

## Options Appraisal

<b>Project:</b>	ICT Data Centre / Hosting Provision
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### Version Control

Current Version [0.02](#)

[Version History](#)

Version	Revision date	Summary of changes
0.01	20.02.2014	Initial draft to support Policy and Resources paper and recommendation
0.02	7/3/2014	Changes as a result of review of financial information
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### Distribution

This document has been distributed to the following people:

Name	Date of issue	Version
Catherine Vaughan, Executive Director Finance & Resources	20.02.2014	0.01
Rob Allen, Pricnipal Accountant	07/03/14	0.02
James Hengeveld, Head of Financial Services	07/03/14	0.02

## 1 Purpose

- 1.1 The purpose of the Options Appraisal is to provide a full and firm foundation for decision making on the project. The recommended option if adopted will then be extended and refined into the Project Initiation Document, which is the working document for managing and directing the project.

## 2 Reasons

### 2.1 Background

- 2.2 The provision of ICT in all organisations is dependent on data centres or computer rooms. These rooms house the servers, data storage, network and telephony equipment on which all ICT service is dependent.
- 2.3 With the increasing dependency of the council on the availability of ICT services to maintain critical services, the reliability, availability and sustainability of this provision is becoming ever more vital. Put simply, many council services cannot be delivered without their ICT being available and reliable.
- 2.4 As the council's reduces its reliance on paper, so it increases its reliance on digital records. The data stored electronically is becoming more varied and is hungrier for storage space – for example voice and video records and telecare sensors. Services need to store and access those records quickly and easily and there is a growing need as well as expectation for this to be 24 hours a day, 7 days a week. Closer partnership working, particularly integration across health and social care further increases the demands for ICT provision to operate effectively across agencies.
- 2.5 While we know that there will be major changes over the coming years to what the council does and how it does it, there are challenges in defining this in detail. This places substantial but unknown demands on ICT and means that we need to plan for it to be accessed more like a utility service as for example water or electricity – always available and able to vary our demand for it quickly and easily.
- 2.6 The other critical drivers to consider are
- the significant shift to more digital services,
  - substantial new sources of ever growing data (e.g. telecare, sensors, Automatic Number Plate Recognition) requiring storage,
  - the increase in multi-agency working and information sharing and
  - the move within services to 24/7 service provision.

These drivers will place substantial unknown demands on ICT hosting and require a shift to viewing the hosting of ICT as more like a utility service, for example water or electricity. Always available and to get “more” simply open the tap. It is vital to be able to plan financially for these increases in an incremental rather than sporadic fashion.

- 2.7 Policy & Resources Committee on 21 March 2013 agreed capital and revenue investment of £5.930m over a 3 year period and this was built into the Council's budget plans at this time. There is also provision within the £2m capital and revenue ICT element of the Workstyles programme.

## **2.8 Reason/Explanation**

- 2.9 The council's equipment is currently housed in a number of rooms spread across the following sites: Brighton Town Hall, Hove Town Hall, Kings House and Bartholomew House. These rooms were selected and fitted out in the 1980's. There has been limited investment and there are significant issues with all of the rooms, ranging from flood risk, water ingress, inadequate power supply, network delivery and distribution, cooling, generator back-ups and fire suppression. The rooms are aged in terms of environmental conditions, with by modern standards, poorly designed cooling and power which produce higher levels of carbon emissions.
- 2.10 These issues pose a significant risk to the availability of all ICT services for the council. There is a real risk that ICT service could be disrupted or fail. This will have serious consequences for the council's ability to continue to deliver its services.
- 2.11 The proposed disposal of Kings House and the major redevelopment of Hove Town Hall mean there is an urgent requirement to address the provision. The building work due to start work on-site January 2015, creates increased risk to the equipment housed there through vibration, dust, power and network interruption. The Workstyles programme amongst other initiatives is also creating an increased demand on ICT capacity which cannot be met from within the existing facilities.
- 2.12 Independent assessment of the main rooms has identified that there are significant structural and design issues that would prevent their redevelopment as fit for purpose data centre environments.

