
# FINAL GUIDELINES FOR CALCULATING THE NET COST OF THE UNIVERSAL SERVICE OBLIGATIONS FOR THE BAHAMAS TELECOMMUNICATIONS COMPANY LIMITED

**GUIDELINES**

**ECS 10/2015**

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## 1. INTRODUCTION

The Utilities Regulation and Competition Authority (URCA) hereby issues the "Final Guidelines for Calculating the Net Cost of the Universal Service Obligations for The Bahamas Telecommunications Company Limited" [ECS 10/2015] (BTC NAC Guidelines). These Guidelines serve as a means to provide guidance to The Bahamas Telecommunications Company Limited (BTC) on the approach that BTC is required to adopt in its calculation of the net cost associated with the provision of its designated universal service obligations (USO) under section 119(1) and Schedule 5 of the Communications Act, 2009 (Comms Act).[1]

These Guidelines were preceded by URCA's Statement of Results and Final Decision "Framework for the Clarification and Implementation of Existing Universal Service Obligations (USO) under Section 119 and Schedule 5 of the Communications Act 2009" [ECS 01/2013][2] and the consultation document "Guidelines for Calculating the Net Cost of the Universal Service Obligations for The Bahamas Telecommunications Company Limited" [ECS 15/2014].[3]

The focus of these Guidelines rests on the quantification of the net cost of the USO, which is the first of several steps, detailed herein which BTC must carry out before URCA can consider whether the estimated net cost of the USO constitutes an unfair financial burden on BTC and whether compensation from a Universal Service Fund (USF) established under section 44(1) of the Comms Act is warranted. BTC is expected to make its own assessment of the unfairness of the burden and present it to URCA as part of its application for compensation. The determination of whether an unfair financial burden exists rests with URCA.

### 1.1 Universal Service Obligations

With respect to universal service obligations, BTC has been entrusted in section 119(1) and Schedule 5 of the Comms Act with the provision of:

- affordable fixed voice telephony, inclusive of access and toll calling to all populated areas in The Bahamas at a uniform price;
- affordable dial-up internet services at a uniform price;
- free dial-up internet services for designated specified institutions; and
- public access to pay apparatus.

For the avoidance of doubt, the requirement to provide nationwide fixed voice telephony under the USO excludes the provision of such services to inhabitants of privately owned islands. BTC is free to choose whether it shall serve private islands and how it shall price its services to those customers.

[1] http://www.urcabahamas.bs/download/088554800.pdf
[2] http://www.urcabahamas.bs/download/012155400.pdf
[3] http://www.urcabahamas.bs/download/071866900.pdf

### 1.1.1 BTC's implementation plan

The operational definitions of the USO will be set out in BTC's implementation plan. The implementation plan shall also include the operational definition of 'populated area' for the purposes of the USO as contained in ECS 01/2013, the minimum requirements with respect to the number and location of public pay apparatus, and the quality features of the provision of access to fixed voice telephony and internet service. URCA recognises that a net cost exercise can only be carried out when there is clarity in relation to the scope of the USO.

## 1.2 Overview of Methodology for USO Net Cost Calculations

URCA may, pursuant to section 44(3) of the Comms Act, apply the universal service fund (USF) to the installation and maintenance of networks and the provision of universal services in areas where the "gross avoidable cost of providing the universal service exceeds the revenue derived from those services".

### 1.2.1 Methodology documented in these guidelines

As noted by URCA in Section 4.1 of its consultation document "Framework for the Clarification and Implementation of Existing Universal Service Obligations (USO) under Section 119 and Schedule 5 of the Communications Act 2009"[ECS 12/2012][4], calculation of the net avoidable cost (NAC) is the widely accepted approach to measuring the loss in profits (i.e., net cost) incurred by the universal service provider (USP) due to it having to meet the USO. This approach is an operational method that seeks to measure the cost incurred in meeting a USO by comparing the profits realised by the USP with and without the USO. This approach is typically used in the electronic communications and postal sectors globally.

