT systems deployed in the OCC datacentres prevent a direct migration to a cloud platform. Therefore, the existing hardware will be used to support services for the duration of the migration.

Further work will be undertaken to develop the Azure Virtual Datacentre in support of migrating services from the physical datacentres. The migration from the physical datacentres will support the council's targets of becoming carbon neutral.

LAN

The local area network equipment will be refreshed using the latest cloud managed WiFi6 devices from Cisco Meraki. This will reduce energy consumption and increase remote management capabilities, whilst providing more stable, reliable and faster network connectivity at sites.

WAN/Internet

Replacement of the Vodafone WAN within 12 - 18 months to achieve benefits such as reducing costs and improving service. OCC will move to using the Internet as its corporate network which will enable more agile enablement of services in buildings along with opportunity to use much faster circuits.

5G presents an opportunity for possible cost-effective resilient Internet connection on mid-size to small sites where a fully redundant Internet connection would not be viable.

OCC will take advantage where possible of the full-fibre gigabit-capable broadband infrastructure being delivered through the Digital Infrastructure Programme.

Security

OCC will expand the security platform that has a view of the whole OCC IT estate and is in line with a cloud first, zero-trust, distributed end user environment.

The Zero Trust model has a requirement for centralised logging, analysis and response that will form the core of a new security platform using a central Security Information and Event Management (SIEM) and Security Orchestration, Automation and Response (SOAR) tools.

Microsegmentation of Data Centre traffic, along with Honeypot and Decoy tools will be investigated to further enhance our cybersecurity capability.

Licensing

For the licensing consolidation the target architecture is to maximise the value of the Microsoft 365 licensing by right-sizing the licensing for users' requirements and replacing functionality of other systems that currently incur additional licensing costs.

Work will be undertaken to develop License Personas to match the tools provided with the needs of the different functions across OCC. This will enable a more granular approach to licensing and reduce costs.

Digital Approach

Using composable architecture and the software building blocks, there will be a commitment to maintain a "digital platform" consisting of generic, reusable components covering several functional areas.
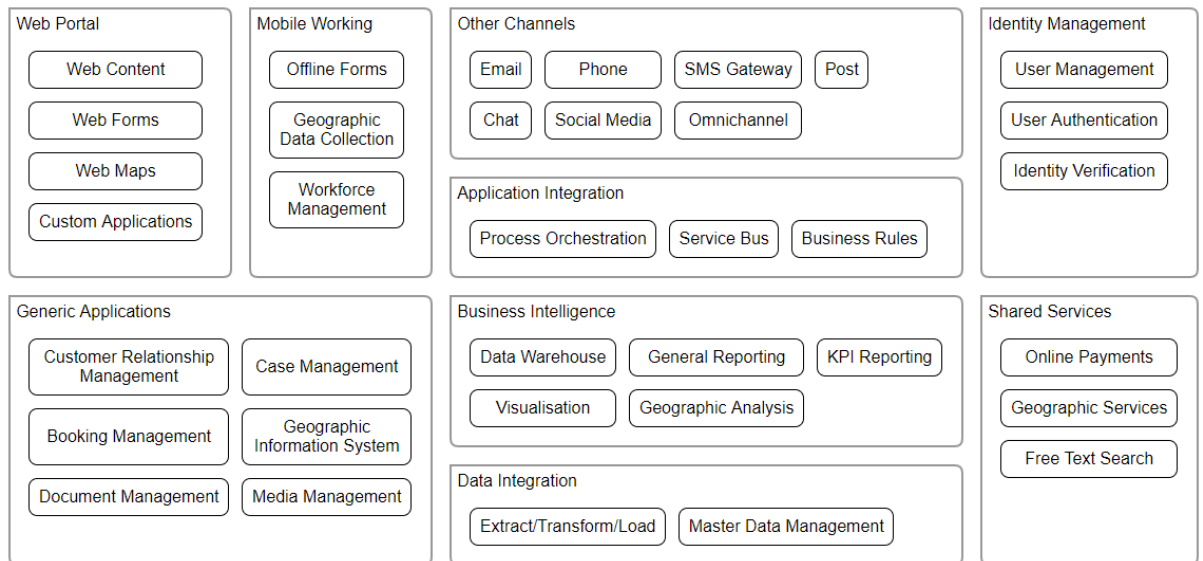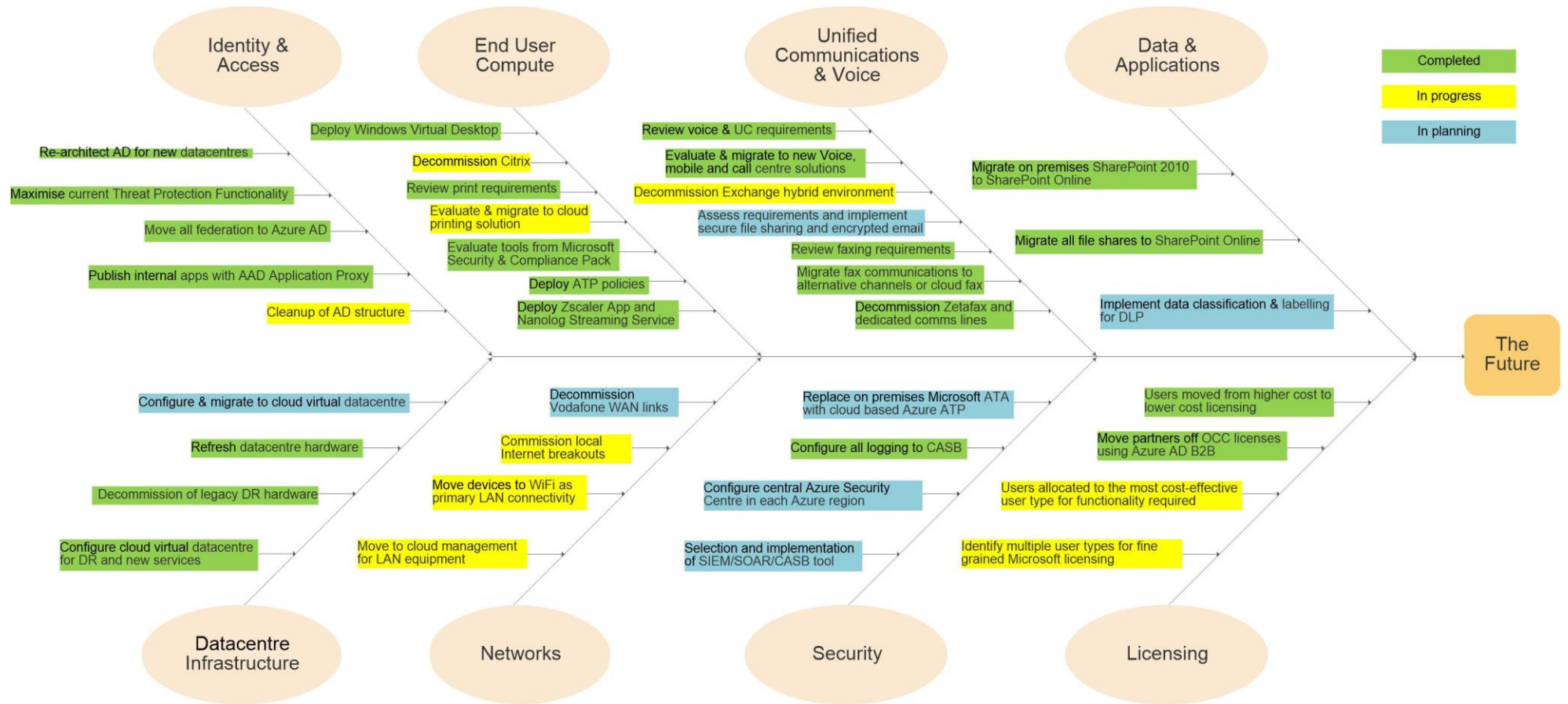
The aim is for components to work together, which is largely accomplished via APIs. This goal informs procurement: systems and services acquired from third parties should have comprehensive and well-documented APIs.

Beyond procurement, the Applications and Systems Change Team plays an internal role in managing APIs:

- Understand the APIs provided by our systems and what they are capable of.
- Look for opportunities to re-use functionality instead of creating standalone functional silos.
  - Example: we encourage business applications to consume mapping services from the corporate ArcGIS platform rather than locally replicating the mapping functionality.
- Using low-code development tools, build new applications that realise business value from APIs.

Consider wrapping generic platform APIs with service-specific API layers that provide simplified and targeted functionality. This is not something that OCC has previously done and would require further integration tooling (e.g. an enterprise service bus). The approach has been successfully practiced at other authorities such as Hackney.

