Deloitte.

MitCo Design Advice.

A Report to Ofcom

18 November 2011

Contents

Important Notice

This report (the "Report") has been prepared by Deloitte LLP ("Deloitte") for the Office of Communication ("Ofcom") in accordance with the Service Requirement Letter for the provision of consultancy services under the Ofcom Consultancy Framework (MC/09) dated 14 September 2011 (referred to as "the Contract") and on the basis of the scope and limitations set out below.

The Report has been prepared solely for the purposes of informing Ofcom on options and approaches for constituting MitCo, as set out in the Contract. It should not be used for any other purpose or in any other context, and Deloitte accepts no responsibility for its use in either regard.

The Report is provided exclusively for Ofcom's use under the terms of the Contract. No party other than Ofcom, is entitled to rely on the Report for any purpose whatsoever and Deloitte accepts no responsibility or liability to any party other than Ofcom in respect of the Report and/or any of its contents.

The information contained in the Report has been obtained from Ofcom and third party sources that are clearly referenced in the appropriate sections of the Report. Deloitte has neither sought to corroborate this information nor to review its overall reasonableness. Further, any results from the analysis contained in the Report are reliant on the information available at the time of writing the Report and should not be relied upon in subsequent periods.

Accordingly, no representation or warranty, express or implied, is given and no responsibility or liability is or will be accepted by or on behalf of Deloitte or by any of its partners, employees or agents or any other person as to the accuracy, completeness or correctness of the information contained in this document or any oral information made available and any such liability is expressly disclaimed.

This Report and its contents do not constitute financial or other professional advice, and specific advice should be sought about your specific circumstances. In particular, the Report does not constitute a recommendation or endorsement by Deloitte to invest or participate in, exit, or otherwise use any of the markets or companies referred to in it. To the fullest extent possible, both Deloitte and Ofcom disclaim any liability arising out of the use (or non-use) of the Report and its contents, including any action or decision taken as a result of such use (or non-use).

Scope

The scope of the Contract defined in the Service Requirement Letter dated 14 September 2011 has been delivered and presented in the following sections of this Report.

The Contract	Relevant sections of this Report
How MitCo might best be constituted and structured to achieve the tasks set out in paragraph 1.6 [of the Contract and with respect to consumer-based mitigation]	• Section 2 presents the nature of consumer demand which MitCo will service • Section 4 presents options for the strategic design of MitCo, how it should be constituted and structured
How the tasks that MitCo will likely be required to undertake under paragraph 1.7 [of the Contract and with respect to levels of consumer support] might best be delivered	• Section 3 presents options for the levels of consumer support MitCo could provide
The key delivery challenges and risks that it is likely to face and how they could be managed and mitigated to ensure a successful delivery	• Sections 5 and 6 present the operational and commercial design challenges for successful delivery by MitCo • Section 7 presents risks and recommendations

1 Executive summary

1.1 Purpose of this Report

New mobile services in the 800 MHz band will lead to interference to existing DTT (Digital Terrestrial Television) services. Without action to mitigate the interference, Ofcom estimate that 2.2m households could lose access to DTT services. Approximately, 40 per cent of households use DTT as their primary means of accessing TV, so around 870,000 DTT-only households could lose some or all of their TV channels.

There are a range of approaches to reducing interference affecting DTT viewers, including:

- Consumer-based mitigation (i.e. provision of filter equipment for installation to affected TV sets); and
- Network-based mitigation (changes made by mobile network operators to the configuration and location of their Long Term Evolution (LTE) base stations so as to reduce the source of possible interference).

In practice, the optimal approach to the interference problem is likely to combine these approaches.

In its June 2011 consultation[1], Ofcom proposed that an organisation is established ("MitCo") to identify and implement such an approach. MitCo would provide support to consumers and identify and secure opportunities for efficient network-based mitigation.

The **purpose of this Report** is to present the findings of an eight week study which examined the key design features of MitCo. This has comprised analysis to address the following questions:

- Who should be responsible for mitigation and, thus, control MitCo activities;
- What are the capabilities, indicative costs and implementation timeframes for operating MitCo; and
- What approaches should be taken to funding and commercial incentives such that MitCo is a viable proposition for both the Government and the potential provider?

This Report builds on the issues presented by Ofcom in the June consultation by setting out options and proposals for further deliberation by Ofcom and policy-makers.

1.2 Nature of the challenge

The challenge of interference mitigation is for the most part concerned with organising the contact centre, distribution and field force capabilities needed to meet DTT consumers' future demand for DTT receiver filters. This demand can, of course, be lessened through network-based mitigation.

There are, however, a number of issues that add complexity to the problem of mitigating interference to DTT consumers:

- **High consumer expectation**. The function of DTT interference mitigation is to solve an emergent deficiency to an established service. Therefore, the level of support expected by consumers, particularly those who may have recently 'switched to digital', is high. The consumer expectation is likely to be greater than when, say, a service is being improved or a brand new service is being offered, because the cost incurred from poor quality provision in this case is one of an actual loss, as compared to a potential future benefit being withheld.
- **Demand uncertainty**. The likely consumers that will require support is dependent on how future 800 MHz mobile network operators rollout. Demand is, therefore, contingent on their individual strategies and, thus, a host of non-DTT related considerations. This creates inherent uncertainty in the demand for mitigation service and a risk to how it is provided. To illustrate a converse

[1] Ofcom 'Coexistence of new services in the 800 MHz band with digital terrestrial television, June 2011

case, for Digital Switchover, the provision of switchover services can be planned within broad parameters defined by DUK and the BBC itself.

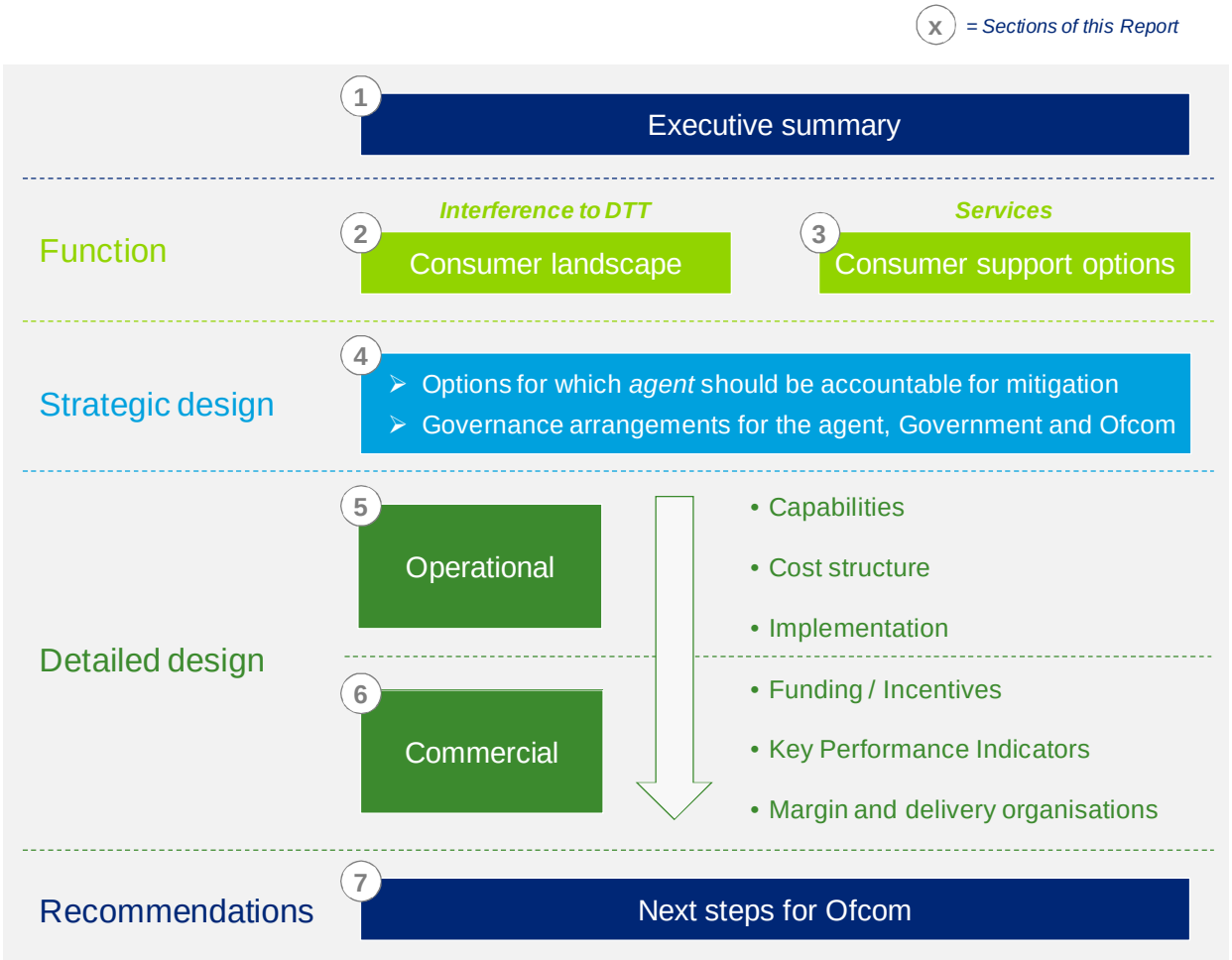
- **Balancing mitigation options**. As noted earlier, there are two main options for dealing with interference (consumer-based and network-based mitigation). The most effective approach is likely to involve a mixture of both mitigation types. Therefore, the optimal balance will depend upon the providers of these services having sufficient knowledge of the relative costs and benefits of each in particular cases and in them coordinating effectively.
- **Managing auction efficiency**. The cost of future DTT interference mitigation could be borne to some extent by the Mobile Network Operators (MNOs) successful in the 800 MHz auction. Therefore, the cost and risk of mitigation needs to be sufficiently understood, bound and communicated to MNOs so as to minimise uncertainty in their valuation of the spectrum being awarded to them.

Therefore, the challenge in defining an appropriate approach to mitigation and a structure for MitCo is that it accommodates the above complexities. The analysis presented in this Report covers these points by defining the *functions* MitCo will need to perform, before considering what *form* it could take to deliver those functions:

- Sections 2 and 3 of this Report consider the functions of MitCo in terms of future DTT consumer demand arising from interference and possible options for the levels of consumer support MitCo could provide in servicing that demand;
- Sections 4 to 6 consider what form MitCo should take, both in terms of the broad strategic approach and then with respect to operational and commercial design; and
- Section 7 presents recommendations.

Figure 1.a visually presents the analysis considered in this Report.

Figure 1.a: Structure of the analysis presented in this Report



1.3 Consumer landscape

The consumer landscape MitCo will be required to address is dependent on the scale of the DTT interference problem and the demographics of the consumer population. At an aggregate level, one can arrive at a reasonable understanding of the nature and incidence of interference to DTT. Broadly, this will equate to 2.2m households, of which:

- 0.4m households will have standard domestic installations (i.e. roof top aerials to receive DTT, with no amplifier);
- 0.9m households are located in blocks of flats or other communal dwellings; and
- 0.9m households are non-communal and use an amplifier to boost the DTT signal they receive.

There is considerable uncertainty and likely variability with regards to how interference will bear out in particular locations and over time.

This uncertainty exists primarily because the location and timing of interference is fully dependent on how MNOs decide to roll out their future network. This will be driven by considerations that are separate and unrelated to DTT. Rather, it will be driven by the particular commercial strategies MNOs may wish to deploy.

The geographical spread of MitCo's activity will be national. Coupled with variability in activity volumes over time, this will naturally build-in complexity and cost in how it operates. Therefore, MitCo will require sufficiently capable demand forecasting expertise, as well as sufficient scale and coverage in its operations to be resilient to variable workload.

Section 3 of this Report sets out the likely interference problem and presents scenarios of how this could happen based on how MNOs roll-out future LTE networks.

1.4 Consumer support

The consumer support MitCo could offer operates on a service continuum, with the addition of each distinct service building to provide a greater level of support to households experiencing interference. This Report considers six options ranging from information only, through to providing a combination of information, filter distribution, contact centre support and installation services to particular groups of consumers.

The key considerations and various advantages and disadvantages of each of these consumer support options are explored in detail in Table 3.c of this Report[2], alongside indicative costings to illustrate the cost of the capabilities required to deliver incremental increases in consumer support services.

Importantly, the stance MitCo takes in terms of consumer-based mitigation is dependent on the level of network-based mitigation that takes place. Network-based mitigation offers the opportunity to lessen the incidence of interference to DTT and, therefore, the demand for DTT receiver filters. The most cost effective approach to mitigating interference is likely to involve a mixture of both mitigation types and this will, in turn, depend upon MitCo having reliable information on the relative costs and benefits of consumer and network-based mitigation in particular cases.

1.5 Strategic design and governance

Five broad approaches to the strategic design of MitCo have been considered: a Broadcaster-led MitCo; a Mobile Network Operators-led MitCo; a third party contractor established through a procurement as the provider of MitCo services; MitCo as an arm's length body of Government; or MitCo established as a public-private partnership between Government and a third party.

Of the five broad approaches examined, a structured assessment of these (see Section 4.5) suggests that the MNO-led and the Contracting approaches are the most attractive and warrant further consideration by policy-makers.

---

[2] Table 3.c: Assessment of consumer support options, pp. 23-24

Given the capabilities required of MitCo will be, for the most part, those that are regularly contracted out in business and by Government, i.e. field force, contact centre and distribution capabilities, Contracting offers a relatively standard model with a clear focus on service delivery. In addition, the Government could achieve value for money through the procurement / tender exercise in awarding the contract and such an exercise could be initiated early, ahead of the 800 MHz spectrum auction. A key set of risks with the Contracting approach is that it does not sufficiently address issues that are specific to this policy area:

- Facilitating an optimal balance of choices between network-based mitigation delivered by MNOs and consumer-led mitigation by MitCo; and
- Avoidance of delays to rollout of the new mobile network.

With regards to those key risks, a MitCo led by MNOs may offer a more attractive approach because it places accountability for the balance of network and consumer -based mitigation with the parties best placed to understand the trade-offs and coordinate action. By extension, it minimises delays to network rollout by placing DTT interference mitigation with the MNOs themselves. Key implications of the approach, however, are that: a robust set of KPIs are in place and clear governance arrangements that monitor compliance.

Overall, we believe both the MNO-led and Contracting approaches could be made to work. On balance, the MNO-led approach (Option 2) appears relatively attractive. Further detail of the benefits and risks in relation to both approaches are presented in Section 4.

1.6 Operational design

MitCo's capabilities will be dependent on the level of consumer support it is required to provide. Those capabilities will need to integrate in an effective end-to-end process and could include:

- Demand forecasting;
- Information campaign design and management;
- Contact centre and online platform operation;
- Warehousing and distribution;
- Field force operation and scheduling, where applicable; and
- Business and support services.

To ensure that the correct consumer mitigation solution is delivered to the correct consumer in an appropriate timescale, MitCo needs to ensure that forecasts of future workload coordinate effectively with resource management in each of its business units, e.g. contact centre, distribution, information and field force / installations, where applicable. In practice, this translates into a number of key service hand-offs that must be effectively managed under a single executive function responsible for the entire service operation.

Analysis of possible unit cost efficiencies, based on benchmarking, suggest that there is a reasonable range of cost uncertainty in MitCo's operations. This cost uncertainty should be managed through the commercial arrangements put in place with the MitCo provider such that it is incentivised to deliver cost under-runs and savings through the range.

1.7 Commercial design

A target cost incentive fee arrangement (TCIF) would seem the most appropriate funding option for MitCo on the basis that the cost uncertainty inherent in its operations is significant enough to preclude a fixed or firm price arrangement, though not so acute as to warrant ascertained cost or 'cost plus' funding types.

There are two aspects to the TCIF arrangements one may wish to place on the MitCo provider, namely:

- the level of the target cost; and

- the incentive fee or shareline arrangement.

'Strawman' options have been presented in this Report for both the MNO-led approach and the Contracting approach based on an analysis of the reasonable cost spread relevant to MitCo's activities.[3]

In addition to their use in controlling costs, incentive arrangements may need to be applied to other important factors valued by the Government, such as the quality of service delivery. These aspects are defined through output-based metrics or key performance indicators (KPIs). KPIs will serve to supplement and sharpen the MitCo provider's natural incentives. This Report has presented 'strawman' KPIs on key aspects of MitCo's service delivery.[4]

Given the nature of incentive arrangements is intimately linked to the level of consumer support MitCo will provide, as well as *who* is accountable for mitigation, further analysis will be required once a decision has been made by policy-makers on the appropriate consumer support option and on the overall strategic approach to be taken (whether, for example, a MNO-led MitCo, Contracting or otherwise).

Further work to refine cost estimates for MitCo, following decisions by policy-makers, should also be undertaken to provide the basis of a robust target cost for MitCo, to ensure cost efficiency incentives are consistent and reward for efficiencies is commensurate with the effort required to achieve them.

1.8 Recommendations

The analysis contained within this Report is structured to provide advice on three key components of MitCo's overall design, as highlighted in Section 1.1 above:

- With regards to responsibility for mitigation, an MNO-led or Contracting approach appear to be the leading options for the operation of MitCo (detailed analysis outlined in Section 4.5);
- The capabilities and costs of MitCo are entirely dependent on the level of consumer support MitCo will be required to deliver. We have presented a range of options for these services and supporting capabilities in Sections 3.3 and 5.2; and
- The funding and commercial arrangements for MitCo depend on which strategic design model is preferred (i.e. MNO-led or Contracting). We have presented the high-level commercial considerations for each of these options in Section 6 of this Report.

We understand that decisions are to be made by policy-makers on:

- The level of consumer support MitCo will be required to provide (explored in Section 3 of this Report); and
- The overall approach to MitCo in terms of its institutional arrangements (explored in Section 4 of this Report).

On the basis that those decisions are made, recommended areas of development in the design of MitCo are likely to involve:

- Refinement of the **cost estimation** so that it can act as a basis for commercial discussion and decision (see assumptions and caveats at Annex A);
- Further analysis in terms of the costs and benefits of **network-based mitigation**;
- Development of a detailed definition of the **remit** of MitCo, based on the feedback from Government and other stakeholders, including the level and nature of consumer support, the detailed commitments to the consumer and other stakeholders, its financial principles and its protocols for consumer and wider stakeholder engagement;
- The role, remit and constitution of the key **governance arrangements**, e.g. the Oversight or Supervisory Board and supporting external governance structures for MitCo, including the commercial and operational relationship between MitCo, the Supervisory Board and Ofcom;

[3] See Figure 6.d and Figure 6.e, pp. 68-69
[4] See Figure 6.g and Figure 6.h, pp. 71-72

- Development of the detailed **funding and incentive arrangements** which the Government should establish with MitCo;
- Development of the **key performance indicators** required to monitor the performance and impact of MitCo and against which it will effectively be contracted to deliver. This should include the definition of a set of operational KPIs defining the operational standards MitCo should aim to achieve;
- Development of a framework of feasible and proportionate **sanctions** that could be applied to MitCo and/or its shareholders for not meeting key performance indicators; and
- **Implementation and set-up** of MitCo, including for example, the process for setting up the MitCo legal and corporate structure and definition of the key programme activities and milestones, including key assumptions and dependencies.

2 Consumer landscape

The purpose of this section is to present the nature and scale of the interference problem, which will drive demand for mitigation, whether network-based and/or consumer-based.

This demand is fully dependent on how mobile network operators (MNOs) roll out their future LTE networks. Network rollout strategies will drive when and where interference occurs for DTT consumers and thus when and where MitCo needs to provide consumer support (or consider network-based mitigation).

The following sections first present the totality of the likely interference problem and then consider scenarios for network rollout which will affect how interference may occur over time.

2.1 Nature of interference

Interference to DTT services from the rollout of mobile services in the 800 MHz band is estimated to affect between 1.9 million to 2.4 million households (HHs) in the UK, depending on the scale and power of the networks established by MNOs. Of these households, approximately 40% are assumed to use DTT as their primary television platform.[5]

A larger number of mobile base stations across the UK or the presence of base stations transmitting at higher power will both drive an increase in the overall levels of interference experienced by DTT consumers, and vice versa.

Figure 2.a below presents the overall levels of interference estimated at low, high and central levels of base station deployment / volume, assuming that all operators transmit at the maximum permissible power level across all base stations.

Figure 2.a: Estimated number of HHs affected without mitigation across network scale scenarios

	Low volume scenario (27,000 base stations)[6]	**Central volume scenario** (34,000 base stations)	**High volume scenario** (39,000 base stations)
Primary DTT HHs	762,000	875,000	956,000
Total UK HHs with ability to receive DTT	1,925,000	2,209,000	2,414,000

Source: Ofcom technical analysis[7]

Not all HHs in the UK use the same type of DTT installation and different installation types have varying levels of susceptibility to interference. Understanding the extent to which DTT interference affects each of these installation types is a key requirement in understanding the consumer landscape MitCo will be required to address.

The Ofcom technical analysis segmented interference volumes by three types of DTT installation. These are:

- **Standard Domestic Installations (SDI):** HHs which use a roof-top aerial to receive DTT with no amplifier (approximately 13 million HHs or 47% of total UK HHs);

[5] Based on Ofcom's latest 'Communications Market Digital Progress Update Report' (Q1 2011) which stated that 39.6% of UK HHs use DTT as their only means of receiving TV. Other HHs use an alternative platform (cable, satellite etc) as their primary means of receiving TV, but may have DTT on a secondary set.
[6] Base station figures assume three LTE networks co-located at base station sites (i.e. 9000 sites equates to 27,000 base stations)
[7] Results from Ofcom Punch modelling from 10th November 2011

- **Communal aerial systems (CAS):** HHs located in blocks of flats or other communal dwellings that use a single DTT receiver aerial with the signal boosted through an amplifier and distributed to each dwelling (approximately 5.6 million HHs or 20% of total UK HHs); and
- **Domestic installations with amplifiers (DIA):** non-communal HHs that use an amplifier to boost the DTT signal, either integrated with the aerial or as an indoor booster aerial (approximately 9 million HHs or 33% of total UK HHs)

Figure 2.b summarises the levels of interference experienced by UK HHs by DTT installation type assuming a central case network volume and no mitigation.

Figure 2.b: Estimated number of HHs affected without mitigation and with consumer based mitigation only by HH installation type

	SDI	CAS	DIA	**Total**
HHs affected by interference	372,000	920,000	917,000	2,209,000
HHs losing DTT services after consumer based mitigation	16,400	9,400	9,100	34,900

Source: Ofcom technical analysis

The type and levels of consumer mitigation that may be required to correct the DTT interference, and hence drive activities for MitCo, vary depending on a number of features:

a) The type of *DTT installation* used by the consumer;

b) The *social or economic characteristics* of the consumer (i.e. they may be elderly or vulnerable); and

c) The speed at which the MNOs *roll out* their networks.

Both points a) and b) represent complexity in the consumer landscape that MitCo will need to manage within the overall framework of consumer support determined by policy-makers; options in this regard are explored in more detail in Section 3 of this Report. For example, interference to CAS or DIA HHs, or to HHs with vulnerable people, could necessitate a higher level of service provision to resolve than the simple supply of information or telephone advice.

With regard to point c), the network rollout strategies employed by MNOs may not affect the overall levels of interference experienced by consumers, but they will have a significant impact on the time profile of MitCo's activities and hence the scale and scope of capabilities MitCo is required to deploy in a given year.

The following sections explore how network rollout could affect the scale of MitCo's activities over time.

2.2 Stylised scenarios for LTE network rollout

The study has developed three scenarios for how mobile network rollout could occur in order to analyse the likely affect on MitCo's required activities and costs. These scenarios are naturally stylised, but they set the bounds within which we reasonably believe consumer demand will rest.

The scenarios for future LTE network rollout and their underpinning assumptions have been developed from an examination of how the current 3G networks have developed (see Box 2.c).

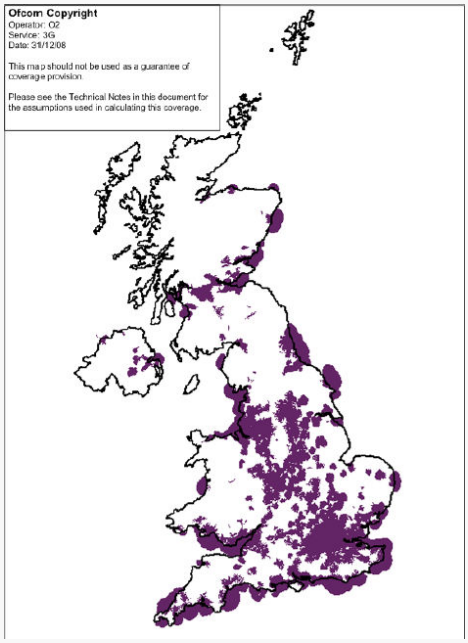
Box 2.c: Lessons from 3G rollout

In considering scenarios for future LTE/4G rollout, we have discussed the pattern of 3G rollout, a potential yardstick, with members of the Ofcom network coverage team.

Key features of 3G which form a starting point for considering LTE/4G rollout include:

- MNOs focused their initial network rollouts on areas of high population density (marginal cost / benefit);
- MNOs predominantly chose existing brownfield sites / upgrades to existing base stations, rather than new sites;
- Initial rollout in high population density areas occurred in the first 2 to 3 years after commencing rollout in 2003/2004. Overall, there was a delay in developing 3G coverage after licences were obtained (lack of compatible handsets and uncertainty on market opportunity), with network coverage to 87% of the UK population (76% coverage by geography) by Qtr 2 2010 (6 to 7 years after start of rollout);
- Even now, the 3G network does not have the same level of coverage as the pre-existing 2G network (due to technical constraints with 3G frequency); and
- There was a new entrant building network capacity (i.e. 3) undertaking an accelerated rollout over 3 to 5 years to develop infrastructure.

The figures below are 3G coverage maps for two MNOs developed by Ofcom in 2009. They illustrate the initial focus on areas of highest population density by MNOs following 3G rollout and provide an indication of the relative speed of the new entrant's network rollout versus a competitor.



MNO 3G network coverage as at 31/12/08[8]

New entrant 3G network coverage as at 31/12/08

Although analysis of the 3G network rollout provides a series of useful parameters to inform LTE network rollout scenarios, there are a number of critical differences that indicate that the rollout of the LTE network could be accelerated significantly versus the time to establish the 3G network. This assumption is driven by three considerations:

[8] Ofcom 3G Coverage maps, 8th July 2009

- **Maturity of the data market**: whilst the 3G licences were sold with uncertainty over the data market, the market is now known to be sizeable and the MNOs are aware there is demand they are not currently addressing;
- **Maturity of handsets and certainty over end-user demand**: whilst the UK was one of the first countries to sell 3G licences in 2000, other nations have already auctioned LTE spectrum and manufacturers have already developed handsets to address the LTE market; and
- **Efficiencies from LTE:** the efficiency benefits from LTE data transfer are likely to mean the MNOs plan their rollout to realise benefits as quickly as possible

As a result of these factors, it is possible that MNOs could deliver LTE coverage to areas of high-population density in 1 to 2 years with a proportional acceleration of rollout in other areas of the UK.

From this analysis and leveraging lessons learned from the 3G network rollout, we have developed a series of high-level assumptions that constitute the framework for our scenario analysis. These key assumptions are:

- MNOs prioritise rolling out their network in areas of *high population density*;
- MNOs use *brownfield sites* / upgrade on existing base station sites;
- *Cost of base station upgrade* is equal between sites and the MNOs upgrade an even number of base stations per annum;
- The UK is segmented by *DTT transmitter regions* for the purpose of analysing the interference impact of network rollout (in line with Ofcom technical modelling);
- Base stations have been allocated between regions using a *proxy based on population size*;
- Highest level of *consumer support* (e.g. as included in the Ofcom consultation document) has been assumed – this will be flexed under consumer support options;
- There is a *linear relationship* between base station activation numbers and interference[9];

These assumptions are intended to bound the likely DTT interference problem and thus the challenge for MitCo and are not intended to be detailed considerations of the likely reality of rollout. In reality the actual network rollout strategies for MNOs are likely to highly commercially sensitive and will vary in response to the strategic priorities of the MNOs. We have assessed the impact on the size and scope of MitCo from three LTE network rollout scenarios, which are summarised in Figure 2.d below:

Figure 2.d: LTE network rollout scenarios considered

1. Fast / Uniform	All new licensees roll out networks at a uniformly fast pace to achieve full coverage within 3 years
2. Slow / Uniform	All new licensees roll out networks at a slower pace to achieve full coverage within 5 years
3. Split	Mirror 3G, with one MNO rolling out their network to full coverage within 3 years for Block A with the other two MNOs rolling out on a slower basis over 5 years.

Source: Deloitte analysis

The three scenarios are constructed for the following purposes:

- **Fast / Uniform:** designed to test the upper boundary of MitCo's levels of activity with all MNOs undertaking an accelerated roll out of their networks to establish competitive advantage;
- **Slow / Uniform:** designed to test the scale of MitCo's activities and costs with MNOs pursuing a network rollout more in line with the pace of the 3G network development; and

[9] A simplifying assumption agreed with Ofcom. e,g. activation of 50% of base stations in a given region causes 50% of modelled DTT interference levels

- **Split:** designed to mimic the affect of a new entrant rolling out one network block at an accelerated pace to build capacity, with other MNOs pursuing a slow / uniform strategy.

2.3 Rollout scenarios

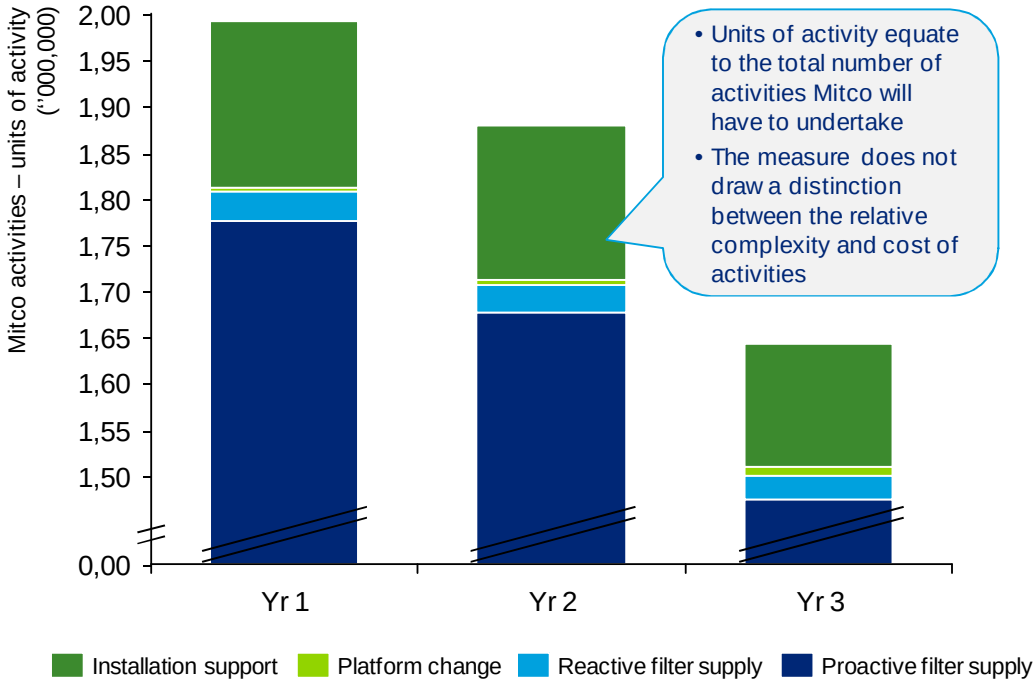
The volumes of interference established through Ofcom's technical modelling imply a range of consumer mitigation activities which in turn inform the implied cost base of MitCo.

2.3.1 Activity profile for MitCo

This analysis assesses the level of activity MitCo would be required to undertake to address the DTT interference driven by rollout of the LTE network by MNOs. These activities may range from the despatch of filter equipment to affected HHs, to the provision of an installation service or platform change for more complex interference problems[10].

Figure 2.e: Activity profile by activity component for Scenario 1 and Scenario 3[11]

Rollout Scenario 1



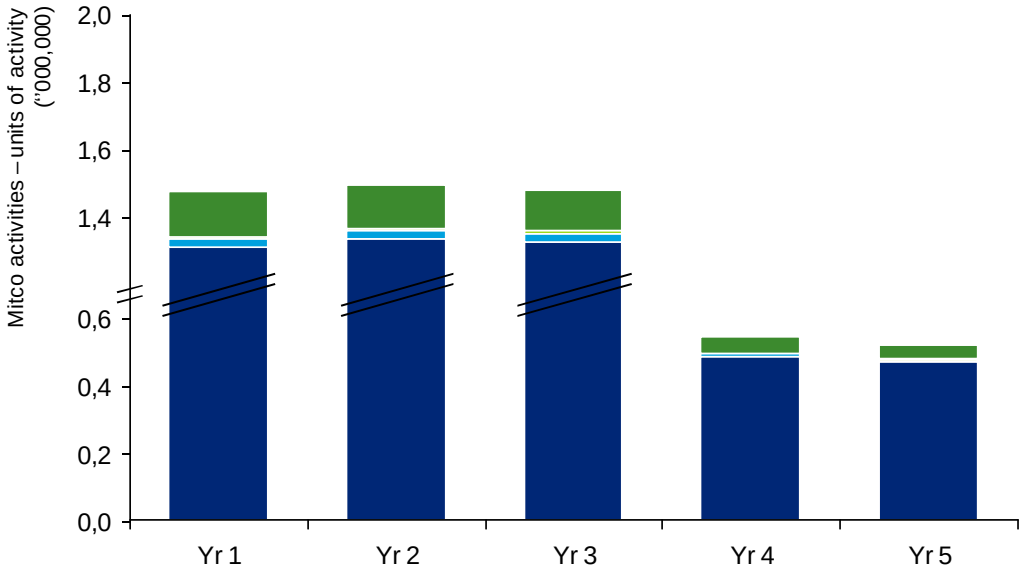
Source: Deloitte analysis based on Ofcom data[12]

[10] Assumptions around the nature of activities MitCo will undertake to resolve a given interference problem are determined by the consumer support framework MitCo is required to operate within. All analysis in this section of the Report assumes the highest level of consumer support

[11] Analysis assumes central case interference volumes with MitCo providing support to HHs in which DTT is the primary TV platform. Scenario 2 has been analysed but not presented, as scenarios 1 and 3 represent more probable rollout options

[12] Ofcom data taken from the results of Punch modelling as at 10th November 2011

Rollout Scenario 3



Source: Deloitte analysis based on Ofcom data

In the context of consumer-based mitigation, MitCo is predominantly concerned with the proactive purchase and distribution of filters to consumers for self-install (i.e. before DTT users experience interference), which broadly represents 90% of its total activities under Consumer Support Option 6.

Potential consumer support activities are outlined below and are explored in more detail in Section 3.3.

- **Proactive filters:** Due to the difficulty in effectively targeting the supply of filters to HHs likely to be impacted by interference prior to interference actually occurring, it is necessary to supply a larger number of filters than the volume of affected HHs in order to have a reasonable level of confidence that filter reach the required HHs. Once MitCo commences operations, it is possible that more precise demand forecasting could improve the targeting to/of affected HHs, potentially reducing the level of proactive filters required. The cost impact of more effective targeting is explored in Section 5.3.2.