## **3 Benefits expected**

- 3.1 Benefits Table

Id	Current Situation	Benefit expected	Measured outcome that you hope to achieve	How the benefit will be measured?	Criteria the benefit meets (VfM, ICE, REG)
1	Data Centre environment is not resilient. Requires repeated intervention to accommodate day to day service.	Day to day service is resilient and fault tolerant.	ICT and Property & Design staff time not committed to just maintaining day to day service.	Availability of services, Downtime, Costs of faults, repairs	VfM
2	Data Centre can not cater for growth – both data growth and new services.	Service can accommodate both data growth and new/changed applications.	Projects and services are not delayed through lack of space	Time to deployment of agreed change work, Changes rejected through inadequate space	VfM
3	PSN CoCo and NHS N3 Security standards increasingly challenging to meet.	BHCC Compliance assured annually	Annual compliance with PSN CoCo, Annual compliance with N3	Compliance certificates annually awarded	REG
4	Information segmentation by security classification is not achievable.	Information can be segmented according to an assessment of its security level.	PSN 2015 CoCo Achieved, Successful segmentation of information	PSN 2015 Compliance awarded, Audits of information sharing and governance	REG
5	Availability of service outside of normal working hours is not assured.	Growing demand for availability of services 24/7 can be met.	Able to supply 24/7 availability as required by business areas without major	Tbc	VfM

			disruption/disproportionate cost		
6	Disaster recovery and business continuity requirements not adequately catered for	Assured provision of Disaster Recovery and business continuity requirements	DR service and BCP plans appropriately in place and tested on regular basis,  BC requirements of services reflected in ICT service capability	Annual DR testing,  Map BC plans to service capability,  Test BCP	VfM
7	Environmental impact of current data centres are above industry standards	Reduced environmental impact through reduced carbon emissions.	Reduction in energy consumption	Measurement of Kwh consumption on annual basis reduced by minimum 30%	VfM

## 4 Options appraisal

In summary the options available are as follows:

1. Recondition the existing rooms
2. New build on-premise
3. Co-location service
4. Hosted service
5. Co-location then hosted service

Options 3, 4 or 5 can all be supplied through either a shared or commercial service provider. Therefore for this options appraisal, shared service vs. commercial service is not considered. This is only a factor when the type of service has been selected.

### 4.1 Option 1 - Recondition existing computer rooms

### 4.2 Option Overview

For this option, the existing computer rooms in Hove Town Hall and Brighton Town Hall would be reconditioned to remediate as far as possible existing problems and to accommodate the service expansion required by the decommissioning of Kings

House. Technical evaluation from consultants has identified significant issues with renovating the existing rooms as the rooms do not have adequate space, poor access, security issues. The environment at Hove Town Hall will also be running significant risk during the extensive and lengthy building work at Hove Town Hall. This option presumes that this room can be maintained during the work. Significant additional cost would be incurred if a temporary data centre had to be installed during the building work.

### 4.3 Benefits

The benefits as described above for each option have been scored and the relative weightings applied for the consideration to be given.

Option 1	Recondition existing rooms			
ID	Benefit	Weighting	Score 1-5	Weighted Score
1	Resilience	3	2	6
2	Growth	1	2	2
3	Compliance	3	2	6
4	Information Governance	2	3	6
5	Service Availability	1	2	2
6	Disaster Recovery	2	2	4
7	Environmental Impact	2	2	4
	<b>Total</b>			<b>30</b>

### 4.4 Risks

Option 1	Renovate existing		
Risk	Likelihood	Impact	Score
Hove Town Hall room equipment suffers damage and outages during building work	4	4	16
Computer rooms still not fit for purpose leading to service failure	3	4	12
Rooms cannot accommodate unexpected service growth	4	3	12
Council unable to finance server and infrastructure refresh after 5 year lifecycle	3	3	9
Unknown or unplanned for requirements lead to	3	3	9

unexpected costs			
Pressures on in-house staffing lead to deterioration in services	2	2	4

## 4.5 Costs

<b>Option 1</b>	
<b>Capital</b>	
Renovation Costs	£1,250,000.00
Server & Storage Costs	£ 500,000.00
Transition Service Costs	£ 350,000.00
<b>Total</b>	<b>£2,100,000.00</b>
<b>Revenue</b>	Year 1
Power / Rental	£ 75,000.00
Hardware Refresh	£ 100,000.00
Maintenance	£ 170,000.00
Estimated cost of in-house management	£ 100,000.00
<b>Total</b>	<b>£ 445,000.00</b>
<b>TCO</b>	
5 Year	£4,325,000.00
7 Year	£5,215,000.00

## 4.6 Value and financial viability

This option provides a poor delivery of benefit at high cost. It also perpetuates existing risks through the use of existing poorly selected locations. This option is not recommended.