Technology Roadmap Sequence

Identity & Access

End User Compute

Unified Communications & Voice

Data & Applications

	Completed
	In progress
	In planning

- Re-architect AD for new datacentres
- Maximise current Threat Protection Functionality
- Move all federation to Azure AD
- Publish internal apps with AAD Application Proxy
- Cleanup of AD structure

- Deploy Windows Virtual Desktop
- Decommission Citrix
- Review print requirements
- Evaluate & migrate to cloud printing solution
- Evaluate tools from Microsoft Security & Compliance Pack
- Deploy ATP policies
- Deploy Zscaler App and Nanolog Streaming Service

- Review voice & UC requirements
- Evaluate & migrate to new Voice, mobile and call centre solutions
- Decommission Exchange hybrid environment
- Assess requirements and implement secure file sharing and encrypted email
- Review faxing requirements
- Migrate fax communications to alternative channels or cloud fax
- Decommission Zetafax and dedicated comms lines

- Migrate on premises SharePoint 2010 to SharePoint Online
- Migrate all file shares to SharePoint Online
- Implement data classification & labelling for DLP

The Future

- Configure & migrate to cloud virtual datacentre
- Refresh datacentre hardware
- Decommission of legacy DR hardware
- Configure cloud virtual datacentre for DR and new services

- Decommission Vodafone WAN links
- Commission local Internet breakouts
- Move devices to WiFi as primary LAN connectivity
- Move to cloud management for LAN equipment

- Replace on premises Microsoft ATA with cloud based Azure ATP
- Configure all logging to CASB
- Configure central Azure Security Centre in each Azure region
- Selection and implementation of SIEM/SOAR/CASB tool

- Users moved from higher cost to lower cost licensing
- Move partners off OCC licenses using Azure AD B2B
- Users allocated to the most cost-effective user type for functionality required
- Identify multiple user types for fine grained Microsoft licensing

Datacentre Infrastructure

Networks

Security

Licensing

3.4 Key Theme 4: Sourcing and Commissioning

The IT Service will establish a clear approach regarding how to source and commission services and systems. This Strategy theme outlines an overall approach which will be followed by the IT Service over the next 5-years and highlights the key procurements which will fall into the proposed transformation programme. The key principles for sourcing and commissioning by the IT Service are also identified as a guide to establishing a more robust and effective strategy. The contract length should be procured for enough time for major architecture, services and applications with built in break clauses e.g. 3+1+1.

The approach will align with the broader procurement and provisioning strategy developing and build on previous work completed by the IT Service to develop a category-based procurement strategy. Additional insight and feedback captured from within the IT Service itself is also included.

3.4.1 Overall Options

In recent years there has been significant change in the options available for commissioning and sourcing by councils, including:

- Development of new ways of engagement.
- More flexible and cost-effective sourcing of services and systems.

Fundamental to the strategy is to improve services delivered externally and reduce costs through more intelligent sourcing, periodic re-procurements and stronger internal commissioning and supplier management.

Changing Landscape for IT Service Provisioning

Outsourcing to Private Sector	Partial Outsourcing - Mixed Economy	Trading Companies	Multi-Council IT Partnerships	Insourcing with Commissioning Model	Traditional In-House Delivery
Large scale outsource of IT services	Specific IT Services outsourced e.g. Cloud Services	Council led Company (s) running IT Services / Multi-Council e.g. LGSS	Joint Working / Shared Services / Consolidated IT Service	Internally Managed with Services Commissioned Externally	Majority of IT In-House with Managed Supplier Contracts

The landscape of IT Service provisioning as presented in the diagram above has evolved across a range of models outlined all of which have been implemented by Councils in one guise or another. In practice the approach is

often a hybrid of various elements falling between complete outsourcing and in-house delivery. In assessing the most appropriate option for the IT Service within OCC, consideration has been given to the current IT Service direction and the overarching Council wide approach to the provisioning of services.

The Council has an established approach to IT Service provisioning which can be summarised as a combination of the more typical in-house operation with some IT services commissioned externally but with ultimate governance, management and assurance remaining within the Council. In addition, the development of joint working arrangements for IT will be progressed in line with the overall corporate strategy.
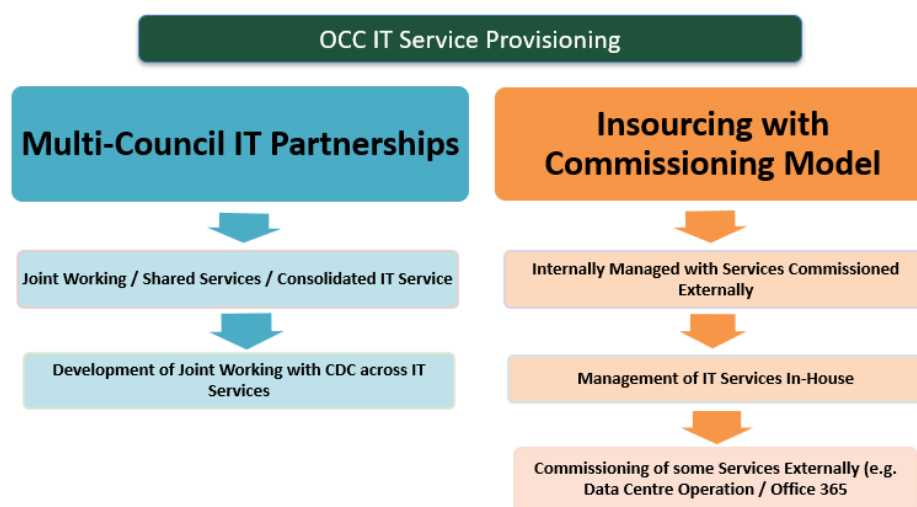
At a strategic level this mixed economy approach will continue but with the potential for additional commissioning of services where greater value for money can be achieved.

This approach is aligned to the growth of the Service Integration and Management (SIAM) model for multi-sourcing, a significant development in the IT provisioning world. The purpose of this approach is to meet business requirements through the management of multiple suppliers and services, in-house teams and become more adaptable to innovation, changing markets and drive costs efficiencies through the cyclical procurement of services. The OCC in-house team would act as the integrator of IT services with a consistent business-facing delivery model.

The rationale for this model is the changing shape of IT services with increasing Cloud based delivery, a service-model based delivery, reduced data-centre provisioning and the need to provide for a more agile and flexible delivery model. This flexibility is key in adapting the sourcing and commissioning approach to the future business needs of the Council and the

rapidly changing technology market and establish a more cost-effective
commercial basis for provisioning IT services and systems.

3.4.2 Key Principles

In developing a more strategic approach to provisioning services, the IT
Service will establish a core set of guiding principles to be applied during the
requirements capture, market assessment and procurement cycles. These
should be taken in conjunction with the specialist procurement standards and
guidelines in place at OCC.

Strategic	Procurement

• Establish a sustainable approach to market awareness and knowledge.
  o Complete market testing and options appraisals.
  o Integrate forward thinking, innovation and research.
  o Engage with partners to share learning.
	• Re-procure services and systems periodically to:
	  o Avoid long-term "lock in" to legacy solutions.
	  o Take advantage of new technology developments.
	  o Drive down costs through competition and new solutions.

• Where appropriate, procure software solutions externally rather than build in-house.	• Engage with relevant government frameworks for service and system procurements.
• Apply a strategic Cloud-first approach to new software procurements.	• Apply a structured risk management approach throughout.
• Apply a mixed economy of in-house and externally procured services.	• Proactively engage procurement advice and apply public sector procurement standards throughout.
• Apply a longer-term perspective during market assessments and procurements.	• Apply a category-based approach to IT procurements where appropriate.
• Apply demand management to eliminate, replace or reduce i.e. only buy what is really needed.	• Explore long-term contracts and apply risk sharing with providers.
• Engage with partners on joint procurements where appropriate.	• Ensure the contracting processes are transparent and fair.
• Application of digital platform strategy.	• Ensure clear roles are set out for external suppliers during procurement.
Process and Practice	Financial
• Apply a robust project approach to the procurement process.	• Ensure that council funds are spent wisely with value for money being a top priority.
• Establish robust commissioning processes with a strong "intelligent client" function to manage supplier relationships.	• Establish clarity internally regarding who covers the various costs within set budgets.
• Establish ongoing service management as part of the commissioning process.	• Perform cost and investment benefit analysis as part of pre-procurement.
• Ensure IT staff are trained and upskilled to support procurement activities.	• Provision annual investment funding to support ongoing improvements.
Council	
• Fully understand the needs of the business with a focus on key outcomes for any IT service.	

• Assess the full life cycle needs for a service or system during procurement process.	
• Engage actively with business areas impacted during procurement.	

As the strategy adoption matures, the core principles will be further developed and integrated into the IT Service operation (where not already in place).

3.4.3 Commissioning Strategy

The delivery of the Strategy over the next 5-years will require a range of sourcing and commissioning initiatives to shift the current services and systems landscape to a new level of operation. The technical roadmap for example, will require some fundamental technical changes, new solutions and changes to service management which will require procurements based on key decisions regarding sourcing and commissioning.

To support these changes the commissioning strategy defines the overarching shape of these changes over the next 5-years. In the immediate period the IT transformation programme will need to launch a series of re-procurements for key components of the technical infrastructure.