- **Reactive filter supply:** This represents the filters MitCo needs to distribute to HHs that were not cured proactively. As the level of consumer support assumed in the rollout analysis involves an emphasis on resolving interference issues *before* interference occurs where possible, the consequential level of reactive filter supply is comparatively low[13].

- **Installation support activities:** This relates to MitCo installing filters on behalf of consumers is largely driven by services supplied to DIA HHs. Although CAS HHs experience the largest volume of interference (from the Ofcom technical modelling), due to the communal nature of the TV service to these HHs (i.e. a single aerial and amplifier) a single installation activity can resolve the interference problem for multiple HHs, reducing the overall level of activity for MitCo. In contrast, under the assumed level of consumer support, each DIA HH may require individual installation support to correct the interference problem.

- **Platform changes:** In the event that other forms of consumer mitigation are incapable of correcting the interference, MitCo could provide a change to a different platform to retain TV services for consumers. This is a consumer option of *last resort* as it represents a loss of DTT (and is generally more costly).

In terms of the overall scale of MitCo's undertakings, the rollout analysis provides a bounded range of activities that serve to inform size and scope of the capabilities MitCo would need to develop and operate.

[13] Proactive filter supply is assumed for SDI and DIA HHs only. Due to the comparatively higher cost of CAS filters, it is assumed that all CAS HHs experiencing interference are dealt with reactively i.e. after interference has occurred

These ranges include:

- c.1 million to 1.7 million filters supplied per annum (depending on rollout scenario), equating to between 4,000 to 7,000 filters despatched per working day;
- c.100,000 to 160,000 installations per annum, broadly equating to between 400 to 600 installations per working day; and
- A limited number of platform changes of between c.4,000 to 6,000 per annum.[14]

Importantly, these averaged activity figures do not provide an indication as to the variable nature of when and where interference may occur. For example, under 'Rollout Scenario 3', the number of filters MitCo may have to supply to consumers ranges from c.1.3 million per annum in year 1 to c.500,000 per annum in year 5. In addition, there may be considerable geographical variation in where installation support is required, potentially necessitating national field force coverage.

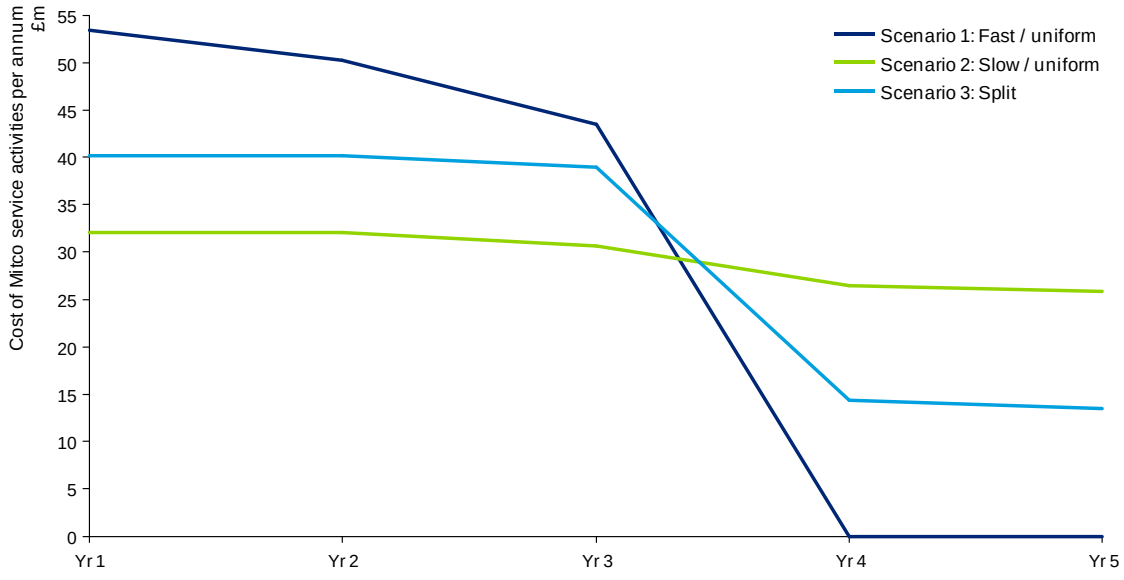
The level of uncertainty over these peaks and troughs and the regional spread of activities indicates that MitCo may require both national coverage and significant resilience in services to meet consumer demand effectively. Both of these factors suggest that sub-contracting key elements of service delivery (most obviously field force operation and logistics and distribution) may be highly beneficial to the agent responsible for operating MitCo, by enabling MitCo to exploit established national infrastructure and the necessary skills, expertise and operational resilience to meet demand without operating an excessive and inefficient cost base.

2.3.2 Cost profile for MitCo

The levels of activity MitCo is required to undertake drive the cost of MitCo's service provision, with the complexity of different mitigation activities being borne out in higher costs for those activities.

Figure 2.f below outlines the per annum cost of each of the three rollout scenarios assessed.

Figure 2.f: Cost profile by cost element by rollout scenario over time[15]



Source: Deloitte analysis based on Ofcom data

[14] These figures assume no network based mitigation. In reality, it is likely that network based mitigation to specific base station sites could have a significant impact on the overall loss of DTT services, with a consequential reduction in the number of platform changes (potentially between 6,000 to 10,000 platform changes in total assuming network mitigation at 1% to 5% of base stations – *Source: Ofcom analysis*)

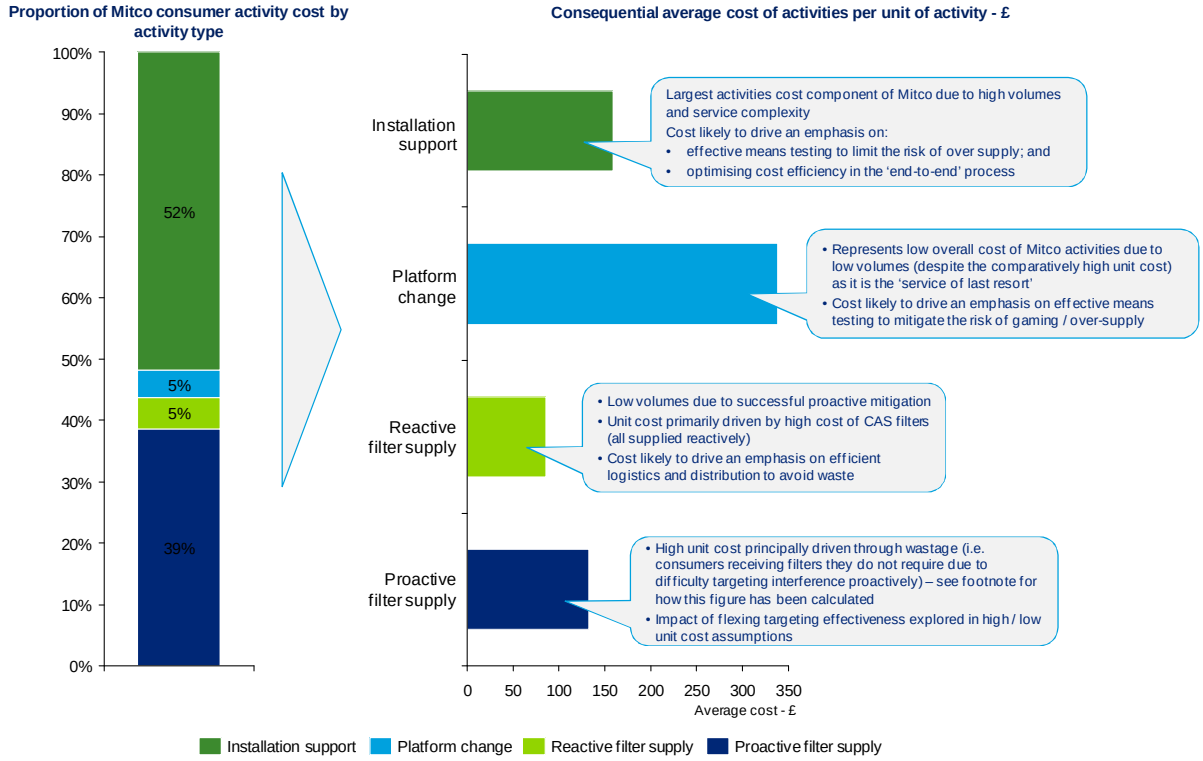
[15] Analysis assumes central case interference volumes / ML costs with MitCo providing support to HHs in which DTT is the primary TV platform and that total volumes of interference do not vary between scenarios.

Figure 2.g illustrates the consequential unit cost base of MitCo by activity types.

The analysis indicates that the provision of proactive filters and the supply of installation support are the principle components of MitCo's overall expenditure on consumer mitigation (representing approximately 90% of total spend on consumer mitigation activities) under Consumer Support Option 6.[16]

In the case of proactive filters, this cost is largely driven by wastage in the supply of filters due to the difficulties associated with effective targeting of likely interference prior to base station activation. The sensitivities around effective targeting are explored in the high and low unit cost analysis in Section 5.3.2.

Figure 2.g: Cost proportion by consumer activity type[17]



Source: Deloitte analysis based on Ofcom data

The high cost of installation support is a result of the complexity of providing home installations. As well as the labour cost and operating expenditure associated with maintaining a fleet and engineer field force, the installation support process involves a range of activities, including:

- effective *diagnosis* of those eligible for installation support;
- *coordination* between the diagnostician and field force scheduling;
- *scheduling* of a field force visit with the consumer; and
- *visit* to the consumer to undertake installation.

[16] Cost of direct consumer mitigation activities only. Cost excludes fixed and semi-variable cost elements such as an information campaign, contact centre operation, online portal development and operation and corporate overhead

[17] **Proportion of MitCo consumer activity cost by activity type** only includes the costs associated with consumer mitigation activities. It does not include fixed and semi-variable cost elements of MitCo (i.e. provision of information, operation of the contact centre and an online portal or any corporate overhead)
Consequential average cost per unit of activity has been calculated by dividing the total cost of the consumer mitigation activity by the volume of the activity MitCo performs. Proactive filter supply average unit cost has been calculated by dividing the total cost of proactive filter supply by the volume of SDI and DIA HHs experiencing interference (from Ofcom Punch modelling of Nov 2011) minus those HHs with interference cured reactively. This method has been adopted to provide an indication of the cost of 'wastage' associated with proactive mitigation

In addition there may be further complexity, and consequential cost, associated with failed installations requiring repeat visits or wasted visits in which the consumer is not at home to receive the field technician[18].

The significant cost associated with the installation support process means a cost efficient MitCo organisation will need to interrogate and scrutinise this cost component on an ongoing basis. In particular, the MitCo organisation will need to:

a) develop effective means testing and diagnosis tools to ensure that installation support only benefits those who require it and are eligible to receive it, thereby mitigating the risk of over-supply; and

b) drive cost efficiency into the end-to-end process and ensure that 'hand-offs' between agents are coordinated and integrated.

2.4 Conclusions

The key conclusions from an analysis of the consumer landscape MitCo will potentially serve are as follows:

- At an aggregate level, one can arrive at a reasonable understanding of the nature and incidence of interference to DTT.
- However, there is considerable uncertainty and likely variability with regards to how interference will bear out in particular locations and over time. The location and timing of interference is fully dependent on how MNOs decide to roll out their future network. This will be driven by considerations that are separate and unrelated to DTT. Rather, it will be driven by the particular commercial strategies MNOs may wish to deploy.
- The geographical spread of MitCo's activity will be national. Coupled with variability in activity volumes over time, this will naturally build-in complexity and cost in how it operates. It will require sufficiently capable demand forecasting expertise, as well as sufficient scale and coverage in its operations to be resilient to variable workload.

[18] The cost of the end-to-end process and additional costs of wasted truck rolls and failed installations have been factored into the installation support unit cost based on *Deloitte benchmark analysis*

3 Level of consumer support

3.1 Introduction

In addressing interference, MitCo can provide a range of possible services to support DTT consumers. This section presents options for support in terms of consumer-based mitigation, which should form the basis for further consideration by policy-makers.

As mentioned earlier, a key interaction is the role of network-based mitigation in lessening the incidence of interference to DTT and therefore the demand for consumer-based mitigation. In practice, the optimal approach to the interference problem is likely to combine these two approaches.

Therefore, the following analysis, firstly, considers levels of consumer-based mitigation without any network-based mitigation taking place. It then considers in Section 3.5 how network-based mitigation can contribute to tackling the interference problem.

3.2 Levels of consumer-based mitigation

There are a range of possible services MitCo could provide and which could be combined in various ways to define its overall stance towards DTT consumers.

3.2.1 Service elements

MitCo could conceivably provide some or all of the following service elements, underpinned by the requisite staff and infrastructure:

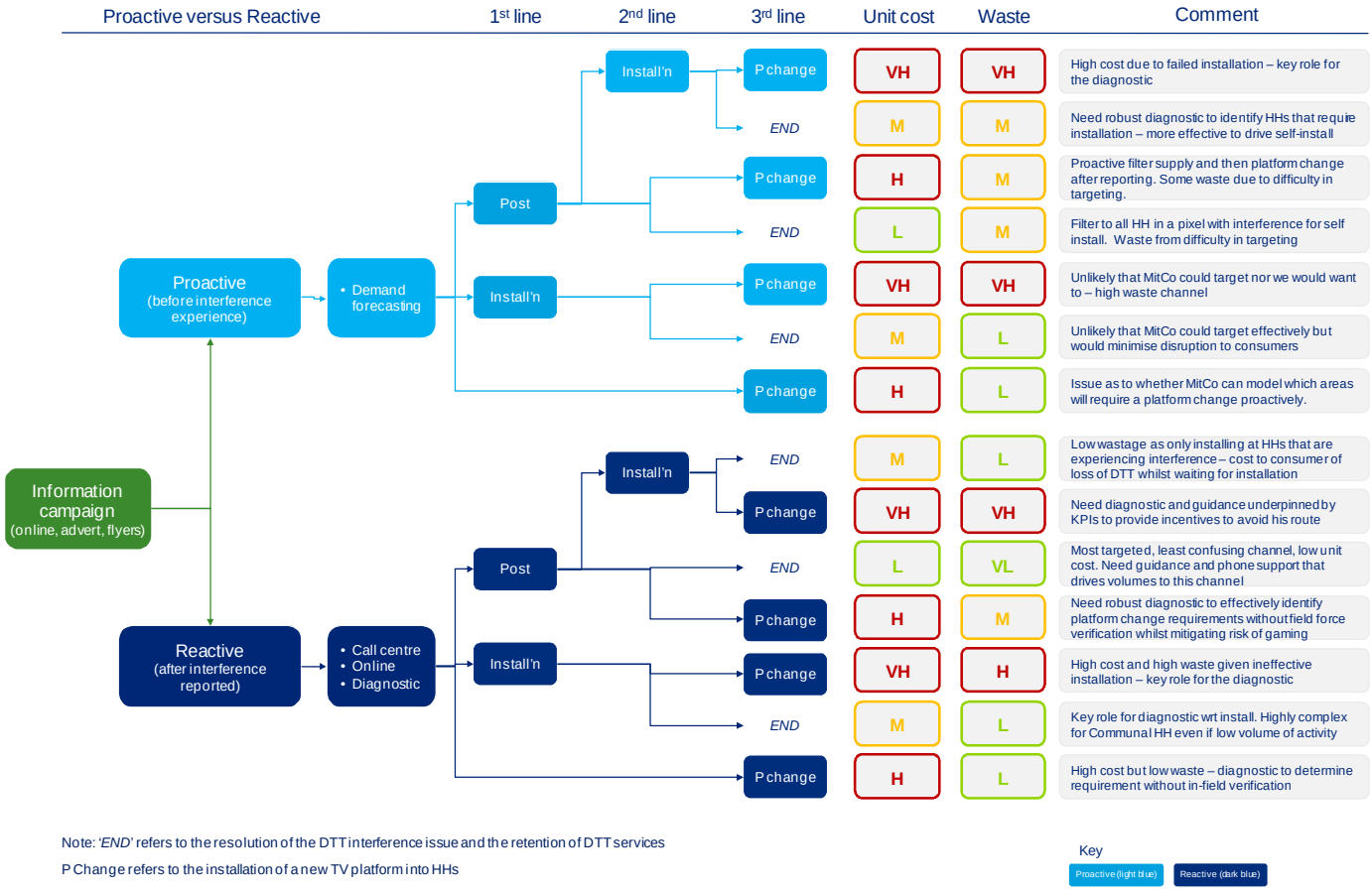
- **Online portal / website:** to raise general awareness of the issue and provide a self-help diagnostic tool as per the current BBC DTT interference services;
- **Information campaign:** to raise general awareness of the issues and provide general information to consumers on how to solve interference or seek further advice either through TV advertising, posted leaflets, outreach events;
- **Contact centre support:** to provide direct walk-through support to the consumer and/or act as the first point of call for diagnosing, deciding and scheduling further support services (see below);
- **Equipment distribution (proactive):** to provide DTT receiver filters and written guidance to consumers through the post, proactively in advance of mobile base station activation'
- **Equipment distribution (reactive):** to provide DTT receiver filters and written guidance to consumers through the post, reactively following base station activation in response to reports of interference via the contact centre or website.
- **Installation services:** an installation service provided by trained technicians to affected households; and/or
- **Specialist support:** possible specialist installation, e.g. install IPTV, platform change, or other support in exceptional cases.

From the perspective of the consumer, the above service elements can be experienced in a range of sequences, for example, an information campaign in a particular area, followed by a consumer contacting a call centre and then an agreement made for an installation service to be provided.

The challenge for MitCo is in offering a range of channels that meet the diversity of consumer needs, whilst balancing against the need for cost efficiency. Some combinations of service will be potentially highly costly and/or wasteful for MitCo, but conversely, they may be necessary in meeting the expectations of certain consumer groups. To illustrate, Figure 3.a presents some of these issues in

terms of possible combinations of service to the consumer, some of which will be attractive for Mitco to provide:

Figure 3.a: Possible combinations of service to the consumer



Source: Deloitte analysis

As can be seen, MitCo will need to avoid protracted processes whereby consumers are offered each line of service support until the most appropriate is found, e.g. postal, installation and then platform change with frequent contact centre dialogue. Rather it should aim to be 'right first time'.

It is crucial that MitCo can identify the consumers that are eligible for its support as smoothly and quickly as possible so as to manage overall cost. This will depend on how effective its diagnostic tools and its contact centre staff are at verifying particular groups early, for example; the vulnerable, those in areas indicating a clear need for platform change etc.

Box 3.d draws lessons from how the Digital Switchover Help Scheme (DSHS) has sought to identify vulnerable groups and Box 5.d identifies aspects of the BBC's online diagnostic tool, used to effectively manage demands for advice.

3.3 Options for consumer support

We have used the elements listed above to build six options for provision of consumer support ranging from basic advice and assistance in Option 1 to a high level of support in Option 6.

3.3.1 Options

In all cases, we assume that support is only provided for primary sets in households using DTT as their primary platform. Where platform changes are provided, they are provided in response to loss of one or more multiplexes (either PSB or Commercial (COM)):

1. **Information only:** MitCo only provides an information campaign targeted at households which are predicted as likely to experience interference to rooftop reception of DTT.[19] Consumers are responsible for obtaining and fitting filters and arranging installation support or platform changes where needed.

2. **Information and filters (reactive):** In addition to the information campaign, MitCo sends filters to households who report interference. Consumers are responsible for fitting filters themselves and arranging installation support or platform changes where needed.

3. **Information and filters (proactive and reactive):** In addition to the information campaign and filters provided in response to interference reports, MitCo sends filters in advance of base station activation to the households most at risk of interference.[20]

4. **Information, filters (proactive and reactive) and platform changes:** In addition to the information campaign and proactive plus reactive provision of filters, MitCo provides platform changes to households where filters would not be effective.

5. **Information, filters (proactive and reactive), DTT installation support and platform changes**: MitCo provides information, filters in advance and a reactive installation service for householders who are unable to fit the filters themselves and who are not leasing their property from a housing association (which under this option would take responsibility for installation).

6. **Information, filters (proactive and reactive), DTT installation support and platform changes:** MitCo provides information, filters in advance and a reactive installation service for householders who are unable to fit the filters themselves. MitCo also offers platform changes where filters do not fix the interference problem. *This option is consistent with the level of consumer support presented and 'costed' in Ofcom's June Consultation.*[21]

The choice of consumer support option will have implications for the ability of MitCo to exert control on certain key policy outcomes. Some options will also present MitCo with practical implementation challenges.

For example, under Consumer Support Options 1 to 3, MitCo can only ensure that all consumers receive information and, under Options 2 and 3, receive filters where needed. It will have no control over the actions that consumers subsequently take and so cannot control the number of platform changes that occur or the number of households that lose all TV services.

Option 4 includes an element whereby platform changes are provided to households where filters are ineffective. There would be a challenge for MitCo in this option to identify (without carrying out a home visit) where platform changes are genuinely needed so that households do not over-claim this support element. One way to do this would be to specify, based on technical modelling, a radius from mobile base stations (in certain high-risk geographical areas) within which households are considered likely to potentially need a platform change. Using this criterion in tandem with a carefully designed diagnostic process, it should be possible for MitCo to provide a reasonably accurate identification of genuine claims. There would be an additional challenge here (depending on the institutional arrangements for

[19] The information would be sent to a slightly wider set of households than is predicted to be affected to ensure all consumers who need to know about the issue are informed.
[20] Proactive filters would be sent to a smaller set of households than those targeted by the information campaign, i.e. only to those most likely to be affected, to reduce wastage. Households who are affected but do not receive a proactive filter could request a filter via the contact centre or online.
[21] Ofcom 'Coexistence of new services in the 800 MHz band with digital terrestrial television, June 2011

MitCo) of holding MitCo to account and ensuring that it is indeed providing platform changes where needed.

Under Options 1 to 4, consumers are expected to fit filters themselves and no free installation support is provided. We present some consumer research later in this section which indicates that for standard installations, consumers generally find self-installation of these filters quite straightforward.

However, installation of filters on amplified systems will be less straightforward. This is because the filter needs to be installed between the aerial and the amplifier for it to be effective. Ofcom technical modelling shows that, in the central case volumes, up to 917,000 DIA households (domestic installations with amplifiers) could be affected by interference (although only a proportion of these will use DTT for their primary TV service). When these amplifiers are located near to the TV (set-back amplifiers or boosters), filter installation should still be quite simple. Amplifiers located elsewhere however will present more of a challenge. The limited available data on use of TV amplifiers in the UK suggests that almost half of DIA households use amplifiers attached to the rooftop aerial, with a further number of people using distribution amplifiers in the loft space.[22] In these cases, filters will generally need to be installed professionally.

3.3.2 Assessment of consumer support options

To inform policy makers' choice of a preferred level of consumer support, we set out in the tables below the indicative costs and impacts of each option.

Costs

While some of the costs under each option are fixed costs (that do not vary according to the number of households served), most of the cost is volume driven.[23]

Annex A presents key cost analysis assumptions and caveats.

IMPORTANT CAVEAT: It should be noted that the costs associated with the consumer support option analysis are indicative only and have been calculated to provide a high-level understanding of the changes in cost as the level of consumer support increases. All other things being equal, these costs have been developed to enable an informed decision on the potential consequential cost impact of changes in consumer support.

These costs do not represent a formal operational costing of MitCo, which would depend on market testing and supplier engagement. Furthermore, the costs are based on volume estimates provided from Ofcom modelling and thus subject to the same uncertainties inherent in that work. All figures are flat cash, un-inflated and undiscounted, are not based on three-point cost estimates and do not take into account elements of formal cost modelling such as cost uncertainty, risk and optimism bias. Testing, discussion and negotiation with a potential provider would be required before 'firm' costings are possible.

Figure 3.b presents costs for each consumer support option against the projected household volumes derived from the three scenarios used in Ofcom's technical modelling.[24] These costs have been estimated through benchmarking unit costs across a range of comparator businesses (see Section 5.3.2).

[22] Ofcom analysis
[23] All costs are undiscounted, un-inflated at current prices
[24] The cost figures are based on a case where only consumer-based mitigation is used. These costs could potentially be reduced if mobile operators choose to use network-based mitigation.

Figure 3.b: Cost of consumer support options with no network mitigation, £m

	Consumer support option	Cost by Ofcom volume modelling scenarios		
		Low volume case	Central volume case	High volume case
1	Information only	£16	£16	£17
2	Information and filters (reactive)	£37	£39	£41
3	Information and filters (proactive and reactive)	£86	£98	£108
4	Information, filters(proactive and reactive) and platform changes	£91	£105	£117
5	Information as per Option 5, except for HH under housing organisation	£154	£181	£203
6	Information, filters (proactive and reactive), DTT installation support and platform changes	£165	£194	£216

Source: Deloitte analysis based on Ofcom data, INDICATIVE

Policy rationale, consumer impact and unintended consequences

The following Figure 3.c presents the policy rationale, consumer impact and intended consequences associated with each option.

Figure 3.c: Assessment of consumer support options[25]

		Policy rationale	Consumer impact	Unintended consequence	Cost
1	Information only	Minimum possible level of support in line with the BBC precedent on managing DTT interference.	Full burden falls on all consumers and welfare cost significant where complex cases and/or vulnerable groups	• Complete loss of TV and DTT in cases where filters do not work and where consumers have limited income or find it difficult to understand the information/take necessary actions to restore TV service; • Consumers may make inefficient spending choices, e.g. where they have insufficient knowledge of the issue; • As no installation support for filters is offered, some consumers may attempt self-installation even when dangerous to do so to save cost, e.g. climbing in loft or on roof; • Could result in an uncontrollable number of platform changes and impact on DTT coverage, especially if alternative platform providers try to attract affected consumers	£16m
2	Information and filters (reactive)	Support is restricted to low cost equipment provision to reported problem HHs.	Burden on consumers reduced for the majority, but welfare cost remains significant on complex cases and/or vulnerable groups	• As above	£39m
3	Information and filters (proactive and reactive)	Demonstrates pre-emptive (though high waste) action for the majority of the population, but general stance is still one of HHs handling installation themselves. Reactive filters sent to housing organisations for CAS.	Burden on consumers minimised for the majority (through pre-emptive support), but welfare cost remains significant on complex cases and/or vulnerable groups where no additional	• As above • Wastage in relation to proactive filters – dependent on the effectiveness of targeting	£98m

[25] The Red / Amber / Green (RAG) rating used in this analysis is relative between options based on their comparative features and does not represent an absolute determination of each one's costs or impacts

			support is provided		
4	Information, filters (proactive and reactive) and platform changes	Provides a pre-emptive equipment service and demonstrates a commitment to fully resolve the small number of very challenging cases where TV is lost. Reactive filters sent to housing organisations for CAS.	Covers the very difficult cases where TV is lost altogether to ensure that TV coverage if not DTT coverage can be restored. But, the bulk of service is kept to a minimum	• May be difficult to specify fair mechanism to limit platform changes to households who really need them; • As no installation support for filters is offered, some consumers may attempt self-installation even when dangerous to do so to save cost, e.g. climbing in loft or on roof; • Some wastage of filters due to proactive approach	£105m
5	Information as per Option 5, except for HH under housing organisation	Supports all except the significant complexity of supporting housing organisation, which should have the capability to organise and deliver mitigation for their residents, as per the DSHS precedent	Near full service support to all consumers, but no responsibility taken where housing organisations are capable on an assumption that they can absorb the time and cost of delivery.[26] This would similarly be the case in Options 2 to 4	• Highest cost on MitCo and potentially therefore to taxpayer; • Some wastage of filters due to proactive approach • Differentiation drawn between types of home ownership that may be difficult	£181m
6	Information, filters (proactive and reactive), DTT installation support and platform changes	As per the June Consultation document, a high level of consumer which provides filters proactively and to reported interference for the bulk of consumers. In addition, for challenging cases (e.g. DIA, CAS) as well as vulnerable groups installation is provided as the standard	Minimises the burden on consumers by committing to significant levels and types of consumer support	• Highest cost on MitCo and potentially therefore to taxpayer; • Some wastage of filters due to proactive approach	£194m

Source: Deloitte analysis based on Ofcom data

[26] Note: vulnerable groups within social housing would be provided a full installation where they apply. Those that are missed by MitCo support and are on some form of income support would in any case have recourse to Housing Benefit to cover on any cost pass-through from landlords

Support for vulnerable consumers

Although one would expect many consumers to be able to take the necessary actions to maintain TV reception themselves, some consumers may benefit from extra assistance throughout the process. These may include elderly or disabled consumers, as well as those who are socially isolated and therefore hard to reach via standard information campaigns. It may be desirable to provide a different level of consumer support to vulnerable consumers than to consumers in general.

There are useful precedents from Digital Switchover (DSO) because of similarities between the issues vulnerable consumers might face here and the issues they face during DSO. For DSO, the main concerns were that vulnerable consumers might struggle to read and understand the information provided and take the necessary actions to maintain their access to TV services, including connecting new digital equipment. Accordingly, the BBC established the Digital Switchover Help Scheme (DSHS). Box 3.d presents lessons in how the DSHS has supported vulnerable groups.

Box 3.d: Lessons on vulnerable consumer support from DSHS

The Digital Switchover Help Scheme provides lessons to MitCo on defining eligibility, identifying and providing a service to vulnerable groups.

Background

The Help Scheme offers eligible people, of which there are c.7 million: advice, support and equipment to convert one television set to digital; 12 months free aftercare; and where appropriate, a new aerial / dish may be fitted. DSHS' eligibility criteria are as follows and align with established criteria:

- Aged 75 or over; or Lived in a care home for six months or more; or
- Eligible for either of the following: Disability Living Allowance (DLA); Attendance allowance; Constant Attendance Allowance; Mobility supplement; or
- Registered blind or partially sighted

People are eligible from 8 months before the switchover date in their region, until one month after the final transmitter switchover in that region. Of those eligible people served, 60 per cent have been over the age of 75, while 40 per cent have qualified through disability criteria or because they lived in care homes.

Consumer support offered

£603 million was originally ring fenced for the DSHS, although outturn now means it is likely to cost closer to £300 million. Spending by the end of the 2009/10 financial year totalled £78 million.[27]

c.7 million people are eligible for the scheme. Between the scheme's inception in 2008 and 2010:[27]

- 1 million responses were received to direct mail
- 2 million calls were handled by contact centres
- c.350,000 installations of digital equipment were completed
- c.140,000 eligible people received guidance only, with these calls lasting on average 5 minutes
- c.740,000 people contacted DSHS to decline help

Identifying and targeting consumers

There are three stages to raising awareness of DSHS:

- Stage one: Direct mail to all eligible households six months before switchover in their area and up to two reminder letters.
- Stage two: Publicity material in local areas (e.g. post offices) and alongside general switchover advertising material.
- Stage three: Layered community outreach programme to engage Local Authorities and charities, particularly in order to pass the message on to the hardest to reach, dubbed the "5%".

18% of eligible people across regions that switched to digital took up the offer of help from DSHS. The standard cost of the scheme to eligible customers is £40.

The service, however, is provided free to people who meet stricter eligibility criteria relating to receipt of either of the following: Pension credit; Income support; Income based jobseekers allowance; Income related employment and support allowance. The fully absorbed cost of providing this service is c.£200 per customer served.[28]

Lessons

- In terms of identification, the DSHS has constructed its approach to information provision based on "an 80%, a 15% and a 5%" of eligible consumers. 80% of people can be reached through general publicity and advertising, 15% through their friends and family and 5% through a community outreach programmes.

[27] Switchover Help Scheme Progress Report p.26
[28] Switchover Help Scheme Progress Report p.26: absorbed costs include operational, marketing and community outreach costs

- For MitCo, the cost of the information campaign has been estimated on the basis of a regional initiative (i.e. not national) with specific targeted, outreach, elements for vulnerable groups. Further detail is provided at Section 5.2.2.

- The DSHS has drawn on established databases to verifying vulnerable people effectively. For example, DWP supplies DSHS with the names and addresses of those eligible through relevant benefits and Local Authority registers are used for information on those registered as blind or partially sighted. These third party data sources allow DSHS to manage and administer the means-testing to minimise over-claiming.
  - For MitCo, this is a relevant issue that should be considered when designing the diagnostic questionnaire used by the contact centre to determine which callers should be treated as vulnerable and possibly eligible for a greater level of consumer support. Further detail on this contact centre diagnostic is provided at Section 5.2.2.
- Moreover, the overriding characteristic of DSHS has been one of under-claiming. The scheme had been budgeted, for the purposes of prudence, on eligibility but take-up has been lower than projected because more people than expected independently converting to Digital TV. It is unclear how this lower outturn cost has been returned to the contracting authority (i.e. the BBC) as an under-spend – this will be dependent on the confidential commercial arrangements established with the supplier.
  - For MitCo, the demand by vulnerable has been aligned with the DSHS and is, thus, a prudent estimate (see **Annex A**).

For DTT Coexistence, all of the consumer support options assume that information will be sent individually to households that will be potentially affected by interference. It may be possible to include information that satisfies most of the additional requirements for vulnerable groups within the information sent to consumers generally.

- For additional outreach support to vulnerable households, along the lines employed by the Digital Switchover Help Scheme, total cost would be in the order of £1.1m on the basis that it would target the five percent of hardest to reach households from the population of those experiencing interference.

- It would also be possible to provide additional support to vulnerable consumers (over and above that offered to other consumers) by providing installation support and platform changes.

Figure 3.e below shows the cost of providing additional support to vulnerable consumers in each consumer support option. The additional cost of providing installation support and platform changes in consumer support Option 6 is zero because in this option these services are already provided to consumers in general.[29]

Figure 3.e: Cost of providing additional installation and information support to vulnerable consumer under each option, £m

	Consumer support options	Additional information	Installation support and platform changes	Total cost
1	Information only	£1	£23	£24
2	Information and filters (reactive)	£1	£21	£22
3	Information and filters (proactive and reactive)	£1	£21	£22
4	Information, filters(proactive and reactive) and platform changes	£1	£19	£20
5	Information as per Option 5, except for HH under housing organisation	£1	£2	£3
6	Information, filters (proactive and reactive), DTT installation support and platform changes	£1	£0	£1

Source: Deloitte analysis based on Ofcom data. Note: Most Likely cost on central volume case

[29] Costs are based on the central case volume figures.

The cost analysis has used the vulnerable eligibility criteria and uptake rates of the Digital Switchover Help Scheme. Using these criteria means that 15% of HHs affected by DTT interference are considered to be vulnerable consumers for the purposes of analysis.

3.4 Policy choices with regards to exceptions

The cost analysis presented above is based on certain assumptions with regards to the treatment of households with primary and secondary DTT sets, interference to public service and commercial multiplex and equipment matching.

The following presents the cost implications of changing some of these key assumptions as a result of possible decisions to be made by policy-makers.

3.4.1 Secondary TV sets

The policy underlying the current analysis implies only households which experience interference DTT on their primary sets are provided support. A key issue, therefore, follows as to whether consumer support should be extended to secondary sets.

Just under 40 per cent of households use DTT as their primary means of accessing TV services. A further 34 per cent of households also have secondary DTT sets (in addition to either a primary DTT set or an alternative TV platform). The cost analysis presented at Figure 3.b assumes that MitCo would only be required to provide support to households that use DTT as their only TV platform, and then only to the primary set in such households.

- If support was extended to secondary sets (regardless of the primary platform), the costs would increase by £67m under Consumer Support Option 4 and by £143m under Consumer Support Options 5 and 6.