Under the NAC approach, the overall net cost of the USO to BTC would be made up of:

- the net cost of providing USO services to uneconomic islands;
- the net cost of providing USO services to uneconomic customers on economic islands;
- the net cost of offering special tariffs to designated specified institutions; and
- the net cost of providing public pay apparatus.

In calculating the net cost of providing USO services to an uneconomic island, the NAC approach would:

- identify the islands on which the USO services generate less revenue than their incremental costs thereby rendering them loss making; and
- aggregate the net losses of the loss making islands as identified above.

[4] http://www.urcabahamas.bs/download/013910600.pdf

As set out in Section 1.2.2 below, any net cost calculation should be done at the level of individual islands. The islands on which BTC incurs a net loss from the provision of USO services will be deemed "uneconomic islands" and those that are profitable will be deemed "economic islands". As the assessment is concluded *ex post*, a net cost calculation can only be carried out for islands that have already been provided with USO services by BTC.

In addition, there may be customers on economic islands who are inordinately expensive to serve and, hence, unprofitable to serve even if they generate a revenue per subscriber that is similar to the national average. For the purposes of these Guidelines, those customers will be called "uneconomic customers on economic islands". The net cost associated with the provision of USO services to those customers, if such a cost exists, will be included in the overall net cost of the USO.

Another element of the potential net cost of BTC's USO arises from BTC's requirement to provide dial-up internet free of charge to specified institutions.[5] This special tariff obligation automatically generates a net cost that should be included in the overall net cost of the USO.

The final element refers to the net cost of providing an adequate number of public pay apparatus across the country. In this regard, the net cost of public pay apparatus is already accounted for in the calculation of the net cost of uneconomic islands. Therefore the methodology focuses on calculating separately the net cost of the public pay apparatus on economic islands.

The total direct net cost to BTC for meeting its USO could be comprised of the sum of the:

- incremental cost minus foregone revenues of serving customers on uneconomic islands, which includes the costs of providing payphone services on those islands;
- incremental cost minus foregone revenues of serving uneconomic customers on economic islands;
- revenues foregone in serving specified institutions on both economic and uneconomic islands; and
- incremental cost minus foregone revenues of uneconomic public pay apparatus on economic islands.

Any intangible benefits associated with the provision of the USO shall be deducted from the direct net cost of the USO. Four intangible benefits identified in Section 4.25 of ECS 01/2013 (i.e., brand recognition, ubiquity, life cycle benefits, and marketing) should be carefully considered by BTC in calculating the net cost of the USO.

[5] Namely, public and church operated schools, public libraries, public hospitals and public medical clinics, senior citizens homes and orphanages.

The estimate of the overall net cost of the USO and all supporting evidence and assumptions are to be submitted to URCA by BTC as part of any application for compensation. URCA will review the robustness of this estimate and establish whether the estimate of the net cost of the USO constitutes an unfair financial burden upon BTC. Where URCA concludes that an unfair financial burden exists, such a finding is expected to activate the USF.

### 1.2.2 Critical elements of a net cost calculation

The net cost calculation rests on three critical elements:

***1) Identification of avoidable activities and network components absent the USO***

The net cost of the USO will be driven by those costs that BTC would avoid and the revenues that it would forego in the event that it ceased to provide USO services.

BTC is therefore required to identify any network components and activities that would not be required if BTC terminated the provision of its USO services on a given island. This will establish whether a cost item is truly avoidable or not as BTC continues to serve customers who do not subscribe to USO services.

***2) Valuation of avoidable costs***

Having completed the assessment above and identified those cost items that would be avoidable if BTC was not required to provide its USO services, BTC would then be required to determine the value of those avoidable costs. The best practice approach for such an assessment would ideally estimate the level of avoidable costs a new operator would save, that is, the costs would reflect the latest and most efficient technology and an optimal network configuration. This is often referred to as "forward looking costs". URCA, agreed in Section 4.21 of ECS 01/2013 that the USP should have the flexibility to build a bottom-up cost model in order to derive estimates of long run incremental costs of activities or of products.