## 4.7 Option 2 - New Build on premise

### 4.8 Option Overview

Under this option a different BHCC site would be selected with appropriate space provision, allowing for expansion, with suitable structural, security and environmental conditions. Within the provided space a new data centre would then be constructed including – power, cooling, fire suppression, racking etc. The principle advantages of this option are the ability to make use of existing economies of scale for security spend and maintenance of building. The major issues with this issue are it will displace staff or partner space from local buildings. In trying to keep space to a minimum, it will also create challenges for planning for any growth in service, including growth in service availability out of hours.

## 4.9 Benefits

The benefits as described above for each option have been scored and the relative weightings applied for the consideration to be given.

Option 2	New Build on-premise			
ID	Benefit	Weighting	Score 1-5	Weighted Score
1	Resilience	3	4	12
2	Growth	1	2	2
3	Compliance	3	4	12
4	Information Governance	2	3	6
5	Service Availability	1	3	3
6	Disaster Recovery	2	3	6
7	Environmental Impact	2	4	8
	<b>Total</b>			<b>49</b>

## 4.10 Risks

Option 2	New build		
Risk	Likelihood	Impact	Score
Unable to find suitable space to accommodate data centre	4	3	12
Usage of space for data centre increases space pressure on Workstyles programme leading to increased cost	3	3	9
Council unable to finance server and infrastructure refresh after 5 year lifecycle	3	3	9



Unknown or unplanned for requirements lead to unexpected costs	3	3	9
Pressures on in-house staffing lead to deterioration in services	2	2	4

#### 4.11 Costs

Option 2	New Build
<b>Capital</b>	
Renovation Costs	£ 200,000.00
Server & Storage Costs	£ 500,000.00
Transition Service Costs	£ 955,000.00
<b>Total</b>	<b>£1,655,000.00</b>
<b>Revenue</b>	Year 1
Power / Rental	£ 50,000.00
Hardware Refresh	£ 100,000.00
Maintenance	£ 170,000.00
Estimated cost of in-house management	£ 100,000.00
<b>Total</b>	<b>£ 420,000.00</b>
<b>TCO</b>	
5 Year	£3,755,000.00
7 Year	£4,595,000.00

#### 4.12 Value and financial viability

This option is the simplest and least disruptive to manage for ICT, providing an assured purpose developed environment for ICT equipment. It is the joint cheapest option, but scores less well on risk and benefits. It will provide additional demand on valuable office accommodation. It provides challenges for the medium term planning around resourcing and managing increased demand both in scale and availability out of hours. It will also require clear asset refresh planning on a 5 year refresh cycle.

#### 4.13 Option 3 – Co-location

#### 4.14 Option Overview

In this option, space and power would be leased in a providers purpose built data centre. Existing and new BHCC owned and maintained server and storage equipment would be installed at the location. This would principally be managed remotely, with some limited bought service. Despite this it would be a requirement that the journey time to site for BHCC staff is not unacceptable, in case of

significant issues. Planning would still be required for refresh of equipment on a 5 year cycle.

#### 4.15 Benefits

The benefits as described above for each option have been scored and the relative weightings applied for the consideration to be given.