3.4.2 Loss of PSB versus COM

Ofcom's technical modelling, used as the basis for Deloitte's analysis above, is based on the loss of PSB or COM multiplex reception. The key question that arises from this is whether platform changes should be offered only where PSB multiplex reception is lost, or also offered if Commercial (COM) multiplex reception is lost.

While mitigation will generally restore viewing to all DTT multiplexes that were available prior to interference, in some cases, consumers may lose access to one or more multiplexes even after mitigation. Our cost estimating assumes that all households that permanently lose access to either a PSB or COM multiplex would be eligible for a platform change.

- If it were decided that platform changes are only offered to households that permanently lose access to PSB, but not COM, multiplexes, the consumer support costs (under Consumer Support Options 4, 5 and 6) would reduce by c.£3m.

3.4.3 Equipment matching

Where MitCo provides a platform change, there is a choice between offering a basic set-top box or one which matches the functionality of a consumer's existing equipment. Our cost estimating assumes MitCo only provides a basic set-top box.

- We estimate that the additional costs of providing higher specification equipment (at an additional cost of £100 per installation) would be £1.8m.

3.5 The role of network mitigation

As noted earlier, there are two main options for dealing with interference:

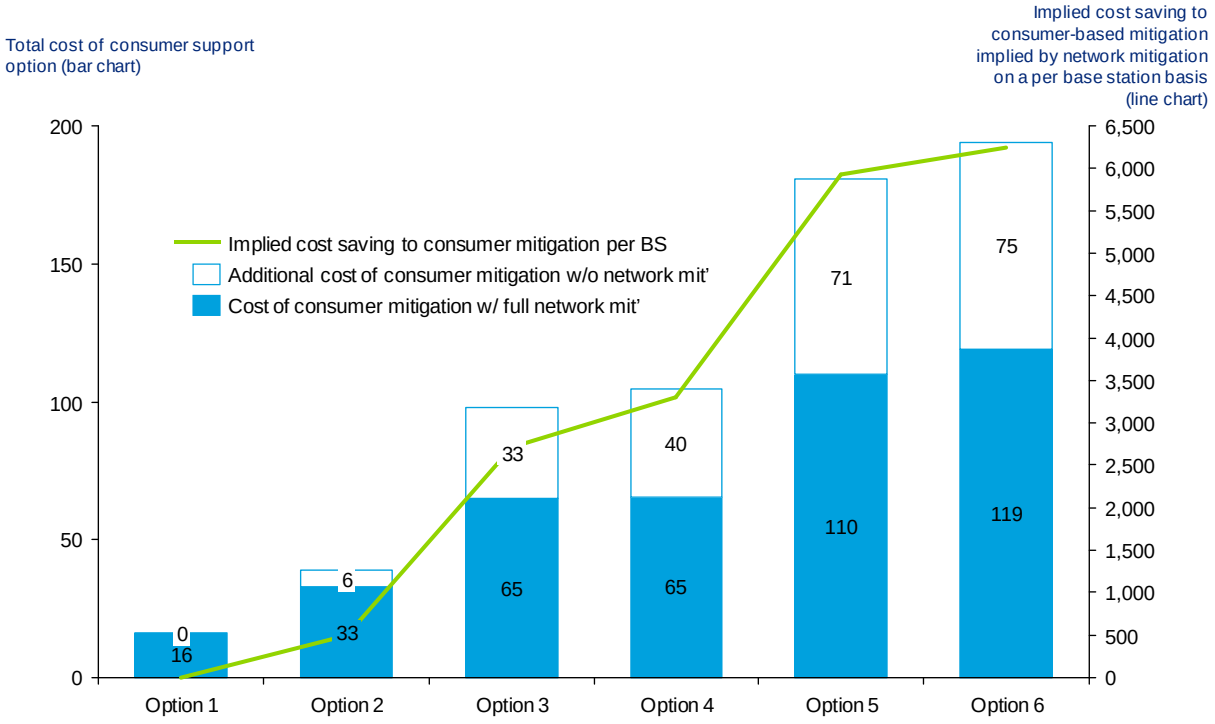
- Consumer-based mitigation (i.e. provision of filter equipment for installation to affected TV sets); and
- Network-based mitigation (changes made by mobile network operators to the configuration and location of their LTE base stations so as to reduce the source of possible interference).

The most cost effective approach to mitigating interference is likely to involve a mixture of both mitigation types. It has been possible to develop reasonably good information on the costs of consumer-based mitigation, which has formed the basis for the cost analysis presented in Section 3.3.

Network-based mitigation offers the opportunity to lessen the incidence of interference to DTT and therefore the demand for consumer-based mitigation. In presenting the effect of network-based mitigation, Figure 3.f presents, for each consumer support option, the cost in terms of consumer-based mitigation if network-based mitigation were applied in the form of power reductions and filtering to all base stations. On top of this, it presents the additional cost incurred if no network mitigation were to take place.

Further analysis and possible consultation is required by Ofcom in terms of the costs and benefits of network-based mitigation.

Figure 3.f: Cost savings to consumer-based mitigation under full network-based mitigation, £m



Source: Deloitte analysis based on Ofcom data

Figure 3.f illustrates the potential cost saving of network-based mitigation by consumer support option.

- The line graph (in green) in the figure shows the implied cost saving per base station in term of reduced consumer-based mitigation that comes from full network-based mitigation. The cost of base station modification would need to be, on average, below the figures implied by this line for full network mitigation to be a beneficial move.
- For example, under Consumer Support Option 6, the cost of base station modification (e.g. power reduction and filtering) would need to be less than £6,400 for it to be beneficial across all base stations.

In reality, full network mitigation will not be cost effective move as many base stations have very little impact on DTT consumers and consequently there is a minimal cost saving to be made. Furthermore, our understanding of the costs of providing network-based mitigation is much less certain. This is because we do not have sufficient information or evidence on the costs to mobile operators of applying network based mitigation – to illustrate from the example cited in the paragraph above, it could be much greater than £6,400 per base station.

In theory, the same effect could be achieved if Ofcom imposed *ex ante* requirements (i.e. licence conditions) on mobile operators to modify their base stations in a way that would mitigate interference.

However, it would be very difficult if not impossible to tailor those obligations to ensure that they were targeted efficiently at those base stations most likely to cause the greatest interference, and Ofcom would also be poorly placed to identify the costs of such obligations. The outcome would almost certainly be sub-optimal, delivering an inefficient level of network-based mitigation at a higher cost than necessary.

By contrast, the mobile operators will be much better placed to understand the costs of modifications to their rollout plans, and to tailor such modifications to deliver the greatest benefit. Hence, if the benefits of network-based mitigation are material, there is likely to a strong argument for institutional arrangements which enable the MNOs to make the relevant trade-offs.

This issue is examined further in Section 4 when considering the appropriate overall approach to designing MitCo and in particular, *who* should be accountable for delivering MitCo's remit.

3.6 Conclusions

The key conclusions from an analysis of consumer support options for MitCo are as follows:

- It is possible to present a range of consumer support options that build to provide greater support to households experiencing interference.
- This Report considers six options ranging from information only, through to providing a combination of information, filter distribution, contact centre support and installation services to particular groups of consumers.
- Lastly, the stance MitCo takes in terms of consumer-based mitigation is dependent on the level of network-based mitigation that takes place. Network-based mitigation offers the opportunity to lessen the incidence of interference to DTT and, therefore, the demand for DTT receiver filters. The most cost effective approach to mitigating interference is likely to involve a mixture of both mitigation types and this will, in turn, depend upon MitCo having reliable information on the relative costs and benefits of consumer and network -based mitigation in particular cases.

4 Strategic design

4.1 Introduction

In its June 2011 consultation[1], Ofcom proposed that an organisation is established ("MitCo") to identify and implement such an approach. MitCo would provide support to consumers and identify and secure opportunities for efficient network-based mitigation.

This section presents: the case for a single organisation for MitCo; the strategic design of a single MitCo organisation in terms of *who* should be accountable for delivering mitigation solutions; and the elements of the required governance.

4.2 The case for a single organisation

Ofcom proposed that "anything other than a single body for managing consumer-based mitigations and aggregating information would lead to significantly higher risks of a lack of coordination."[30] There are a number of issues cited that support that statement, which centre on increased transaction costs arising from multiple organisation:

- **Information to the consumer:** "For information provision [not having a single body] would raise risks that DTT consumers were given conflicting advice, given the same advice multiple times, or in the worst case missed entirely. Multiple bodies would also be very confusing for DTT consumers as to whom they should contact and in what circumstance."[30]
- **Service to the consumer:** "Similarly in respect of mitigation, consumers are more likely to receive several DTT receiver filters or no DTT receiver filters if multiple bodies are present. There would also be a likelihood of inefficiencies from different bodies solving problems in the same area in different ways."[30]
- **Technical diagnosis:** "Co-ordination would be needed with DTT stakeholders over issues such as indentifying whether interference is mobile related or generated from something else."[30]
- **Optimal mix of mitigation solutions:** a key aspect of providing mitigation will be that deciding between network-based and consumer-based mitigation in particular cases. This decision-making process will be complicated if the number of organisations delivering consumer-based mitigation is increased.

Furthermore, an **integrated model for service delivery** may point to a single organisation:

- To illustrate, a key feature of the design detailed in Section 5.2 of this Report is that the demand forecasting capability that determines likely interference volumes and type of service (e.g. whether installation or platform change is required for particular household segments) must inform how any information campaign is delivered in particular regions, visits to the online portal and contact centre resourcing from month to month. These operational capabilities need to integrate.
- For example, in the case of the DSHS, even though different sub-contractors are employed to deliver the discrete elements of the contact centre and the field force, there is one prime contractor (i.e. Carillion) which is singularly accountable to the BBC for overall service delivery.

[30] Ofcom 'Coexistence of new services in the 800 MHz band with digital terrestrial television, June 2011, paragraph 6.19

4.3 Objectives

MitCo's overarching objective will be to deliver the desired level of mitigation (as set out in Section 2) as efficiently as possible.

However, there is an important interaction between the design of MitCo and both auction efficiency and the expected level of auction receipts. While the level of auction receipts is not a relevant criterion for Ofcom, delivering the maximum value to the taxpayer is an important consideration for policy-makers.

Hence, at a more detailed level, the operational and commercial arrangements for MitCo should:

- Deliver the *right outcome* for DTT consumers;
- Allow *timely and efficient rollout* of new mobile broadband networks to achieve a good outcome for mobile consumers;
- Encourage MitCo to carry out its activities at *least cost to the taxpayer*;
- Enable MitCo to balance *consumer-based and network-based mitigation* efficiently;
- Enable an *efficient auction*, and efficient use of spectrum after the auction, thereby avoiding detrimental impact on auction revenues; and
- Be *practical* and workable (including from a legal perspective).

These objectives are have been developed into detailed criteria (see Section 4.5.1), which have been used as the basis for assessing the broad approaches for MitCo. Five options for the strategic design have been considered below.

4.4 Broad approaches for MitCo – five options

In building on Ofcom's June Consultation, this study has considered five distinct options with respect to *who* should be accountable for leading consumer mitigation under the auspices of MitCo:

1. Broadcaster-led MitCo;
2. Mobile network operators (i.e. the new licensees) -led MitCo;
3. A third party contractor established through a procurement as the provider of MitCo services;
4. MitCo as an arm's length body of Government; or
5. MitCo established as a public-private partnership between Government and a third party.

The following sub-sections describe the options with further detail presented at **Annex B**.

4.4.1 Option 1: Broadcaster led

Under this approach, MitCo would be jointly owned and operated by a selection of broadcasters.[31] MitCo would report to a Supervisory Board comprising representatives from the broadcasters, the MNOs, Government, Ofcom and, potentially, consumer groups.

The Supervisory Board would monitor MitCo's performance against a set of output-based Key Performance Indicators (KPIs) which policy-makers would specify prior to MitCo's establishment.

We anticipate that Ofcom would need to impose licence conditions on the MNOs to cooperate with MitCo. Specifically, the MNOs would need to provide information to MitCo about their rollout plans, and would also need to give MitCo sufficient time to carry out mitigation. However, in the event of slow mitigation by MitCo, the MNOs would potentially need to have the right to roll out before consumer-based mitigation had been concluded. This could have significant negative implications for consumers and it is unclear to what extent the MNOs would take such implications into account in their rollout plans.

[31] "Broadcasters" in this context includes Mux-operators

In the event of underperformance (and specifically delayed mitigation) by MitCo, the Supervisory Board would be able to recommend that Ofcom impose sanctions on MitCo as set out in licence conditions and/or other obligations. These might relate to the level of funding. In any event, it is likely that the issue of sanctions will need to be addressed through the arrangements for the establishment of MitCo.

Figure 4.a presents summary benefits and risks of Option 1.

Figure 4.a: Summary benefits and risks of Option 1

Benefits	Risks
• Broadcasters/ MuxCos have capability insofar as they understand the consumer: TV reception / equipment issues; accustomed to communicating through the right channels to consumers / trusted provider of information; and strategic / management skill to drive towards the right solutions • Strong natural incentive, thus placing lower need on KPIs to drive behaviours other than on cost-efficiency • Lower political risk given this places the responsibility with the most vocal lobby with respect to the interference issue, at the centre of driving mitigation • Proof of concept / implementation body already established as Digital UK (which is majority-owned by the BBC, with other broadcasters and MuxCos)	• Two parties (broadcasters and MNOs) will place significant pressure on MitCo funding through 'gold-plating' in the case of broadcasters and market power in the case of MNOs on MitCo • Does not effectively optimise network versus consumer mitigation. The prospect of buying network mitigation is complex – see below. • Set-up of this arrangement is dependent on Government / broadcaster cooperation – there may be a risk of delay and / or gaming by broadcasters (e.g. wrt advertising and licence fee negotiations). • Mitigation may cause delays to network rollout

Source: Deloitte analysis

Option-specific issues

The following issues were raised through discussion with Ofcom stakeholders.

a. **Whether MitCo should buy or "procure" network mitigation.** MitCo could potentially seek to procure network-based mitigation from the MNOs, but we consider it unlikely that such procurement would be effective:

   - First, the MNOs are likely to be in a strong bargaining position as they are uniquely placed to understand the costs of network-based mitigation. MitCo would have little prospect of knowing whether offers of mitigation from MNOs genuinely reflected underlying costs;
   - Second, in the event that the MNOs' rollout plans varied substantially, there would be significant risk to MitCo that the early purchase of network-based mitigation from one MNO would lock it into a need to purchase mitigation from other MNOs subsequently, thereby further weakening its bargaining position, and possibly raising the costs of network-based mitigation even more; and
   - Third, there would be a significant challenge to specify precisely what MitCo was purchasing –for example, it would be highly challenging MitCo know and verify that an MNO's intended base station deployment (which MitCo wished to defer) was, in fact, genuine.

b. **In the absence of MitCo buying network mitigation, how could Government ensure that MNOs coordinate with MitCo?** Under this option, Ofcom might need to impose two specific types of additional licence condition:

   - a condition to ensure that MitCo had sufficient time to carry out its work in a particular area before the MNOs rolled out their networks; and

- technical licence conditions that deliver network-based mitigation, for example through reductions in power levels, fitting base station filters, etc.

c. **Notification period that new licensees should give to MitCo before rolling out.** MitCo would need to send both information and proactive filters to HH in areas that would become affected.

- For proactive filter targeting to be effective it may be the case that information is sent to households in affected areas ahead of proactive filters are provided. Leads times for delivery will range between two working days and a week[32].
- It would also be necessary for MitCo to provide households with time to consider the information provided and/or install filters, as well as organise any necessary distribution and field force capability.
- Therefore, the required notification that MNOs may need to provide MitCo would be at least one month. The precise notification period will depend on the speed of communication between MNOs and MitCo and readiness of MitCo's capability.

4.4.2 Option 2: MNO led

Under this approach, MitCo would be jointly owned and operated by the MNOs who win the 800MHz spectrum, possibly with shareholdings proportionate to their 800MHz spectrum holdings. As with Option 1, it would report to a Supervisory Board comprising representatives from broadcasters, the 800 MHz licensees, Government, Ofcom and, consumer groups. The Supervisory Board would monitor MitCo's performance against a set of output-based KPIs.

A critical feature of this approach is that MitCo is provided with a fixed sum to carry out consumer-based mitigation, but can keep (some or all of) any under-spend. MitCo is free to choose between network-based and consumer-based mitigation, with the MNOs that own MitCo benefiting from their share of the under-spend if they can reduce costs by making changes to their networks. Figure 4.b presents summary benefits and risks of Option 2.

Figure 4.b: Summary benefits and risks of Option 2

Benefits	Risks
• Incentives (both financial and reputational) placed on the MNOs to balance network-based and consumer-based mitigation, and to ensure that mitigation and rollout are properly coordinated • Allows effective decision-making between mitigation and network rollout • Offers the opportunity to consistently tie together specifications and requirements on MNOs (both through MitCo and the licence conditions) to minimise the risk of conflicting incentives • Consistent with policy to date regarding MNO involvement, as expressed in June consultation	• Consumer mitigation is under-provided as MNOs are more interested in rolling out their networks than in addressing the needs of DTT consumers. This could lead to a poor service to DTT consumers and loss of reputation for the platform – robust KPIs are required • Challenge of establishing a single body in the most desirable form given limited levers available – possibly delaying network rollout • Cooperation between MNOs may be strained at times if they have divergent rollout strategies, since one MNO's rollout may demand particular MitCo funds at a point in time which may be contended by other MNOs within MitCo – effective protocols will need to be established

Source: Deloitte analysis

[32] Section 5.3.2 considers the timings relating to the supply of information from MNOs to Mitco in more detail and section 6.3.2 outlines at a high-level the KPIs that may be necessary to drive the proactive supply of information / mitigation

Option-specific issues

The following issues were raised through discussion with Ofcom stakeholders, against which possible approaches are presented.

a. **Whether an MNO-led MitCo should be responsible for network and consumer-based mitigation.** There are a range of issues to consider from MNOs paying for network and consumer mitigation individually, paying for consumer-based mitigation collectively via MitCo or paying for both network and consumer -based mitigation collectively via MitCo. Each will generate different incentives.

- Given the following known facts:
  - There is a marginal diminishing impact in terms of interference as base stations rollout in a particular area, i.e. saturation is achieved when the activation of another base station no longer raises the overall level of interference in an area; and
  - Consumer-based and network-based mitigation are, to some extent substitutes, i.e. implementation of one form of mitigation reduces the required level of implementation of the other to meet a given level of interference.
- Then the following issues could arise under various approaches:
  i. If each MNO pays the cost of its own consumer and network mitigation requirement arising from the interference each causes, then there will be hold-up problem in terms of network rollout and in terms of gaming since the first MNO to rollout would be liable to implement greater mitigation to the second or third MNO rollout in the area.
  ii. If all consumer mitigation is paid for by MitCo, then the cost of consumer mitigation is shared equally between them irrespective of when the requirement on consumer mitigation arises, and who causes it.
    - Thus, it should not affect how and when each MNO rolls out its base stations. However, the first MNO to rollout in an area would prefer that MitCo provides a higher level of consumer mitigation than if it paid for consumer mitigation itself because that MNO bears the full cost of network mitigation at a given point in time, but only pays for a proportion of the cost of consumer-based mitigation (a third in the case of a three MNO-owned MitCo).
    - It should be noted that the first MNO's incentives towards MitCo implementing high levels of consumer support will be mitigate somewhat by the prospect that future gainshare will be forgone if a sub-optimal solution is delivered, given that the fixed cost against which gainshare is earned would be established on the basis of an optimal mix of network versus consumer mitigation activity, other things being equal.
  iii. If MitCo pays for all network and consumer mitigation, then in any choice of network mitigation or consumer mitigation at any given time all MNOs share costs irrespective of when they rollout. The relative price of network versus consumer mitigation to each MNOs remains constant irrespective of the order in which an particular MNO activates its base station.
- In our view, approaches ii or iii could be made to work.

4.4.3 Option 3: Contracting / competitive procurement

Under this approach, MitCo would be an organisation identified and contracted with through a Government procurement process. The MitCo-contractor will report to a function in the Government that manages delivery against the contract (e.g. in the case of DSHS, the BBC has a dedicated 30 person team working with the contractor, Carillion).

The Government will monitor the MitCo-provider's performance against a set of metrics or KPIs, which can be specified to a detailed level, e.g. input KPIs on call centre performance times. In the event of underperformance, by MitCo, the Government would enforce the terms of the contract in terms of pre-defined financial penalty.

Figure 4.c presents summary benefits and risks of Option 3.

Figure 4.c: Summary benefits and risks of Option 3

Benefits	Risks
• Open competition for MitCo provider will deliver value in terms of least cost / high quality provider, if the competition is well-structured and a competitive market exists for the types of capabilities need in MitCo • Allows Ofcom to minimise its regulatory intervention – limited to Government as the contract vendor monitoring and enforcing the contract • Significant scope in the contractual terms to establish KPIs directly with the agent in terms of cost, time and quality • Able to begin the process for establishing the agent earlier than options, which depend on direct MNO or direct broadcaster engagement – this point may be somewhat weakened by the fact that the process under this option may in its entirety take longer under OJEU	• The problem of optimising network versus consumer mitigation is not fully internalised – the contract and licence conditions have to provide consistent specific obligations on the contractor and the MNOs regarding cooperation • The contract needs to be attractive, e.g. since there is no mandation, i.e. contract margin at least greater than internal hurdle rates in these businesses • Does not effectively optimise network versus consumer mitigation. The prospect of buying network mitigation is complex • The risk that contractual arrangements cannot adequately deal with uncertainty about the volume of households requiring mitigation or the costs of mitigation – this can be managed to some extent through the fee arrangements, which share risk in financial terms (e.g. fixed fee, target cost incentive fee)

Source: Deloitte analysis

It should be noted that the issues presented under Option 1 with regards to whether MitCo should buy or "procure" network mitigation from MNOs, how Government can be assured that MNOs will cooperate with MitCo and notification periods are applicable to Option 3.

4.4.4 Option 4: Government arm's length body

Under this model, an arm's length body is established by the relevant Government Department (e.g. DCMS) for as long as mitigation services are required.

MitCo provides consumer mitigation only and coordinates with MNOs, who are obligated through the licence conditions to provide reasonable network mitigation. As with Option 1, it would report to a Supervisory Board comprising representatives from broadcasters, the 800 MHz licensees, Government (as Chair), Ofcom and, consumer groups. The Supervisory Board would monitor MitCo's performance against a set of output-based KPIs. Roles, responsibilities and powers of MitCo, may need to be stipulated through statute or some other legislation

Figure 4.d presents summary benefits and risks of Option 4.

Figure 4.d: Summary benefits and risks of Option 4

Benefits	Risks
• As delivery risk rests with the Government, MitCo would have a more balanced natural incentive towards trading off where network versus consumer mitigation is required and in balancing time, cost and quality in use of limited funds • As Government, possible to balance stakeholder interests with no particular self-interest hindering discussion / arbitration	• Key delivery risk rests with the Government, i.e. delivery of consumer mitigation and coordination and direction to MNOs on their network mitigation. Rather than this being passed or shared with agents that are strategically more capable or naturally incentivised to deliver particular elements of the solution • Implementation cost and time may be significant, particularly the case if a statutory body is set up or a NDPB. Given the limited lifespan of MitCo this is potentially unacceptable • Wind-down cost in terms of TUPE liabilities on public employees etc will be non-trivial even if MitCo is small

Source: Deloitte analysis

It should be noted that the issues presented under Option 1 with regards to whether MitCo should buy or "procure" network mitigation from MNOs, how Government can be assured that MNOs will cooperate with MitCo and notification periods are applicable to Option 4.

4.4.5 Option 5: Public-private partnership

Under this approach, a public-private partnership is established between Government (e.g. DCMS) and a private sector provider, possibly as a Joint Venture with equal share between both parties. MitCo provides consumer mitigation only and coordinates with MNOs, who are obligated to provide reasonable network mitigation through the licence conditions.

Government (e.g. DCMS) partners with a private sector organisation(s) to establish joint ownership of MitCo body with a joint board of directors. Partners share risk of overspend (up to a cap) and share the benefit of under-spend through a shareline upon the winding up of the organisation. The JV earns profit based on achieving service KPIs to incentivise service delivery, whilst shareline incentivises cost effective delivery. Figure 4.e presents summary benefits and risks of Option 5.

Figure 4.e: Summary benefits and risks of Option 5

Benefits	Risks
• As delivery risk rests with the Government, MitCo would have a more balanced natural incentive towards trading off where network versus consumer mitigation is required and in balancing time, cost and quality in use of limited funds • As Government, possible to balance stakeholder interests with no particular self-interest hindering discussion / arbitration • Brings thirdy party expertise to bear in terms of service delivery	• Key delivery risk rests with the Government, rather than this being passed or shared with agents that are strategically more capable or naturally incentivised to deliver particular elements of the solution • May take some time to set up and implement given negotiation required between Government and a third party to be identified

Source: Deloitte analysis

It should be noted that the issues presented under Option 1 with regards to whether MitCo should buy or "procure" network mitigation from MNOs, how Government can be assured that MNOs will cooperate with MitCo and notification periods are applicable to Option 5.

4.5 Assessment of strategic design options

The issue of strategic design is concerned with identifying possible 'agents' that should be accountable for delivering the outcomes Government wishes to achieve. Each agent will come with its own natural incentives.

This study considered five distinct options for who should be accountable for leading consumer mitigation under the auspices of MitCo and how these options should be structured at their top-level. The options are described, alongside summary benefits and risks, in Section 4.4 above.

The following section presents an assessment of the relative merit of these options.

4.5.1 Criteria for the assessment

An assessment of the merit of these options requires consideration as to which structure produces the most desirable behaviours by all relevant parties so as to deliver the *performance* outcomes Government wishes to achieve, as well as being *practical* to implement.

We would consider the following performance outcome applicable: sufficient mitigation of interference to DTT at an appropriate cost. Accordingly, the study has constructed an assessment of the options around criteria which reflect our understanding of the performance and practicality required. These criteria are presented in Figure 4.f.

Figure 4.f: Assessment criteria

Performance:

- Service delivery ('sufficient mitigation')
  1. **Strategic capability:** structure places the responsibility with the 'agent' best capable of delivering a high quality service
  2. **Ability to balance network and consumer mitigation:** structure best enables decision-making and coordination of choices between network and consumer mitigation
  3. **Consumer focus:** structure encourages a delivery of a service which presents high quality to the consumer
- Cost ('appropriate cost')
  4. **Cost efficiency (DTT cost):** structure minimises the total cost of consumer mitigation services
  5. **Incentive (DTT cost):** structure minimises the total risk incentive package required to encourage the delivery of mitigation services
  6. **Auction value (wider cost):** structure minimises distortion on the auction so as to maximise the potential value it can generate for the taxpayer
  7. **Auction efficiency (wider cost):** structure minimises uncertainty created on the auction process
  8. **Rollout efficiency (wider cost):** structure minimises the distortion on timely rollout of new mobile networks

Practicality:

9. **Governance and control:** structure offers strong levers for Government and/or Ofcom to influence delivery strategy
10. **Simplicity:** structure is sufficiently simple and transparent so as to enable smooth communication and interaction between parties
11. **Burden on Ofcom:** structure minimises the degree of ongoing regulatory intervention likely by Ofcom
12. **Burden on Government:** structure minimises the degree of ongoing Government intervention in delivery
13. **Implementation:** there is minimal risk / cost in setting up and winding down the structure and of it collapsing

4.5.2 Assessment summary

An assessment of the options has been carried out against the criteria presented above. This has been based on Deloitte deliberation and discussions with Ofcom. It has not involved any direct contact between Deloitte and potential interested parties (e.g. Broadcasters or MNOs). The assessment is, therefore, subject to those limitations.

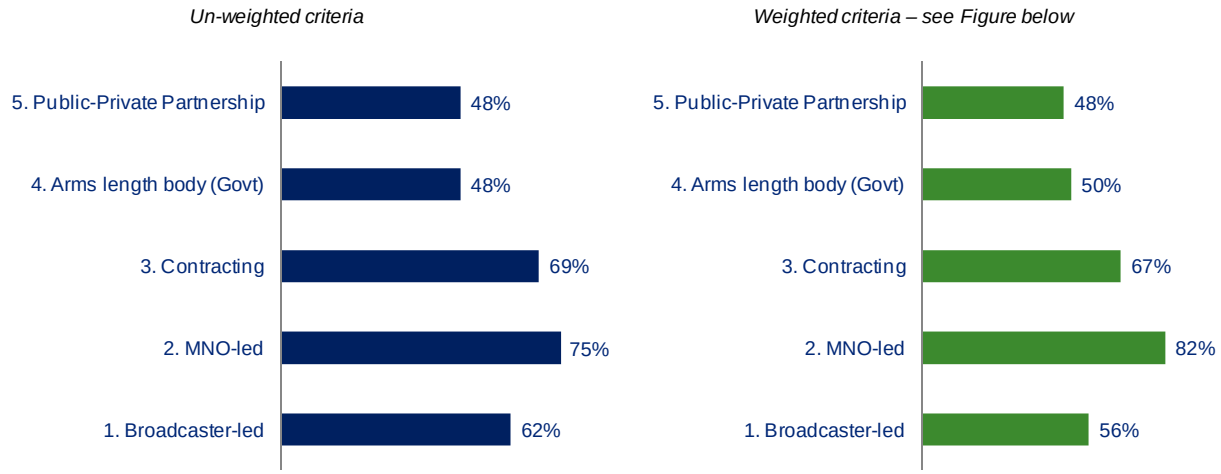
Based on the rationale developed in discussion, each option has been scored against each criterion on a scale from 1 to 4 to reflect our relative confidence in delivering against the relevant criterion.

Although scores have been used to present the assessment, the analysis is naturally qualitative, based on a judgement from the evidence and from experience. Thus, the text rationale against each option and each criterion is the key consideration for policy-makers. The summary assessment is presented at Figure 4.g, and a full assessment is presented at **Annex C**.

Overall score

Based on the rationale, individual scoring and criteria weighting established in discussion with Ofcom, Figure 4.g presents the aggregate score for each option. Figure 4.h presents the criteria weighting:

Figure 4.g: Aggregate score (out of 100) on un-weighted and weighted criteria



Source: Deloitte analysis

Figure 4.h: Criteria weighting

	Criteria weighting	Implied relative weighting
Strategic capability	2	5%
Ability to balance network and consumer mitigation	5	12%
Consumer focus	4	10%
Cost efficiency	3	7%
Incentive	2	5%
Auction value	5	12%
Auction efficiency	5	12%
Rollout efficiency	5	12%
Governance and control	4	10%
Simplicity	3	7%
Burden on Ofcom	1	2%
Burden on Government	1	2%
Implementation	2	5%
Total		**100%**

Source: Deloitte and Ofcom discussion

Commentary

Of the five broad approaches, our assessment suggests that the MNO-led (Option 2) and the Contracting approaches (Option 3) are the most attractive and warrant further consideration by policy-makers.

A **Government arm's length body and a PPP (Options 4 and 5, respectively**) score weakest overall. This is because on the criteria related to performance (i.e. service delivery and cost) they represent weak structures.

- The case for a Government-led approach in this area is weak because there is no significant public policy argument in the provision of consumer mitigation services, nor does the Government possess unique capabilities relative to the market. Indeed, there are a range of market providers that possess the contact centre and nationwide field force capability and expertise over Government in order to drive towards an efficient and effective service to the consumer.

- Under a PPP model, Option 5, the capability of Government is strengthened through the injection of third party expertise and hence this option scores stronger relatively to Option 4 in terms of service delivery. However, Option 4 is significantly less practical in terms of its simplicity and governance relative to Option 4.

Of the remaining three options, **Broadcaster-led (Option 1)** scores lowest because by placing responsibility for delivering consumer mitigation with the broadcasters, it delivers a sub-optimal balance in terms of service delivery. This is largely because it does not offer a strong structure for managing the decisions required with respect to choices over consumer versus network mitigation. It also scores poorly in terms of cost efficiency and in minimising (the risk of) distortion to mobile network rollout.

Given the capabilities required of MitCo will be, for the most part, those that are regularly contracted out in business and by Government, i.e. field force, contact centre and distribution capabilities, **Contracting (Option 3)** offers a relatively standard model with a clear focus on service delivery. For example, in the case of the Digital Switchover Help Scheme a contracting approach had been established as the preferred route to delivering the service requirements. The key performance indicators and financial incentives established on the contractor would require careful consideration, but could be established with a significant degree of governance and control by the Government.

In addition, the Government could achieve value for money through the procurement / tender exercise in awarding the contract and such an exercise could be initiated early, ahead of the auction. A key set of risks with the Contracting approach is that it does not sufficiently address issues that are specific to this policy area:

- Facilitating an optimal balance of choices between network-based mitigation delivered by MNOs and consumer-led mitigation by MitCo; and

- Avoidance of delays to rollout of the new mobile network.

With regards to those key risks, a **MitCo led by MNOs (Option 2)** may offer a more attractive approach because it places accountability for the balance of network and consumer -based mitigation with the parties best placed to understand the trade-offs and coordinate action. By extension, it minimises delays to network rollout by placing DTT interference mitigation with the MNOs themselves. However, the key implications of the MNO-led approach are that:

- A robust set of KPIs needs to be established on MNOs to drive high quality service delivery to DTT consumers.

- Equally, clear oversight and governance arrangements need to be designed that monitor those KPIs.

- In addition, implementation will be complex because it will be linked to auction timetables – for example, key milestones in relation to constituting MitCo's operational capability can only be progressed after the auction has completed and new licences are granted.

Overall, we believe both Options 2 and 3 could be made to work. On balance, the MNO-led approach (Option 2) appears relatively attractive.

Figure 4.i: Summary representation of the assessment scoring

		1. Broadcaster led	2. MNO led	3. Contracting	4. Arms length body (Government)	5. Public-Private partnership
Performance	Strategic capability	4	3	3	1	3
	Ability to balance network and consumer mitigation	1	4	1	1	1
	Consumer focus	4	3	3	3	3
	Cost efficiency	2	3	4	1	2
	Incentive	4	3	3	4	3
	Auction value	2	4	2	2	2
	Auction efficiency	3	3	3	3	3
	Rollout efficiency	1	4	2	1	1
Practicality	Governance and control	1	3	4	4	1
	Simplicity	2	3	3	1	2
	Burden on Ofcom	2	1	3	2	2
	Burden on Government	3	3	2	1	1
	Implementation	3	2	3	1	1

Source: Deloitte analysis

Sections 5 and 6 which follow focus on the detailed operations and commercial design of the 'MNO led' and 'Contracting' approaches.

Caveats

We note that we have not had the opportunity to directly interview the parties considered in our analysis. We have relied on data and information provided to us by Ofcom, including notes of meetings held between Ofcom and interested parties. In addition, we have used our knowledge and understanding of the market and of the selected parties to inform our considerations.

4.6 Governance

The following section considers the stakeholders with an interest in MitCo's activities and the approach that could be taken to governance under the various strategic design options.

4.6.1 Stakeholder analysis

Ahead of an exposition of governance, Figure 4.j considers the stakeholders that may have an interest in MitCo and which may, therefore, need to be accommodated within the governance arrangements.