In the absence of requisite information to build a bottom-up cost model, URCA is of the view that BTC should use the actual costs of providing the USO with adjustments made for efficiency as appropriate. Such adjustment may be necessary given that BTC's cost accounting records are on a historical cost accounting basis (HCA).

URCA recognises that costs valued on an HCA basis do not depict the costs of a new entrant as best practice would require. Costs valued on a current cost accounting (CCA) basis are recognised as being superior in that they depict the costs a new operator would face entering the market. CCA is therefore considered superior for evaluations of the true avoidable cost of the USO. However, until URCA considers revision to the costing methodology for separated accounts, URCA accepts that the net cost calculation shall be determined on a HCA basis.

That acceptance notwithstanding, these Guidelines can be applied using either the HCA or CCA approach. At this stage, URCA accepts that costs will be valued on a historical cost basis for the purpose of calculating the net cost of the USO.

***3) Cost data broken down by area***

Another critical element to BTC's calculation of the net cost of its USO is an understanding of how an activity/network component varies under different geo-demographic conditions. A net cost calculation relies on the availability of cost data broken down according to the main drivers of costs. For example, the unit cost of providing a line to a new subscriber in a rural area may be higher than that of an equivalent line in an urban area. In such a situation, a net cost of the USO may rise as the USP is required to provide a service at a uniform price despite differences in the cost of provision across geo-demographic zones. For example, a subscriber line in the rural area would generate a negative contribution. The uniform price of the service could be below the cost of connection in a rural area while a subscriber line in an urban area could generate a positive contribution to the USP.[6]

The cost information necessary for BTC to calculate the net cost of its USO would be obtained in part from BTC's cost accounting records and in part from new statistical assessments of costs. These are discussed further in these Guidelines.

### 1.3 Scope of these Guidelines on Application of the Methodology

In developing these Guidelines, URCA has given consideration to a methodological approach that is:

- **Based on currently available data**. This ensures that the adopted approach is practical to implement and that the methodology chosen to calculate the net USO costs will be determined by data that is largely currently available. These Guidelines provide a view on the minimum required disaggregation of the cost data.
- **Transparent**. The methodology chosen should be easily understood.
- **Easy to update and flexible.** The selected approach allows the USO net cost calculation to be updated easily as data becomes available and is sufficiently flexible to be extended to incorporate the availability of new data as BTC extends its network and service offering, if necessary, to meet its obligations under the Comms Act.

### 1.4 Structure of these Guidelines

The various aspects of the methodology are discussed as follows:

- Section 2 sets out how BTC is to calculate the net cost of the USO of uneconomic islands.

[6] Without variations in costs of providing the same service to different areas, the obligation of a nationwide service at a uniform price (matching costs) would not be a burden on the USP. Equivalently the obligation of providing a nationwide service where a same service can be charged at non-uniform price would not be binding on BTC.

- Section 3 sets out how BTC is to calculate the net cost of uneconomic customers on economic islands.
- Section 4 sets out how BTC is to calculate the net cost of the USO special tariffs granted to specified institutions for the provision of internet services.
- Section 5 sets out how BTC is to calculate the net cost of USO public pay apparatus on economic islands.
- Section 6 sets out how BTC should treat reasonable profits (i.e., cost of capital) and potential cost efficiency improvements in the calculation of the net cost of the USO.
- Section 7 sets out how to calculate the value of intangible benefits associated with the provision of the USO.
- Section 8 sets out the information that is to be provided by BTC as part of an application for funding, including information that will aid assessments as to whether an unfair financial burden exists.

## 2. NET COST OF UNECONOMIC ISLANDS

This Section of these Guidelines sets out how BTC is to calculate the net cost of providing universal services to uneconomic islands.

It provides guidance on how to determine:

- whether an island is uneconomic (i.e., whether meeting the USO on a given island imparts a net cost on BTC);
- the activities and network components that would not be necessary absent the USO and whose costs would be avoided; and
- the foregone revenues if BTC were to stop providing the USO services.