<b>Option 3</b>				
<b>Co-Location</b>				
<b>ID</b>	<b>Benefit</b>	<b>Weighting</b>	<b>Score 1-5</b>	<b>Weighted Score</b>
1	Resilience	3	4	12
2	Growth	1	3	3
3	Compliance	3	4	12
4	Information Governance	2	3	6
5	Service Availability	1	3	3
6	Disaster Recovery	2	3	6
7	Environmental Impact	2	4	8
<b>Total</b>				<b>50</b>

#### 4.16 Risks

<b>Option 3</b>	<b>Co-lo</b>		
<b>Risk</b>	<b>Likelihood</b>	<b>Impact</b>	<b>Score</b>
Unable to source appropriate supplier at cost and quality	2	4	8
BHCC lack the skills and experience to manage supplier, leading to risks	3	3	9

in quality of service and/or cost			
Supplier does not adequately meet security requirements	2	4	8
Unknown or unplanned for requirements lead to unexpected costs	3	3	9
Pressures on in-house staffing lead to deterioration in services	2	2	4

#### 4.17 Costs

Option 3	Co-lo
<b>Capital</b>	
Renovation Costs	£ 200,000.00
Server & Storage Costs	£ 500,000.00
Transition Service Costs	£ 934,000.00
<b>Total</b>	<b>£1,634,000.00</b>
<b>Revenue</b>	Year 1
Power / Rental	£ 175,000.00
Hardware Refresh	£ 100,000.00
Service	£ 40,000.00
Management of Service	£ 200,000.00
Maintenance	£ 148,000.00
<b>Total</b>	<b>£ 663,000.00</b>
<b>TCO</b>	
5 Year	£4,949,000.00
7 Year	£6,275,000.00

#### 4.18 Value and financial viability

Co-location as a long term strategy is the most expensive option, this is because many of the same service costs as on-premise are incurred, with additional costs through managing remotely and in paying a provider for their management of a high quality purpose build environment. This is a well established market model used widely across industry so there is little opportunity to drive down cost. Market provision is moving away from this model towards hosted environments as the service value that can be delivered at scale is greater for both provider and customer. While space is at a premium for office accommodation within Brighton and Hove, it may be cheaper to lease equivalent additional office space rather than rent co-location space long term.

#### 4.19 Option 4 - Hosted

#### 4.20 Option Overview

This option is a straight migration to a managed "cloud" type hosting model. The selection would be to a supplier who is able to supply PSN CoCo, IL2 and IL3 hosting environments with appropriate assurance. The service provider would supply the physical hosting environment and all server and storage infrastructure. Additionally they will supply management of this infrastructure, including backups, monitoring and security provision.

#### 4.21 Benefits

The benefits as described above for each option have been scored and the relative weightings applied for the consideration to be given.

Option 4	Hosted			
ID	Benefit	Weighting	Score 1-5	Weighted Score
1	Resilience	3	5	15
2	Growth	1	5	5
3	Compliance	3	4	12
4	Information Governance	2	4	8
5	Service Availability	1	5	5
6	Disaster Recovery	2	4	8
7	Environmental Impact	2	4	8
	Total			<b>61</b>

#### 4.22 Risks

Option 4	Hosted		
Risk	Likelihood	Impact	Score

Migration direct to hosted ahead of consolidation of server and storage infrastructure leads to delay and increased cost through suppliers action to reduce risk and complexity.	4	4	16
Unable to source appropriate supplier at cost and quality	3	4	12
BHCC lack the skills and experience to manage supplier, leading to risks in quality of service and/or cost	3	4	12
Supplier does not adequately meet security requirements	2	4	8
Unknown or unplanned for requirements lead to unexpected costs	2	3	6
Suppliers hosted infrastructure unable to host unusual or unexpected BHCC services	2	3	6

#### 4.23 Costs

Option 4	Hosted
<b>Capital</b>	
Renovation Costs	£ 200,000.00
Server & Storage Costs	
Transition Service Costs	£1,500,000.00
<b>Total</b>	<b>£1,700,000.00</b>
<b>Revenue</b>	Year 1
Power / Rental	£ 175,000.00
Hardware Refresh	
Service	£ 175,000.00
Management of Service	£ 146,000.00
Maintenance	
<b>Total</b>	<b>£ 490,000.00</b>
<b>TCO</b>	
5 Year	£4,180,000.00
7 Year	£5,172,000.00

#### 4.24 Value and financial viability

This option provides the fastest move to an option providing the greatest benefits and lowest running costs. However the risks associated with migration when the pace is being driven by outside factors are significant. There is a real risk that cost, time or both will grow significantly when the supplier carries out their due diligence. This is also likely to lead to inappropriate security classification and segmentation of data increasing either cost or risk (in hosted more secure data costs more to host). There are no real strategies to mitigate against the risk within this option.