Figure 4.j: Stakeholder interests and natural incentives

Stakeholders	Interests
Ofcom	• Ensure efficiency in the LTE auction • Ensure appropriate mitigations to interference that deliver quality to consumers and at cost • Bear the associated reputational risk of mitigation activity being sub-optimal
Future 800 MHz licensees	• Ensure future licensees make informed decisions with respect to their participation in the auction for the future 800MHz spectrum
Public service broadcasters[33]	• Stakeholders in DTT directly affected by interference to their consumers
Commercial broadcasters	• Stakeholders in DTT directly affected by interference to their consumers, but with greater flexibility with regards their services being delivered to consumers through alternative platforms
Multiplex operators[34]	• Stakeholders in DTT directly affected by interference to their consumers and which may also have an interest via DMOL (Digital Television Multiplex Operators Limited) which provides technical platform management for the DTT platform and thus relevant in the case of a platform change. • Face a risk of reduction in the value of their business, which dependent on audience coverage achieved in their multiplex. Particular issue for commercial multiplex operators in terms of value of channels on their multiplexes.
DMOL	• See "multiplex operators"
DTT consumer groups	• Directly affected by interference activity excepting an appropriate level of consumer support provided on a proactive basis, i.e. before they experience interference problems • Loss of confidence in DTT services and consequential impact in switching to alternative platforms.
HM Treasury	• Ensure value for money and efficiency in raising and spending of public funds • Bear the associated political / reputational risk
DCMS / Government	• Responsible for policy in relation to DSO and DTT market along with BIS • Bear the associated political / reputational risk of mitigation activity being sub-optimal
Digital UK	• Ensure high quality service to DTT consumers on a proactive basis (as per Coexistence Consultation response)
BIS	• Responsible for policy in relation to DSO and DTT market along with DCMS • Bear the associated political / reputational risk of mitigation activity being sub-optimal
Manufacturers, retailers and aerial installation companies	• In digital switchover, manufacturers, retailers and the aerial installation companies of television equipment formed a Supply Chain Group to coordinate and consolidate supply chain input to the process and provide a clear conduit for communication. • Representatives from this Group may seek representation in the DTT interference mitigation process

Source: Deloitte analysis

Box 4.k considers lessons on governance from digital switchover.

[33] BBC, ITV, Channel 4, Five
[34] Arqiva, BBC, SDN (ITV), Digital 3 & 4 (owned by ITV and Channel 4) and DMOL, the organisation in charge of managing the DTT platform on behalf of its members, the licensed MUX operators.

Box 4.k: Transferable lessons on governance from Digital UK

Digital UK has been established as a joint venture funded by the public service broadcasters and the commercial digital terrestrial multiplex operators. The following lessons can be drawn with regards to governance.

- DUK is accountable to various regulatory bodies including the DCMS and Ofcom and accordingly each shareholder appoints a representative to the Digital UK Board (the BBC appoints two representatives).
- There are also three observer positions on the Digital UK Board for representatives of manufacturers and retailers from the Supply Chain Group, and the Chief Executive of the Help Scheme.
- In addition, an independent chair and the Digital UK Chief Executive are Board members.
- It has a strong record in liaison with stakeholders in the TV equipment manufacturers, retailers, installers; digital platform operators; local authorities, housing associations and other property landlords; consumer groups and charities; and many other interested stakeholders to ensure understanding of and support for the switchover programme.
- It has developed integrated plans for each regional switchover project, and working with the other programme partners (particularly DSHS Ltd) to monitor progress; identify and manage risks and issues that may arise; and report to the Programme.

4.6.2 Implied governance by option

It is necessary to consider the governance for each option in terms of what structures should be established around MitCo's activity in order to guide and verify performance.

This is dependent on the character of the options in terms of where they place accountability and responsibility for delivery. The five options for strategic design can be viewed from the following RACI perspective.

Figure 4.l: RACI view by option

		Accountable	Responsible	Consulted	Informed
1	Broadcaster	Broadcaster	Third party	MNO, Ofcom, Govt	N/a
2	MNO	MNO	Third party	Ofcom, Govt	B'casters
3	Contractor	Third party	Third party	MNO, Ofcom, Govt	B'casters
4	Govt	Govt	Govt	MNO, Ofcom	B'casters
5	PPP	Govt/Third Party	Govt/Third party	MNO, Ofcom	B'casters

Source: Deloitte analysis

Each option for the strategic design implies a certain type of overarching governance in terms of where executive power rests – this arises as a naturally consequence of the type option. See Figure 4.m.

Figure 4.m: Governance implied by each strategic design option

	Option for MitCo	Implied executive governance structure	Rationale
1	Broadcaster-led	Supervisory Board	• Executive powers are required in a Board to hold MitCo to account for the spending of public funds.
2	MNO-led	Supervisory Board	• Executive powers are required in a Board to hold MitCo to account under the terms of the licence conditions and for the spending of possible public funds (depending on funding option)
3	Contracting	Contract management arrangements	• No executive governance other than that established between the party letting the contract and the contractor. • There may be a role for a structure with advisory

			powers, e.g. a Supervisory Board.
4	Government-led	Supervisory Board	• Executive powers required in a Board to hold MitCo to account for the spending of public funds as would be the case with any public sector model where a separate organisation is established (e.g. an Arm's Length Body or a public sector business)
5	Public-private partnership (JV)[35]	Joint Board of Directors	• Given Government and a third party's role within a joint venture / partnership arrangement, a joint Board of Directors with executive powers would be required. • This may consult with other structures (e.g. representing broadcasters or MNOs) which would act in an advisory capacity

Source: Deloitte analysis

4.6.3 Further detail on possible governance for Options 2 and 3

The governance arrangements under each option should include the following elements:

a. The *purpose* of the governance structure/s;

b. The *functions*, including powers and responsibilities of the governance structure/s;

c. The *constitution*, including membership of the governance structure/s, roles and responsibilities, the decision-making process

The following considers the governance arrangements for Options 2 and 3.

Option 2: MNO-led approach

Under Option 2, MitCo is established by the three MNOs successful in the 800MHz auction. The expectation established through the auction process and/or the licence negotiations is that they would set up an equal-share joint venture.

Figure 4.n presents the possible 'strawman' governance arrangements that may be required.

Figure 4.n: 'Strawman' governance arrangements for Option 2

Element	Description
a. Purpose	• Ensure MitCo is achieving its key performance indicators (KPIs) as expected under the licence conditions placed on constituent MNOs
b. Functions	• The Supervisory Board would: o Report to Ofcom on any issues regarding the conduct of network mitigation and MitCo's delivery against its Key Performance Indicators – Ofcom on the basis of this advice may decide to execute sanctions o Advise MitCo on whether its mitigation measures are achieving an output defined by KPIs it has signed up to, e.g. maintain television coverage o Advise MitCo on whether its operations and service represents cost efficiency and value for money based on an audit it commissions o Advise MitCo on the nature and extent of significant risks it might face in its operations o Advise MitCo on the handling of particular instances of consumer mitigation where particular challenges have arisen o Advise MitCo on handling its obligations with regards to balancing its approaches to network and consumer mitigation so as to optimise the reduction

[35] Note: In this area, a Government-owned Contractor-operator model would be no different to a Contracting approach since there are no public sector fixed assets already established that one would wish to allow a Contractor to operate under a GOCO arrangement – hence, the model is not relevant.

	in interference to DTT consumers
c. Constitution	• Possible membership of the Supervisory Board and rationale: o Chairperson role exercised by either- a. an independent appointment b. a Government official; or c. Ofcom o Independent advisors responsible for audits requirements, technical and/or consumer interest in line with the remit of the Supervisory Board o Chief Executive or equivalent of MitCo representing the views of its management o Representation from the 800 MHz licensees that are obliged to coordinate activity with MitCo under their licence conditions and which jointly own MitCo o Representation from the broadcast and multiplex operator community o A representative from Ofcom that is party to any discussion that later develops into advice to from the Supervisory Board to Ofcom o A representative from Government that has an interest in ensuring MitCo delivers against its remit o Possible observer positions which bring experience and learning from related areas: a. Representation from retailers and manufacturers from the Supply Chain Group for Digital Switchover as per the Digital UK model b. Representation from Digital UK, which also sits on the Project Board which monitors the performance of DSHS Ltd c. Additional representation from consumer groups • Decision-making, possibly o Through consensus, managed by the Chair, underpinned by voting rules to be defined

Source: Deloitte analysis

Option 3: Contracting

Under Option 3, MitCo is established through the tendering of a contract to a market provider. A contract management capability would need to be established in the contracting authority, which would be the basis for governance. Figure 4.o presents a possible 'strawman' in this regard.

Figure 4.o: 'Strawman' governance arrangements for Option 3

Element	Description
a. Purpose	• Ensure that MitCo is meeting its service delivery targets, Key Performance Indicators and other obligations set out in the contractual arrangements agreed with the supplier
b. Functions	• The contract management function (which would sit in Government) would: o Monitor performance against service targets and KPIs on an ongoing basis through performance reports generated by the supplier; o Validate KPI performance and determine levels of fee earned by the supplier based on the achievement of pre-determined performance levels; o Identify and enact appropriate contractual sanctions for failure to meet performance targets; o Audit activities to assess cost efficiency / cost control of supplier's operations (based on presumption of open-book accounting stipulated within the contract); o Regularly audit performance with random sampling of mitigation provision to assess performance of diagnosis and consumer mitigation channels; o Sample check validity of performance reports through direct access into supplier system; o Arbitrate between MNOs and MitCo in relation to network versus consumer -

	based mitigation trade-offs; o Advise Ofcom on failure of MNOs to comply with licence conditions directly concerning relations with MitCo and Ofcom on the basis of this advice may decide to execute sanctions; and o Provide input into adjustments / amendments to KPIs and service targets in contract where appropriate.
c. Constitution	• Capabilities within the function and rationale: o Technical and engineering capability: to independently verify MitCo demand forecasting; o Finance capability: to independently assess MitCo's cost base and expenditure; o Central contract management: to monitor and analyse supplier performance reports; o Regional contract management: to independently sample practical mitigation provision performance; o Legal capability: to provide support and guidance on enforcement of contractual arrangements; o Stakeholder management: to liaise with MitCo stakeholders (e.g. MNOs, Broadcasters, Government, Consumer Groups, Ofcom and other interested parties); and o Business management: to coordinate and manage contract management resources. • Decision making: o Validation of levels of fee earned by the contractor or the authorisation of contractual sanctions based on KPI performance could be determined by a separate board within the contract management capability, potentially with representation from MitCo; o A clear dispute resolution and arbitration process to mediate and resolve contractual disputes arising from determinations of fee award and sanction.

Source: Deloitte analysis

4.7 Conclusions

The key conclusions from an analysis of strategic design options for MitCo are as follows:

- Five broad approaches to the strategic design have been considered: a Broadcaster-led MitCo; a mobile network operators -led MitCo; a third party contractor established through a procurement as the provider of MitCo services; MitCo as an arm's length body of Government; or MitCo established as a public-private partnership between Government and a third party.
- Of the five broad approaches examined, a structured assessment of these suggests that the MNO-led and the Contracting approaches are the most attractive and warrant further consideration by policy-makers.
- Given the capabilities required of MitCo will be, for the most part, those that are regularly contracted out in business and by Government, i.e. field force, contact centre and distribution capabilities, Contracting offers a relatively standard model with a clear focus on service delivery. In addition, the Government could achieve value for money through the procurement / tender exercise in awarding the contract and such an exercise could be initiated early, ahead of the auction. A key set of risks with the Contracting approach is that it does not sufficiently address issues that are specific to this policy area:
    - Facilitating an optimal balance of choices between network-based mitigation delivered by MNOs and consumer-led mitigation by MitCo; and
    - Avoidance of delays to rollout of the new mobile network.

- With regards to those key risks, a MitCo led by MNOs may offer a more attractive approach because it places accountability for the balance of network and consumer -based mitigation with the parties best placed to understand the trade-offs and coordinate action. By extension, it minimises delays to network rollout by placing DTT interference mitigation with the MNOs themselves. Key implications of the approach, however, are that: a robust set of KPIs are in place and clear governance arrangements that monitor compliance.

- Overall, we believe both the MNO-led and Contracting approaches could be made to work. On balance, the MNO-led approach (Option 2) appears relatively attractive.

5 Operational design issues

5.1 Introduction

The following section presents: an analysis of the capabilities required of MitCo once established; the implied cost structure of the organisation; and the implementation issues related to its set-up, lifespan and wind-down.

5.2 Capabilities

The capabilities MitCo will require include the direct element of its service delivery, as well as the necessary corporate overhead with respect to management, oversight and support services.

A key feature of MitCo's operational design is that all elements of service delivery may need to be integrated into single end-to-end delivery process. To ensure that the correct consumer mitigation solution is delivered to the correct consumer in an appropriate timescale, MitCo needs to ensure that forecasts of future workload coordinate effectively with resource management in each of its business units. In practice, this translates into a number of key service 'hand-offs' that must be effectively managed under the coordination of a single executive function responsible for the entire service operation. These 'hand-offs' include:

- **Demand forecasting integrated with the entirety of the consumer service workforce**. The demand forecasting capability provides input into the workforce and resource planning processes of the information campaign, contact centre and field force by informing the likely levels and location of interference activities;
- The **web portal and online diagnostic tool integrated with the contact centre**, by channelling specific queries or interference issues to the relevant personnel to enable them to make appropriate consumer mitigation decisions;
- The **contact centre integrating with the logistics and distribution** and field force scheduling capabilities to ensure that consumer problem diagnosis translates into the correct consumer mitigation solution; and
- **Field force scheduling capability integrated with field force technicians** to ensure field resources are deployed in a productive and cost efficient manner to resolve consumer mitigation issues as quickly as possible within the constraints of MitCo's cost base.

A failure with one of these process 'hand-offs', or the development of conflicting priorities if each channel of service delivery becomes 'siloed', would ultimately lead to a sub-optimal experience of interference mitigation by the consumer.

We have analysed relevant case studies with comparable operations to those of MitCo to understand their broad capabilities and use them as a basis for building a reasonable cost picture for MitCo. These case studies included organisations operating across the range of MitCo's operations from contact centre operators, field force suppliers, business service providers and integrated end-to-end service organisations (e.g. cable suppliers, fixed line telecoms companies), as well as specific examples of similar consumer delivery programmes in the telecommunications space.

To illustrate by example, Box 5.a describes the features from Channel 5 returning with regards to capabilities it required and features of its service delivery.

Box 5.a: Channel 5 retuning

The retuning exercise carried out before the launch of Channel 5 yields lessons in the capabilities required in conducting a nationwide field force operation to households nationwide.

Background

Channel 5 won the bid for a fifth terrestrial channel on 27th October 1995 and was awarded the licence on 12th April 1996. The channel launched on 30th March 1997. In areas receiving 5 on UHF channels 35 or 37, the transmission was likely to cause interference in some homes. This was because equipment such as VCRs and satellite or cable decoders would sometimes be pre-set to transmit their signals to TV sets using these previously reserved frequencies. Before its launch, Channel 5 was required by the Independent Television Commission (ITC) to retune 90% of affected homes. The Channel 5 retuning programme resolved the interference issue by visiting each affected home individually and re-tuning equipment to an alternative UHF channel, unused in that part of the country

Capabilities

Channel 5 recruited retuning engineers and supervisors to work directly for the broadcaster. In total, c.10 million homes were visited by retuning engineers, with c.3 million VCR's requiring retuning.[36] (Stringent security measures were in place to prevent instances of fraud, given the scale of the operation.) In addition, the contact centre operated by CCN Group was forecast to receive an estimated 4 million calls.[37] The service was provided free of charge to affected homes. Further, they engaged CCN Group to run their direct mail campaign, operate an external contact centre, and create an online database providing details of households to be retuned, to engineers. Thus, in order to carry out the retuning programme the following capabilities were engaged by Channel 5:[38][39]

- 6500 retuning engineers (with average productivity of approximately 6 field visits per day per engineer);
- 380 supervisors (with a supervisor to field engineer ratio of approximately 1:17); and
- 800 contact centre operators (outsourced to CCN Group)

Costs and performance

The award of UHF channel 35 to broadcast the Channel 5 signal increased the total cost of retuning from an estimated £100 million to c. £150 million.[40] This figure includes £5 million for the retuning advertising campaign, with Saatchi & Saatchi responsible for through the line advertising. Total retuning cost was significantly greater than the £55 million originally estimated.[41] Before the launch of the station, Channel 5 claim to have successfully retuned 99.76% of potentially affected homes without the need for a revisit.[42]

Lessons

The Channel 5 retuning exercise presents a number of lessons to MitCo around the timescale, size of workforce and cost of managing and implementing a large scale project which requires homes to be visited individually. In order to protect the public from the potential risks of sending thousands of engineers into millions of homes across the country, Channel 5 devised a successful system of security checks to be implemented prior and during installation:

- All relevant information was posted to households before re-tuners visited. This underlines the precedent for proactive and pre-emptive layers of support.
- In managing the efficiency of the field force, which is key to ensuring its size and cost is minimised, a number of initiatives were used, which are relevant to the practical working of MitCo where it offers installations:
    - Households were given a unique security code which re-tuners would match before entering the premises
    - Appointments for re-tuning were made where possible
    - Re-tuners wore clearly branded clothing
    - Re-tuners carried individually numbered identity cards linked to a unique password. This could be verified by calling a security helpline number
    - With the agreement of the Association of Chief Police Officers, all potential recruits were, with their consent, checked against police records for previous convictions

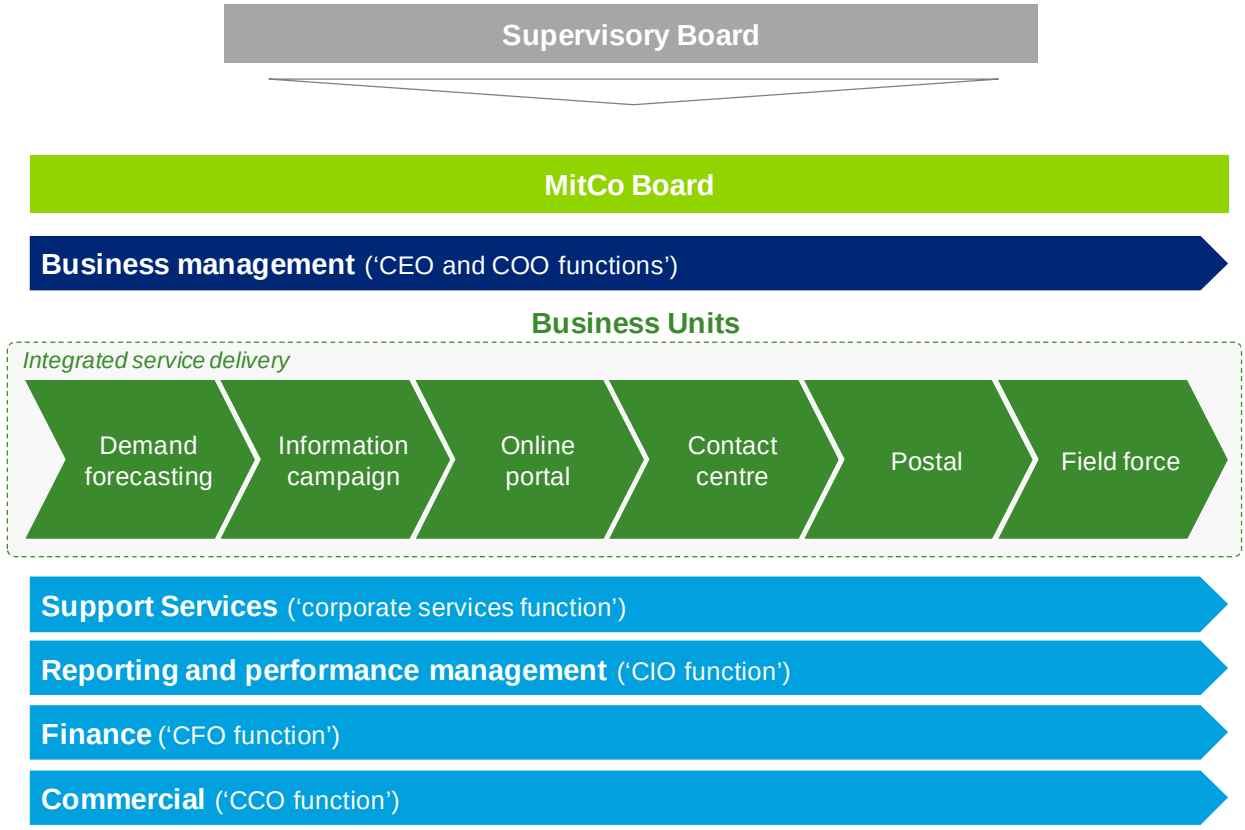
[36] Channel 5 – History (http://www.thisisfive.co.uk/history.shtml)
[37] Interview with Nick Fuller, Head of CCN Telecommunications Services, Birmingham Post 21/12/1996
[38] Channel 5 Duty Office 1997
[39] Birmingham Post 21/12/1996
[40] Pearson 1997
[41] Reuters News 05/08/1996
[42] Channel 5 Duty Office 1997

In categorising the key capabilities required of MitCo, these can be presented as follows:

- the MitCo Board and management;
- Business management or the 'Chief Executive and Chief Operating Officer functions';
- Business units, each organising and delivering discrete elements of the service MitCo provides to the consumer (e.g. contact centre, field force);
- Support services, including information and communications technology, human resources etc;
- Reporting and performance management or the 'Chief Information Officer function';
- Finance or the 'Chief Finance Officer function';
- Commercial, the 'Chief Commercial Officer function'; and
- In addition, the governance arrangements which sit above MitCo, and to which its management will be accountable, requires capability and resourcing.

Figure 5.b is a visual representation of these capabilities. These capabilities would be resourced through labour and technology and would, in sum, represent the labour and overhead elements of MitCo's cost base. The remaining element of the cost base would comprise of direct materials, e.g. equipment purchase, distribution costs and materials in relation to the information campaign. Importantly, the COO function would retain visibility and accountability for each element of the integrated service delivery.

Figure 5.b: Required capabilities of MitCo[43]



Source: Deloitte analysis

Figure 5.b is estimated in cost terms in Figure 5.e (Section 5.3).

[43] See Annex D for further detail on the overall capabilities matrix

5.2.1 Skills and capabilities

Annex D presents a detailed break-down of the roles and functions of the capabilities presented above and indicative full-time equivalent resourcing – this is used as the basis for the cost estimate of MitCo capabilities required under Consumer Support Option 6.

5.2.2 Other expenditure

In addition to staffing, key capability requirements include:

- Information campaign;
- Problem diagnosis;
- Contact centre;
- Equipment and distribution;
- IT infrastructure; and
- Other

Information campaign

In many cases the information campaign is potentially the first line of contact with consumers affected by, or likely to be affected by, DTT interference. As a result, the information campaign is a key channel for delivering cost efficient consumer mitigation by equipping consumers with the information they require to make the appropriate choices on mitigation requirements and driving, where practical, high rates of self-installation[44].

The information campaign may have four broad aims pertaining to the supply of information to consumers:

1. **Raise awareness:** drive awareness of the interference issue and potential corrective actions;
2. **Outline levels of consumer support:** provide consumers with clear direction on what levels of consumer support they can expect / are eligible to receive and how they access it;
3. **Communicate timings:** equip customers with the information they need to mitigate the interference prior to interference occurring; and
4. **Provide technical support:** where applicable, provide technical guidance to drive self-installations.

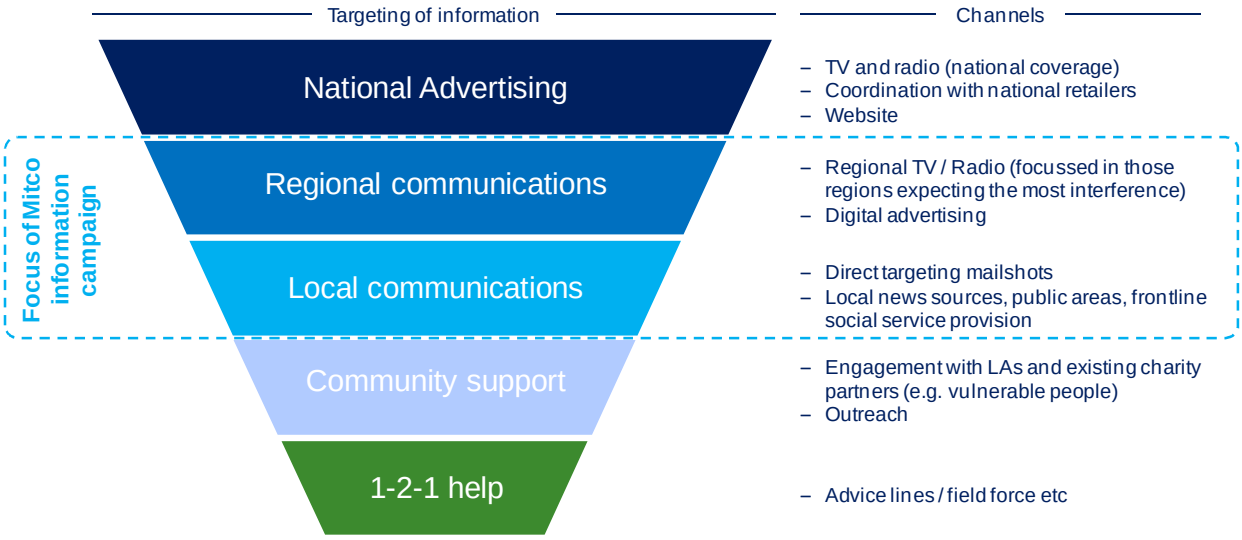
Analysis of the Digital UK[45] case study indicates that the overall supply of information to consumers can be categorised in a framework that defines the geographical parameters of support, levels of targeting and the likely information channels.

This framework is illustrated in Figure 5.c below:

[44]Recognising that self-installation is only likely to be practical an SDI HHs and a proportion of DIA HHs. The information campaign should provide consumers with sufficient information to mitigate the risk of consumers in DIA HHs making inappropriate or ill-informed choices regarding self-installing filters

[45] Digital UK are the organisation responsible for coordinating and delivering the information campaign to support the Digital Switchover (DSO) programme and as such, is a highly relevant comparator

Figure 5.c: Information campaign framework[46]



Source: Digital UK

Due to the relatively low proportion of UK HHs likely to be affected by interference (approximately 8% of UK HHs) and the higher rates of interference in known channel areas, MitCo is unlikely to require an information campaign on a scale akin to that adopted for DSO (which has currently addressed 74% of UK HHs[47]). As such, this Report assumes MitCo will pursue a more targeted information campaign with an emphasis on regional and local communications channels. This assumption involves:

- **Excluding national advertising**: due to the levels of unnecessary concern and confusion that may be generated in HHs without an interference problem if a broad nationwide campaign was pursued. A nationwide campaign could also drive a consequential impact on both the cost of the campaign and the associated cost of increased demand on other customer channels (e.g. the contact centre); and
- **Excluding community support:** this channel involves cascading information through existing charity networks to provide information for hard to reach vulnerable groups. This channel has been excluded from the general information campaign, but is an option for additional targeted support for vulnerable people assessed in Section 3 of this Report.

A targeted regional and local information campaign could exploit a range of channels, from traditional media, such as television and radio advertising and advertising in the print media, to more innovative methods concerned with providing information to hard to reach HHs, such as advertising through ATMs, in areas where the public access front-line services (e.g. job centres, doctor surgeries) or through direct targeting by email.

The indicative cost of the information campaign has been calculated through an assessment of comparable campaigns. More detail on this analysis is outlined in **Annex A**.

The broad capabilities required to deliver the information campaign may include:

- Design and development of *campaign* concepts and literature;
- Design and development and *technical support* of a web platform and digital advertising;
- *Procurement* of advertising space by channel / platform;
- *Management* of distribution channels; and
- Performance management and *reporting* on campaign effectiveness.

[46] Sourced from 'Digital UK's 10 transferable lessons from the UK's digital television switchover programme.'
[47] Ofcom 'Communications Market Digital Progress Update Report' (Q1 2011)'

Contact centre diagnosis

A key enabler of cost efficient service delivery is the correct and expedient diagnosis of interference faults and the selection and implementation of the appropriate mitigation solution. To achieve this aim requires an effective and practical diagnosis tool to identify faults and segment consumers based on their requirements and eligibility.

The diagnostic tool can operate either online or through the contact centre (see box 5.d) but will require those making the diagnosis to have access to a range of consumer and network information to make the diagnostic process suitably robust. Likely information / questioning may include:

- Number and *types of DTT installations*/ platforms the household has in order to understand eligibility;
- The courses of *action already taken* by the consumer, e.g. receiver filters have been fitted correctly. This will be particularly important in the case of DIA households where the prospect of consumers making inadequate installations is greater given the complexity of fitting, e.g. in cases of masthead or attic installations. Consumers will need to demonstrated that they have made best efforts to install a filter;
- *Type of interference* experienced to understand and dismiss other causes of possible interference;
- *Location* to validate proximity to a base station and DTT channel region, both of which significantly affect whether there is a requirement for platform change; and
- Customer *demographic* information to ascertain their competency and knowledge.

As well as correctly identifying interference problems, the diagnosis process will also need to factor in the requirements and eligibility of the end consumer when selecting the appropriate form of consumer mitigation. Eligibility considerations the diagnostic may need to accommodate are driven by choice on levels of consumer support, but may feasibly include:

- Consumer demographics;
- Aerial installations (fixed or set-top);
- Whether DTT is their primary TV platform; and
- Whether the interference is affecting PSB or COM.

Importantly, the more eligibility criteria / exclusions that are applied to consumer support, the more the diagnostic tool (and ultimately the diagnostician) will need to police what consumer support is offered to whom. Therefore, although these principles for consumer support may be attractive in principle, in reality they may lead to two complications that should be considered when determining eligibility criteria:

1. Increased administrative expense to effectively monitor eligibility; and
2. Risk to effective delivery due to ‘gaming’ by the consumer (i.e. the consumer obtaining levels of consumer support either through administrative error or design that they would not otherwise be entitled to).

Box 5.d below illustrates the process and lessons learnt from the BBC’s diagnostic tool.

Box 5.d: BBC's diagnostic tool

Two of the key functions for MitCo are to:

a. Identify an interference problem and prescribe the appropriate mitigation solution as quickly and efficiently as possible; and

b. 'Police the line' of consumer support determined by Government. e.g. being able to segment customers and mitigate the risk of gaming to ensure that consumer support is only provided to those eligible to receive it.

Both of these functions require MitCo to have a robust means for diagnosing problems and determining the eligibility of consumers to receive services.

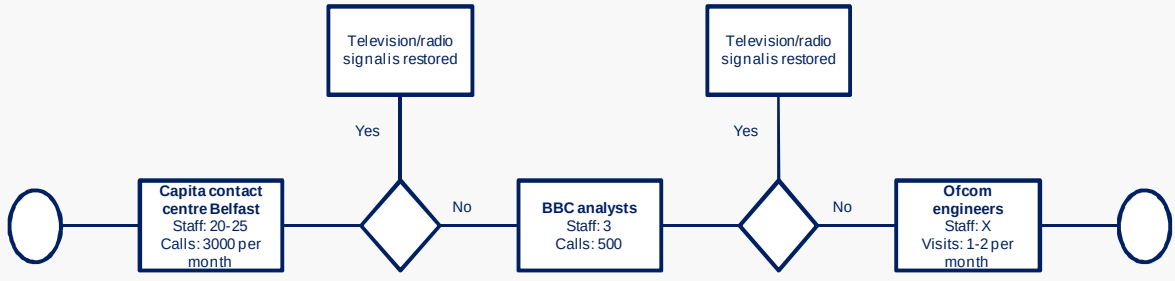
As part of the BBC Charter, the BBC currently provides an investigation service to those experiencing TV and radio interference. The service helps viewers and listeners investigate, and where possible, resolve interference problems affecting their domestic reception. The service utilises information provided to consumers via a website and an online diagnostic tool available to first line consumer support representatives. Although provided by the BBC, the service covers reception interference for all UK broadcasters. Relevant interference cases are researched by the team and forwarded to Ofcom for further investigation if required.

The operation and management of this diagnostic service provides a number of useful lessons for MitCo, especially regarding how MitCo correctly diagnoses mitigation solutions and consumer eligibility at lower levels of consumer support (i.e. without verification by a field force technician)

The diagnostic process utilises first and second line support to funnel complex cases to analysts within the BBC. Key elements include:

- A front-line customer service team managed through an outsource arrangement with Capita. The arrangement is a BBC wide agreement also covering complaints, comments, enquires and ticketing etc. The customer service team operates 24/7 365 days a year. Within the wider team a small number of agents are trained in basic reception and interference issues and called upon as and when required. On-going training and daily support is provided by the BBC.
- The front line support team receives c.3,000 calls per month related to reception and interference issues
- This team transfers issues they cannot resolve to 3 x highly skilled and experienced analysts within the BBC to perform a more detailed diagnostic (approximately 500 calls a month[48]) The analysts themselves benefit from easy access to the BBC's Spectrum and Operations teams.
- In instances where, post investigation by the BBC analysts, it is believed to be an issue related to interference, the case is referred to Ofcom to investigate. (approximately 1 to 2 cases a month)

Based on known interference volumes (as opposed to reception issues), the telephone diagnostic process has a success rate of over 99% without the need for a field visit.



Lessons

- The diagnostic could be quite protracted (an average duration of 3 hours spread over two weeks to resolve cases) as identifying the cause of interference was often problematic. The causal link between the timing of base station activation and interference should make this diagnosis process easier for MitCo, but they would require network rollout information to make an appropriate diagnosis;
- The BBC analysts have access to current BBC DTT transmitter information to identify DTT transmitter

[48] All figures are broad averages. Data sourced from engagement with the head of the BBC investigation service

related problems. It is possible MitCo may have also require access to this and, if possible, other multiplex operator information to avoid misdiagnoses;

- The BBC and Capita use an integrated CRM system to record calls and funnel complex interference calls through to the in-house BBC analytical team;
- Resolving interference issues with vulnerable people can take much longer than standard calls, as much of the diagnosis tool involves 'self-help'. As a result, it may be more efficient and effective for MitCo to consider provide higher levels of support for vulnerable people; and
- Front line call centre operatives need a suitable level of technical skills. They need to be supported by a technically skilled team of specialist analysts.

Contact centre operations

The contact centre is likely to be a key component of successful service delivery for MitCo in its role as a cost efficient channel for consumer interaction[49]. MitCo's contact centre may be required to perform four broad functions:

1. A channel for performing consumer *diagnostics* (and processing online diagnostic results) and funnelling consumers into the appropriate mitigation solution;
2. Acting as an additional *conduit* for the supply of information to consumers;
3. Providing over the telephone installation *support* and guidance to assist consumers in the self-install of filters; and
4. Providing an outlet to *capture consumer complaints* around service delivery standards and a channel to communicate responses to complaints.

The size of the contact centre is highly dependent on both the overall level of consumer support determined by Government and the volume of interference driven by the MNOs network rollout strategies (as both these factors could have a significant impact on the call volumes the contact centre is required to manage). The cost of the contact centre could conceivably range from c.£1 million to c.£2.5 million per annum depending on the volume of calls experienced, and hence the number of telephone operatives required[50].

The contact centre may also require the technology infrastructure (potentially in the form of a CRM system and associated business processes) to efficiently record caller information, raise jobs and flag actions through to the relevant delivery channel.

This process may also need to be supported by a robust performance management and reporting capability to generate and analyse management information, monitor case hand-offs and drive continuous improvement.

Equipment and distribution

Alongside installation support, equipment supply and distribution represents the primary mechanism for MitCo to resolve interference problems for the majority of affected consumers. Due to the scale of the filters MitCo will be required to source and distribute over its life (potentially more than 5 million filters), effective procurement and logistics may be a key requirement to delivering effective and cost efficient mitigation.