3.4.4 Future Direction and Recommendations

Change will continue to feature in the area of sourcing and commissioning, particularly with the shift to on-demand "pay per-use" services, the growth in global Cloud providers and the gradual replacement of many traditional legacy applications in local government with Cloud based offerings. The scaling of infrastructure inherent in Cloud creates economies of scale and rapid delivery routes which will allow organisations to become more agile in procurement, and the potential to transition away from expensive long-term contracts. This will require a more proactive and agile culture within IT to adapt to these opportunities.

Over the course of the next 2 -3 years most of the infrastructure landscape in OCC will be replaced requiring careful sourcing and commissioning through a range of strategic partners. In terms of the approach to this the following actions will be adopted:

1. Using a procurement framework approach during supplier selection to apply the following to decision making:
   a. Ensure requirements are outcome focussed.
   b. Apply open and established standards.
   c. Apply a Cloud first approach.
   d. Do not duplicate platforms that already exist and can be used.
   e. Apply innovation throughout.
   f. Ensure alignment with the councils' climate action objectives

g. Encourage competitive engagement from suppliers.
h. Ensure that SMEs are involved and can compete.
2. Establishing an annual profile of procurement spend activity.
3. Engaging with service areas to integrate "ghost IT spend" into the profile.
4. Establishing guidance on contract lengths and avoid inflexible longer-term contracts.
5. Completing procurements through existing frameworks as the first choice.
6. Consolidating on existing application standards i.e. Office 365.
7. Building flexibility into any contract to allow for change.

A key aspect of the future strategy for the IT Service is to promote the practice of continuous improvement with respect to how the service is delivered and in terms of the internal processes including the ongoing procurement approach.

The following areas are recommended as improvements by the IT Service to the current procurement rules and process to introduce new systems/services/suppliers:

- Simplifying procurement processes and the associated hurdles to complete.
- Investigating procurement limits; for instance, costs and investments for new systems are set to five years of costs even for small systems.
- Changing procurement thresholds to increase the range.
- Investing in the suppliers, developing partnerships and contributing to the requirements surrounding local government systems.

3.5 Key Theme 5: Digital Strategy Alignment

The world of IT and digital is constantly changing to support the advances in the use of technology to realise the benefits in terms of efficiency, reduced costs and ease of use. With increased demand for online and digital services, which work anywhere, anytime at the user's convenience this roadmap outlines how the IT Service will continue to meet these challenges for the next five years. The Strategy will drive the development of the main infrastructure systems changes and this will be aligned to digital services. This will address the customer requirements for digital engagement and services such as the website and digital online transactions. In keeping with the requirement to create digital solutions in alignment with the strategy we will maintain a digital development capability.

3.5.1 Digital Strategy Overview and Alignment

"In an internet enabled and consumer driven
age, the experience of using our online
services must be such that our customers
prefer to use them, allowing us to prioritise
investment on digital and free up staff to focus
on dealing with complex human interactions"

The Digital Strategy key areas are listed below:

- We will develop our solutions in-line with the Local Digital Declaration, and we will share our experiences and lessons learned across the Council, with our local partners and within our wider public service networks.

- Customer engagement and user centric design will be at the core of our digital services so that they deliver improved customer outcomes and, in doing so, relieve Council pressures.

- The way we use and share data is key. We will actively lead initiatives with our local and regional partners and service providers about how we invest in data science and data sharing capabilities, tools, and platforms.

- We will encourage, incentivise, and trust our staff to experiment and embrace digital changes – and arm them with the skills to do so. Our informal processes and behaviours will support our staff to do so.

- The Digital Team will play a central role in supporting the Council to design, select, procure, deliver, and support digital solutions – as well as ensuring consistency and adherence to standards.

- We'll take advantage of the tools and technologies that are currently available to us, whilst investing tactically where we need to.

- We will develop our internal capabilities to reflect the mixed economy technology landscape of in-house and 3rd party systems that is prevalent across local government.

- Our digital systems will support us to collect better insight, data, and customer feedback, which we will use to improve our customer offer, the services we deliver and our policies.

- We will embed our Digital Strategy within the Council's transformation work, following its agreed design principles.

3.5.2 IT and Digital - Areas of Responsibility

The key to a successful digital transformation (and what is required) is the relationship between the IT Service, the programme leading change, and the business/service areas.

Clear ownership and working model will be established to ensure the IT Service effectively underpins and enables the required changes.

This will be facilitated by the IT Digital and Customer Programme Board.

3.6 Key Theme 6 - Cyber Security

Cyber security consists of technologies, processes and controls designed to protect systems, networks, programs, devices and data from cyber-attacks. Effective cyber security reduces the risk of cyber-attacks and protects against the unauthorised exploitation of systems, networks and technologies.[1]

The IT Service has the Cyber Essential Certification and treats the threat seriously, taking proactive action to manage the ongoing threat. However, the threat is ever present and continues to evolve, it is therefore imperative that the IT Service takes a holistic approach to managing the risks, this will include:

- Keeping up to date with the latest risks, solutions and prevention methods.
- Working with the Information Management Team to ensure the implications of GDPR on data security are understood and built into the plan and ensuring senior officers are aware of their responsibilities.
- Working with partners such as the police to provide awareness training and education so that every OCC end user is aware of their role in preventing cyber threats.
- Documenting processes and policy to clearly define roles, responsibilities and procedures. Cyber threats are constantly evolving, so processes need to be regularly reviewed.
- Maximising the use of technology to reduce cyber risks (network, application, monitoring).
- Ensuring all suppliers meet cyber security requirements for new and existing contracts.
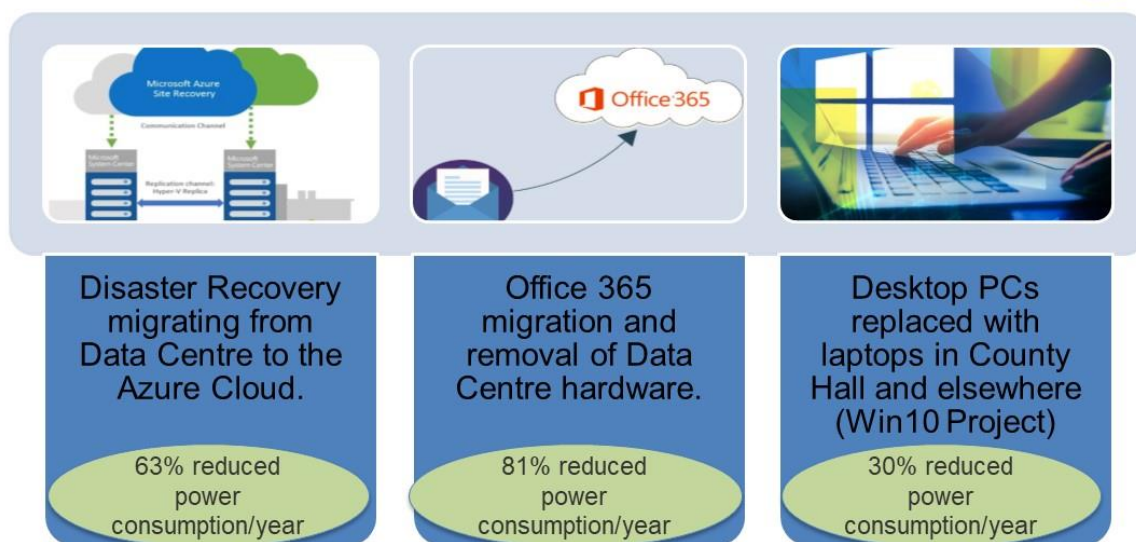
The IT Digital, Innovation and Customer Programme Board will have a standing agenda item to review Cyber Security status and the TDA will provide technical assistance as required.

3.7 Key Theme 7 - Carbon Footprint Reduction

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[1] https://www.itgovernance.co.uk/what-is-cybersecurity

Technology can play a significant role in helping reduce carbon emissions. The OCC IT Service focuses on supporting carbon footprint reduction in several areas as illustrated in the diagram below.

Carbon Footprint Reduction

Disaster Recovery migrating from Data Centre to the Azure Cloud.	Office 365 migration and removal of Data Centre hardware.	Desktop PCs replaced with laptops in County Hall and elsewhere (Win10 Project)
63% reduced power consumption/year	81% reduced power consumption/year	30% reduced power consumption/year

- Inclusion of low energy criteria in device procurement
- Implementation of energy saving settings for all devices. (i.e. power down / low energy operation)
- Progressive migration to the Cloud reducing energy footprint
- Procurement of carbon neutral solutions / supplier selection.

Microsoft have been carbon neutral in their Azure datacentres since 2012, using sustainable energy sources such as wind, solar and hydro-electric generated power.