#### 4.25 Option 5 – Co-location then hosted

#### 4.26 Option Overview

Under this option, the transition made initially to a co-location provider using existing and some new server and storage infrastructure. This allows for the maximum amount of virtualisation to be achieved, shrinking the footprint of the infrastructure and allowing time for assessment of the data security levels of data. The virtualised infrastructure and data is then moved across into the service providers PSN CoCo IL2 and IL3 hosted infrastructure, taking advantage of the lower running costs of hosted.

#### 4.27 Benefits

The benefits as described above for each option have been scored and the relative weightings applied for the consideration to be given.

Option 5	Co-location then Hosted			
ID	Benefit	Weighting	Score 1-5	Weighted Score
1	Resilience	3	5	15
2	Growth	1	5	5
3	Compliance	3	4	12
4	Information Governance	2	4	8
5	Service Availability	1	5	5
6	Disaster Recovery	2	4	8
7	Environmental Impact	2	4	8
	<b>Total</b>			<b>61</b>

#### 4.28 Risks

Option 5	Co-lo then hosted		
Risk	Likelihood	Impact	Score
Unable to source appropriate supplier at cost and quality	3	4	12

BHCC lack the skills and experience to manage supplier, leading to risks in quality of service and/or cost	3	4	12
Supplier does not adequately meet security requirements	2	4	8
Unknown or unplanned for requirements lead to unexpected costs	2	3	6
Suppliers hosted infrastructure unable to host unusual or unexpected BHCC services	2	3	6
Delays in migration to hosting leads to cost overruns	2	3	6

#### 4.29 Costs

Option 5	Co-lo - Hosted	
<b>Capital</b>		
Renovation Costs	£ 200,000.00	
Server & Storage Costs	£ 350,000.00	
Transition Service Costs	£ 934,000.00	
<b>Total</b>	<b>£1,484,000.00</b>	
<b>Revenue</b>	Year 1	Year 2
Power / Rental	£ 175,000.00	£ 175,000.00
Hardware Refresh		
Service	£ 40,000.00	£ 175,000.00
Management of Service	£ 100,000.00	£ 146,000.00
Maintenance	£ 148,000.00	
<b>Total</b>	<b>£ 463,000.00</b>	<b>£ 496,000.00</b>
<b>TCO</b>		
5 Year	£3,931,000.00	
7 Year	£4,923,000.00	

#### 4.30 Value and financial viability

This option provides for the best balance of strategic benefit and risk and the second best cost benefit. It should be recognised that there is a risk that delays to migrate to hosted once in co-lo will lead to cost overruns, therefore it is important that the follow on project is prioritised. It should also be recognised that BHCC will have created a critical service dependency on a supplier. Due diligence of the supplier and BHCC skill in managing the supplier will be crucial to ensure business continuity. It should also be noted that the PSN compliant full hosting market is not full mature yet. There is potential that new entrants will deliver greater value or lower costs ahead of a contract refresh point.

## 5 Evaluation

### 5.1 Benefits Comparison

Comparison		Option 1	Option 2	Option 3	Option 4	Option 5
ID	Benefit					
1	Resilience	6	12	12	15	15
2	Growth	2	2	3	5	5
3	Compliance	6	12	12	12	12
4	Information Governance	6	6	6	8	8
5	Service Availability	2	3	3	5	5
6	Disaster Recovery	4	6	6	8	8
7	Environmental Impact	4	8	8	8	8
	<b>Total</b>	<b>30</b>	<b>49</b>	<b>50</b>	<b>61</b>	<b>61</b>

### 5.2 Risk Comparison

All options present significant risks to the organisation but these vary significantly between the options. Options 1 and 4 have the greatest risk associated and ones which cannot be adequately mitigated. Risk mitigation strategies are viable for all other options.