### 2.1 Analysis at Island Level

In Section 4.21 of ECS 01/2013, URCA stated that it would give further consideration to the reasonableness of an island as the unit of analysis when developing guidelines on the methodology for calculating the net cost of the USO. Having duly considered the various options, URCA is of the view that the net cost of the USO should initially be assessed at the island level. In URCA's view, this level of analysis is not only pertinent insofar as it is consistent with the presumption that an operator would make its initial decisions about entering the market at an island level, but it also reflects the technical organisation of the communications network of an operator. This takes account of the investment decisions and commercial activities of an operator that are not subject to a USO.

The calculation of net cost at this level consists of quantifying the difference between avoidable costs and the foregone revenues should BTC stop providing universal services to an island as a whole.

If the avoidable costs are larger than the foregone revenues from the provision of USO services, it is expected that BTC with full commercial freedoms would be better off not providing these services. In this situation the island is deemed to be "uneconomic".

If the foregone revenues are larger than the avoidable costs, it is expected that BTC with full commercial freedoms would be better off continuing to provide the services in question even in the absence of a USO. In this situation the island is deemed to be "economic".

Based on the results of the 2010 Census published by the Department of Statistics, URCA posits that for the purposes of these Guidelines, there are a minimum of 16 islands for which a separate net cost of the USO may be calculated provided USO services are made available on those islands. In Table 1 below, URCA lists the most populated islands in The Bahamas,

together with the surface area and population density of those islands.[7] The least populated island is Ragged Island and the smallest (by surface area) is Bimini (11 sq. miles).

**Table 1: Populated Islands**

| Island | Population | Area (sq. miles) | Population density (per square mile) |
|---|---|---|---|
| Abaco | 17,224 | 649 | 26.5 |
| Acklins Island | 565 | 192 | 2.9 |
| Andros | 7,490 | 2,300 | 3.3 |
| Berry Islands | 809 | 12 | 67.3 |
| Bimini, Cay Lobos & Cay Sal | 1,988 | 11 | 180.7 |
| Cat Island | 1,522 | 150 | 10.1 |
| Crooked Island | 330 | 84 | 3.9 |
| Eleuthera, Harbour Island & Spanish Wells | 11,515 | 200 | 57.6 |
| Exuma and Cays | 6,928 | 112 | 61.9 |
| Grand Bahama | 51,368 | 530 | 96.9 |
| Inagua Islands | 913 | 599 | 1.5 |
| Long Island | 3,094 | 230 | 13.5 |
| Mayaguana | 277 | 110 | 2.5 |
| New Providence | 246,329 | 80 | 3,079.1 |
| Ragged Island | 72 | 14 | 5.1 |
| San Salvador & Rum Cay | 1,039 | 90 | 11.5 |

Source : The Bahamas Department of Statistics 2010 Census. http://statistics.bahamas.gov.bs/download/044192000.pdf

## 2.2 Avoidable Costs Absent the USO

In assessing the net cost of the USO, BTC will have to identify the network elements that would not be necessary should it stop providing USO services. BTC will also have to identify those network elements that will be unavoidable as it continues to provide other (non-USO) electronic communication services on the island that are independent of the access lines. URCA notes that the network components in BTC's separated accounts may provide a suitable level of granularity for assessing which components are likely to be avoidable.

The avoidable costs to be considered are those which are related to providing access to subscribers (including specified institutions), electronic communications services (including internet services) over the subscriber lines and public pay apparatus.

BTC's separated accounts include an allocation of costs to network components and services according to whether a cost can be directly allocated to one component/service, indirectly allocated or if it is common across all components or services. The basis of allocation is indicative as to whether a cost might be avoidable. These costs are inclusive of:

- costs that are directly allocated to an activity and/or service can be expected to be fully avoidable;