The Strategy will aim to increase this further to support OCC commitment to deliver zero net carbon emissions by 2030 by:

- Migrating all OCC services from the current physical SCC datacentres to the Azure virtual datacentres (which are carbon neutral).
- Reducing the quantity of printing that currently takes place and encouraging a cultural change to a paper-lite, digital workspace environment.
- Implementing advanced building blocks such as the Zero Trust model, to enable Agile working, thereby reducing travel journeys.
- Assessing IT suppliers' environmental policies and impact as part of procurement exercises with the objective of all IT provided goods and services having a zero net carbon footprint.
- Working with current suppliers to promote and influence their direction to meet the Council objective of reducing net carbon emissions
- Running only what we need, not just running all the time.
- Reducing our Digital Carbon Footprint, for example by;
  - Simplifying the user experience.
  - Maximising the value of content.

- Reducing the sizes of images and videos.
- Using colours that reduce energy consumption.
    - Recording and reporting on any project benefits that contribute to the council's climate change objectives

The IT Service will monitor and report the effects of technology on reducing the Council's carbon footprint, along with enabling analytics on building use, to give insights and informed decisions around how we need to use our property estate.

4. Transformation Programme and Plan

In developing the IT Strategy for the Council detailed consideration has been given as to how it will be delivered and over what timeframe. There will be several fundamental changes in the provisioning of ICT delivered through the ICT Strategy all of which will require considerable change in the underlying technology and the established approach to delivering change.

It would not be possible to deliver this level of change through the day-to-day business as usual services of the IT Service. Where the scope of change involves multiple projects, significant business impact and requires additional resource it is recommended that a programme approach be adopted. A programme approach is essential where critical business outcomes are involved and there is complexity and a broad scope of change involved.

The rationale for a programme approach can be summarised as followed:
- Key business outcomes are involved.
- Multiple projects are involved in delivering these outcomes.
- Focused programme team is required to expedite delivery.
- Additional programme and project delivery resource is required to affect the change.
- Blended team of internal staff with external delivery resource.
- Significant organisation and culture change are required, which drives the need for a programme led approach.
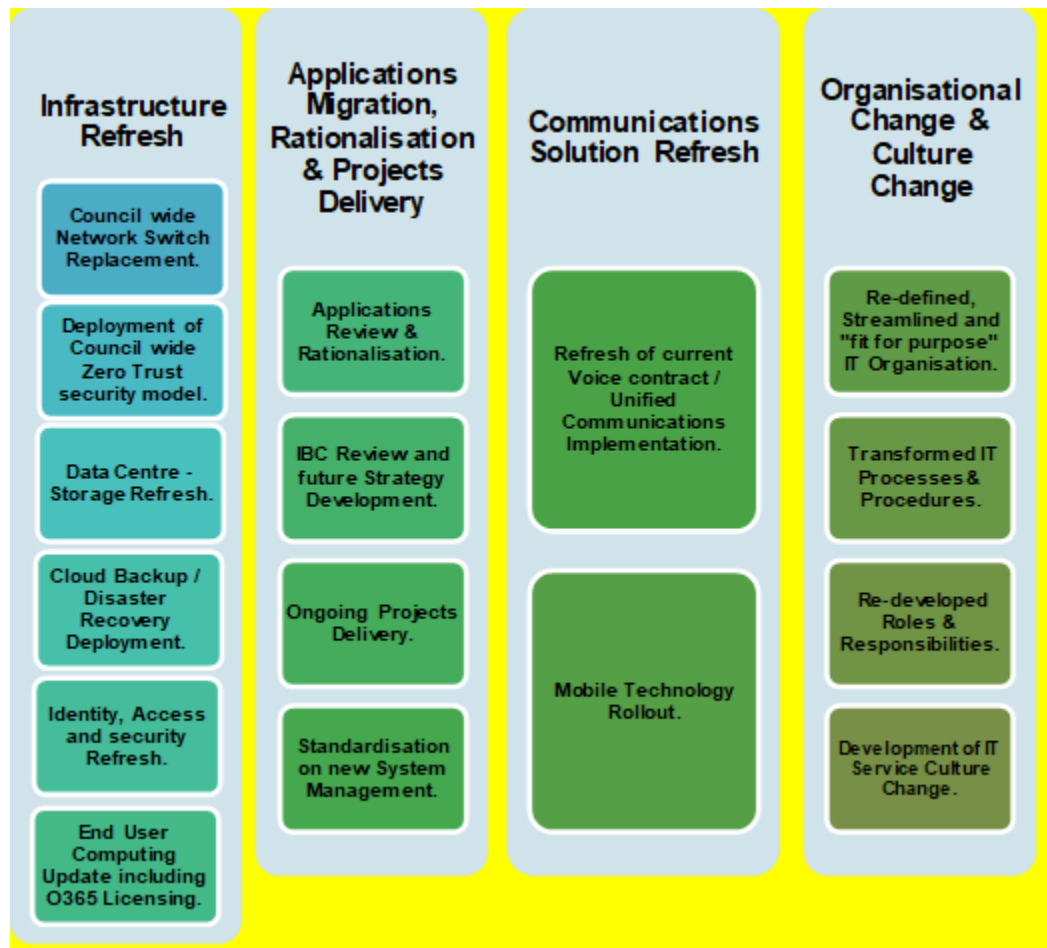
The ICT Strategy has been defined over 5-years which will include a minimum of 2 years of technology refresh and transformation supported by organisation and culture change across the IT Service. Over the next 2 years the Council will require investment in a number of fundamental infrastructure components and a range of new ICT enabling technologies replacing out-of-date and unsustainable systems. Without this investment higher future costs will arise as presented in the supporting business case.

To deliver the ICT Strategy will require the following changes which are separated into four areas covering the base infrastructure, ICT applications, communications systems and the IT Service itself. A workstream approach is proposed for the delivery of the programme as outlined in the overview plan supported by robust governance, an external implementation partner, committed forward investment and an ongoing proactive engagement across the Council at all levels.

Following the approval of the ICT Strategy, a programme initiation and design will be completed to define the detailed projects and programme outcomes applying best practice techniques.

The programme plan is based on information available and once the programme and individual projects are fully initiated that there may be additional factors to be taken into consideration which may impact timeline and/ or costs.

The diagram below outlines a summary plan covering the defined programme workstreams which are designed around the logical grouping of projects areas and with work packages for each of the main deliverables.

Infrastructure Refresh
- Council wide Network Switch Replacement.
- Deployment of Council wide Zero Trust security model.
- Data Centre - Storage Refresh.
- Cloud Backup / Disaster Recovery Deployment.
- Identity, Access and security Refresh.
- End User Computing Update including O365 Licensing.

Applications Migration, Rationalisation & Projects Delivery
- Applications Review & Rationalisation.
- IBC Review and future Strategy Development.
- Ongoing Projects Delivery.
- Standardisation on new System Management.

Communications Solution Refresh
- Refresh of current Voice contract / Unified Communications Implementation.
- Mobile Technology Rollout.

Organisational Change & Culture Change
- Re-defined, Streamlined and "fit for purpose" IT Organisation.
- Transformed IT Processes & Procedures.
- Re-developed Roles & Responsibilities.
- Development of IT Service Culture Change.

Other Key Activities

The development of ICT Strategy has been completed but has also identified several additional areas of work that will be addressed.

Customer Contact Centre review alignment

A review being led by PwC is currently underway and the emerging finding in relation to the IT service is as follows:

- Technology does not support a high performing operation - colleagues report a poor experience when connecting to the telephony and back office service systems. There is a lack of integration and no common system to host customer data as well as no technology to support their day to day operation. As a result, there are many manual processes.

Detailed Digital Strategy development

The high-level strategy has been agreed. There is now a need to develop a deeper approach and implementation plan.

Website review

The corporate website has been identified as an area that needs improvement and should also be aligned to the Digital Strategy development.