Operating an effective supply and distribution function requires a number of capabilities, including:

- Managing *supplier relationships* and sourcing filters;
- *Inventory management* (closely integrated with demand forecasting);
- *Warehousing – usable* filters (both main logistics warehouse and regional 'spokes' if required);

[49] Based on Deloitte benchmark analysis inbound call centres and online channels represent the most cost efficient channels for sales (a useful proxy for customer service volumes) and dominate the channel mix for the best performing organisations in the benchmark reference group

[50] Assumptions around contact centre costings are explored in more detail in section 5.3.2

- *Warehousing – defective/* returned filters;
- Distribution *channel management* (i.e. contract management of specialist logistics supplier); and
- Coordination with *field force* schedulers and engineers.

In addition to the capabilities above, effective equipment sourcing may also require technology infrastructure (typically supply chain management software) to effectively track and process inventory through supply and distribution.

IT infrastructure

In addition to the capability specific IT infrastructure already outlined for the contact centre and supply chain management, MitCo may also require a range of additional IT infrastructure (both hardware and software) to support its operations.

This infrastructure may include desktop hardware for staff, data management hardware (alongside the associated support capability) and ERP / CRM systems and licences. The costing of these capabilities in this Report is based on high-level benchmarks of IT infrastructure expenditure rather than estimating the cost of specific systems implementation and hardware unit costs.

Other

The capabilities within this category are principally:

- Platform changes; and
- Property and facilities;

Platform changes

In terms of platform changes, one strategy could be to utilise the existing field force operated by the alternative platform supplier (be it freesat or cable) to provide new platform installations. However, MitCo could still require a capability to correctly identify HHs that require platform changes. This capability should be designed to meet two broad objectives:

1. Identify and schedule platform changes to those HHs that require them as cost efficiently as possible; and
2. Mitigate the risk of HHs obtaining platform changes incorrectly (either through gaming or administrative error)

As the value of a platform change is significantly more than a receiver filter, the risk of consumers potentially wishing to game MitCo to obtain one are consequently higher. In order to mitigate the risk of gaming, consumers could only be offered a platform change after contact centre verification. The contact centre diagnostic could be made reasonably robust since some of the key data is independently verifiable, e.g. location. Any requirement for more expensive cable platform changes could also be verified by a field force technician if this level of consumer support is supported.

It is expected that MitCo, within the financial incentive mechanism established, will minimise unnecessary and costly platform changes through effective diagnostics and mechanisms. For example, MitCo could conceivably charge a call out fee to consumers who claim for platform changes that are discovered to be based on deliberate misinformation provided to the contact centre. Equally, MitCo may decide to reimburse eligible consumers for installations they have already paid for, but which have proven to be insufficient in mitigating interference.

As an additional check and balance the Supervisory Board could commission audits on the diagnostic process being employed by MitCo and randomly sample a handful of platform change cases to verify that the process and decisions made by MitCo were reasonable.

Property and facilities

The property and facilities cost element of MitCo is concerned with the supply of sufficient gross internal area (GIA), workstations and amenities to cater for MitCo's personnel. MitCo may be required to source, acquire (either through rental or purchase) and maintain property and facilities including office space, warehousing and facilities from which to operate a field force. The cost of property and facilities in this

Report has been calculated using benchmark analysis rather than cost estimates relating to specific facilities or locations.

5.2.3 Information sharing and processes

To adequately provide consumer mitigation it is necessary for MitCo to understand and predict the effects of interference from network rollout prior to interference occurring. This is a key requirement of the demand forecast capability within MitCo.

For the demand forecast capability to be effective, it must have access to sufficient data from MNOs. This information sharing should be kept to a minimum based on what is necessary for MitCo to perform as expected. As a minimum MitCo may require information from MNOs on:

- the *location* of base stations to be activated;
- the *timing* of their rollout and base station activation; and
- *technical* data pertaining to the base station (power levels, filtering etc).

In all likelihood, an ongoing dialogue with MNOs relating to network rollout strategies is likely to be the most effective means of adequately forecasting future demand and making the optimum choice between network and consumer -based mitigation, as opposed to prescribing information requirements in MNO licence conditions. This is due to the inherent uncertainties of what information, and in what detail, will be required to model interference and make decisions on mitigation choices in 'real time'.

As the MNOs' rollout strategies are commercially-sensitive, MitCo will potentially have access to data from each MNO that could impact competition in the mobile network market if it were misused or inappropriately disclosed. It will, therefore, be necessary for MitCo to develop robust information security and confidentiality practices.

There are broad principles around information security that may need to be established early:

- **Information in, not out:** as far as possible information provided by MNOs should not be released or communicated by MitCo to any other organisation;
- **MNO specific dialogue:** as far as possible the dialogue between MNOs and MitCo should be MNO specific and exclude explicit data relating to any other MNO, even if MitCo's recommendations may be informed by aggregate data;
- **Anonymity of data:** data provided to MNOs on network rollout could be anonymised prior to being aggregated to mitigate the risk of personnel being able to draw conclusions on rollout strategies of specific networks; and
- **Relevant data:** data required by MitCo should be relevant to its undertakings (i.e. excluding data on wider MNO business operations such as pricing, customer base, sales or existing 2G or 3G network information).

How early MitCo will be required to have access to network information prior to an MNO actually rolling out their network in a given region may ultimately be determined by the speed at which MitCo can effectively coordinate and implement mitigation efforts. One benefit of an option in which MitCo is operated by MNOs is that it would eliminate the requirement to prescribe *ex ante* an information sharing obligation, as MNOs would be naturally incentivised to manage the flow of information to keep their network rollout strategies as flexible and adaptive as possible.

In real time network rollout scenarios, both the timing of information exchange and the nature of the data being provided are subject to significant uncertainties and 'unknowns' that make arriving at a definitive answer difficult. For this reason, 'internalising' the issue within MNOs may be attractive.

5.3 Cost structure

Having determined the broad capabilities of MitCo under Consumer Support Option 6, we have used benchmark and case study analysis to inform the likely skills and productivity assumptions implicit within each of these capabilities.

Benchmark metrics were identified across a range of comparable industries in both the private and public sector to provide an indication of MitCo's potential staffing levels and other lines of expenditure. These benchmarks assumed an average level of productivity and efficiency performance, reflecting the uncertainty in the future efficiency of MitCo's operator.

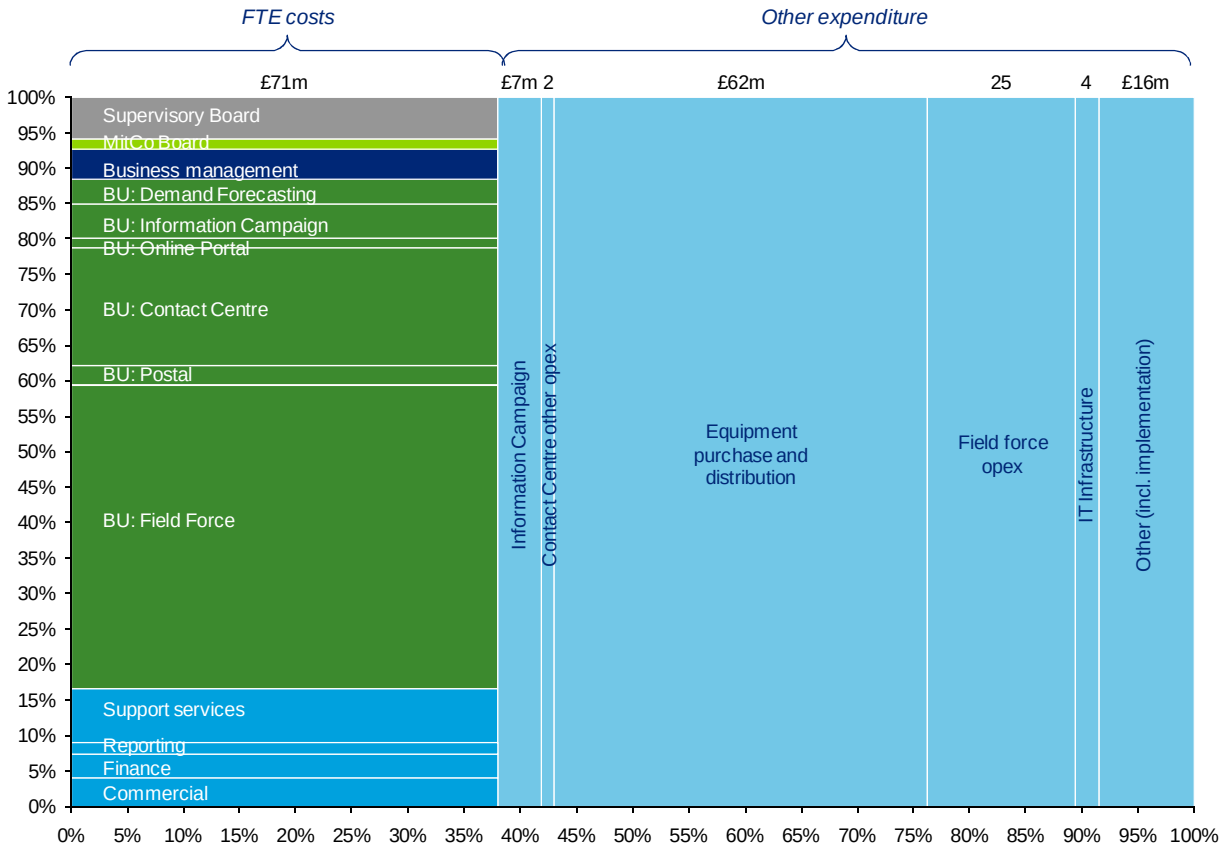
5.3.1 MitCo cost estimate under Consumer Support Option 6

It should be noted that the total costs of MitCo by consumer support option are presented in Section 3.3. These costs were estimated based on volumes and unit costs of *activity*.

Based on the issues discussed in Section 5.2 the analysis below presents the cost structure of MitCo under Consumer Support Option 6, derived from an estimation of MitCo's required *capabilities*.

This has been based on benchmark analysis, in terms of potential FTE numbers and other operating expenditure. Capabilities have been identified and sized before being aggregated to develop an overall capability-based cost structure.[51] This capabilities-based cost estimate is intended to validate the activity-based cost estimate (outlined in Sections 2 and 3 of this Report). Figure 5.e presents the cost structure of MitCo broken down by capabilities and segmented between people costs and other expenditure.

Figure 5.e: MitCo cost structure by capability under Consumer Support Option 6



Source: Ofcom interference volumes; Deloitte analysis. Central volumes scenario. INDICATIVE

[51] Analysis assumed MitCo would provide the highest level of consumer support outlined in Section 3 of this Report (Consumer Support Option 6) with a lifespan of 5 years

The annual cost of the Supervisory Board is estimated at c.£1.2m pa, and likely to be less than £2m pa depending on precise resourcing assumptions with respect to membership and remuneration.

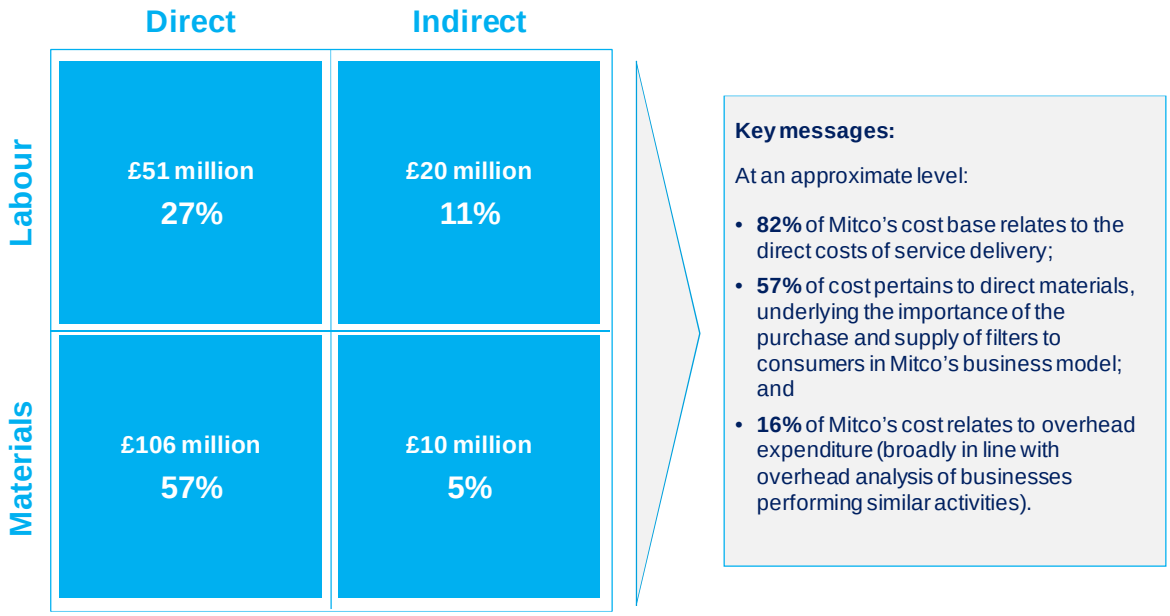
Under the capability-based costing approach illustrated above, the total cost of MitCo is c.£187 million over five years of operation. This represents a cost variance of approximately 4 per cent from the cost of providing a similar level of consumer support under the activities based cost estimate in Section 3.

This variance is principally driven by inherent differences in the two costing approaches. An example of such difference is the cost of providing installation support through the operation of a field force:

- Whilst the activities based costing approach applies a cost to each installation, in the analysis above the cost of installations is borne out by the labour cost of field force technicians and schedulers and other operating expenditure (largely the cost of operating and maintaining a fleet and remote IT systems);
- The cost of installations in the input based costing approach is highly dependent on the number of field force technicians MitCo is required to operate, which in itself is driven by the activity volumes from rollout scenarios and productivity assumptions (derived from benchmarks).

The input based approach takes an average requirement for field force technicians across rollout scenarios. This approach was necessary, in light of the uncertainty surrounding potential rollout scenarios, but in reality may underestimate the level of field force personnel required in years of peak activity, thereby potentially underestimating the cost to MitCo of meeting those levels of consumer demand. Figure 5.f below segments the capability cost base of MitCo between its direct and indirect elements, by both labour and materials, to provide an indication of the key drivers of MitCo's expenditure.

Figure 5.f: MitCo cost base by cost under Consumer Support Option 6



Source: Deloitte analysis, INDICATIVE

Importantly the capability analysis underlines three key considerations for MitCo:

- **Impact of demand variability:** variability in demand (both volume and location) driven by rollout scenarios may have a significant impact on MitCo's capabilities and cost base. As a result, it is critically important that MitCo has sufficient interaction and information exchange with MNOs regarding demand forecasting to ensure that it is able to manage the impact of these demand fluctuations (in terms of workforce and resource planning) as effectively as possible, to provide optimal service levels to consumers;
- **Efficiency in logistics and distribution**: Approximately 62% of MitCo's cost base is driven by direct and indirect materials (predominantly the supply of filters to consumers). As this is such a significant cost element for the organisation, MitCo could look to drive cost efficiency through the adoption of good practice processes and procedures; and

- **Opportunities for subcontracting**: Analysis of MitCo's capabilities and case studies of similar programmes suggests that the majority of MitCo's consumer service activities could be effectively sub-contracted to specialist service delivery suppliers. The scope of services that could potentially be sub-contracted is illustrated in Section 6.4.1.

5.3.2 Cost, uncertainty and the role of benchmarking

The cost of MitCo under various consumer support options is presents in Figure 3.b in Section 3 of this Report. These cost figures are our best estimates based on available data. There are however a range of possible costs for each element within the consumer support options.

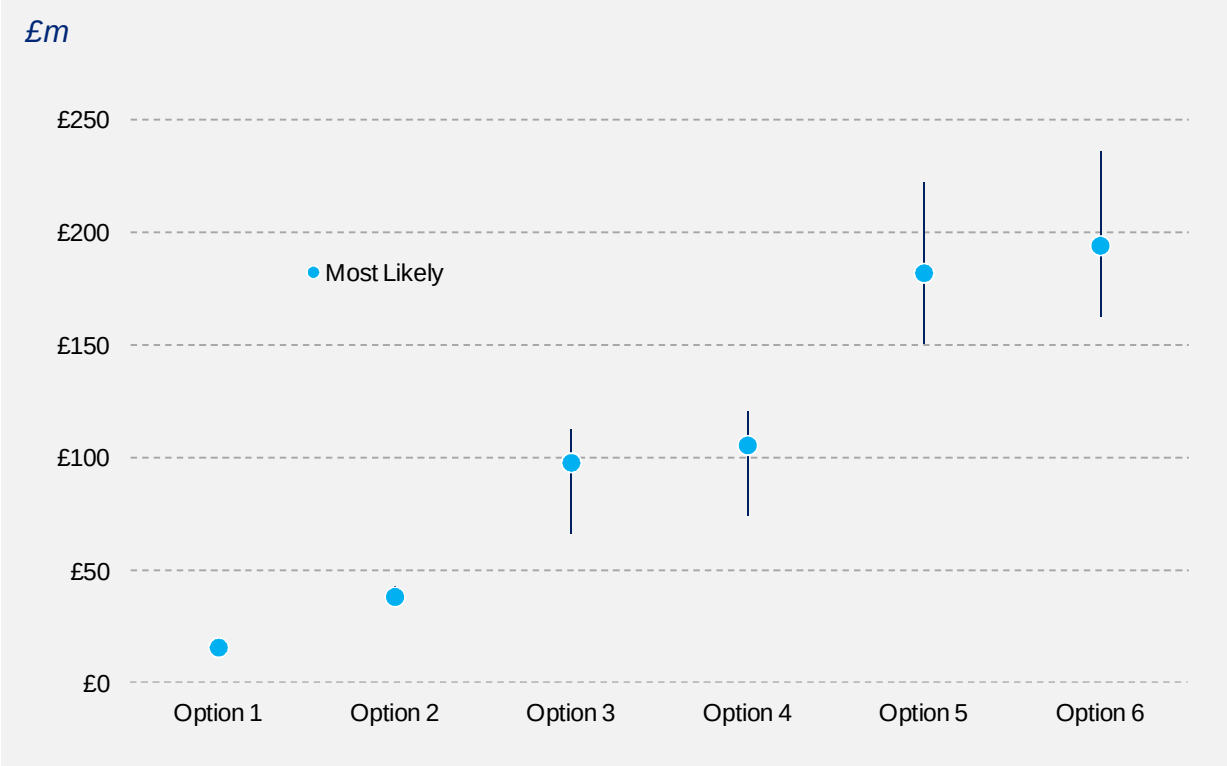
In Figure 5.g, we present cost ranges for each consumer support option to reflect the plausible parameter values which underlie the consumer support cost assumptions. The cost spreads represent the conceivable minimum and maximum values – the 'most likely' cost value represents the point around which total costs are likely to fall. The cost ranges have been developed through analysis of a range of benchmarks and case studies, against each of MitCo's capabilities and activities, including:

- Information campaign;
- Web portal;
- Contact centre;
- Field force;
- Business management; and
- Support services.

Analysis of productivity and efficiency benchmarks from various industry groupings produced a range of results ranging from poor performers to good performers. For the purposes of the 'most likely' cost analysis we took the average across the comparator set for each metric to recognise the uncertainty regarding levels of efficiency in MitCo. In reality, it may be possible for a high-performing operator / supplier to MitCo to perform better than these unit cost assessments imply.

Annex A provides detail on the unit cost assumptions that underpin the cost ranges presented below.

Figure 5.g: Total lifetime cost of consumer support options with no network mitigation



Source: Deloitte analysis based on Ofcom data, based on central volume case, INDICATIVE

On average, there is a 30% spread in costs between the low and high cost estimates, across options. The spread is largely driven by:

- **At the low cost estimate:** efficiency in targeting proactive support. The most likely cost currently assumes a rate of approximately 10 filters supplied proactively per affected SDI HH (addressing approximately 90% of SDI HHs experiencing interference prior to interference occurring). The low case cost estimate assumes that MitCo may be able to target the SDI HHs that require filters more effectively, with a subsequent decrease in the number of proactive filters required to c.3 filters supplied proactively per SDI HH affected (addressing approximately 55% of SDI HHs experiencing interference prior to interference occurring); and
- **At the high cost estimate:** increased installation service costs for the supply of installation support to CAS and DIA HHs, derived from analysis of the average installation cost on the DSHS.

5.4 Implementation

The following section presents key implementation issues in relation to: set-up of MitCo; its lifespan; and wind-down.

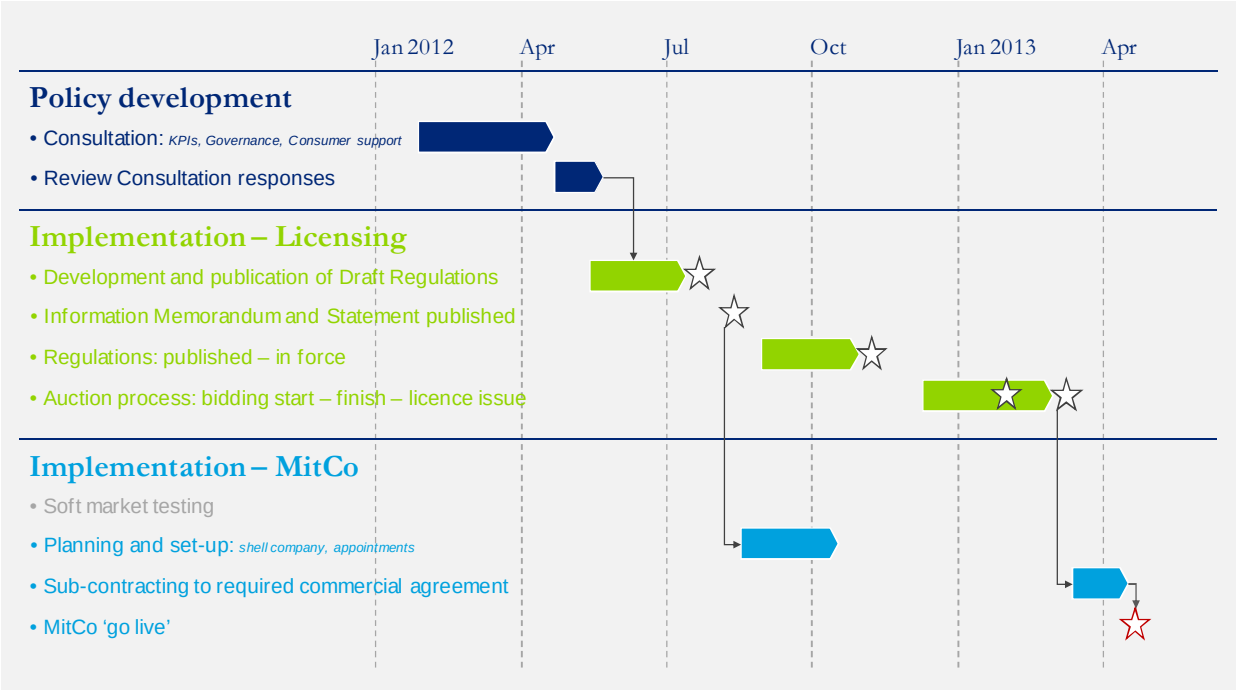
5.4.1 Set-up

The steps and timeframe for the setting up of MitCo will be dependent on the strategic design option chosen. The following considerations relate to the MNO-led and the Contracting options.

Under the **MNO-led approach**, it will be possible to plan and establish some rudimentary aspects of implementation ahead of the auction.

However, some significant implementation steps will not be possible until after the auction on future mobile networks has completed, because those steps depend on MNOs organising themselves and making decisions for which they must be directly accountable. This may include, for example, establishing commercial agreements with suppliers (e.g. letting contracts with equipment providers or business services providers) and setting up key operational aspects of MitCo (e.g. appointing members of MitCo's senior management). These steps would have to occur at pace, under the direction of the MNOs that have been successful in the LTE auction. Accordingly, Figure 5.h presents an illustrative plan of implementation activity.

Figure 5.h: Illustrative implementation for the MNO-led approach (Option 2)



Source: Deloitte analysis. Note: timeframes are indicative because they are dependent on Ofcom planning assumptions

Under the **Contracting approach**, it will be possible for Government (as the contracting authority) to begin significant aspects of the implementation earlier than the auction, e.g. procurement / tendering and possible pilot exercises. The timeline for procurement will depend on the type of procurement procedure chosen. Of the possible processes,[52] precedent would suggest that a Competitive Dialogue may be appropriate (as was the case for procurement of similar contact centre and field force capability for the Digital Switchover Help Scheme) or given Government's emergent understanding of the marketplace that shorter, Restricted Procedure is appropriate.

Further detail of these processes is as follows:

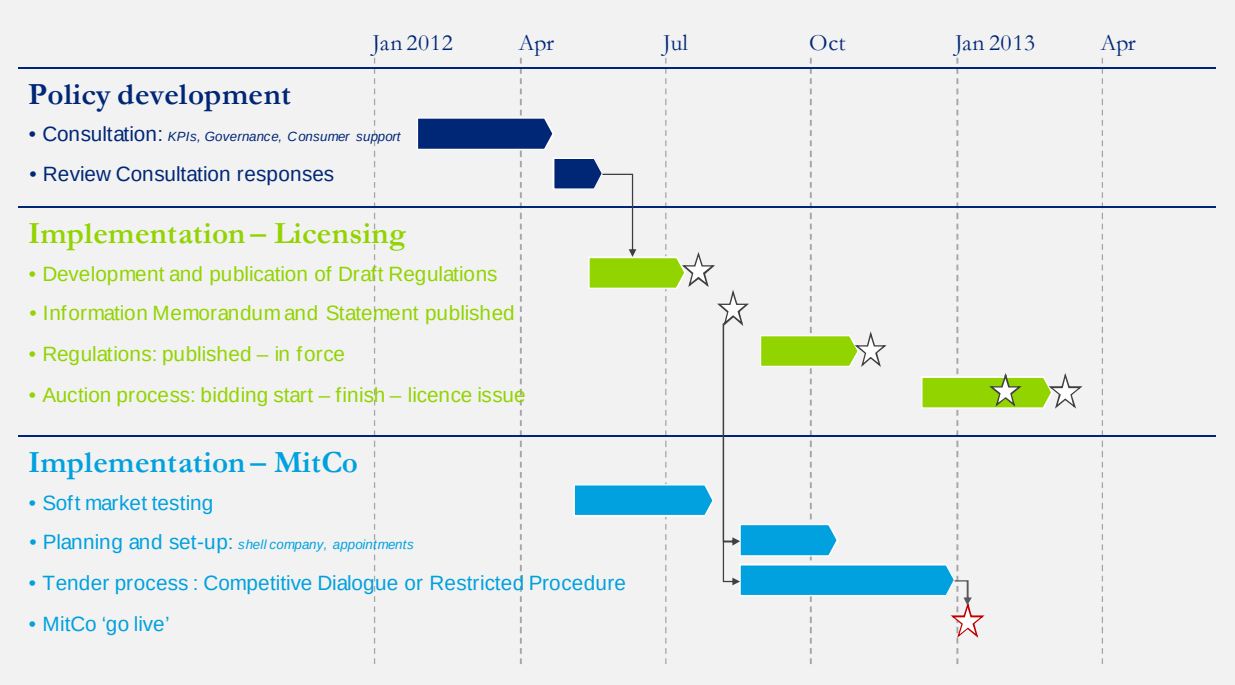
- **Competitive Dialogue** is designed for 'complex' procurements where the contracting authority requires some form of dialogue with the supplier to develop the specification. The aim of this procedure is to promote flexibility by allowing the contracting authority to discuss all or any aspects of the contract with each bidder on an individual basis.
    - In the case of the DSHS, a process of Competitive Dialogue was used. This was designed to last one year to accommodate a £1m pilot exercise to test delivery in a specific UK location, as well as provide time for the BBC to consider critical uncertainties they saw with regards to the maturity of the marketplace and the appropriate end-to-end service delivery model they required.[53]
    - Conceivably, a Competitive Dialogue can be conducted over as short a period as 16 weeks, which could be possible if the marketplace into which Government is contracting is mature and there is a clear understanding of the service requirements.
    - Given that the capabilities required for MitCo are similar to a range of field force businesses (e.g. distribution and logistics, business support services, cable telecoms[54]) and an analogous contracting experience now exists in the form of the DSHS, a compressed Competitive Dialogue or, indeed, a Restricted Procedure (see below) could feasibly be employed.
- **Restricted Procedure** is appropriate where viable specifications and / or pricing models already exist. This route does not preclude dialogue with potential suppliers as 'Clarification' can be sought on how bids meet the requirements. This route may be feasible for contracting a provider for MitCo given the established precedent in the form of DSHS and a maturing supplier market.

Figure 5.i presents an illustrative plan of implementation activity, which will require further development. The key feature of the implementation under the Contracting approach is that significant implementation can begin as soon as there is clarity on the requirements for MitCo, i.e. at the publication of the Information Memorandum and Statement.

This, in turn, allows the tendering process, either under a Competitive Dialogue or a Restricted Procedure, to begin before the auction has begun, with a view to establishing MitCo 'go live' at the time the LTE licences are granted.

[52] Negotiated Procedure, Competitive Dialogue, Restricted Procedure and Open Procedure. Detail on the mandatory timeframes and guidance for these procedures are available through the Cabinet Office and HM Treasury
[53] OGC, Competitive Dialogue Case Study: BBC's Digital Switchover Help Scheme, 14 July 2009
[54] Section 6.4 of this Report presents possible suppliers of MitCo services or sub-suppliers to an MNO-led MitCo

Figure 5.i: Illustrative implementation for the Contracting approach (Option 3)



Source: Deloitte analysis. Note: timeframes are indicative because they are dependent on Ofcom planning assumptions

5.4.2 Lifespan and wind-down

The lifespan of MitCo is dependent on the speed of future LTE network rollout. Section 2 of this Report considers the annual activities and cost of MitCo under different speeds of network rollout to a state of 100% coverage.

It is reasonable to believe, taking the experience of 3G network rollout, that the bulk of LTE rollout should occur over approximately five years. If rollout occurs more quickly then MitCo's annual spend will rise, as its lifespan diminishes. Figure 5.j shows the annual spend profile for MitCo under the three scenarios considered.

Figure 5.j: Annual spend of MitCo by rollout scenario and lifespan for Consumer Support Option 6, £m

Rollout Scenario 1 (3 years)	Rollout Scenario 2 (5 years)	Rollout Scenario 3 (5 years)
£65m	£39m	£39m

Source: Deloitte analysis

After the LTE network has reached near full coverage (as defined by the Government's targets), the nature of MitCo's activities will begin to take a different complexion that may warrant a different operating and commercial approach. The volume of consumer-based and network-based mitigation activity will fall dramatically.

In considering this, the following principles could apply after network has rolled out to sufficient coverage:

- Interference to DTT consumers arising from new, but deficient installations (which in turn may arise from new housing development) should not come under the remit of MitCo;
- An enduring obligation for the life of the LTE licence should exist on MNOs with regards to network mitigation;
- Consumer-based mitigation should be the responsibility of MitCo for a time limited period after the coverage target has been met to account for consumers that have been slow to respond.

After the network has rollout out sufficiently, two options for MitCo could be pursued with regards to mitigating interference caused by further network proliferation:

1. **MitCo continues in a reduced form:** the extant parties, e.g. MNOs under Option 2 and a Contractor under Option 3, remain accountable and responsible for mitigation activity.

2. **MitCo services are let or re-let to a contractor:** a different party is considered to provide consumer-based mitigation on a reduced scope / lower volumes and under different commercial terms. Under the MNO-led and the Contracting approaches, the Government could consider letting a contract for consumer mitigation to represent the fact that: the supplier market has matured; and the nature of the mitigation services would be well-understood by Government, who would be likely be the contracting authority.

A key problem to manage is the coordination of decision-making between consumer-based and network-based mitigation. This should be more manageable after rollout under any form MitCo takes because the volumes of interference will be significantly lower.

5.5 Conclusions

The key conclusions from an analysis of the operational design of MitCo are as follows:

- MitCo's capabilities will be dependent on the level of consumer support it is required to provide. Those capabilities will need to integrate in an effective end-to-end process.

- To ensure that the correct consumer mitigation solution is delivered to the correct consumer in an appropriate timescale, MitCo needs to ensure that forecasts of future workload coordinate effectively with resource management in each of its business units, e.g. contact centre, distribution, information and field force / installations, where applicable. In practice, this translates into a number of key service hand-offs that must be effectively managed under a single executive function responsible for the entire service operation.

- Analysis of possible unit cost efficiencies, based on benchmarking, suggest that there is a reasonable range of cost uncertainty in MitCo's operations. This cost uncertainty should be managed through the commercial arrangements put in place with the MitCo provider such that it is incentivised to deliver cost under-runs and savings through the range.

6 Commercial design issues

6.1 Introduction

Commercial design is concerned with how the operator of MitCo is remunerated and incentivised to deliver its required functions (defined in Section 3 of this Report). This section presents an analysis of: funding options intended to drive cost efficiency; key performance indicators designed to provide incentives on efficiency and service delivery; and supplier organisations that represent commercially credible providers.

6.2 Funding and incentives

The financing for consumer-based mitigation will like be raised through auction of the new 800 MHz band. Funding in the context of this section refers to how MitCo, tasked with consumer-based mitigation, is remunerated for its activities. How this is done provides the key basis for how MitCo is encouraged to deliver services efficiently. A range of funding options is explored below.

6.2.1 Types of funding / remuneration

Systems of remuneration differ in the way they impact on the provider's behaviour and the degree with which they contribute to efficiency, quality and innovation.[55] Remuneration could be: fixed or variable; and retrospective or prospective; or a blend of the above. These elements are described further in Figure 6.a and further developed in Figure 6.b.