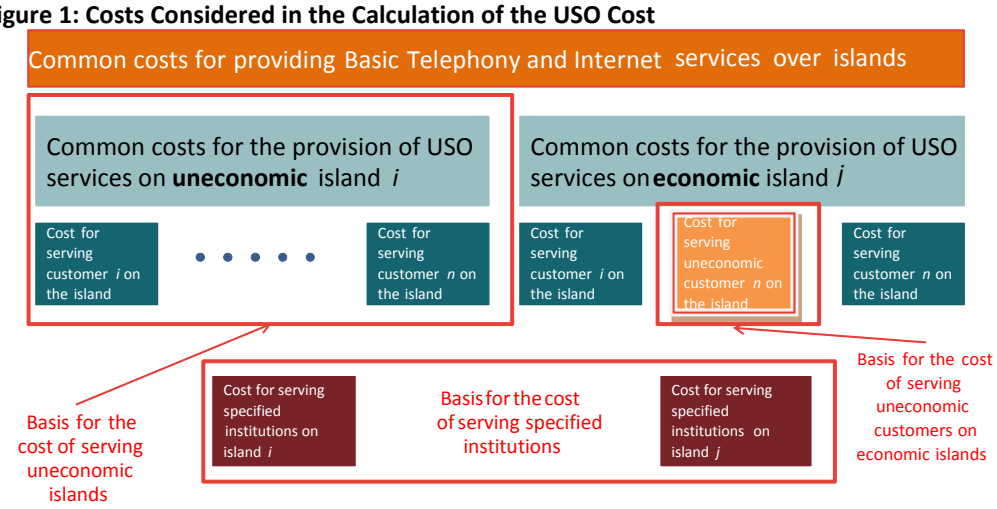
[7]Data from the national statistics also includes Spanish Wells http://statistics.bahamas.gov.bs/download/095485600.pdf

- costs that are indirectly allocated (or are joint costs) need further scrutiny as to whether they are avoidable; and

- costs that are common should be treated as unavoidable to the extent they are common to other non-USO services the USP would continue to provide on the island absent the USO, and to the extent they do not vary with the number of customers served.

Costs that are only common to the provision of the USO services for a specific island would be treated as avoidable. Costs which are common to the provision of USO services across groups of islands that will continue to be served, absent the USO, would be treated as unavoidable. This is illustrated in Figure 1.

**Figure 1: Costs Considered in the Calculation of the USO Cost**




Source: URCA

## 2.3 Avoidable Costs at Island Level

Ideally, avoidable cost data would be available at an island level from within BTC's existing separated accounting system. However, where this is not the case, URCA is of the view that BTC should consider the following two options to estimate avoidable costs:

1. BTC can undertake a geographically disaggregated cost allocation exercise for each of the main islands served by BTC and group all smaller islands together.

2. BTC can conduct a statistical analysis on the variation of costs within and across islands and construct the costs of an island according to the mix of areas present on each island. This option is further discussed in Sections 2.3.1 and 2.3.2 below.

### 2.3.1 Variations in the cost of providing access by zone

The net cost of the USO is caused by costs varying by geographical zones, whilst prices are uniform.[8] Therefore, URCA will critically review the robustness of BTC's approach and the application of the approach to the determination of cost variability by zones – both of which must be documented in detail by BTC as part of any application for compensation.

BTC's assessment of the variability of costs should focus on the variability of costs in providing access. This is because the cost of providing an access line to a customer can vary significantly compared to the cost of services provided over these lines (e.g., calls).

In that regard, BTC should firstly divide an island into geographical zones according to the different geo-demographic characteristics of serving customers living in those zones. This is because servicing costs may differ according to geo-demographic characteristics. In arriving at a view as to how the cost of access varies under different geo-demographic characteristics (or equivalently cost drivers), BTC should use a bottom-up cost model, or network planning data. This exercise should allow BTC to obtain a unit cost of access per zone.

Secondly, BTC should allocate its subscribers on each island to the various zones that make up the island. Thereafter, BTC should derive a weighted unit average cost of access for the given island using the share of subscribers per zone as the weight.

### 2.3.2 Cost of providing communication services over subscriber lines

The cost of providing USO services over the access lines will be assumed to neither vary by zone nor by island. On this basis, the average national unit cost (e.g., cost per minute for call services) in the separated accounts is a good starting point to establish a cost estimate for such provision of electronic communication services.