ICT Transformation Programme Overview Plan
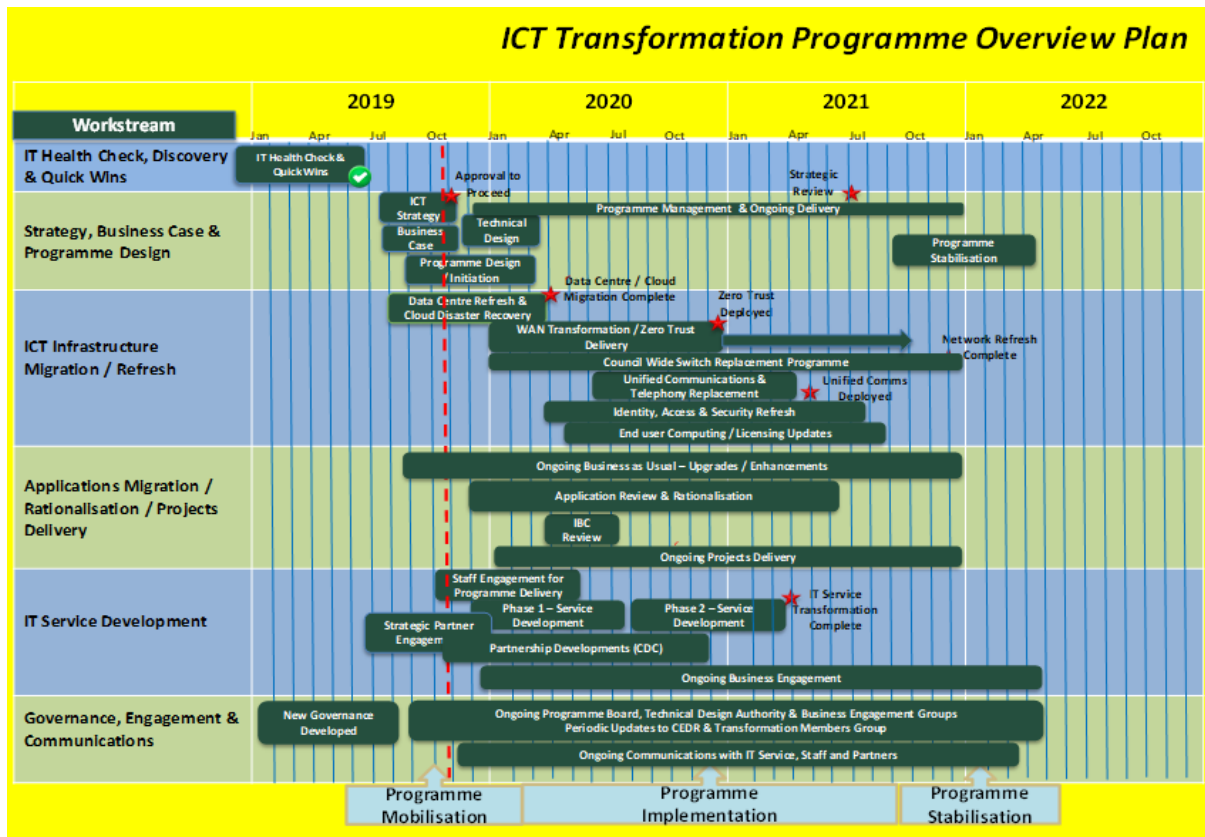
5. Innovation

Innovation is the ability to change and to do things in new ways. This capacity is key to service improvement within the council. We are able, for example, to replace manual processes with more efficient online workflows. Innovation is also driven by emerging pressures such as COVID-19. The pandemic motivated a shift to remote working, among other changes.

The council can make substantial progress by commissioning or building solutions that, while new to us, are readily available and generally familiar elsewhere. There are also many problems for which current tools and methods are inadequate. Solutions will require advances in the state of the art. The example of online workflows is relevant: some citizens are not online and cannot use them. To automate services for this customer base, we may need to work with industry partners who are developing superior methods of voice and image recognition.

The council's strategic priorities set out an ambitious agenda for change and improvement within Oxfordshire. Many of the priorities will respond to innovative approaches that advance the state of the art in healthcare, energy, climate action, transport, democratic engagement, and other areas. The council's innovation strategy is designed to meet these challenges.

Innovation within Oxfordshire County Council focuses on step change innovation. Its mission is to solve Oxfordshire's hardest problems and, at the same time, to bring investment into the county and increase the profile and prowess of local industry.

One key aim is to be effective at securing grant funding to supplement council resources and to target funding aimed at experimentation and greater risk taking.

5.1 Strategic Priorities

The Innovation focus areas align with the council's strategic priorities.

Council priority	Innovation focus
1. Climate action	Energy infrastructure and systems integration Clean energy – hydrogen and fuel cells Renewable energy Green Home Grants – domestic retrofits Electric vehicles – rolling out the charging network Dashboarding of council climate performance
2. Inequalities	Upskilling people in digital communication for access to healthcare and transport *Growth opportunity, especially digital inclusion and transport poverty*
3. Health and wellbeing	Air quality Drone delivery for medicines COVID-19 response
4. Support for care	Assistive technology for older adults Micro enterprises for providing care Community support circles
5. Transport	Integrated transport management Oxfordshire Mobility Model Active travel – cycle infrastructure and safety Connected and automated vehicles Data driven road safety Data aggregation and machine learning in network monitoring
6. Nature and green spaces	*Growth opportunity* Crowdsourced data collection with TVERC Moss Wall
7. Children and young people	*Growth opportunity* Remote learning Virtual Reality demonstrations
8. Local democracy	Placemaking – involving citizens in urban design Innovation Framework for planning and development
9. Local partnerships	Extensive collaboration with businesses and universities as well as other local authorities and central government Support of libraries and cultural services Development of standards

5.2 Innovation process

The process of innovation needs to balance three factors:

- Innovation is risky – it involves technologies, methods, business models, and partners that are new and untested.
- This risk is associated with higher potential rewards of improving performance and customising products to our needs.
- As a customer for the benefits of innovation, the council understandably has a low appetite for risk.

Via the "Innovation Funnel", we manage the journey from risk to safety:
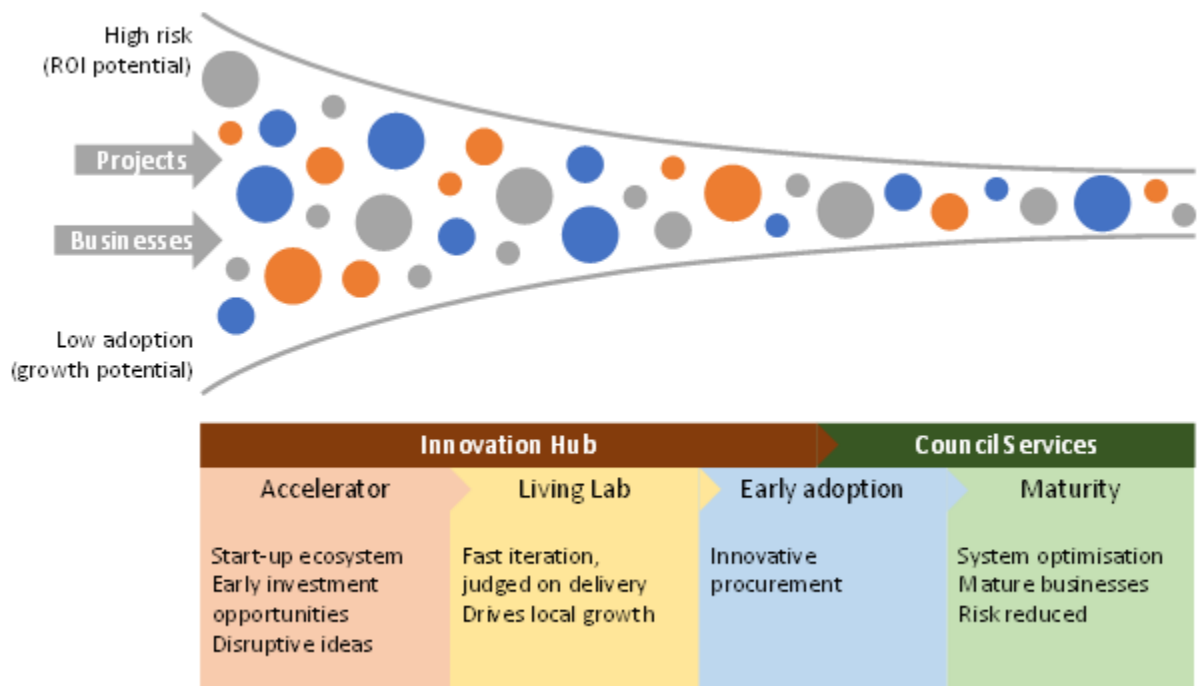
Projects and business partnerships start out at the wide end of the funnel where risk is high and market adoption of solutions is low (or zero, if they are brand new). IT matches investment opportunities to development partners, fuelling the business start-up ecosystem.

The "Living Lab" approach closely involves customers in solution design – not merely as test subjects. Customers can be inside or outside the council. If inside, projects are sandboxed to eliminate negative service impact.

As the funnel narrows, it becomes clearer which projects and partners are viable. Successful solutions become available for procurement by early adopters, including the council. Eventually, viable solutions mature along with the companies responsible for them.

5.3 Strategic impact

The IT Service contributes to the development of multiple strategies and frameworks which guide innovation in Oxfordshire. Leading on the creation of the Oxfordshire Electric Vehicle Infrastructure Strategy and strong input into the Local Transport and Connectivity Plan. Further work is being finalised on an Innovations Framework for new development and infrastructure.

Other strategies with past or current contributions include the following:

- Oxfordshire Climate Action Framework
- Oxfordshire Plan 2050
- Oxfordshire Infrastructure Strategy
- Oxfordshire Local Industrial Strategy
- Oxfordshire Digital Infrastructure Strategy

Many innovation projects have a strategic impact. For example:

- Working with BSI and ASAM in Europe to develop national standards for automated vehicles. The team is now applying the learnings to drone deployment. Having regulatory frameworks and standards in place enables Oxfordshire to host cutting-edge industry in these areas.
- Energy planning and system integration – mapping resources against the future needs of the county for buildings and transport.
- Electric vehicle infrastructure – making Oxfordshire ready for the EV transition, which is progressing faster than the national average.
- Traffic network management – ensuring that all road users are catered for, not just vehicles.
- Vehicle data connectivity and in-vehicle messaging – key enablers for automated driving.
- Mapping care provision across Oxfordshire to support strategic procurement.