Figure 6.a: Fixed / variable and retrospective / prospective payment types[55]

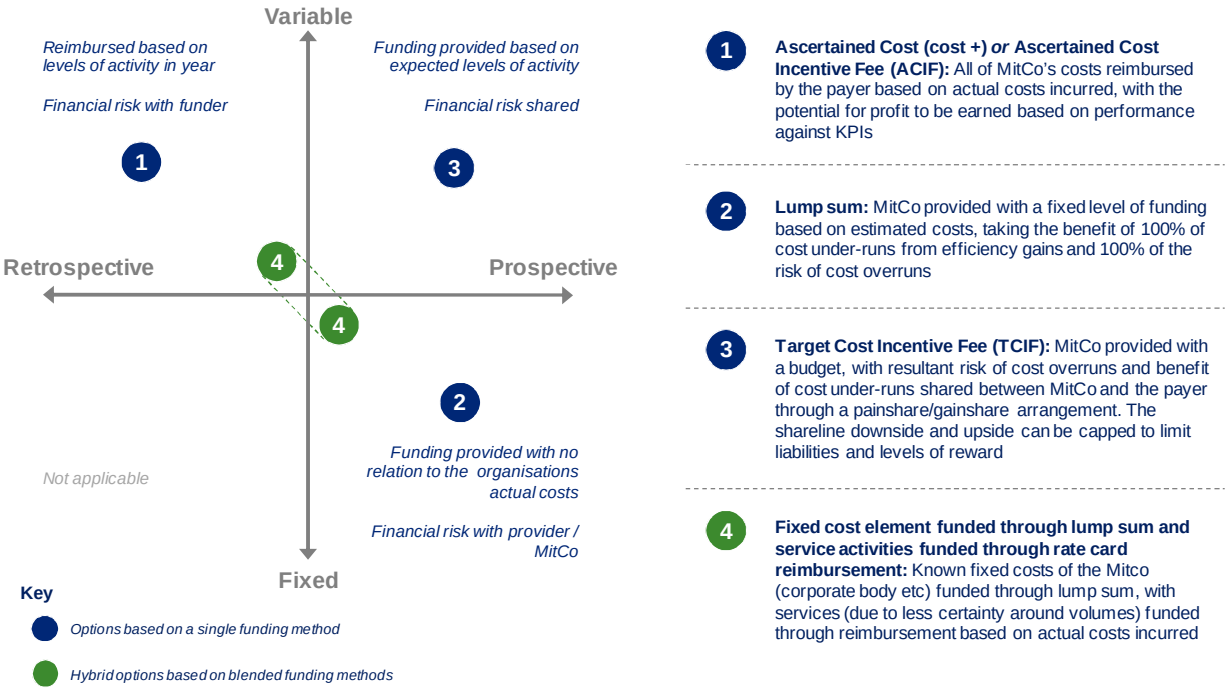
	Description	Incentive	Impact on MitCo
Fixed	The amount MitCo is reimbursed / funded does not change as its activities change (e.g. increase or decrease or mix)	MitCo receives a 'lump sum', which is determined *ex ante* and is not related to its production. As a result, MitCo has a strong incentive to reduce marginal costs (as marginal funding is zero)	This may lead to a reduction in the number / intensity of mitigation activities (if MitCo can retain surpluses) , i.e. less quality. Open to the risk that MitCo will not effectively service high cost groups of consumers
Variable	Variations in MitCo's activities induces changes in the amount of funding. The incremental income is equal to the amount MitCo is reimbursed for an extra unit of mitigation	Because of the strong link between income and activity, MitCo has a strong incentive to increase production, until marginal income equals marginal cost	Variable systems with generous fees (or gross margins) may cause over-production or induce consumer-mitigation activities that poses insufficient benefit.
Prospective	MitCo's funding or payment schedule is determined *ex ante*.	As MitCo's costs are financed with a set budget, it has incentives to drive efficiency, i.e. Reduce marginal cost per unit of reimbursement, without lowering marginal returns	If MitCo is allowed to keep surpluses and accountable for deficits, the system is suitable for containing costs. However, there is a risk that providers in pursuit of efficiency, economise on volume and /or quality
Retrospective	MitCo's own costs are fully or partially reimbursed *ex post*.	Since reimbursement is based o real costs, MitCo has very little incentive to decrease costs	MitCo would have an incentive not to reduce costs and not drive technical efficiency. The system, however, provide certainty to a MitCo provider where costs and volumes are highly uncertain

Source: Deloitte analysis drawing on Jegers et al (2001)

[55] Jegers et al (2001) A typology for provider payment systems in health care, Health Policy 60

Figure 6.b combines the various payment types presented above to develop options for funding / remuneration of MitCo.

Figure 6.b: Typology of remuneration for MitCo



Source: Deloitte analysis

Of the options presented in Figure 6.b, a target cost incentive fee arrangement (Option 3) would seem most appropriate. The rationale is presented as follows:

- **Ascertained cost or 'Cost-plus' (Option 1):** the level of unit cost uncertainty is not so great as to warrant a funding regime of ascertained cost. This type of funding is often used in research and development-intensive programmes where the supplier market is immature and/or the nature of the requirement is challenging to define in terms of specific outputs; rather, requirements have to be defined in terms of customer needs and outcomes against which specific outputs are developed subject to emerging technology and advances in research. Given these characteristics it is reasonable to limit the transfer of financial risk onto the supplier, but to hold it significantly to account on quality and innovation. This type of funding is often used in Aerospace & Defence contracting.

- **Fixed price (Option 2):** In the case of MitCo, the complexity of managing the balance of network and consumer mitigation, coupled with the potential uncertainty in volumes (which are driven by a need to service diverse household groups nationwide) and unit costs (which draw across broad areas of capabilities such as contact centre, field force) implies that a fixed price funding regime is inappropriate. Fixed price funding is often used in narrowly prescribed contracting, where the market is mature, competitive and the service being commissioned is near-commoditised such that significant financial risk can reasonably be transferred to the supplier.

- **Target cost incentive fee (TCIF) arrangement (Option 3),** would be appropriate in the case of MitCo on the basis that an overall target fee can be established on the basis of robust cost estimating, with prospective for an incentive fee to be earned for driving achievable, though stretching, levels of cost efficiency. Given the likely cost uncertainty it is reasonable to establish a regime that shares financial risk between the supplier (in this case, the MitCo-provider) and the contracting authority (the Government). TCIF is often used in infrastructure contracting, e.g. Heathrow Terminal 5, and a range of complex procurements.

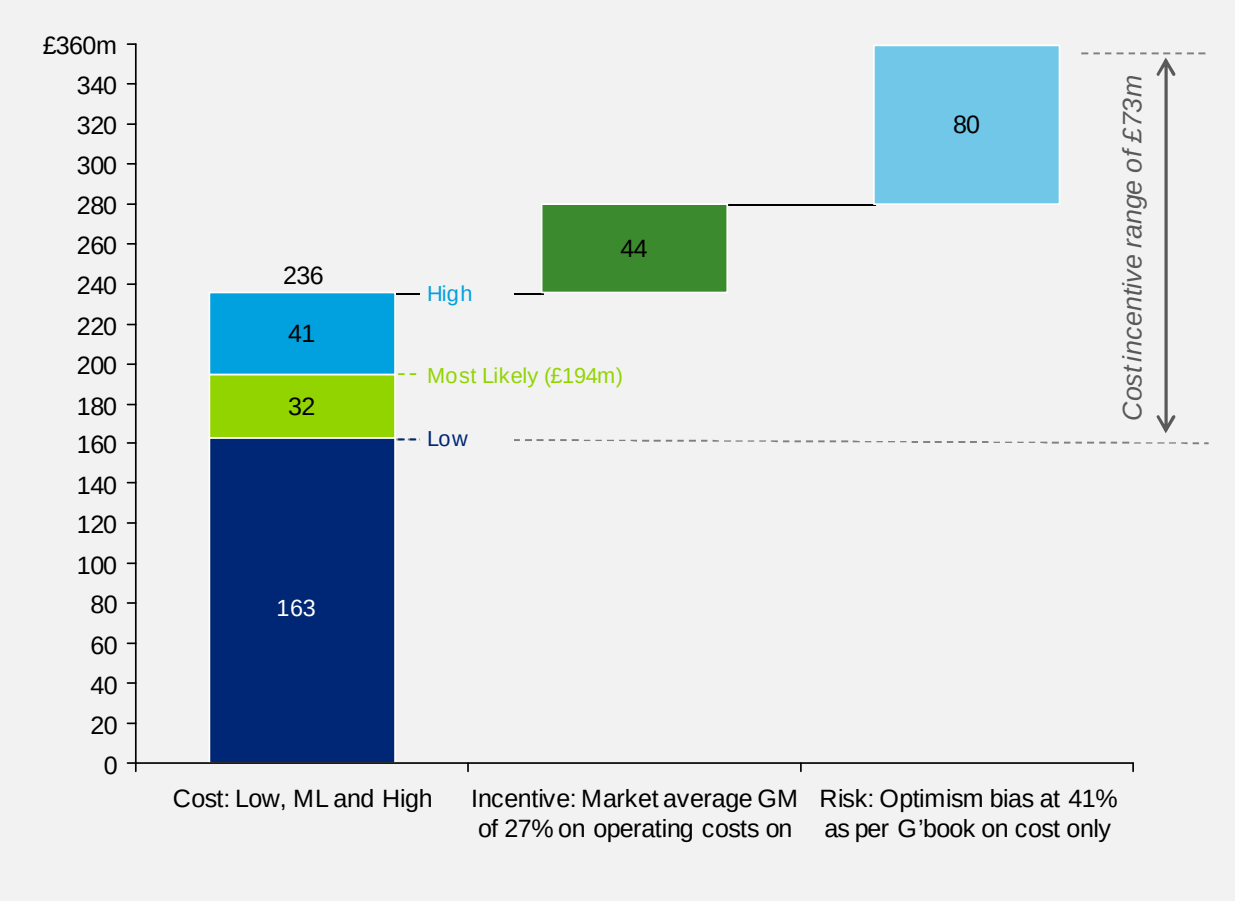
On the basis of the analysis presented in Section 5, notably Figure 5.g on cost spreads, one would expect the MitCo-operator to be able to deliver cost efficiencies if it is appropriately incentivised through a TCIF arrangement.

The cost range through which MitCo could be incentivised is generally defined by the most optimistic (low cost) and pessimistic (high cost) estimates for MitCo activities taking account of any 'normal', risk-free profit required by a commercial provider and risk margin as follows:

- The 'normal', risk-free profit has been calculated based on applying to the direct (non-overhead) costs of MitCo the average gross margin[56] of 27 per cent derived from a comparator group of business support service providers, contact centre operations and logistics and distributions businesses.
- The risk premium is based on applying optimism bias uplift of 41 per cent to the operating costs of MitCo derived from HM Treasury guidance in relation to an 'outsourcing' project.[57] Optimism bias has been applied in the absence of a thorough quantified risk analysis (which has been outside of the scope of this study).

To illustrate, Figure 6.c presents the implied cost incentive range that is relevant to MitCo activities on the current cost estimates under the central volume case for Consumer Support Option 6 excluding vulnerable groups.

Figure 6.c: Cost incentive range for MitCo activity under Consumer Support Option 6



Source: Deloitte analysis. Cost estimate is based on the central volume case for Consumer Support Option 6, excluding vulnerable groups

[56] Based on three years of financials (FY2008/09 to FY2010/11) for 26 businesses: Royal Mail Group; DHL Global Mail (UK) Ltd; FedEx UK Ltd; TNT Post UK Ltd; UK Mail Group Plc; Dx Network Serives Ltd; Citipost AMP Ltd; MM Teleperformance Ltd; Vertex Data Science Ltd; Club 24 (Ventura) Ltd; Sitel UK Ltd*; Clientlogic Ltd*; LBM Holdings Ltd; Acxiom Ltd (2 touch); Response (Building rewarding relationships) Ltd; Promotional Logistics Ltd; Telecom Service Centres Ltd; Serco Group Plc; Capita Group Plc; Vertex Group Ltd; Carillion plc; Aramark Ltd; WS Atkins; Emcor (UK) Ltd; Interserve (Facilities Management) Ltd; OCS Group UK Ltd

[57] HM Treasury, The Green Book 'Appraisal and Evaluation in Central Government' and Review of Large Public Procurement in the UK', published in July 2002, page 32, Table 4.

6.2.2 Target cost incentive fee funding design

In constructing the appropriate TCIF arrangement, two elements of the design are relevant:

- The **target cost**, which is the best estimate of cost determined mutually by the potential supplier and the contracting authority; and
- The size of the **incentive fee** or **shareline** which determines how the excess cost (over-run) or savings in cost (under-run / underspend) in relation to the target cost will be shared between the supplier and the contracting authority.

There is a trade-off in consideration of both the elements above. For example, one could set a very tight target cost at a low estimate of likely outturn cost with a generous shareline to the supplier for delivering an under-spend, along with a capped downside risk for the supplier. Conversely, one could set a generous target cost at a high cost level with less generous shareline to the supplier for delivering under-spend, coupled with a heavy or full painshare for over-run on the target cost. The balance between target cost and incentive fee is often agreed between both parties through the contract negotiations.

In the case of MitCo, the appropriate funding option will be dependent on *who* is made accountable for delivery (see discussion at Section 4) since each 'agent' – whether Broadcasters, Government, MNOs, or a third party, contractor – will each come with its own set of natural incentives, and against which the funding regime will act in order to further sharpen behaviours towards high quality / low cost delivery.

Therefore, the following presents 'strawman' options for funding under the two leading approaches to the strategic design of MitCo established at Section 4 of this Report, namely, the MNO-led and Contracting approaches.

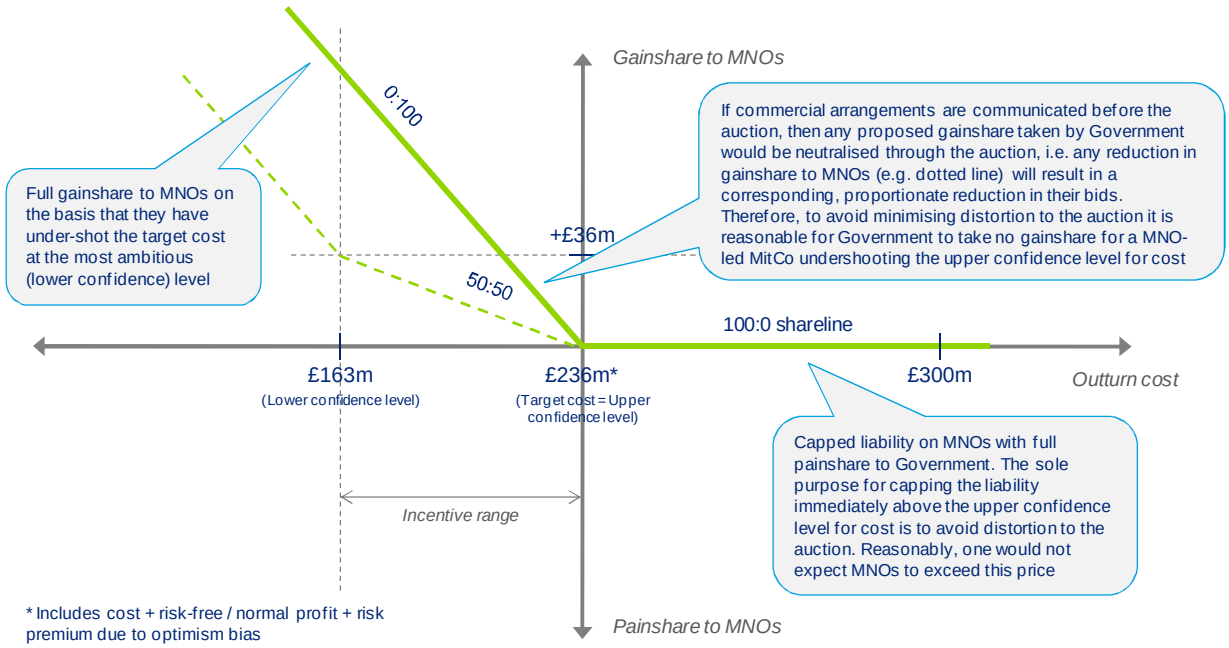
MNO-led approach (Strategic Design Option 2)

Under the MNO-led approach to MitCo the following issues apply:

- **Determining target cost:** There is inevitably a degree of uncertainty in our estimating of costs, as highlighted in Section 5.3.2. Although we have sought to ensure that we have a reliable estimate of the upper cost bound, there remains a risk that costs could exceed that level. However, if the MNOs were to bear the costs of overspend, they would face greater uncertainty in the auction which would tend to reduce auction efficiency. We consider that this risk would be best mitigated by ensuring that the MNOs' MitCo liabilities are capped, with Government bearing any overspend risk. That overspend risk could be minimised by using upper bound figures for the target cost of MitCo funding.
- **Determining incentive fee and shareline:** MNOs may have a weak incentive to look after the interests of DTT consumers. To some extent this risk would be mitigated by the reputational risk to the MNOs. The MNOs' incentives to be cost-efficient are weakened by any gainshare with the Government, other things being equal. Reducing the Government's share of any underspend would sharpen incentives (although potentially increase revenue uncertainty for the MNOs). In addition, any shareline to MNOs as a collective would be further shared between them, thus possibly diminishing their individual incentives. And lastly, the value of gainshare as compared to other revenue generating opportunities in MNOs is relatively small, in the tens of millions. This points may argue towards full gainshare to the MNOs. Ultimately, this is a consideration for Government.

Figure 6.d illustrates the interaction of the above issues by mapping the relationship between outturn cost (x-axis) against the implied gainshare (y-axis).

Figure 6.d: 'Strawman' target cost incentive fee for the MNO approach



Source: Deloitte analysis

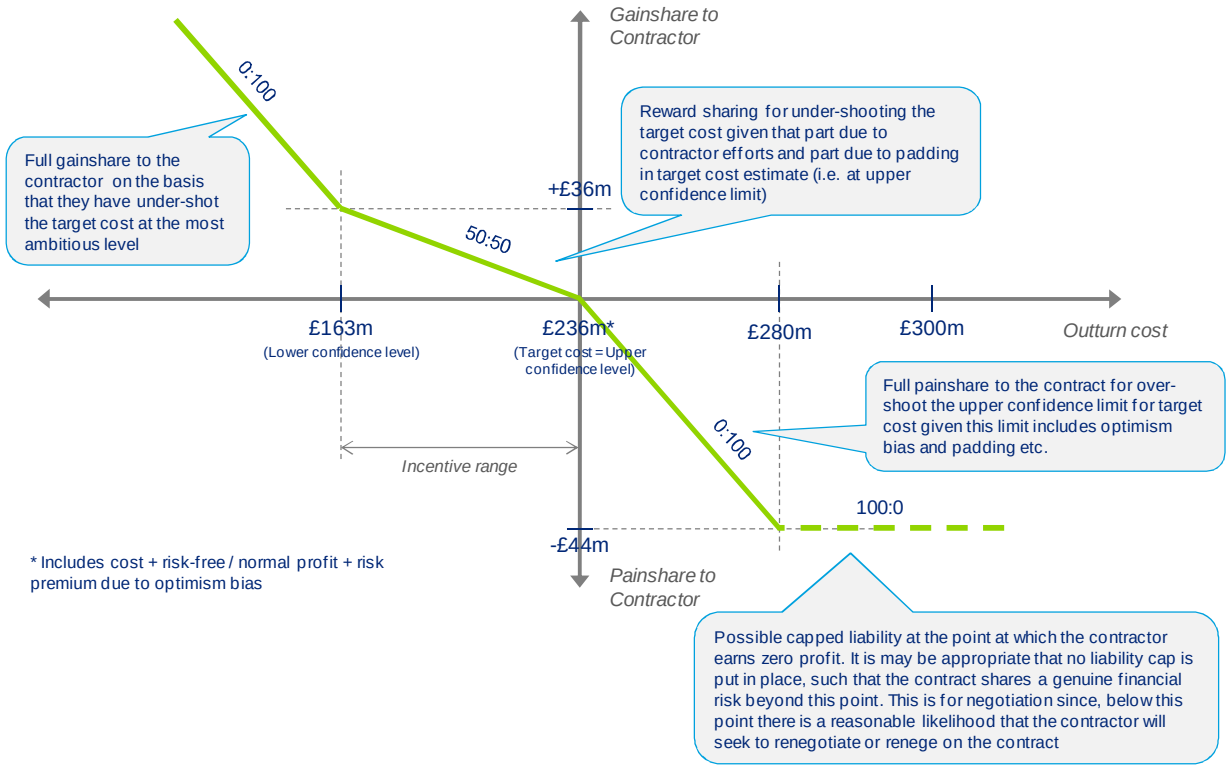
Contracting approach (Strategic Design Option 3)

Under the Contracting approach the following issues apply:

- **Determining target cost:** The target cost could be set at the upper end of the cost incentive range at the pessimistic (high cost) estimate. However, the incentive arrangement should be adjusted accordingly.
- **Determining incentive fee and shareline:**
    - Given that the target cost is set at the upper-end of the range, any underspend against that target cost should be shared with Government and the Contractor on the basis that it would be driven to some extent by the target cost being set at the most pessimistic level.
    - However, if the MitCo Contractor is able to deliver an underspend below the low cost, most optimistic estimate, it is reasonable that it earns a greater, possibly full gainshare as reward for under-shooting cost at the low-end of the cost incentive range.
    - Conversely, if the Contractor over-runs on the target cost, it is reasonable that the Contractor bears full painshare given where the target cost had been set. This could apply up to (and possibly beyond) the point at which the MitCo Contractor loses all profit on the contract.

Figure 6.e illustrates the interaction of the above issues by mapping the relationship between outturn cost (x-axis) against the implied gainshare (y-axis).

Figure 6.e: 'Strawman' target cost incentive fee for the Contracting approach



Source: Deloitte analysis

6.3 Key Performance Indicators

In addition to their use in controlling costs, incentive arrangements will need to be applied to other important factors valued by the Government, such as the quality of service delivery. These aspects will be defined through output-based metrics or key performance indicators (KPIs). KPIs will serve to supplement and sharpen the MitCo provider's natural incentives.

6.3.1 Possible KPIs

A set of detailed KPIs will be required to drive behaviours at service level to deliver value in terms of cost and quality

In the context of MitCo's activities, its service KPIs should be:

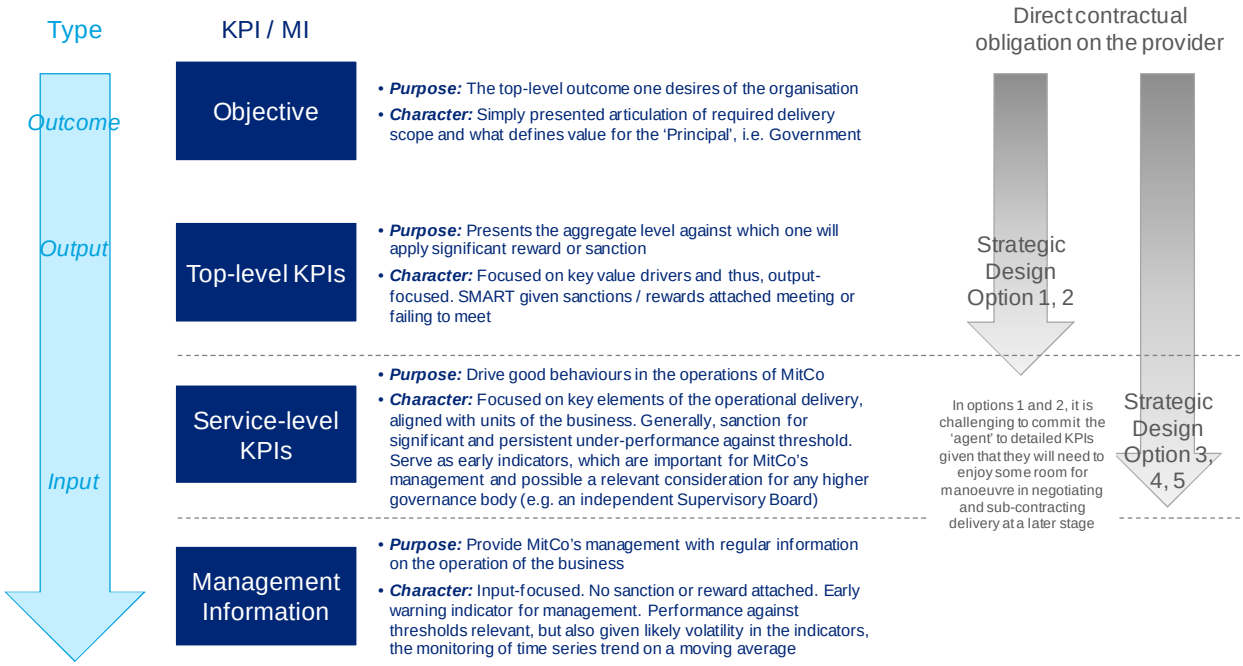
- Individually, **SMART**[58], with particular focus on objectiveness, since they will be the basis for reward or sanction;
- Collectively, focused on the range of issues the Government and Ofcom **value**;
- As a set, **not so numerous** as to dilute the incentive power of any single KPI;
- **Consistent** with each other so as to create a tension in the trade-off between cost, quality and timeliness, but not be so at odds and constraining such that the pursuit of one KPI fundamentally undermines the pursuit of another; and

[58] This means the measure has a Specific purpose for the business, it is Measurable to really get a value of the KPI, the defined norms have to be Achievable, the improvement of a KPI has to be Relevant to the success of the organization, and finally it must be Time phased, which means the value or outcomes are shown for a predefined and relevant period.

- **Sensitive to the natural incentives** of the MitCo provider so as to sharpen their behaviours and mitigate against their undesirable natural instincts, e.g. focus on efficiency where a provider would naturally have powerful incentives to pursue high quality / high cost services.

There are a range of KPIs one can put in place to establish effective control of the MitCo provider. These vary from top-level, output focused KPIs to input focused service-level KPIs and through to Management Information – the latter being of interest but which would not generally form part of MitCo's contractual obligation to the Government.

Figure 6.f: Types of KPI and relationship to the Strategic Design Options



Source: Deloitte analysis

As illustrated in Figure 6.f above, the level of specification and detail that can be placed into those KPIs and which can be 'contracted' with the MitCo provider will vary by the strategic design option.

- For example, under a Contracting approach, the level of KPIs placed onto MitCo and to which it will be held account will be potentially more specific than under the single-sourcing options, such as MNO-led and Broadcaster-led.

- Under the single-sourcing options, the MNOs and Broadcasters will need to sub-contract delivery to another organisation or set of organisations. They will, therefore, require sufficient 'room for manoeuvre' in terms of the how they are held to account by Government because they bear the delivery risk of further sub-contracting delivery at a later date.

6.3.2 KPIs for MitCo

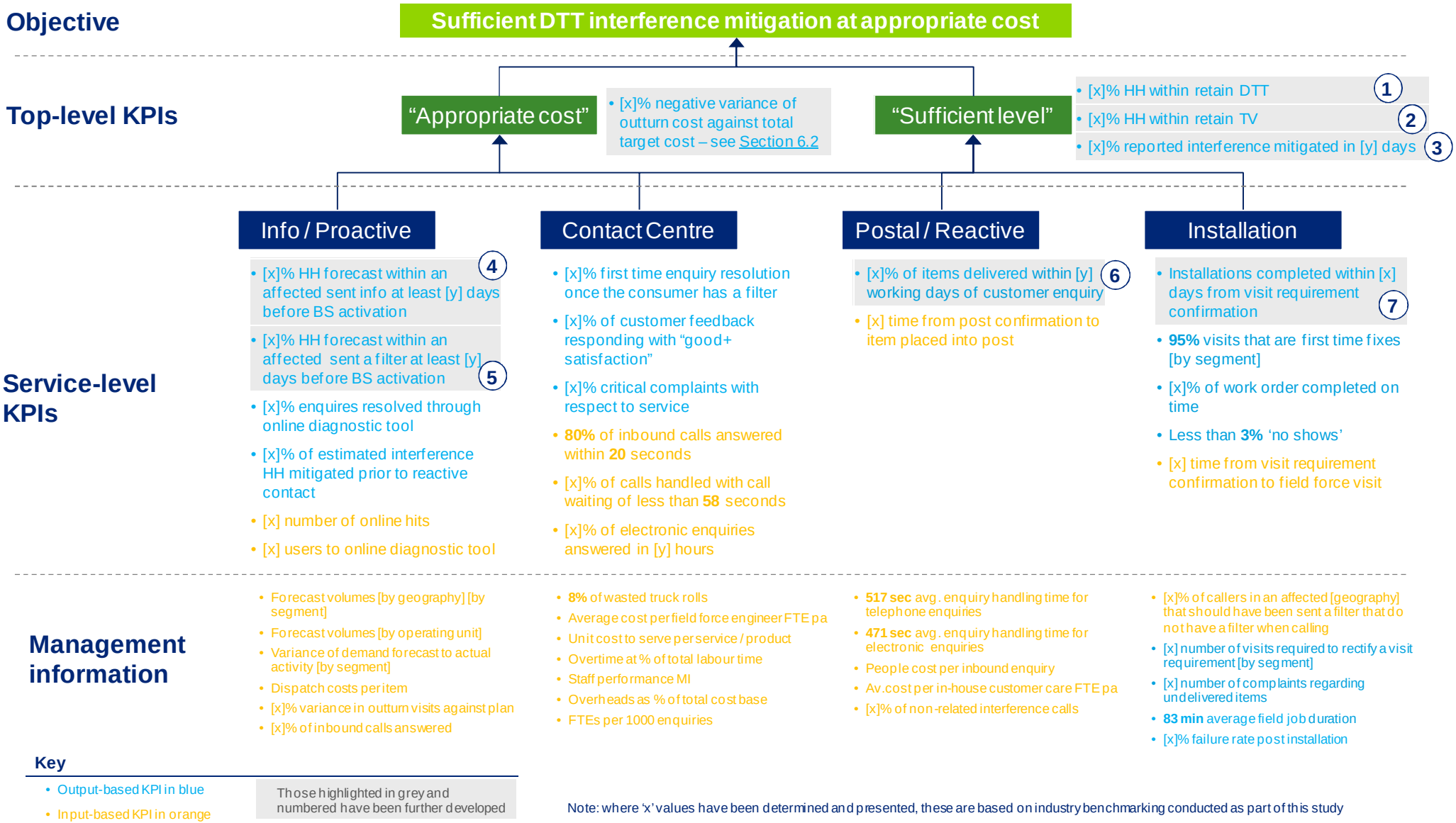
For MitCo, there are a range of top-level KPIs can be established which relate to *outcomes*, such as the retention of DTT services, and the *timeliness* of service.

These would be supported by service-level KPIs that align behind, and deliver, the four key elements of MitCo's service: information and proactive support; contact centre support; postal and reactive distribution; and installation support. It should be noted that these capabilities would depend on the level of consumer support MitCo is required to provide (discussed under Section 3 of this Report).

For the purposes of illustration the following analysis assumes that MitCo provides a level of consumer support consistent with Consumer Support Option 6.

The following KPIs, structured in Figure 6.g have been developed from examining comparator businesses with contact centre, distribution and field force capabilities.

Figure 6.g: Structured hierarchy of KPIs relevant for MitCo



Under Consumer Support Option 6, Government would require the following KPIs in Figure 6.g to be placed on the MitCo provider to be confident the level of consumer support it wants to achieve is, indeed, being met.

The KPIs were developed based on:

- Drawing on Ofcom's technical modelling of volumes to understand what *levels* of mitigation can be achieved by customer segment; and
- Industry benchmarks to establish reasonable thresholds in terms of *time to serve* in delivering those levels of mitigation.

The KPIs represent those which we would consider important in underpinning delivery, building on those highlighted and numbered in Figure 6.g above.

The precise threshold values presented are the starting point for negotiation with the relevant prospective MitCo provider, since agreement and assurance will need to be sought on their ability to deliver against those KPIs and at what cost.

There are seven KPIs – the first three top-level relate to levels of interference to be mitigated (i.e. coverage) and the proceeding four service-level KPIs relate to particular service elements (e.g. postal, field force) required to deliver the top-level KPIs.

Figure 6.h: 'Strawman' KPIs for Consumer Support Option 6

KPI type	KPI detail including thresholds
1. Top level	**[TBD]%** of HH affected by interference within the UK retain DTT
2. Top level	**[TBD]%** of HH affected by interference within UK retain TV
3. Top level	**[TBD]%** of reported HH experiencing interference mitigated in **5 days** **[TBD]%** of reported HH experiencing interference mitigated in **8 days** **[TBD]%** of reported HH experiencing interference mitigated in **13 days**
4. Service level	**[TBD]%** HH forecast sent info at least **1 month** prior to BS activation **[TBD]%** of Housing Associations and LAs with affected communal HHs sent info at least **2 months** prior to BS activation
5. Service level	**[TBD]%** of estimated interference HH mitigated prior to reactive contact.
6. Service level	**[TBD]%** of items delivered (once reported) within **3** working days of customer enquiry
7. Service level	**[TBD]%** of HH receive an installation **13 days** after visit requirement confirmation **[TBD]%** of HH receive an installation **8 days** after visit requirement confirmation **[TBD]%** of HH receive an installation **5 days** after visit requirement confirmation

Source: Deloitte analysis based on Ofcom data and analysis of benchmark comparators. Note: Based on central volume case, no network-based mitigation

Further analysis and consultation will be required to develop precise KPIs that meet the interests of Government based on its preferred choice of consumer support option and the interests of the provider in terms of feasibility and cost.

Further analysis will also be required on the nature and size of rewards and sanctions attached to compliance and non-compliance against agreed the KPIs.

6.4 Possible delivery organisations

Under the MNO-led approach to MitCo (Strategic Design Option 2) it is likely that the MNOs will contract-out delivery of MitCo's activities to a sub-contractor or a number of sub-contractors who possess the relevant expertise in terms of contact centre, nationwide field force network and distribution capabilities.

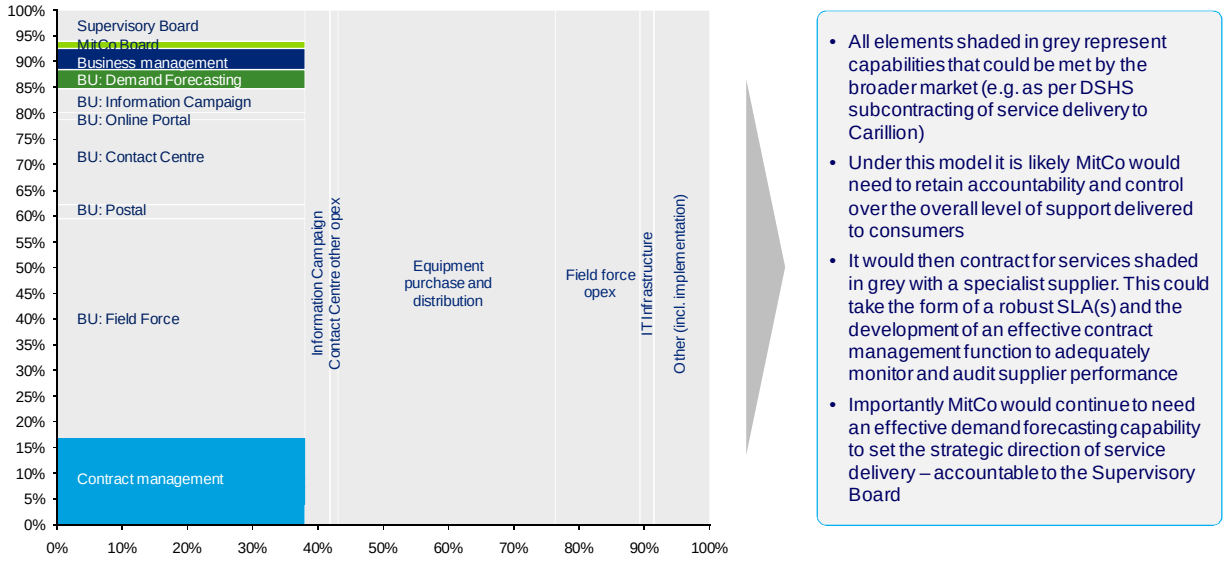
Indeed, even under the Contracting approach (Strategic Design Option 3), the prime contractor may sub-contract.

This section presents analysis possible the capabilities that could be sub-contracted and possible delivery organisations that could provide such services, either commissioned by MNOs in Option 2 or directly by the Government in Option 3.

6.4.1 Capabilities that could be sub-contracted

Of the MitCo capabilities presented in Figure 5.e of Section 5, the following Figure 6.i presents, in 'greyed out' shading, capabilities that could be further sub-contracted by the prime MitCo provider.

Figure 6.i: Opportunities for subcontracting service delivery



Source: Deloitte analysis

Sub-contracting elements of service delivery could have inherent benefits (around operational resilience, access to skilled personnel and technology, established good practice processes, reduction in overhead through economies of scale etc) that could help to optimise the productivity and efficiency of consumer facing activities.