One critical element necessary for the determination of the cost of the communications services delivered over an access line is measuring the quantities of the communications services (i.e., minutes) used by subscribers. The most appropriate information set would be the actual usage of each individual subscriber. Where BTC cannot provide or obtain this information, BTC may consider a stratification of its subscribers for each service provided over the subscriber lines. For example, business subscribers may make and receive a higher volume of calls than households. As such, an island with a relatively higher proportion of business subscribers would be assumed to have a higher usage per line.

The simplest option for BTC would be to assume that the average usage across all lines is the same. In this instance, BTC would take the average quantity per subscriber for a given service and the number of subscribers on an island to establish the cost of providing the service over the lines on that island.

[8] This is only the case where, overall, the average revenue is set to cover all costs.

## 2.4 Foregone Revenues Absent the USO

### 2.4.1 Foregone revenue from rentals, outgoing calls and internet (dial up)

The revenues foregone with the removal of USO services should be calculated as the sum of the products of the volumes of each universal service and their respective average revenue per minute (or monthly flat fee as applicable in the case of dial-up internet).[9]

### 2.4.2 Foregone revenue from incoming calls from other operators

Revenues foregone would also include the interconnection revenues of calls made by non-BTC fixed line customers based in The Bahamas or any customers based abroad. They will also include the interconnection revenue arising from mobile calls to fixed BTC customers. Absent the USO subscriber lines, BTC would not earn those revenues anymore as callers would not be able to reach their end recipients.

### 2.4.3 Foregone revenue for other services dependent on the fixed telephony network

Absent the USO and with the (hypothetical) withdrawal of access lines, other services dependent on the fixed telephony network would not be available. This applies, for example, to leased lines, and digital subscriber line (DSL) broadband services. Revenue applicable to those services dependent on the fixed telephony network would be foregone absent the USO.

### 2.4.4 Foregone revenue from incoming calls from BTC customers on other islands

BTC is required to give special consideration to incoming traffic from BTC customers located on other islands. This is because the incoming revenue associated with BTC customers on one island is the outgoing revenue generated by BTC customers on another island.

To the extent that the foregone revenues of subscribers in an uneconomic island include revenues from incoming calls of BTC customers on another island, the revenues on this other island would correspondingly be lower. Hence, an iterative process is necessary to come to a view as to which islands are uneconomic. There is a need to reassess islands which may be deemed economic if received calls are taken into account. As economic islands become uneconomic, then consideration is to be paid to the incoming calls from economic islands to the "newly" uneconomic island, etc. That is, if a service is no longer provided on 'Island A', revenues from calls from 'Island A' could no longer be included in assessing the profitability of 'Island B'.

[9] Since a service may be charged at a different rate during the day, URCA is of the view that BTC should use the average revenue. This will capture the mix of calls during the day on average in that year. Equally this might allow the situation where there are two-part tariffs.

In order to estimate the net cost associated with interconnection flows, it is therefore necessary to have information on the traffic and revenue originating and terminating on the different islands and networks. Ideally, this would require the use of a matrix of calls and revenue flows as shown in Table 2 below. The cell of interest would be the totals reported in each column (X1, to Xn).

**Table 2: Call Minutes and Revenues from Incoming Calls – Calls Made by BTC Subscribers**

| Traffic originated on | Traffic terminated on | | | |
|---|---|---|---|---|
| | **Island 1** | **…** | | **Island n** |
| **Island 1** | | | | |
| **…** | | | | |
| **Island n** | | | | |
| **Total** | X1 | X2 | | Xn |

Source: URCA

### 2.4.5 Foregone Revenues from Public Pay Apparatus

The foregone revenues from public pay apparatus include both the outgoing calls made from public pay apparatus and other revenues, including for example the revenues from the sale of advertising space on payphone kiosks.

The revenues are given by the sum of the actual and specific public pay apparatus revenues per island. If this information is not available, nationwide average revenue per payphone may be used instead.