Finally, in addition to targeting particular problems, innovation projects provide an evidence base to support further development.

5.4 Innovation and IT Services

Moving Innovation into IT Services supports the alignment of the innovation strategy with the larger technology strategy. This benefits from privileged access to the council's technology resources. Similarly, IT Services benefits from the innovation horizon scanning, analysis, and solution creation resources. Besides responding to known service requirements, the iHub can detect and respond to impending disruption.

5.4.1 Service improvement

To bring innovation to service improvement, the iHub will work closely with the IT Services Customer Engagement team. The Business Partners in this team hold the primary relationship with internal customers. The partners will collect and document the services' requirements, building up a portfolio of

challenging problems to solve. They will also educate the services on the range of emerging solutions, giving a sense of what is possible.

The iHub will use its expertise to create improvement frameworks for the services. The frameworks will lay out potential solutions – some within current IT capabilities, others requiring a step forward. They will define roadmaps to implementation, identifying options for funding and resourcing.

In many cases, solutions will be readily available and can simply be procured and deployed. In other cases, given funding, the iHub will launch projects to bridge the gap between what's available and what's required. If appropriate, the iHub will work with external funding sources and industrial partners to advance the state of the art.

Once solutions have been procured or developed, the iHub will work with other teams in IT Services to bring the solutions into BAU. To enable implementation, the iHub will increase the level of technology and knowledge transfer.

The IT Services governance processes will play an important role in curating the list of projects. The services have numerous requirements, and there is a risk of taking on too many projects and of tackling problems that lack feasible solutions. The team should be willing to say "no" to a problem – or, in the spirit of innovation, to redefine the problem in a way that makes it solvable.

5.4.2 Principles

Certain principles apply to innovation, modulating the principles that apply to IT service provision in general:

- Engagement with both senior managers and operational staff to ensure alignment and buy-in
- Agile governance as appropriate for innovation projects
    - Note that, in many cases, project partners and funding bodies exert their own governance
- Tactical procurement to meet short-term project needs
- Bespoke software development to create new capabilities
- Agile architecture

Innovation projects should always look to their legacy. Regardless of the level of success, projects should aim to leave a lasting positive impact in the form of tools, data, and processes that can be used going forward. Lessons learned from failure as well as success will be shared.

5.4.3 Organisation

A discussion is now ongoing about the organisational structure of the iHub. The current semi-autonomous setup of the iHub reflects the difference in ways of working required for innovation. Such an arrangement is well-established and common practice in large organisations.

There is also a case for externalising and commercialising some of the innovation function. An external entity would have more flexibility in pursuing funding sources, more agility in launching projects, and greater control over the realisation and exploitation of intellectual property. This entity would continue to be linked with mirroring structures within the council.

6. Digital Infrastructure

The Oxfordshire County Council Digital Infrastructure Team leads the Digital Infrastructure Programme in partnership with the Oxfordshire Local Enterprise Partnership, Oxford City Council, and the district councils. The Digital Infrastructure Partnership aims to achieve full-fibre gigabit-capable broadband and 5G connectivity throughout the county via a mix of public and private investment.

This section will not rehearse the separately documented digital infrastructure strategy. It highlights areas of alignment with the council's strategic priorities:

- Climate action
  - o Provide data for climate analysis by enabling a network of embedded sensors.
  - o Reduce the need for travel by enabling working at home or at local hubs with improved connectivity.
- Inequalities
  - o Increase digital access to online services, including council services, by improving home connectivity.
  - o Increase local access to council services by providing connectivity to community centres. This also makes digital workstations and support available to people who may not have equipment or knowledge.
- Health and wellbeing
  - o Support the NHS plan to shift funding to community-based care by providing connectivity to community centres.
  - o Enable high-volume data transport for 3D scans by providing 5G in-building WiFi at local hospitals.
- Support for care
  - o Support home care monitoring with improved home connectivity.
- Transport
  - o Support future travel by enabling a network of traffic sensors and providing vehicle connectivity for telemetry and remote control leveraging street furniture to deploy a low powered network of sensors.
  - o Support interactive travel platforms and enhanced travel information by providing connectivity to bus stops and stations.
- Children and young people
  - o Support "smart schools" with improved connectivity.
  - o Enable augmented reality attractions through 5G.

- Local democracy
  - Increase digital access to information and democratic mechanisms.
- Local partnerships
  - The Digital Infrastructure Partnership provides:
    - Improved collaboration with districts
    - A common front door into public services across Oxfordshire
  - Via the planning process, encourage the "baking in" of Internet of Things capability to all infrastructure projects, increasing the availability of sensor data.

Connectivity is also key to the IT technology strategy. The Digital Infrastructure Programme is supporting the wide area network replacement project by promoting commercial fibre expansion.

7. Data, Analytics and Visualisation

7.1 Building data value

Data is of critical importance to the council:

- Effective decision-making by officers and members depends on good information about the matter at hand.
- All the council's services run on data and require the data to be correct, timely, and available.
- To implement the council's strategic priorities – especially climate, inequalities, health, social care, and transport – we need the deep understanding that comes from comprehensive data.

Getting the most out of our data requires a strategic approach to building data value:

Stewardship	Creating and maintaining data
Understanding	Knowing what we have
Protection	Protecting data against loss or intrusion
Quality	Ensuring data is accurate
Sharing	Putting data where it needs to be
Analysis	Figuring out what the data means
Visualisation	Making the meaning of the data visible
Insight	Getting value from data

7.1.1 Stewardship

Data records are created, updated, and removed. This activity usually happens in the service areas where the data naturally arises. Some datasets (such as digital maps) are maintained within IT Services, or acquired from third parties (in particular open public data from ONS or data within the Public Sector Geospatial Agreement).

Data maintenance becomes stewardship when those responsible understand their role in supporting the data value chain:

- Use appropriate data stores – well-structured databases rather than ad hoc spreadsheets
- Capture sufficient data to enable not only standard business processing but also analysis and insight
- Look for errors and correct them
- Comply with statutory requirements, e.g.:
    - Not collecting more data than necessary
    - Not retaining data longer than necessary
    - Not using data inappropriately

It is important to note that there are a range of activities involved in effective data stewardship, and these are dispersed across the council.

In particular the responsibility for collecting and maintaining quality data is often with operational and management information teams in service areas, responsibility for data processing and transformation are with analytical and data integration teams, and the overall responsibility for the council's compliance with legal and good practice requirements relating to data sits with a dedicated information management function in legal services.

Getting this right will require effective teamwork across those functions.

To enable data stewardship, we will work across this ecosystem to:

- Establish clear ownership of data assets
- Clarify the responsibilities of data owners
- Promote a data culture and mindset
- Provide good tools for data maintenance
- Set standards and provide guidance

7.1.2 Understanding

A successful data strategy crucially depends on knowing what data assets we have, where they are, what format they are in, and how they are used. It is helpful to think in terms of business entities such as customers, children, parents, buildings, and so on. Multiple business systems can hold information about the same entities, and the entities can participate in multiple business processes. Where this is the case, and there are different versions of the truth, it becomes important to clarify which version is most trustworthy – and to adjust processes to take this into account.

To support data understanding, we will maintain an asset register or data catalogue. Time permitting, we will explore other methods:

- Create a business entity model
- Identify master data for entities (the trusted version)
- Map data flow between users, processes, and systems
- Include datasets external to the council as well as those we maintain

7.1.3 Protection

Data has no value to us if we lose it or allow it to be corrupted. Data becomes a liability if we allow the wrong people to see it, or if we break the laws regarding its retention and use.

To protect our data, we will:

- Follow best practice in operating and securing our systems and networks
- Maintain our security accreditations
- Educate users in secure data practices
- Comply with data protection legislation and other regulations and statutes
- Perform data protection impact assessments for systems and processes
- Monitor organisations that process data on our behalf

7.1.4 Quality

The value of data is directly proportional to its quality. Data cannot serve its intended purposes unless it is correct, complete, and up to date. Accuracy is also a requirement under data protection law.

To ensure data quality, we will:

- Work with data owners to define standards for data quality
- Comply with data protection law:
- Document our processes for correcting errors
- Document and carefully consider any claims of inaccuracy

We will also explore the development of automated methods:

- For assessing and reporting on data quality
- For detecting and reconciling conflicts between systems holding different versions of the same entities

7.1.5 Sharing

Realising data value often involves moving or copying data from its natural home:

- Sharing data with a user base other than its owners and usual processors
- Making data available to other systems for transactions or reporting

Examples include:

- A service sharing its data with an internal or external team who will analyse it
- A business system transmitting account data to a payment system to allow customers to pay down their account balances

- A business system populating a data warehouse from which reports are generated

As a general principle, we want to collect data once and use it many times.