- If the provider accountable for MitCo chooses to sub-contract consumer activities to potentially realise these benefits, the composition and capabilities of MitCo could become markedly different than the capabilities structure outlined in Figure 5.e. Under a sub-contract model, MitCo itself would require a significantly enhanced commercial and contract management capability to effectively articulate service requirements and monitor contractor performance.
- Analysis of comparable programmes indicates that this contract management capability could require as many as thirty FTEs to adequately track and interrogate performance management data at both a national and regional level (it is possible a proportion of these personnel would be located regionally to monitor the effectiveness of consumer activities on the ground).[59]
- In addition, as the ultimately accountable agent and liaison with MNOs, MitCo could require close integration with sub-contractors regarding demand forecasting and setting the strategic

[59] Based on DSHS case study

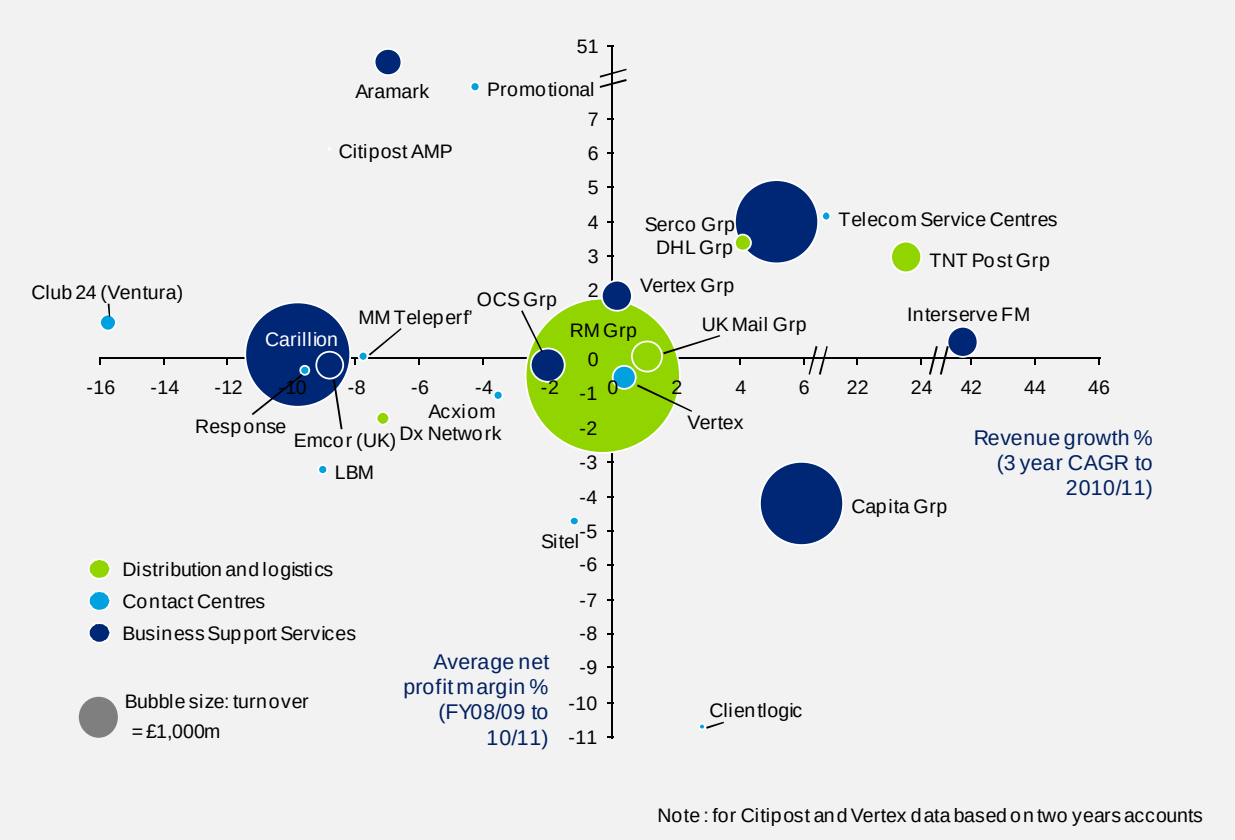
agenda for service delivery, to ensure that the optimum trade-offs between network and consumer -based mitigation are achieved and that the appropriate service levels are delivered to consumers.

6.4.2 Possible supplier organisations

In delivering the capabilities required, there are a range of suppliers in the business support services, contact centre and logistics and distribution sectors. Various telecommunications businesses, particularly in fixed line and cable sub-sectors, will have established field forces.

Figure 6.j, which represents key financials for a business support, contact centre and logistics and distribution businesses, shows that the market is broad in terms of historic financial performance and business size. There is a potentially wide supplier base into which the MitCo provider could sub-contract in order to realise the benefits of economies of scale from some large businesses *in* the market and/or competition *for* the market.

Figure 6.j: Profitability and growth of key suppliers in the distribution, contact centre and business support sectors



Source: Annual accounts data

Box 6.k presents commercial lessons learnt from the Digital Switchover Help Scheme.

Box 6.k: DSHS commercial arrangements

Due to the similarities in operations and the consumer landscape addressed, the DSHS is a useful proxy to understand how commercial arrangements with MitCo could be structured to incentivise service delivery. This case study examines: How DSHS is structured and funded; how subcontractors are remunerated; and what KPIs have been included in the SLA to drive service standards.

Structure and funding

DSHS Ltd was established as a wholly owned subsidiary of the BBC to deliver the DSHS programme which subcontracted service delivery to Eaga PLC, since acquired by Carillion and renamed CES Energy Services (CES). DSHS Ltd primary functions are to:

- set the strategic direction of the programme through requirements definition; and
- manage CES's performance against its contract.

DSHS Ltd employ approx. 30 FTE, of which c.50% are involved with ongoing contract management, including auditing of CES and its subcontractors. There is a regional manager in each of the regions in which the Help Scheme is operating, providing scrutiny of performance output.

CES subcontract all field force activities to two suppliers - AVC and Euro Aerials. CES also subcontract a proportion of front line contact centre activity to The Contact Company.

Funding is supplied from the BBC licence fee (approximately £603 million was originally ring fenced for DSHS, of which the CES contract cost was forecast to be £495m, but, due to lower take up and cost efficiencies, approximately £300million is forecast to be required.

Subcontractor remuneration

CES are paid a fee by DSHS Ltd on a retrospective variable basis composed of three elements:

1. **Fixed fee** – to cover the fixed cost element of activities;
2. **Cost of equipment and installation** – also known as the 'pay as you go fee'. This fee covers the cost of installation services, with the majority passed through the supply chain to CES's sub-contractors; and
3. **Variable fee** – payment to CES as per response to the Scheme by an eligible person

Contract KPIs

In their contract management capacity DSHS capture and monitor a range of KPIs and management information segmented by service delivery channel. These include:

Contact centre

- Proportion of calls answered within 15 seconds – contractual target is 85% (KPI);
- Rate of call abandonment – target of no more than 5% of calls abandoned (KPI);
- Proportion of aftercare first time fixes – target of 70% (KPI);
- Average call handling time – 383 seconds on avg over the last 9 months (MI); and
- Average calls answered per agent per shift - avg of 40 to 60 calls per agent per 8 hour shift (MI).

Field force

- Compliance to appointment window (arriving in agreed appointment slot) – target of 92% (KPI);
- Number of aftercare visits required as a result of a faulty installation – target of no more than 9.5% (KPI);
- Installation volumes per month – avg of c.57,000 per month over the last 9 months (MI); and
- Days from consumer option selection to successful installation – current avg of 16 days (MI).

Lessons

The commercial arrangements around DSHS present a number of lessons relevant to MitCo used in our cost analysis. These include:

- The contract is sufficiently flexible to permit changes to SLA requirements for CES during peak demand to mitigate the risk of perverse incentives if more stringent KPIs cannot be met;
- DSHS only pay cost and fees for the first installation (contractors absorb cost of repeat visits) providing a strong incentive for first time fixes;
- DSHS contract managers have direct access to sub-contractor's CRM system to allow sample testing and reporting to monitor performance on an ongoing basis;
- Emphasis of DSHS on 'no blank screens' potentially incentivising over-supply, necessitating the operation of permanent audit staff to monitor cost efficiency and cost control; and
- DSHS use subcontractors to leverage the benefits of operational resilience and economies of scale from specialist suppliers.

Further analysis and discussion would be required by the MNOs and/or Government depending on the strategic design option chosen in order to test the market and source suppliers that can offer value for money.

6.5 Conclusions

The key conclusions from an analysis of the commercial design of MitCo are as follows:

- A target cost incentive fee arrangement would seem the most appropriate funding option for MitCo on the basis that the cost uncertainty inherent in its operations is significant enough to preclude a fixed or firm price arrangement, though not so acute as to warrant ascertained cost or 'cost plus' funding types.
- There are two aspects to the TCIF arrangements one may wish to place on the MitCo provider, namely: the level of the target cost and the incentive fee or shareline arrangement.
- 'Strawman' options have been presented in this Report for both the MNO-led approach and the Contracting approach based on an analysis of the reasonable cost spread relevant to MitCo's activities.
- In addition to their use in controlling costs, incentive arrangements will need to be applied to other important factors valued by the Government, such as the quality of service delivery. These aspects are defined through output-based metrics or key performance indicators (KPIs). KPIs will serve to supplement and sharpen the MitCo provider's natural incentives.
- This Report has presented 'strawman' KPIs on key aspects of MitCo's service delivery.
- Given the nature of incentive arrangements is intimately linked to the level of consumer support MitCo will provide, as well as *who* is accountable for mitigation, further analysis will be required once a decision has been made by policy-makers on the appropriate consumer support option and on the overall strategic approach to be taken (whether, for example, a MNO-led MitCo, Contracting or otherwise).

7 Recommendations

The analysis contained within this Report is structured to provide advice on three key components of MitCo's overall design, as highlighted in Section 1.1:

- With regards to responsibility for mitigation, an MNO-led or Contracting approach appear to be the leading options for the operation of MitCo (detailed analysis outlined in Section 4.5);
- The capabilities and costs of MitCo are entirely dependent on the level of consumer support MitCo will be required to deliver. We have presented a range of options for these services and supporting capabilities in Sections 3.3 and 5.2; and
- The funding and commercial arrangements for MitCo depend on which strategic design model is preferred (i.e. MNO-led or Contracting). We have presented the high-level commercial considerations for each of these options in Section 6 of this Report.

We understand that decisions are to be made by policy-makers on:

- The level of consumer support MitCo will be required to provide (explored in Section 3 of this Report); and
- The overall approach to MitCo in terms of its institutional arrangements (explored in Section 4 of this Report).

On the basis that those decisions are made, recommended areas of development in the design of MitCo are likely to involve:

- Refinement of the **cost estimation** so that it can act as a basis for commercial discussion and decision (see assumptions and caveats at Annex A);
- Further analysis in terms of the costs and benefits of **network-based mitigation**;
- Development of a detailed definition of the **remit** of MitCo, based on the feedback from Government and other stakeholders, including the level and nature of consumer support, the detailed commitments to the consumer and other stakeholders, its financial principles and its protocols for consumer and wider stakeholder engagement;
- The role, remit and constitution of the key **governance arrangements**, e.g. the Oversight or Supervisory Board and supporting external governance structures for MitCo, including the commercial and operational relationship between MitCo, the Supervisory Board and Ofcom;
- Development of the detailed **funding and incentive arrangements** which the Government should establish with MitCo;
- Development of the **key performance indicators** required to monitor the performance and impact of MitCo and against which it will effectively be contracted to deliver. This should include the definition of a set of operational KPIs defining the operational standards MitCo should aim to achieve;
- Development of a framework of feasible and proportionate **sanctions** that could be applied to MitCo and/or its shareholders for not meeting key performance indicators; and
- **Implementation and set-up** of MitCo, including for example, the process for setting up the MitCo legal and corporate structure and definition of the key programme activities and milestones, including key assumptions and dependencies.

A Analytical assumptions

IMPORTANT CAVEAT: It should be noted that the costs estimated provided within this Report are indicative only and have been calculated to provide a high-level understanding of the changes in cost as the level of consumer support increases. All other things being equal, these costs have been developed to enable an informed decision on the potential consequential cost impact of changes in consumer support.

These costs do not represent a formal operational costing of MitCo, which would depend on market testing and supplier engagement. Furthermore, the costs are based on volume estimates provided from Ofcom modelling and thus subject to the same uncertainties inherent in that work. All figures are flat cash, un-inflated and undiscounted, are not based on three-point cost estimates and do not take into account elements of formal cost modelling such as cost uncertainty, risk and optimism bias. Testing, discussion and negotiation with a potential provider would be required before 'firm' costings are possible.

A.1 Assumption specific to consumer support options

Criteria	June Condoc	Revised Central	**Comment** (note that changes on the June Condoc are highlighted)
Fixed and semi-variable cost elements			
Cost of information campaign	£15,600,000	£6,328,352	Represents a regional campaign to 11m households, based on the following: case studies of swine flu (c£7m for 23m HH) in England; AV referendum (£16m for 27m HH) in the UK; Welsh electoral commission (£0.6m for 3m HH) in Wales; 'Are you doing your bit?' (£19.4m for 27m HH) in UK; and two previous estimates conducted as part of the June Condoc.
Cost of contact centre	£9,400,000	£12,496,500	The cost of the contact centre is largely driven by volumes and therefore changes between levels of consumer support. The cost presented here is the contact centre cost based on the same level of consumer support as that assumed in the June consultation document, i.e. Consumer Support Option 6 of this report. The cost has been calculated using: - outputs from analysis of case studies (DSHS etc) and benchmark comparators in the form of productivity and efficiency metrics (avg call waiting time, avg call duration, avg call wrap up time, avg. cost of contact centre FTE etc); and - Ofcom technical outputs and activity assumptions to determine potential daily call volumes. These outputs were then used as inputs into a contact centre 'Erlang' calculator for a contact centre operating 10 hours a day with constant uniform demand
Online portal	n/a	£1,204,537	Based on set-up time cost of five FTEs for 6 months to develop an online portal and digital information campaign at professional services capitation rates (using ICT Government framework rates for Delivery Services) and team of two people to support and maintain on capitation rate derived from eleven cable operators (based on research and BBC investigation service performance)
Overhead allocation for management (e.g. CEO and COO functions) and support capabilities (e.g. CCO, CFO, HR functions) in MitCo	n/a	16.3%	Based on identification of capabilities and roles, FTE requirements and capitation rates per FTE per capability (using CIPFA benchmarks) Overhead apportionment has been sense checked against businesses performing comparable operations through analysis of annual report data. These companies include: Carillion; Serco; Capita; WS Atkins; Aramark; UK Mail; TNT Post; Citipost AMP; BT Group; Telecom Service Centres; Promotional Logistics; MM Teleperformance; and FedEx (UK)
Cost of establishing MitCo	n/a	£1,000,000	Nominal value presented
Vulnerable outreach programme	n/a	£1,133,039	Represents a community outreach programme targeted at 5% of HHs affected by DTT interference, based on DSO contracting of Digital Outreach Ltd (DOL) to provide outreach services to hardest to reach 5% of the UK population. Cost estimate extrapolated from the cost per HH of the DOL programme.

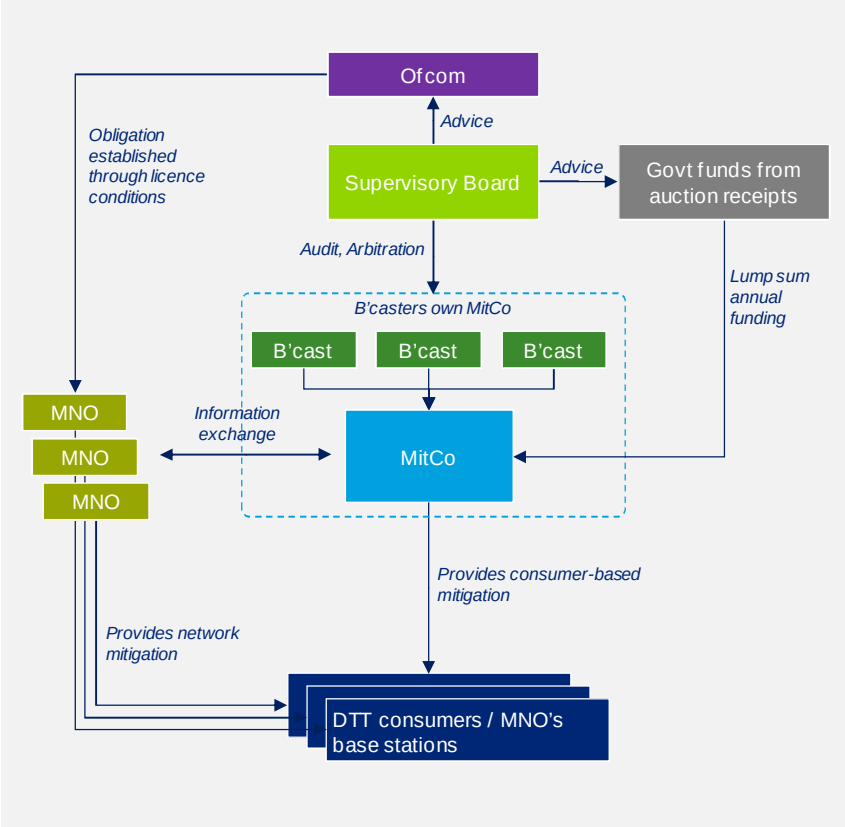
A.2 Common unit cost assumptions

Criteria	June Condoc	Revised Central	**Comment** (note that changes on the June Condoc are highlighted)
General			
Proportion of households for which DTT is their primary TV platform	N/a	40%	Assumed to apply to all segments except CAS HHs (which are assumed to be 100%). (40% does not apply to CAS HHs as it only takes one HH per communal dwelling with DTT as their primary platform to necessitate the supply of mitigation)
Escalation in the number of filters sent to households under reactive mitigation	1.5	1	Revision based on assumption that support will only be provided to primary sets
Proportion of HHs with vulnerable people requiring installation support	20%	15%	Revised based on an assessment of uptake for installation support for the Digital Switchover Help Scheme (Note this has been uplifted to 20% for the high case unit cost estimates)
SDI households			
Number of DTT receiver filters sent proactively for every SDI HH affected by interference	6	6	Note that the level of proactive filter supply has been amended in the low case cost assumptions to reflect the impact of more effective targeting of affected HHs
Gross factor for proactive mitigation (reflecting the difficulty in targeting SDI HHs only with proactive filters)	1.66	1.66	n/a
Failure rate of proactive filter support (i.e. the level of reactive remaining after proactive has been undertaken)	N/a	20%	Based on Ofcom technical analysis
Cost of installation support	£200	£112	Based on revised benchmarking of a range of providers, including the Digital Switchover Help Scheme and eleven cable providers, built up from: - benchmarks of field force productivity (e.g. average visits a day, failure rates and wasted truck rolls); - benchmarks of field force scheduling productivity; and - costs from comparator groups (e.g. cost per field force FTE and % of field force cost related to opex)
Cost of DTT filter purchase	£8	£8	n/a
Cost of DTT filter distribution	£2	£3.02	Based on average cost of logistics, warehousing and distribution per unit despatched from a reference group of 11 cable companies
CAS households			
Average number of flats per communal dwelling (single aerial)	16	16	Based on Ofcom analysis of census data
Cost of DTT filter purchase	£125	£125	n/a
Cost of DTT filter installation	£250	£224	Based on double the time of the cost of installation support for an SDI reflecting the relative complexity of a CAS filter installation (prudent assumption of an installation time of approximately 2.8 hours)
DIA households			
Average number of flats per communal dwelling (single aerial)	N/a	3.3	Ofcom analysis based on the ratio of total number of DIA households to the number of DIA households affected by interference in pixels where interference occurs
Number of TVs per household	2.5	1	Revision based on assumption that support will only be provided to primary sets
Cost of DTT filter purchase	£10	£10	n/a
Cost of DTT filter installation	£200	£156	Mid point between the June Condoc and the revised standard installation service cost assumption on the basis that there is a broadly a 50/50 split between those HH with masthead amplifiers (external requiring a costly service) and those internal requiring much shorter and cheaper installation support
Platform changes			
Cost of freesat platform change	£250	£250	n/a
Proportion of households (after DTT receiver filtering) requiring a platform change that can receive freesat	94%	94%	n/a
Cost of cable platform change	£3,450	£3,450	n/a
Proportion of households (after DTT receiver filtering) requiring a platform change that cannot receive freesat but can receive cable	3%	3%	n/a

B Description of strategic design options – detail

B.1 Broadcaster-led

Description	•MitCo is established by the broadcasters. The MNOs are required via licence obligations to cooperate with MitCo. •Funding is via auction receipts.

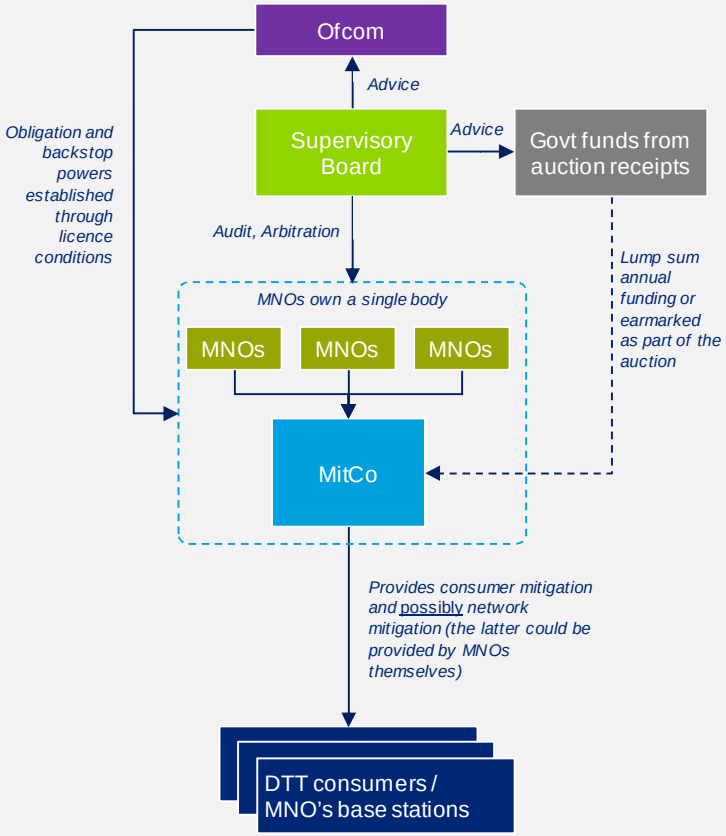


Detail

- ***Delivery structure:*** Government works with broadcasters / MuxCo operators to establish a joint venture ('MitCo') owned by the operators, with any sub-contracting up to the established MitCo. This would most likely be done through a consultation process and possibly with majority-share held by the BBC as per Digital UK.
- ***Service:*** MitCo provides consumer mitigation and possibly buys network mitigation from MNOs.
- ***Governance:*** Set up an Supervisory Board which includes owners of MitCo (broadcasters / MuxCos), MitCo management, and MNOs, with Government chairing.
- The Supervisory Board' core functions:
  - advise Government on release of funds to MitCo;
  - audit / hold MitCo's management to account for performance; and
  - advise on particular challenges of interference mitigation
- ***Raising funds:*** Out of the auction receipts going to the Consolidated Fund, with subsequent public expenditure.
- ***Payment to MitCo:*** Provided as a lump-sum, though upside / downside incentives and KPIs consideration given natural incentives of broadcasters and pressure from MNOs
- ***Incentives:*** Not-for-profit, natural incentive on quality arise from owners of MitCo facing the direct cost of poor delivery (lost viewers, lost commercial revenues from advertising etc.). Efficiency KPIs required to steer behaviours to cost-effective delivery
- ***Contractual relationship:*** To be determined.

B.2 MNO-led

Description	• A licence obligation is placed on the MNOs to manage, including coordinating, their approach to interference. They will be 'steered' towards establishing a MitCo. • Funding is via auction receipts.

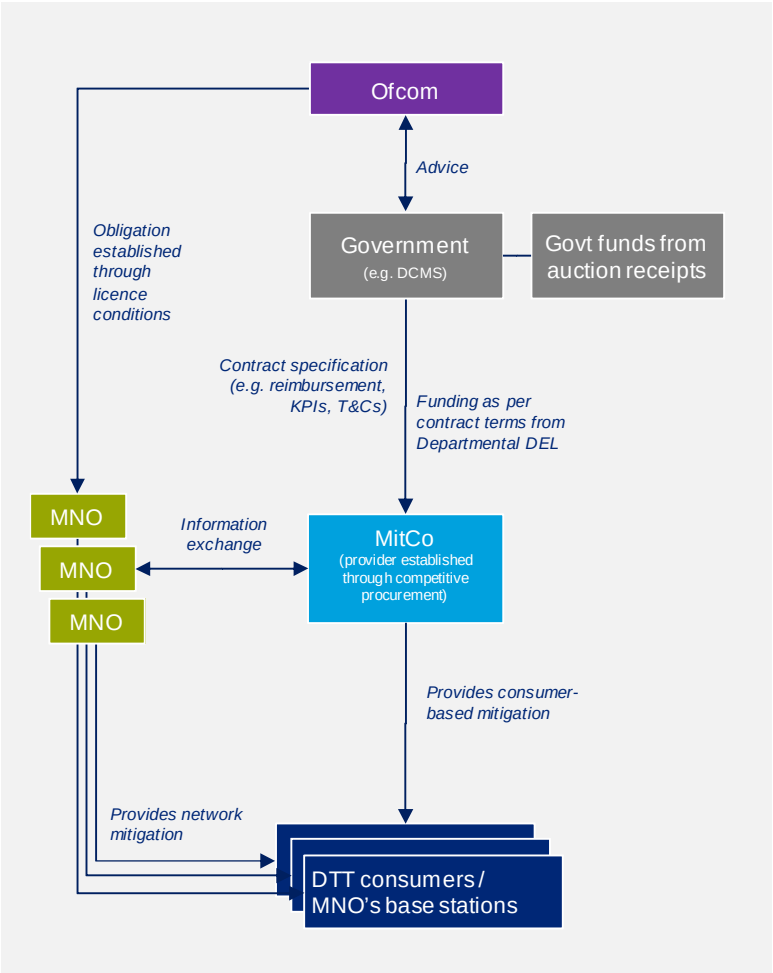


Detail

- ***Delivery structure:*** Licence conditions specify sufficiently and within legal bounds such that MNOs form a single body, possibly a joint venture.
- ***Service:*** MitCo provides consumer mitigation and network mitigation.
- ***Governance:*** Set up a Supervisory Board which includes MNOs, broadcasters, MuxCos, with Government or Ofcom chairing. This holds to account the MitCo organisation responsible for mitigation.
- The Supervisory Board' core functions:
  - advise Government on release of funds to MitCo;
  - audit / hold MitCo's management to account for performance;
  - back-stop powers – through advice to, and enforcement from, Ofcom – in the event that MitCo under-performs, e.g. halt roll-out; and
  - advice and arbitration on particular instances of interference/mitigation.
- ***Raising funds:*** Through the auction process either as: a. 'auction receipts' defined by the Auction Regulations to the Consolidated Fund; or b. 'ringfenced' monies within MNOs and specified in the licence conditions.
- ***Payment to MitCo:*** Provided as a lump-sum by MNOs, with under-spend retained according to a shareline between Government and MitCo. Overspend covered by Government.
- ***Incentives:*** A target cost on agreement of forecast volumes and unit costs; gainshare is provided with capped downside on MNOs (to avoid distorting auction), but enough room for manoeuvre between expected cost so that the lump sum incentivises the desired mitigation behaviours. Specific and robust KPIs required on quality to bolster possibly weak natural incentives of MNOs to deliver for DTT consumers.
- ***Contractual relationship:*** Legal obligations on MNOs created by licence conditions.

B.3 Contracting / competitive procurement

Description	• Government or Ofcom tenders for a provider (which could be a broadcaster consortium, an MNO-consortium, or a third party) to provide consumer mitigation services. MitCo is the supplier that best meets the requirements of the tender. Funding is via auction receipts.

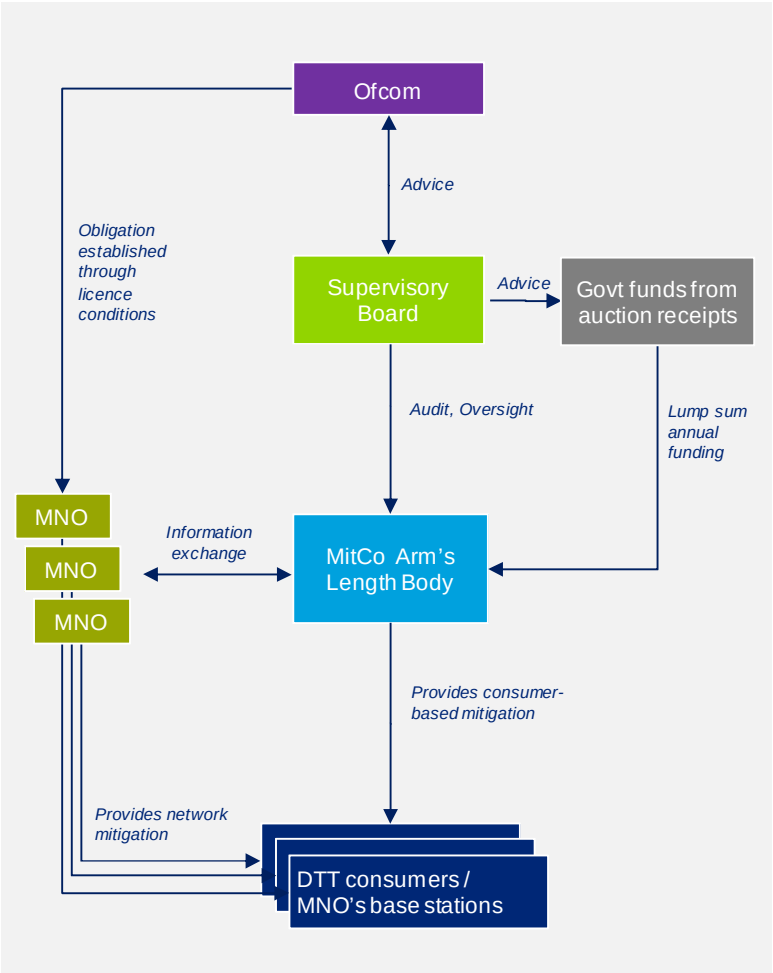


Detail

- ***Delivery structure:*** Up to the market, e.g. a consortium or JV owned by broadcasters, MNOs or both or neither, e.g. a business services firm. Open question as to whether Government or the MitCo-provider works with MNOs to plan volumes likely to run through the contract in any given year.
- ***Service:*** MitCo provides consumer mitigation only and coordinates with MNOs, who are obligated to provide reasonable network mitigation through the licence conditions.
- ***Governance:*** Government (e.g. DCMS) lets a contract, with the relevant procurement / commercial capability responsible for managing the contract.
- ***Raising funds:*** Out of the auction receipts going to the Consolidated Fund or to the relevant Department holding the contract. No hypothecation (since if the mitigation contract is procured for less than what was indicated, through competitive tendering, the difference is a windfall to Government).
- ***Payment to MitCo:*** Paid through the contract based on delivery of outcomes (e.g. volumes of consumer mitigation service delivered to date) specified in the contract – paid out of relevant Department's DEL.
- ***Incentives:*** A target cost incentive fee arrangement is specified in the contract with both upside and potentially downside shareline arrangements for the MitCo-provider. Further profit on operations / service will be required to ensure the contract is reasonably attractive.
- ***Contractual relationship:*** The contract that is let between Government and the MitCo provider specifies the levels of consumer mitigation support, KPIs etc and the extent to which the MitCo-provider works with MNOs – see above. Equally, the licence conditions on MNOs will specify some level of cooperation MNOs show to MitCo.

B.4 Government arm's length body

Description	• An arm's length body set up by DCMS for as long as mitigation services are required.

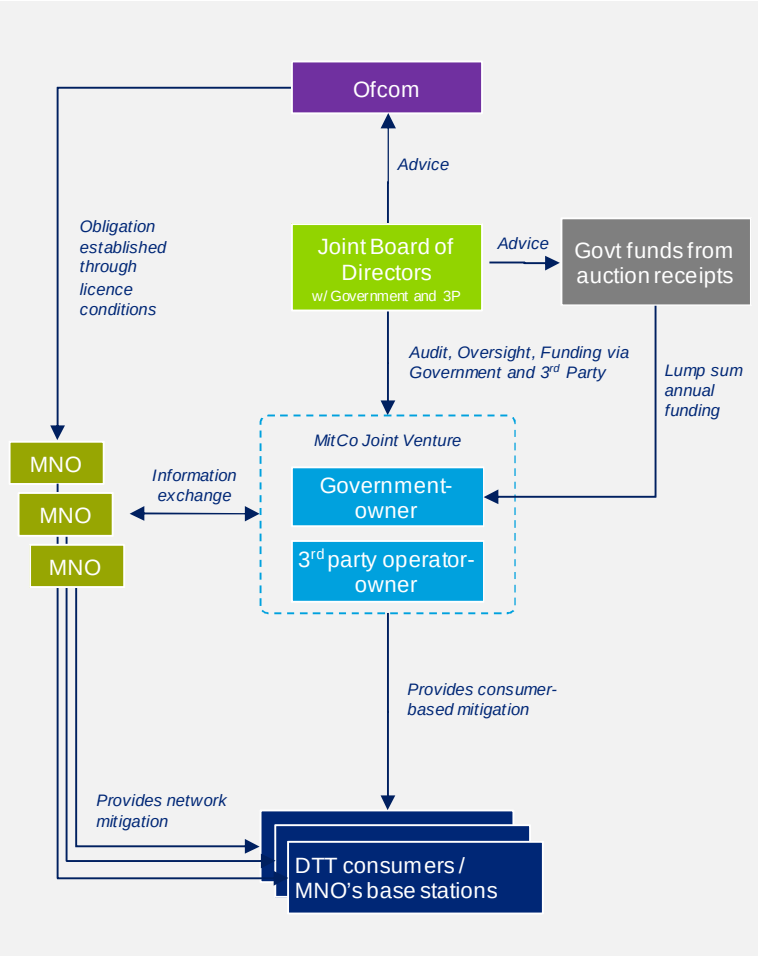


Detail

- ***Delivery structure:*** An arm's length body ('MitCo') established by DCMS for as long as mitigation services are required.
- ***Service:*** MitCo provides consumer mitigation only and coordinates with MNOs, who are obligated through the licence conditions to provide reasonable network mitigation.
- ***Governance:***
  - Government (e.g. DCMS) establishes an arm's length body which is accountable to Government.
  - There would be an Supervisory Board with representatives from both Govt and MNOs to audit activities and spending.
- ***Raising funds:*** Out of auction receipts.
- **Payment to MitCo:** Provided as a lump sum to the delivery organisation.
- ***Incentives:*** Not for profit. Incentives driven from Government being accountable and need to demonstrate value for money to MNOs as well service to the consumer / public.
- ***Contractual relationship:*** Roles, responsibilities and powers of MitCo, may need to be stipulated through statute or some other legislation

B.5 Public-private partnership

Description	• Government partners with a private sector provider in the form of a public private partnership – for example, a JV.