### 5.3 Cost Comparison

The following table outlines

	£ Million		
	Capital	5 Year TCO	7 Year TCO
<b>Option 1 – Renovate existing</b>	2.1	4.3	5.2



<b>Option 2 – New build</b>	1.7	3.8	4.6
<b>Option 3 - Co-location</b>	1.6	4.9	6.3
<b>Option 4 – Hosted</b>	1.7	4.2	5.2
<b>Option 5 – Co-lo then hosted</b>	1.5	3.9	4.9

## 5.4 Evaluation Statement

Based on the balance of benefit, risk and cost, it is recommended that Option 5 is pursued. Consideration should be given to the very mixed market available through Shared and Commercial Service providers. A strong mix of sector specialists from should be involved to maximise the probability of high quality responses.

If this procurement is not successful then there are two options to consider – one is co-location for a medium term period suggest three years and re-examine the market conditions after two years. Second is carry out new build and again review market after three year period. Both will incur capital costs now and likely incur similar capital costs again a migration point in three years.

In order to ensure an appropriate balance of benefit, risk and cost is analysed during the evaluation process the following evaluation criteria are recommended.

<b>Weighting</b>	<b>Criteria</b>
20%	Information security and PSN requirements
10%	Environmental impact
10%	Service quality and assurance
5%	Service capacity growth
5%	Risk management
50%	Total cost of ownership

## 6 Budget

The ICT Investment fund set aside the following capital and revenue funds

### Investment Profile Capital & Revenue combined by Theme

	<b>13-14</b>	<b>14-15</b>	<b>15-16</b>	<b>TOTAL</b>
<b>Enterprise Content Management &amp; Records Management</b>	£ 230,000.00	£ 480,000.00	£ 535,000.00	<b>£1,245,000.00</b>
<b>Follow Me Desktop &amp; Replacement Operating System Delivery</b>	£ 400,000.00	£ 500,000.00	£ 300,000.00	<b>£1,200,000.00</b>
<b>Identity and Access Management &amp;</b>	£ 60,000.00	£ 300,000.00	£ 240,000.00	<b>£ 600,000.00</b>

<b>Customer Account</b>				
<b>Core Telephony Infrastructure &amp; Unified Communications</b>	£ 500,000.00	£ 225,000.00	£ 200,000.00	<b>£ 925,000.00</b>
<b>Local Area Network (LAN), Network Security &amp; core site wireless</b>	£ 100,000.00	£ 420,000.00	£ 230,000.00	<b>£ 750,000.00</b>
<b>Data Centre &amp; Utility Computing</b>	£ 200,000.00	£ 460,000.00	£ 550,000.00	<b>£1,210,000.00</b>
<b>TOTAL</b>	<b>£1,490,000.00</b>	<b>£2,385,000.00</b>	<b>£2,055,000.00</b>	<b>£5,930,000.00</b>

There is also £100k provision within the Workstyles ICT Budget.

The transition costs highlighted above are a combination of the following key elements, data centre, networking and infrastructure to support ECM and records management. There is therefore adequate investment funding available for the project.

With all the options there will be additional annual revenue costs associated with the provision of these services whether managed in-house, through a co-location or hosted service. There will be a reduction of existing energy budgets of approximately £75,000 and there are existing ICT budgets for maintenance of £170,000 and internal cost of management of the existing data centres of approximately £100,000. There will be a projected annual service pressure of between approximately £75,000 to £318,000 depending on the selected option.

## 7 Timescale

The key drivers for timescales are the service demands from multiple projects, especially Workstyles Phase 3. Building works at Hove Town Hall starting January 2014, also create the greatest level of risk for the existing Hove Town Hall computer room. The following outline timetable is suggested to mitigate the risk and make service available as quickly as possible.

<b>Activity</b>	<b>Date</b>
Finalisation of procurement approach	Mar-14
Issue of tender documents	Apr-14
Tenders returned	Apr-14
Technical & Financial Evaluation	May-14
Site Visits	May-14
Clarification Period	May-14
Contract Award	May-14
Contract Commencement	Jun-14
Pre-Migration Tasks	Jul-14
Migration Tasks	Oct-14
Service Commencement	Jan-15