## 2.5 Net Cost of the USO per Island

The net cost of the USO for an island is derived from the difference between the aggregate foregone revenues (i.e., rentals, outgoing calls, fixed internet, service incoming calls, and public pay apparatus) and aggregate avoidable costs (for access and services relying on access) for the island as a whole.

From this first round of analysis, BTC will have determined the islands that are economic and those that are not. The sum of the losses made by each of the uneconomic islands will correspond to the direct net cost of providing the USO to uneconomic islands.

## 2.6 Summary of Critical Elements of Approach

The critical elements to the calculation of the net cost to uneconomic islands are:

- The variability in costs for the provision of access. This level of granularity of access cost data is necessary for any net cost calculation. In the absence of direct information on cost variability, these guidelines recommend a statistical assessment of costs.
- The variability in the quantities of services consumed by subscribers. If unavailable, an average usage for each communication service should be adopted until more relevant and appropriate data becomes available.
- The treatment of BTC subscribers on one island calling BTC subscribers on another island.

Table 3 below summarises the key components of the calculation discussed above.

**Table 3 : Model to Estimate the Net Cost of USO from Uneconomic Island**

| |
|---|
| **Avoidable costs** |
| + Access cost (weighted average unit cost per line (weight according to the zones that make the island) multiplied by the number of lines on the island) |
| + Communication costs (costs per call minutes multiplied by the relevant number of calls/minutes, for each call type – for the island as a whole) |
| **Foregone revenues** |
| - Retail revenue from access (i.e. rental), outgoing calls, internet services and ancillary services as applicable |
| - Wholesale revenue from access, outgoing calls and ancillary services as applicable |
| - Revenue from retail incoming calls |
| - Revenue from interconnection services as a result of domestic and international incoming calls (termination, transit etc.) |
| - Revenue from other services (including leased lines, DSL broadband ) |
| **= Net cost of an island** |

## 3. NET COST OF UNECONOMIC CUSTOMERS ON ECONOMIC ISLANDS

Uneconomic customers exist on two types of islands. First, uneconomic customers may be large in number on an island, making the island overall "uneconomic". Second, uneconomic customers may be in the minority and surrounded by economic customers, leaving the island economic to serve by BTC. These islands are called the "economic islands" for the purpose of these Guidelines.

This Section sets out how BTC is to calculate the net cost of serving uneconomic customers on economic islands.[10]

The calculation of the net cost of uneconomic customers on economic islands can only be carried out after the economic and uneconomic islands have been identified (as described in Section 2 above).

### 3.1 Definition of Uneconomic Customers

***Conceptual definition***

Identifying individual customers is not required in the first stage of the calculation of the net cost of the USO (i.e., the identification of uneconomic islands in Section 2 above) since the calculation is done at island level. However, identifying uneconomic customers on an economic island requires an analysis of net cost at an individual level. This is a more involved exercise that relies on evidence of the variability in costs of providing access (connection) at a high level of granularity.

URCA maintains that uneconomic customers on economic islands be identified as those with high costs of access which exceed the revenue they generate, even if those revenues match the average nationwide revenue made per customer.[11]

In these circumstances and assuming that BTC were able to identify such customers individually, absent the USO it would have chosen to disconnect them, having taken into account the possible negative impact on its branding of disconnecting these individuals.

### 3.2 Determination of the Number of Customers who are Uneconomic to Serve

Ideally, in performing the calculation of net avoidable cost for uneconomic customers, BTC should seek to identify uneconomic customers (who subscribe to at least one of BTC's USO services) individually. Where BTC is unable to do so, BTC may adopt a statistical approach to determine the set of uneconomic customers on economic islands. In the latter instance, BTC would be required to provide evidence to URCA justifying how it has identified those uneconomic customers.

[10] Whether these customers become economic over their life time is discussed in Section 7 on Intangible Benefits.

[11] The dynamic effects are dealt with as part of the intangible benefit called the "Life Cycle Effect".