There is an increasing requirement for transparency in council activities. Making our data public goes a long way towards satisfying this requirement while avoiding time spent on processing information requests. Once data is public, it is also quite possible for members of the community to devise new uses for it, in some cases removing the need for the council to develop its own applications. Example: the council publishes planning data which is then harvested by other parties for consultation by building firms.

To support data sharing, we will:

- Comply with data protection law regarding the sharing and re-use of data
- Document our compliance in data sharing agreements
- Increase efficiency by automating data sharing wherever possible
- Maintain a suite of data integration tools with central expertise in using them
- Review data sharing processes in accordance with changes in corporate strategy – for example, review IBC SAP data sharing in light of the upcoming ERP review

We will consider using a data management system to facilitate sharing (like data.gov.uk).

7.1.6 Analysis and visualisation

For many purposes, data is useful as is. Additional value can be realised by analysing data to understand what it is telling us:

- Descriptive analytics tells us what happened
- Diagnostic analytics tells us why it happened
- Predictive analytics tells us what is likely to happen
- Prescriptive analytics tells us how we can affect the outcome

Visualisation is the process of transforming the quantitative results of analysis into imagery that is engaging and easily grasped. The teachings of analysis and visualisation provide a foundation for effective service delivery and policy making.

We will:

- Promote an analytical culture that bases decisions on information
- Maintain a suite of analysis and visualisation tools with central expertise in using them
- Maintain central expertise in the analysis of general datasets to support county-wide concerns

- Support democratisation by enabling domain experts in council services to analyse and visualise their own data using the tools
- Increase efficiency by automating the analysis process wherever possible

7.1.7 Insight

Data value is realised when the data has meaning and is usable for a business purpose. Sometimes the value chain is short and simple:

- A social worker conscientiously enters client data into the care management system.
- Another social worker refers to the data when picking up the case.

To achieve deeper insight, the chain is more complex:

- Client data is automatically copied to a data warehouse. It is converted from a format suitable for transactions to one suitable for analysis.
- Reports are generated from the warehoused data to show the basic facts and figures.
- Data is copied from the warehouse to analysis and visualisation tools to look for patterns.

7.2 Organisation

Various teams across the council service areas and within IT are responsible for different aspects of the data strategy:

	Service Areas	App Support	GIS	Integration	Insight	iHub	Information Management
Stewardship	X	X	X			X	
Understanding	X	X	X	X	X	X	X
Protection	X	X	X	X	X	X	X
Quality	X	X	X	X		X	X
Sharing	X	X	X	X		X	X
Analysis	X	X	X		X	X	
Visualisation	X	X	X		X	X	
Insight	X	X	X		X	X	

- Service areas are responsible for the full value chain for data that they own.
- The IT Applications and Systems Support Team shares responsibility with the services for data residing in the adult and child social care systems (Liquidlogic) and education system (Capita One, soon to be Liquidlogic).

- The IT GIS (Geographic Information Systems) Team shares responsibility with the services for digital mapping data residing in the ArcGIS repository. The team has primary responsibility for core datasets shared across the council.
- The IT Data Integration Team specialises in automated data transport and quality assessment.
- The IT Insight Team specialises in analysis and visualisation alongside statistics and modelling.
- Projects in the Innovation Hub can generate data or consume data for processing and analysis.
- The Information Management Team focuses on asset management, data protection, quality issues, and data sharing agreements.
- All teams that handle data have a shared responsibility for data protection.

The role of the IT Business Partners is key to the effective coordination of all parties involved in handling and exploiting data:

- Encouraging the service areas to follow data stewardship principles and standards
- Explaining the tools and services that IT can provide
- Bringing the service areas' requirements to the IT teams
- Emphasising the significance of data to the success of the service areas' projects

7.3 Challenges

The data strategy faces several challenges

Challenge	Approach
Increased data volumes and complexity: • 3D, LIDAR • Historical data (change over time)	Review storage systems
Increased data velocity – real-time data	Review storage systems
Increased requirement for data sharing and interoperability	Review integration resourcing
Democratisation multiplies data silos, increases inconsistency in data management	Improve communication via the Business Partners
Services losing data experts, increasing pressure on the IT teams	Review resourcing, work with the services on training
Sometimes unclear where responsibility lies between IT, Information Management, and the service areas	Review roles and re-align IT with Information Management

7.4 Statutory requirements

Data strategy operates within a legal framework:

- General Data Protection Regulations 2016
- Data Protection Act 2018
- Digital Economy Act 2017
- Freedom of Information Act 2000
- Environmental Information Regulations 2005
- Re-use of Public Sector Information Regulations 2015
- INSPIRE Regulations, 2009
- Local Government Acts 1972, 1985, 1988 and 1992
- Public Records Acts 1958 and 1967
- Regulation of Investigatory Powers Act 2016
- Copyright, Designs and Patents Act 1988
- Copyright and Rights in Databases Regulations 1997
- legislation governing council services, in particular adult and child services

There are also standard principles and codes of practice:

- Caldicott principles
- Transparency Code of Practice
- The Section 46 Code of Practice under the Freedom of Information Act

7.5 Geographical data strategy

The geographical data teams (GIS teams) at OCC and CDC are responsible for the full value chain for core spatial datasets shared across the councils. Thus they are an exemplar of the data strategy as a whole. This section provides further detail specific to geographical data strategy.
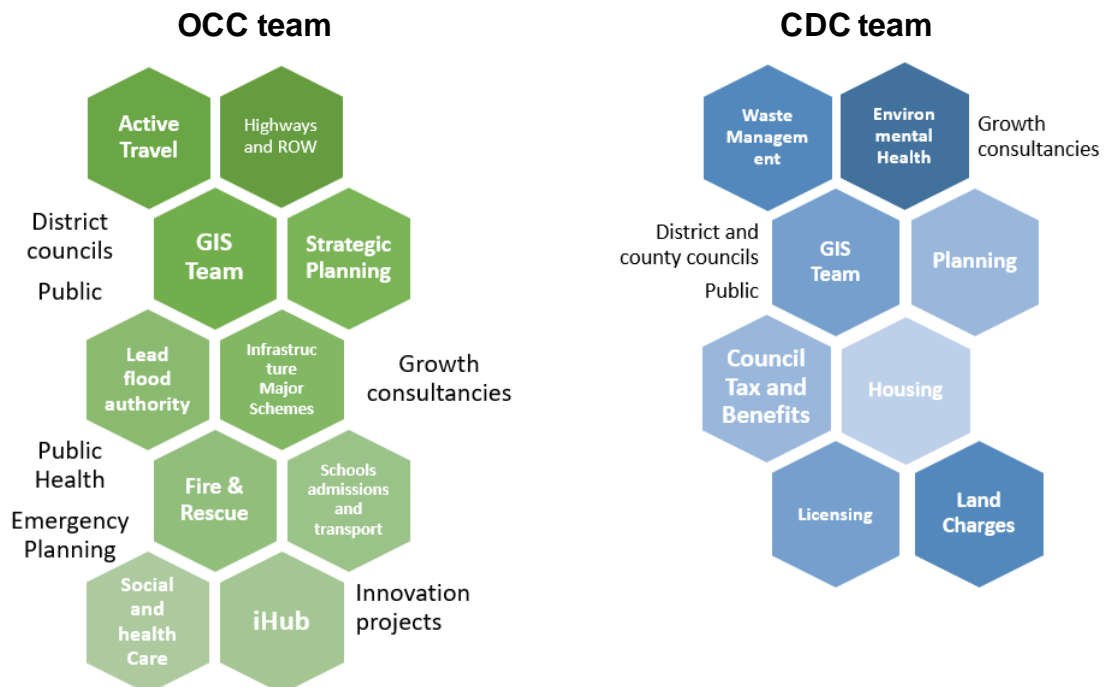
7.5.1 Strategic priorities

Geographical location is key to the council's strategic priorities:

- Climate action
  - The energy land-use map identifies suitable locations for solar or wind renewable energy generation.
  - The woodland treescapes map identifies land suitable for planting trees to reduce greenhouse gases.
- Inequalities
  - Maps identify localities where services should be targeted to help the most vulnerable.
- Health and wellbeing
  - Ordnance Survey road network data is used to work out how far communities must travel to obtain good food and resources.
- Support for care
  - The care and support brokerage team uses maps to direct suppliers to take on new care packages near to existing clients.
- Transport
  - Spatial models of the growth of population over time and the predicted housing growth are used to guide transport planning.

- Nature and green spaces
  - Map data supports the creation of habitat and nature recovery networks to influence growth planning for OP2050.
- Children and young people
  - Geographical data is used to calculate the sufficiency of school provision for the changing population.
- Local democracy
  - Engagement tools like StoryMaps and Survey123 allow people to see the geographical context of proposed changes in consultation and engagement.
- Local partnerships
  - Publication of our asset mapping enables digital businesses to target provision of better infrastructure and better renewable energy solutions.