Detail

- ***Delivery structure:*** A public-private partnership between Government (e.g. DCMS) and a private sector provider, possibly as a joint venture with equal share between both parties.
- ***Service:*** MitCo provides consumer mitigation only and coordinates with MNOs, who are obligated to provide reasonable network mitigation through the licence conditions.
- ***Governance:*** Government (e.g. DCMS) partners with a private sector organisation(s) to establish joint ownership of MitCo body with a joint board of directors.
- ***Raising funds:*** Out of auction receipts.
- ***Payment to MitCo:*** Provided as a lump sum to the delivery organisation.
- ***Incentives:*** Target expenditure is established based on the level of efficiency indicated by the private sector organisation(s) in the procurement of a partner for the delivery body.
  - Partners share risk of overspend (up to a cap) and share the benefit of under-spend through a shareline upon the winding up of the organisation.
  - The joint venture entity earns profit based on achieving service KPIs to incentivise service delivery, whilst shareline incentivises cost effective delivery.
- ***Contractual relationship:*** Government contracts with the JV for the provision of mitigation services. Service level standards stipulated in the contract.

Note: It should be noted that in this area, a Government-owned Contractor-operator model would be no different to a contracting approach since there are no public sector fixed assets already established that one would wish to allow a contractor to operate under a GOCO arrangement – hence, the model is not relevant.

C Assessment of strategic design options – detail

C.1 Rationale by performance criteria on 'sufficient mitigation'

		1. Broadcaster led		2. MNO led		3. Contracting / competitive procurement		4. Arms length body (Government)		5. Public-Private partnership	
Performance	Strategic capability	4	- Broadcasters understand the market and concerns of consumers as those households affected by DTT interference are largely their consumers. - Broadcasters have strategic / management experience of coordinating similar activities (e.g. Digital UK, DSHS) from which they can draw extensively. - It should be noted that the above points are valid on an assumption that there is sufficient obligation placed on MNOs through licence conditions to provide information to Broadcaster-led MitCo with regards network rollout that allows informed choices by MitCo on areas of activity.	3	- MNOs have less experience of managing similar programmes, but understand the nature of the problem and would be able, through their understanding of rollout, to effectively model consumer demands over time and by geography. - Conversely, they have less experience of understanding DTT consumers and the nature of interference on DTT, consumer needs and expectations.	3	- Government likely to contract with a supplier with the capabilities to plan and implement delivery. - As with MNOs, a Contractor may have less expertise of DTT consumers, but can source necessary technical expertise. - It should be noted that the above points are valid on an assumption that there is sufficient obligation placed on MNOs through licence conditions to provide information to the Contractor with regards network rollout that allows informed choices by MitCo on areas of activity.	1	- DCMS lack the direct experience of running operations of this type in-house (either in terms of strategic or operational capabilities). - DCMS do not understand the nature of the problem or the consumer market as well as MNOs or Broadcasters, or indeed a Contractor that has previous experience of providing field force, contact centre or postal services. - It should be noted that the provision of mitigation is based on the assumption that there is sufficient obligation placed on MNOs through licence conditions to provide information to the Government with regards network rollout that allows informed choices by MitCo on areas of activity.	3	- A third party private partner would provide skills and experience to address Government's capability gaps and thus be able to provide the same level of strategic capability required as under Options 1 and 3. - It should be noted that the above points are valid on an assumption that there is sufficient obligation placed on MNOs through licence conditions to provide information to the PPP with regards network rollout that allows informed choices by MitCo on areas of activity.
	Ability to balance network and consumer mitigation	1	- Broadcasters are dependent on appropriate (and some cases confidential) information from MNOs to successfully coordinate its consumer mitigation activity, but it will not be able to make trade-offs between consumer versus network mitigation as effectively as MNOs. It will be highly challenging for two separate entities (a Broadcaster-owned MitCo) and a MNOs to collectively make an optimal decision with regards to network versus consumer mitigation when they face highly divergent costs and benefits of action and there is a signficant information asymmetry. For example, Broadcasters are naturally incentivised to limit the disruption to DTT consumers by placing emphasis on more network mitigation, even where this is sub-optimal. - Relations between MNOs and Broadcasters could become strained given distinct (even if overlapping) consumers they serve, undermining the communication necessary to drive effective coordination.	4	- Under this option, the issue of balancing network versus consumer mitigation is internalised to the extent that all mitigation solutions are within the responsibility and control of MNOs. MNOs have fullest access to network information required to make informed trade-offs between mitigation types. - There are risks that MNOs may not be able to cooperate effectively, particularly where MNOs have divergent rollout strategies, but this should be manageable within a set of clear operating protocols established by MitCo at the outset which governs its activity in a way that is seen as fair amongst MNOs.	1	- A Contractor is an impartial agent incentivised to drive the best mitigation solution in terms of cost vs. quality trade-offs, but may lack the necessary information - this will depend on the effectiveness of information sharing with MNOs, as with the 'Broadcaster led' option. - The Contractor is dependent on appropriate (and some cases confidential) information from MNOs to successfully coordinate its consumer mitigation activity, but it will not be able to make trade-offs between consumer versus network mitigation as effectively as MNOs. It will be highly challenging for two separate entities (a Contractor-owned MitCo) and a MNOs to collectively make an optimal decision with regards to network versus consumer mitigation when they face highly divergent costs and benefits of action and there is a signficant information asymmetry. - The Contractor may be potentially undermined by the market power of the MNOs (in the context of network mitigation) or the quality of information supplied by MNOs.	1	- As with Options 1 and 2, the Government is is dependent on appropriate (and some cases confidential) information from MNOs to successfully coordinate its consumer mitigation activity, but it will not be able to make trade-offs between consumer versus network mitigation as effectively as MNOs. It will be highly challenging for two separate entities (a Government-owned MitCo) and a MNOs to collectively make an optimal decision with regards to network versus consumer mitigation when they face highly divergent costs and benefits of action and there is a signficant information asymmetry. - Government is likely to be less capable at defining the information requirements from MNOs to successfully coordinate trade-offs between network and consumer mitigation. - Process by which Government defines and coordinates the types of mitigation potentially quite bureaucratic, undermining the speed of mitigation delivery.	1	- Option likely to deliver the same coordination capability as Option 3.
	Consumer focus	4	- There are powerful natural (commercial and reputational) incentives on the Broadcasters to be highly consumer focused to prevent loss of DTT services and provide a high quality of customer care in the process.	3	- It is possible to establish a strong reputational stake on MNOs through the licencing process that establishes them as accountable for MitCo and consumer mitigation activity. This could drive a natural incentive to focus on the consumer, which can be reinforced through KPIs (on coverage, customer service). It should be noted, however, that there is less scope to define a breadth of KPIs at the set up of this option than there is under a Option 3 where the contractual arrangements generally tend towards specific KPIs and strong direct levers of control on the Contractor, through the contract management function established by the authority. - Given under this option, MNOs will be able to provide network mitigation, thus reducing the requirement on consumer mitigation, it is reasonable to envisage that less consumer support may be required to deliver good consumer outcomes. This is highly dependent on the incentive mechanisms put in place within MitCo to deliver the optimal balance between network and consumer led mitigation, hence the option not scoring as high as 4.	3	- The contractor is naturally indifferent on consumer-focus but can be commercially and reputationally incentivised through the contract and related, detailed KPIs on a range of metrics from coverage, quality and input measures of efficiency and productivity of its capabilities (e.g. field force, contact centre and postal/online service). Government as the contracting authority would be able to ensure the Contractor is as consumer focused as necessary through the ability to define incentives and multi-layered KPIs in the MitCo contract, as well as monitor and control performance through the governance processes established as part of the contract. - However, it is possibly the case that the reputational risk of poor delivery may lay with Government rather than with the Contractor, hence this option not scoring as high as 4.	3	- Government is incentivised to be consumer focused due to the significant political and reputational risk associated with poor performance in relation to what is for the most part seen as a public service. However, it is unlikely to have the in-house experience and capability to effectively deliver a high quality service to consumers.	3	- Nothing about this option is likely to make it more or less consumer focused than Options 3 or 4.

C.2 Rationale by performance criteria on 'appropriate cost': DTT

		1. Broadcaster led		2. MNO led		3. Contracting / competitive procurement		4. Arms length body (Government)		5. Public-Private partnership	
Performance	Cost efficiency	2	- Broadcasters are naturally incentivised to deliver a high quality service, but with the corollary that 'gold plating' may occur in terms of customer support, e.g. over-supply of installations, at the expense of cost efficiency. - Broadcasters are weakly able (due to imperfect information from MNOs) and weakly incentivised to optimise the cost efficiency of network mitigation vs. consumer mitigation trade-offs (due to their natural incentive to place greater emphasis and interpretation of data modelling to place burden on network operators). - This could be mitigated through the funding mechanism on the Broadcasters, e.g. responsibility for cost overruns, but will depend on how credible this arrangement could be in practice if Broadcaster's over-spend, particularly where reputational risk can be pushed onto Government. i.e. there is a high degree of uncertainty on future volumes and Government / Ofcom would have approached Broadcasters as a single-source provider as opposed to procuring provision through the market.	3	- The incentive on MNOs to be cost efficient arises largely from the gainshare mechanism and any financial liability they may bear if they overspend. Given that in order to avoid distortion to the auction the target cost for mitigation may be set particularly high and MNOs liabilities above that cost would be capped, it is unreasonable to think MNOs would have a powerful incentive to be cost efficient through the sub-contracting arrangements they would put in place, except for the opportunity it offers earn gainshare. Gainshare on this activity, which is not part of MNOs' core business, split three ways (possibly four ways) and the absolute value of it over time (sub-£50m three years hence) is possibly not a powerful incentive on cost-efficiency in of itself.	4	- The competitive procurement process under this option and engagement with the supplier base would serve to drive cost efficiency as compared to single-sourcing (which is the case as under the Broadcaster and MNO led opions). The nature of the capability being procured (contact centre, field force, postal) is relatively uncomplex with regards to determining KPIs and management information to provide Government with line of sight into efficiency (e.g. DSHS, B2B outsourcing). The key complexity arises in the contractor understanding where demand will arise, which must depend on information from MNOs on rollout, which could be made an obligation on MNOs through licence conditions. - It may be the case that the Contractor, having won the contract, is incentivised to deliver more volumes than is required to inflate the overall value of the contract. This risk could managed through a target cost incentive fee (capped fee and variable fee elements with minimal to zero margin on units of activity) or a fully fixed deal to manage risk of over-spend, coupled with robust oversight and auditing of the contract.	1	- The cost-efficiency incentive on Government arises from a need to spend taxpayers' money in way that demonstrates value for money. There is uncertainty, however, with Government's ability to deliver in-house provision of the required capability in a way that is cost efficient, given the lack of experience and a commercial incentive.	2	- Inclusion of a profit focused private sector partner is likely to drive a greater cost efficiency focus as against Option 4, but this has not been scored as highly as Option 3 refelcting the dilution in the commercial incentive through sharing gains with Government
	Incentive	4	- Option currently assumes that the Broadcasters are naturally incentivised (both commercially and reputationally) to deliver mitigation and, therefore, require a limited additional financial premium to supplement cost to deliver required rates of return	3	- MNOs have no natural incentive to be deliver a high quality, cost-efficient service, but this can be achieved through a combination of reputational and licensing sanctions. Some form of gainshare arrangement may be required to provide sufficient financial incentive, but this will be capped to avoid distortion to the auction process - thus, any overspend would be met by Government, thereby providing no downside incentive on MNOs, hence this option not scoring as high as a 4.	3	- A single tier of profit for the Contractor delivering mitigation would be required that can be linked to contractual performance (i.e. through specific KPIs) and a capped liability on Government. - It may be the case that the incentive on the Contractor has to be sufficient to make contracting attractive, but given the competitiveness of the market in provision of field force, contact centre and postal services, it is reasonable to assume the contracting authority could derive value for money through the tender / procurement process in awarding the contract.	4	- No requirement for the inclusion of profit margin.	3	- Single tier of profit, but Govt is likely to be the beneficiary of a proportion of this through the JV arrangement

C.3 Rationale by performance criteria on 'appropriate cost': wider

		1. Broadcaster led		2. MNO led		3. Contracting / competitive procurement		4. Arms length body (Government)		5. Public-Private partnership	
Performance	Auction value	2	- Base station power downs may be a significant element of the overall mitigation package required to restore DTT. Under this option it would be necessary to specify ex ante in licence conditions which base stations or regions, would require such power down, so that MNOs have visibility and certainty going into the auction. In addition, it would be necessary to specify a licence condition on MNOs that ensures MitCo has had sufficient time to carry out its work before the MNOs rollout their networks. Together, these two types of licence condition tend to reduce the value of the spectrum and hence auction revenues because they restrict the ability of the MNOs to make efficient choices. These conditions can be framed in a way that delivers a reasonable degree of certainty prior to the auction so as to not reduce auction efficiency - see 'auction efficiency' criterion.	4	- Base station power downs may be a significant element of the overall mitigation package required to restore DTT. Under this option it would **not** be necessary to specify ex ante in licence conditions which base stations or regions, would require such power downs. Since MNOs would be responsible for all mitigation activity, whether DTT receiver filtering or various forms of network mitigation (including powering down of their base stations in particular areas), it is reasonable to believe that they can deliver an optimal mix of mitigation options. This would therefore limit the potential detrimental effect on the value of the spectrum being licenced because Ofcom / Government will not be required to specify ex ante any specific base station power down solutions thereby allowing the MNOs to efficiently deploy their networks	2	- Base station power downs may be a significant element of the overall mitigation package required to restore DTT. Under this option it would be necessary to specify ex ante in licence conditions which base stations or regions, would require such power down, so that MNOs have visibility and certainty going into the auction. In addition, it would be necessary to specify a licence condition on MNOs that ensures MitCo has had sufficient time to carry out its work before the MNOs rollout their networks. Together, these two types of licence condition tend to reduce the value of the spectrum and hence auction revenues because they restrict the ability of the MNOs to make efficient choices. These conditions can be framed in a way that delivers a reasonable degree of certainty prior to the auction so as to not reduce auction efficiency - see 'auction efficiency' criterion.	2	- Base station power downs may be a significant element of the overall mitigation package required to restore DTT. Under this option it would be necessary to specify ex ante in licence conditions which base stations or regions, would require such power down, so that MNOs have visibility and certainty going into the auction. In addition, it would be necessary to specify a licence condition on MNOs that ensures MitCo has had sufficient time to carry out its work before the MNOs rollout their networks. Together, these two types of licence condition tend to reduce the value of the spectrum and hence auction revenues because they restrict the ability of the MNOs to make efficient choices. These conditions can be framed in a way that delivers a reasonable degree of certainty prior to the auction so as to not reduce auction efficiency - see 'auction efficiency' criterion.	2	- Base station power downs may be a significant element of the overall mitigation package required to restore DTT. Under this option it would be necessary to specify ex ante in licence conditions which base stations or regions, would require such power down, so that MNOs have visibility and certainty going into the auction. In addition, it would be necessary to specify a licence condition on MNOs that ensures MitCo has had sufficient time to carry out its work before the MNOs rollout their networks. Together, these two types of licence condition tend to reduce the value of the spectrum and hence auction revenues because they restrict the ability of the MNOs to make efficient choices. These conditions can be framed in a way that delivers a reasonable degree of certainty prior to the auction so as to not reduce auction efficiency - see 'auction efficiency' criterion.
	Auction efficiency	3	- Funding is provided by Government as public expenditure (but derived from auction receipts). Given that the raising of income from the auction and the expenditure are de-linked, there is no distortion on auction efficiency, assuming costs and uncertainty (e.g. likely volumes based on technical modelling, unit costs, geographical coverage, minimum service level) in relation to MitCo delivery are well-defined so as to allow specification of the required funding envelope before the auction. - MNOs may perceive some uncertainty with regards to their ability to rollout their network given that delivery of consumer mitigation would be delivered by a separate organisation and that they would be obliged to work closely with it. This might add uncertainty into the auction, hence this option is not scored as a 4.	3	- Funding for MitCo is raised through the auction of licences for MNOs. Any under-spend in activity by MitCo, would be returned (in part) to MNOs through gainshare, but this will be uncertain depending on both how effective MitCo is and future volumes. Furthermore, as a deferred revenue the prospect of gainshare will not be recognised until cash is paid under an accruals accounting basis. There would, therefore, be an uncertainty in the future revenue stream of MNOs that would manifest itself in auction bids (where the cost of the MNOs' bids would be recognised as an accrued expense as soon as it is committed). - Requires licence conditions on MNOs to define how funding will be supplied and the extent of the non-financial liability on MNOs - these could be significant enough that MNOs accommodate for this through their bids for spectrum licences.	3	- Funding is provided by Government as public expenditure (but derived from auction receipts). Given that the raising of income from the auction and the expenditure are de-linked, there is no distortion on auction efficiency, assuming costs and uncertainty (e.g. likely volumes based on technical modelling, unit costs, geographical coverage, minimum service level) in relation to MitCo delivery are well-defined so as to allow specification of the required funding envelope before the auction. - MNOs may perceive some uncertainty with regards to their ability to rollout their network given that delivery of consumer mitigation would be delivered by a separate organisation and that they would be obliged to work closely with it. This might add uncertainty into the auction, hence this option is not scored as a 4.	3	- Funding is provided by Government as public expenditure (but derived from auction receipts). Given that the raising of income from the auction and the expenditure are de-linked, there is no distortion on auction efficiency, assuming costs and uncertainty (e.g. likely volumes based on technical modelling, unit costs, geographical coverage, minimum service level) in relation to MitCo delivery are well-defined so as to allow specification of the required funding envelope before the auction. - MNOs may perceive some uncertainty with regards to their ability to rollout their network given that delivery of consumer mitigation would be delivered by a separate organisation and that they would be obliged to work closely with it. This might add uncertainty into the auction, hence this option is not scored as a 4.	3	- Funding is provided by Government as public expenditure (but derived from auction receipts). Given that the raising of income from the auction and the expenditure are de-linked, there is no distortion on auction efficiency, assuming costs and uncertainty (e.g. likely volumes based on technical modelling, unit costs, geographical coverage, minimum service level) in relation to MitCo delivery are well-defined so as to allow specification of the required funding envelope before the auction. - MNOs may perceive some uncertainty with regards to their ability to rollout their network given that delivery of consumer mitigation would be delivered by a separate organisation and that they would be obliged to work closely with it. This might add uncertainty into the auction, hence this option is not scored as a 4.
	Rollout efficiency	1	- Broadcasters are naturally incentivised to be DTT consumer focused, possibly at the expense of distorting the efficiency and speed of MNO network rollout, where such a lever on rollout is provided. Any lack communication between a Broadcaster-led MitCo and MNOs on the nature of their forward planning activity could affect rollout. This could be significant where Broadcasters are focused directly on the interests of DTT consumers and MNOs are conversely focussed on their network. - There is an issue of timing insofar as MNOs would need to give MitCo sufficient notification that could be much greater than under Option 2, i.e. there is a transaction cost between entities that will affect network rollout. The importance of this point is dependent on how agile MNOs generally are in how they rollout networks; whether this is done from inception to execution in a matter of weeks or months. The assumption made in the scoring is that MNOs are agile and a notification period of a month or so, could materially affect the value they derive from rollout.. - There is significant uncertainty in relation to Broadcasters possibly blaming Government for failure and the impact of consumer pressure being exploited by Broadcasters to halt rollout.	4	- MNOs are highly incentivised to ensure that DTT mitigation does not disrupt rollout of the future network. - It is within MNOs' control to ensure consumer and network mitigation is delivered to quality and time requirements to prevent rollout disruption. Furthermore, any distortion to network rollout that may occur is created through there own collective action, i.e. not exogenous or imposed on them. - MNOs have the advantage of being able to manage information requirements within a shorter time scale - although, this is still dependent on effective coordination of MNOs' plans within MitCo.	2	- It is possible for Government to make 'not gating rollout' a KPI in the MitCo contract, but to ensure the Contractor is able to meet its other service KPIs will be dependent on the quality and speed of information sharing with MNOs. There may be a natural tension between incentives on the Contractor to meet quality and consumer support standards and the requirement to not distort rollout efficiency. - There is an issue of timing insofar as MNOs would need to give MitCo sufficient notification that could be much greater than under Option 2, i.e. there is a transaction cost between entities that will affect network rollout. The importance of this point is dependent on how agile MNOs generally are in how they rollout networks, whether this is done from inception to execution in a matter of weeks or months. The assumption made in the scoring is that MNOs are agile and a notification period of a month or so, could materially affect the value they derive from rollout and hinder the execution of their commercial strategy.	1	- From a Government's perspective, the most significant political and reputational risk lies in failing to deliver effective mitigation, as future '4G' consumers are unlikely to value and therefore voice a concern over the lack of a future service where the issue is a matter of months. Equally, those consumers will recognise the issue of lost DTT because they are for the most part the same group. - As a result, a Government-led MitCo may be incentivised at the margin to deliver consumer mitigation at the expense of rollout efficiency where it has the powers to halt rollout.	1	- From a Government's perspective, the most significant political and reputational risk lies in failing to deliver effective mitigation, as future '4G' consumers are unlikely to value and therefore voice a concern over the lack of a future service where the issue is a matter of months. Equally, those consumers will recognise the issue of lost DTT because they are for the most part the same group. - As a result, a PPP-led MitCo may be incentivised at the margin to deliver consumer mitigation at the expense of rollout efficiency where it has the powers to halt rollout.

C.4 Scores and rationale by practicality criteria

		1. Broadcaster led		2. MNO led		3. Contracting / competitive procurement		4. Arms length body (Government)		5. Public-Private partnership	
Practicality	Governance and control	1	- The Government can negotiate with Broadcasters and establish sufficient governance procedures, through a funding agreement which establishes the contractual terms. The key issue is that it would be difficult for the Government to exercise control due to a lack of clear levers on Broadcasters, once locked-in.	3	- Governance and control is derived from obligations established under the licence conditions on MNOs. Sanctions can be applied on rollout to specific regions that will offer a powerful lever for Government and Ofcom. - It is, however, difficult for Government/Ofcom to be responsive under this option because of **a)** the timings of understanding where problems have arisen by an inability to 'see' through the MNOs and into the sub-contractor delivering the service for them and **b)** the time taken in escalating decisions through the Supervisory Board and Ofcom. This effectively hampers governance and control to the extent that this would score as a 3.	4	- It is possible to establish a strong set of governance procedures through the contract to provide clear and transparent governance and performance management, including examination of weekly / monthly management information and monitoring against contracted KPIs. The precedent established in other areas, and in particularly in the DSHS suggests that a strong level of control can be provided with graded financial sanctions and rewards linked to KPIs.	4	- Governance and control internalised within Government and so in theory should be strong, i.e. lower costs of transaction and communication and clearer oversight *within* an organisation.	1	- Potentially complex governance arrangements involving establishment of a formal joint venture.
	Simplicity	2	- Communications and engagement between Broadcasters and MNOs potentially fraught due to conflicting agendas	3	- Communications between MNOs are internalised within the MitCo, which should allow for smoother communication between parties. - There is, however, the potential complexity in relation to communications and negotiations between MNOs over confidential rollout information.	3	- It is possible to establish a contract for the required field force, contact centre capability that is simple and draws on a range of established precedent in the area of B2B outsourcing and notably in the public sector with respect to DSHS and other services. - The Contractor acts as an objective third party in engagements with MNOs and Broadcasters.	1	- As per existing Government arrangements, but will require a complex set of arrangements established within Government to set up the option that are potentially unmanageable, e.g. setting up of delivery capability, with respect to contact centre, field force etc.	2	- Complexity arises in establishing a joint venture / PPP arrangement that: a. is contrary to current Government policy; b. does not meet the standard JV rationale of commercialising strategic capabilities that are unique to Govt (services are commoditised); and c. has a short life-span and little scope for future revenue generation. - Complexity arises in determining equity and sharelines splits between Government and JV partner and commercial terms.
	Burden on Ofcom	2	- Both Broadcasters and MNOs would be involved in the delivery of mitigation (both consumer and network mitigation). There is a potential ongoing requirement for Ofcom arbitration of conflicts and a requirement to employ sanctions stipulated in the licence conditions on MNOs. - Ongoing requirement for Ofcom via the necessary governance arrangements which bring Broadcasters and MNOs together in a Supervisory Board.	1	- Ofcom's use of sanctions (stipulated in MNO licence conditions) a key incentive to drive mitigation performance. Therefore, there is potential for Ofcom to be heavily involved in managing MNO performance	3	- Ofcom may be required to exercise powers established through licence conditions over MNOs to ensure compliance with MitCo, but Ofcom would not have direct responsibility for management of the Contractor, nor likely significant calls for it to arbitrate conflicts.	2	- Ofcom may be required to exercise powers established through licence conditions over MNOs to ensure compliance with MitCo and to arbitrate or provide advice between Government provision of consumer mitigation and MNO provision of network mitigation.	2	- Ofcom may be required to exercise powers established through licence conditions over MNOs to ensure compliance with MitCo and to arbitrate or provide advice between PPP provision of consumer mitigation and MNO provision of network mitigation.
	Burden on Government	3	- There are strong natural incentives on Broadcasters to deliver mitigation services that may necessitate less Government involvement (as per Digital UK model) - However, there would still be a requirement for sufficient ongoing oversight to interrogate spend by MitCo to ensure this can drive towards cost-efficiency.	3	- Govt would need to ensure that top level service KPIs are being met. - Potentially burdensome on Govt if detailed oversight of some key metrics is required (e.g. customer complaints) but Ofcom likely to bear the majority of the burden of exercising sanctions. If detailed oversight of MNOs running MitCo is required to improve the speed of sanctioning, this may require a contract management capability as deep as that necessary for the Contractor option.	2	- Significant contract management capacity and expertise likely to be required to ensure appropriate outcomes are delivered by the contractor. This would involve monitoring and interrogation of contracted output KPIs, input KPIs that support these and ongoing management information in order to provide early warning on service delivery. In addition, capability would be required to monitor commercials and funding to the Contractor to maintain enduring value for money on-contract.	1	- Requires the resourcing of a team within Government with sufficient capacity, skills and capability to monitor and deliver effective mitigation	1	- Requires the resourcing of a team within Government, but capability and skills gaps potentially addressed through the private sector partner, who would share responsibility for project delivery.
	Implementation	3	- Broadcasters naturally incentivised to deliver mitigation (i.e. platform / revenue protection) and so will want to work actively in developing the organisation and setting it up. - They have a pre-existing organisation / vehicle in DUK that could take up the remit of MitCo and coordinate service delivery if this can be made to work in contractual terms.	2	- Cooperation between MNOs within MitCo is a key issue and a potential blocker to the success of this option. If MNOs fail to cooperate or do not have confidence in the confidentiality of their network information, there is potential for paralysis. - One could not initiate significant elements of the implementation process, e.g. of tendering for a sub-contractor, ahead of the auction completing. Rather, only some implementation could begin ahead of the auction (e.g. planning, Articles of Association for Mitco). Moreover, given that MNOs would become accountable for such an organisation eventually, they will need to conduct their own due diligence to assure themselves that the planning and processes put in place are sufficient to manage the risk they have taken on.	3	- Procurement of services is a tried and tested delivery option and could be started immediately, with various established procurement routes (e.g. open procedure, restricted procedure, competitive dialogue as in the case of the DSHS) open for Government to pursue, as opposed to the establishment of bespoke structure, which would the case in Option 2 and to a lesser exten,t because of the existence of DUK, in Option 1. - Due diligence can ensure that only financially viable suppliers with the capability for service delivery are considered for selection. - The tender exercise could be established early, ahead of the auction.	1	- Potential that undue bureaucracy prevents the organisation from being delivered in time. Significant burden on Government in organising the resources necessary to establish MitCo - full burden of implementation borne by Government.	1	- Procurement of a preferred partner would be complicated by commercial and legal negotiations over the joint venture / PPP and successful integration of private and public sector cultures / personnel. - There is a risk that additional complexity increases the risk that the vehicle collapses prior to service delivery. - Despite third party involvement the nature of the structure being established in partnership with Government implies a similar level of complexity in implementation as under Option 4.

D Capabilities – detail

The following table illustrates the capabilities and indicative FTEs and numbers required for MitCo under Consumer Support Option 6, where an information campaign, online support, contact centre, proactive and reactive filters and installation services are provided.

These capability requirements have been used as the basis for the capabilities cost analysis presented at Section 5.3.

	Capabilities – indicative FTEs	FTEs
Supervisory Board, including support	Senior membership • **Independent Chairperson (TBC):** Provides independent advice and chairmanship in line with the remit and mission of the Supervisory Board as set out by Government / Ofcom • **Independent advisor on technical and audit:** Independent representative on the Supervisory Board of issues regarding MitCo's performance against KPIs based on technical modelling expertise and audit • **Independent advisor on consumer interests:** Independent representative on the Supervisory Board in the areas of consumer service and quality • **Government representative:** Provide appropriate challenge and scrutiny of MitCo's management • **MitCo CEO:** Represents the interest of MitCo in delivering against its remit • **Ofcom representative:** Provide advice and steers on MitCo's delivery within the context of MitCo's contract and MNOs' licence conditions • **MNOs (various numbers TBD):** Represent interests of the three MNOs who are obliged to coordinate with MitCo over types of mitigation • **Broadcasters / MuxCo (various numbers TBD):** Represent some of the interests of consumers Support / secretariat • **Technical modelling support:** Provide analysis and scrutiny of MitCo's demand forecasting and performance for the Supervisory Board • **Audit support:** Provide advice and assurance of MitCo's performance to the Supervisory Board • **Consumer interest support:** Provide analysis and advise to Supervisory Board members on issues of MitCo's consumer support • **Secretariat:** Provide support to Supervisory Board members, primarily the independent Chairperson and advisors	~20
MitCo Board	• Independent **Chairperson** (TBC) • MitCo **management**: CEO, CFO, CCO, COO or equivalents (FTE numbers included below) • **Non-Executive Directors** (x3) • **Secretariat to MitCo Board:** Supports the Chairperson, CEO and the MitCo Board, in the form of: a lead adviser; supporting adviser; and administrative / diary management	7
Business management	• **CEO:** Responsible for the overall management of MitCo • **COO:** Responsible for the management of the business unit providing direct services to the customer • **Consumer strategy:** Responsible for ensuring the business units provide an integrated service to consumers • **Mitigation strategy:** Responsible for determining the strategy with respect to mitigation (network versus consumer, proactive) for a particular geographic area based on demand forecasting • **Operational efficiency of business units:** Responsible day to day management and oversight of the six business unit heads • **Resource management / planning:** Responsible for resource planning across the business units • **Schedule and BU integration:** Responsible for managing the integration of service delivery by the individual business units	16
Demand	• **BU Head Demand Forecasting:** Accountable for demand forecasting based on	12

forecasting	agree modelling methodology • **Capacity planning:** Plans forward capacity against which demand is compared • **Engage with MNOs re. network based mitigation:** Engage with MNOs over the robustness and consistency of the demand modelling data, liaising with stakeholder management in 'Support Services' • **Technical / volume modelling:** Accurate technical modelling of future volumes and likely consumer requirements based on a modelling methodology agreed with the Supervisory Board, assumed to require a team of four to ensure strong level of resilience given the importance of this function in driving the activities of MitCo	
Information campaign	• **BU Head Information Campaign:** Accountable for the effectiveness of the information campaign • **Local / outreach activity execution:** Responsible for local level information and guidance, e.g. with local authorities, local services, community support organisations, assumed to require 12 staff, focusing on local issues in each of the nine English Regions and three Devolved Countries. • **Management, planning and brand:** Responsible for managing the information campaign at national, regional and local level to ensure effective coordination, planning and message to the consumer • **National / Regional adverstising execution:** Responsible for national and regional advertising, e.g. television and radio, assumed to have two staff members for each medium	19
Online	• **BU Head Online Portal:** Accountable for effectiveness of the online portal • **Diagnostic tool development:** Responsible for development and maintenance of the structure and working of the diagnostic tool used on the online portal to provide customers with advice and information • **Portal maintenance:** Responsible for maintenance of the portal infrastructure and technology, liaising with the IT and infrastructure maintenance in 'Support Services'	5
Contact centre	• **BU Head Contact Centre:** Accountable for the effectiveness of the Contact Centre • **Contact centre management and work-planning:** Responsible for liaison with the demand forecasting business unit to understand and manage medium term demand, as well as short-term weekly, daily planning • **Contact centre operatives:** Responsible for handling client calls and referral and schedule for field force systems • **Diagnostic tool development:** Responsible for developing and continuous improvement to the diagnostic used by the contact centre to drive effectiveness	53
Postal	• **BU Head Postal:** Accountable for the effectiveness of the postal channel • **Logistics / distribution:** Responsible for managing the logistics and distribution of the postal service • **Postal management and planning:** Responsible for planning forward workload in the medium and immediate terms • **Supplier management:** Responsible for managing relations with key suppliers / sub-contractors of the postal service	11
Field force	• **BU Head Field Force:** Accountable for the effectiveness of the field force • **Field force management and workplanning:** Responsible for medium term and immediate, daily workload management for the field force technicians • **Equipment and warehousing management:** Responsible for maintenance and warehousing of DTT filter and other equipment in a state of readiness for the field force technicians • **Field force technicians:** Responsible for providing household installations, including platform change and filter installation	124
Support services	• **Human resources (incl. L&D):** Responsible for managing recruitment, employee terms and conditions and providing learning and development programmes • **Payroll:** Responsible for managing, with Finance, payroll of key members of staff • **Purchasing:** Responsible for purchasing of commodities and consumables • **IT and infrastructure maintenance:** Responsible for general software and hardware maintenance for the business, including CRM, ERP and Contact Centre servers, infrastructure	26

	• **Communications:** Responsible for internal business communications • **Legal:** Responsible for providing internal legal support to all business functions • **Estates management:** Responsible for managing strategic estates policy and for maintenance of property and facilities • **Scheduling between the Contact Centre and Field Force business units:** Responsible for managing the workload scheduled between the Contact Centre business unit and the Field Force, working with the business management function and business unit heads • **Stakeholder management – external:** Responsible for general liaison with the MNOs, Broadcasters and other parties • **Stakeholder management – Government:** Responsible for general liaison with Government stakeholders, e.g. DCMS, HMT, Ofcom and the Supervisory Board	
Reporting and performance management	• **CIO:** Accountable for management information and general support services • **Analysis, monitoring and reporting of management information:** Responsible for monitoring daily and weekly progress against management information, including analysis and reporting of key results and recommendations • **Data gathering and creation of management information:** Responsible for data gathering across the business units and development of a singular view of management information in the business	5
Finance	• **CFO:** Accountable for financial management and control in MitCo • **Financial reporting:** Responsible for financial reporting and preparation of the management accounts • **Forecasting and Budgeting:** Responsible for annual forecasting and budgeting • **Tax & treasury:** Responsible for tax and treasury function • **Transaction processing:** Responsible for execution of accounts payable and receivable	11
Commercial	• **CCO:** Accountable for the commercial strategy and contract management in MitCo • **Acquisition and commercial strategy:** Responsible for acquisition and the approval of new contract with suppliers and others • **Contract management:** Responsible for the management and control of extant contracts • **Control & risk management:** Responsible for risk management and control and change reques • **Incentivisation and SLA requirements definition:** Responsible for managing and scrutinising delivery of the key performance indicators MitCo is contracted for under its main contract with Government • **Supplier management:** Responsible for managing supplier and industry relations, coordination with the business units and 'Support Services'	11

[This page has been kept intentionally blank]