7.5.2 Governance

The OCC and CDC geographical teams are both part of the Data, Analysis and Visualisation Team within IT Services. They help the other service areas to use location, maps, and the national gazetteer to standardise digital location data, joining up what we know about our towns and villages to improve service planning, growth, and operational service delivery. The OCC team supports 200 desktop users and 500 web and mobile application users; the CDC supports 45 desktop and 200 web/mobile users.

OCC team

CDC team

Active Travel

Highways and ROW

District councils

Public

GIS Team

Strategic Planning

Lead flood authority

Infrastructure Major Schemes

Growth consultancies

Public Health

Emergency Planning

Fire & Rescue

Schools admissions and transport

Social and health Care

iHub

Innovation projects

Waste Management

Environmental Health

Growth consultancies

District and county councils

Public

GIS Team

Planning

Council Tax and Benefits

Housing

Licensing

Land Charges

A culture of continuous improvement supports council teams to become digital, efficient, and innovative. Improvements are based on small organic changes from staff ideas, business plans, audits, and statutory requirements. Larger changes are evolved from the councils' vision, values, business priorities, and directorate strategies. These are delivered through service

requests, work packages, and projects. Changes disrupt previous ways of working to make life simpler, more directed, and efficient. New work is prepared and reviewed at the IT Services Senior Leadership Team.

The geographical teams ensure that the platform of technologies meets the growing demand for place-based services for other teams across the organisations and to the public and businesses. Esri ArcGIS is the desktop and server applications platform integrated into business applications. Tracking, analysing, and visualising strategic and operational geographic data is now critical to many services.

Both councils have consolidated spatial data in the central spatial database with web maps, StoryMaps, dashboards, and mobile applications to enable staff to self-serve. This promotes democratisation and improves decision making, transparency (a single version of the data), and business workflows.

7.5.3 Geographical data objectives

Objectives	Benefits
1. To provide and maintain high quality, up to date, definitive map, address, and council business geographical data.	• Operations and analysis can refer to a single consistent version of the truth • Avoids duplication of effort • Information is easier to join up across systems and services
2. Facilitate the creation of statutory datasets: • The local land and property Gazetteer (LLPG) for Cherwell DC and • the National Street Gazetteer for Oxfordshire CC.	• Statutory responsibilities met • Quality and reliability standards can be recognised by the GeoPlace Gold standard achievement
3. Make geographic information easy to find	• Enables greater take up of location information
4. Mandate and promote use of data standards: • Address data will hold the UPRN (unique property reference number) • Street systems will reference the USRN (unique street reference number) • The Public Sector Geospatial Agreement (PSGA) will be used to source Ordnance Survey maps, APGB aerial photography and digital terrain models, and other data sets added to the PSGA relevant to the councils' services.	• Data standards make data creation, data interoperability, and data sharing easier • Business systems are designed to work effectively and efficiently with standardised data • The PGSA agreement enables the council to benefit from economies of scale and access the latest and most accurate map data for service planning and delivery without direct cost to the council
5. Provide staff with the geographical software and tools to deliver services both	• Virtual desktop (VDI) mapping tools support agile working

general and specialist according to need. E.g. web maps to locate schools, libraries and other council property, and mobile tools	• VDI tools are faster and speed up processing and improve productivity
6. Promote the use of free training materials and raise awareness of geographical data	• Greater take up and confidence in use of maps and tools
7. The GIS platform will support other council business information management systems	• Reduces the complexity and cost of other business systems if they can consume mapping services from the GIS platform

7.5.4 Geographical data management

The geographical teams have the responsibility for the end to end management and maintenance of map and address data for the council, partners, and the public. The central government brokered Public Sector Geospatial Agreement (PSGA) enables the ordering, download, and use of standard data sets, maps, address gazetteers, and aerial photography.

The Esri ArcGIS and FME tools are used to prepare the data for use in maps, business applications, modelling, analysis, and reporting. The data resources are expanding to the some of the data sets being available via application programming interfaces (APIs) facilitating access to some hosted data services.

Whilst some customers are sophisticated and ready to take these new services, others require support. Many housing growth studies require the team to transfer data sets to facilitate mandated studies before major infrastructure schemes can go ahead. The team uses its automation tools to continually revise and streamline the geographical data supply to make it more efficient and secure.

7.5.5 Workflow, integration, and interoperability

Effective use of geographical data tools in a post COVID world requires desktop provision that copes with an unpredictable user network connection as our people work in an agile way. The ArcGIS desktops are now available at OCC through a Dell Horizon virtual desktop and for CDC through Azure, so that the person works on a view of the server in the data centre. This avoids the need to procure hundreds of high end laptops to perform these tasks locally. Users can work faster, which increases productivity and reliability. The work is saved on the server if a user's signal drops.

The GIS management tools are used to set up automated geographical data transformations on a daily or more frequent basis to prepare data for business solutions – such as plotting adult social care client locations for service delivery, planning for adult social care, and planning safe and well visits for the Fire and Rescue Service.

Business geographical data is made available in web mapping services to enable hosted business systems to see a single version of the truth. Data from the master geographical database is maintained once and viewed through many map tools and devices, e.g. council owned property, schools, and energy supply information.

7.5.6 Training and education

The Esri ArcGIS enterprise agreement provides free access to over 250 e-learning courses and tutorials to enable desktop users people to learn how to use the ArcGIS software. Intranet resources provide awareness and build knowledge of available geographical resources.

7.5.7 Outreach and engagement

Geospatial solutions will grow to be used extensively for outreach, engagement, and interaction and feedback. For example, the solutions will support the main consultation for the Local Transport and Connectivity Plan, Oxfordshire 2050 Plan, and other strategies.

7.6 Technology Roadmap

Some aspects of the data strategy have technology requirements. The data technology roadmap is as follows:

- **Stewardship**
  - Review storage systems to address increased data volume, complexity, and velocity.
  - GIS: Continue and promote the use of ESRI ArcGIS as the single master data platform.
    - Extend the ESRI contract to 24 July 2024. Looking beyond 2024, review ESRI for re-procurement or replacement.
    - Ensure that other business systems integrate with the master spatial database.
  - GIS: Continue and promote the use of the ESRI toolset on the desktop, in the browser, and via mobile applications.
    - Review the range of tools with a view to defining corporate use cases and standards.
    - Encourage the switch from desktop to browser. Provide task-appropriate tools.
    - Continue providing the Horizon VDI solution for desktop users, to bring the desktop close to the servers, whether in the data centre or in the cloud.
    - Enable online/offline working with data synchronisation between devices and servers.
    - Provide mobile workforce management tools.
    - Migrate desktop users from ArcMap to ArcPro.
    - Migrate mobile applications to the new Fieldworker model.

- Investigate ESRI plugins for other tools: Office365, Power Platform, AutoCAD, etc.
  - o GIS: Review the current hybrid hosting model (on-premise servers to manage costs, data security, and upgrade timing; cloud services for scalable and resilient public access).
    - Delay full migration to the cloud until the end of the current ESRI contract, to get full value from our expenditure on the desktop VDI solution.
    - Migrate the on-premise estate from Windows 2012 by summer 2023. Consider upgrading ArcGIS to the latest stable version at the same time.

- **Understanding**
  - o Consider using automated data discovery tools to build the data catalogue.

- **Quality**
  - o Consider extending the use of Talend Data Quality or a similar tool to automate data quality assessment.

- **Sharing**
  - o Re-procure Talend Data Integration for the medium term, to support continuity of automated data processes.
  - o Decommission Talend Master Data Management along with the Single View of a Child application.
  - o Review data integration tools currently in use (Talend, FME, SSIS) with a view to defining corporate use cases and standards.
  - o Consider using a data management system to facilitate sharing.
  - o GIS: Continue the use of FME as the specialised geographical data integration tool.
    - Looking beyond the contract end in Nov 2024, review FME for re-procurement or replacement.

- **Analysis and Visualisation**
  - o Review analysis, reporting, and visualisation tools currently in use (Tableau, PowerBI, ArcGIS, Business Objects, Crystal Reports, R, Python) with a view to defining corporate use cases and standards.
  - o Replace the insight.oxfordshire.gov.uk website. The current site runs on Drupal 7, which reaches end of life in November 2022. The replacement will align with the digital presence strategy.
  - o GIS: Continue the use of the ArcGIS toolset to create data applications.
    - Review our applications for retirement, update, or migration as the toolset changes.
    - Integrate with the public website to provide "where I live" information, maps, and gazetteer lookups.

There are some other general considerations regarding licensing and support:

- As usage of tools by service areas increases, IT Services will reach a decision point about increasing the number of centrally funded licenses or requiring service areas to buy licenses.
- Council staff and partner organisations use tools other than those mandated and supported by IT Services. For example, other organisations use alternative GIS platforms such as GeoServer and QGIS. There is a decision to be made about the level of support that IT Services can provide for these tools. Full support would require running the tools in-house and spending staff time on engaging with them.