Assuming average usage, a customer who subscribes to at least one of BTC's USO services may be uneconomic to serve if the costs of serving that customer are significantly above average. This could arise because:

- some network elements may be dedicated to serve a particular (uneconomic) customer; or
- some network elements for access may be used in much higher quantities for a particular customer when compared with an average customer (e.g., a customer may live further from an exchange, leading to higher access network costs).

A simple way to identify uneconomic customers would be to compare the avoidable cost of serving those customers with the average revenue generated by BTC's customers who use at least one USO service. If the avoidable cost exceeds the average revenue, the customer is considered to be uneconomic. If avoidable costs can be modelled as a function of observable parameters (e.g., population density in the area, percentage of the area in a hilly terrain, etc.), it will be possible to identify uneconomic customers based on a set of specific parameters.

### 3.3 Avoidable Costs Absent the USO

The avoidable cost of network elements used to serve uneconomic customers shall be based on information collected by BTC in preparing its separated accounts (e.g., cost per unit of network equipment).

To calculate the avoidable cost of services offered over these lines, BTC should use the nationwide average unit cost of providing services multiplied by the quantities of services used by an average customer. This is consistent with the approach to the average revenue per customer.

### 3.4 Foregone Revenues Absent the USO

To the extent that potentially uneconomic customer groups are not easily identified, their specific net revenues from non-access/communication services may not be identifiable. The national average outgoing revenue per customer can therefore be used as an alternative estimate. The revenue foregone from incoming calls received by uneconomic customers should also be accounted for in calculating revenue foregone absent the USO.

The average revenue for electronic communications as identified – plus the line rental – will constitute the foregone revenue per uneconomic customer on an economic island.

### 3.5 Net Cost of Uneconomic Customers

The average revenue per uneconomic customer is to be set against the average avoidable cost of serving said customers. The sum of the losses for all uneconomic customers will correspond to the net cost of the uneconomic customers on economic islands.

A statistical analysis of access costs is critical for this evaluation. Where BTC is not able to provide the associated evidence for differing costs of connected customers, URCA may dismiss

any claim that the USO imparts a net cost on BTC as a result of serving uneconomic customers in economic areas.

## 4. NET COST OF SPECIAL TARIFFS TO SPECIFIED INSTITUTIONS

This Section provides guidance to BTC on how it should calculate the net cost of providing its internet (dial-up) services for free to specified institutions (including Community Centers).

A specified institution using a USO internet (dial-up) service creates a *de facto* net cost for BTC. Absent this USO, BTC may choose to serve the specified institutions as it would be entitled to charge for the service – as long as the specified institutions continue to be subscribers of access lines.

This Section speaks directly to the foregone revenue from providing USO to specified institutions. The avoidable costs associated with the actual connection of specified institutions are already taken into account in the determination of both economic and uneconomic islands.

### 4.1 Specified Institutions

URCA reaffirmed in Section 4.11 of ECS 01/2013 that the following designated specified institutions (as per Schedule 5 of the Comms Act) are eligible to obtain access to USO services free of charge.

"Specified institutions" are taken to mean:

- All public and church operated schools registered with the Ministry of Education;
- Public libraries registered with the Ministry of Education;
- Public hospitals and public medical clinics registered and/or operated by the Ministry of Health and/or the Public Hospital Authority;
- Senior citizens homes registered with the Residential Care Establishment Licensing Authority;
- Orphanages registered with the Residential Care Establishment Licensing Authority;
- Community Centers (registered with URCA);
- The College of The Bahamas;
- The Bahamas Technical and Vocational Institute;
- The Bahamas Hotel Training College; and
- Eugene Dupuch Law School.

### 4.2 Net Cost of Special Tariffs

The net cost of special tariffs corresponds to the opportunity cost of providing dial-up internet services for free. This is illustrated in Table 4 below. It is given by the standard tariff monthly flat rate that the specified institutions would be charged absent the USO.

The estimated opportunity costs (i.e., revenues not earned) should then be adjusted to account for the possibility that faced with the standard tariff, specified institutions would alter and reduce their usage of dial-up internet services. This adjustment should be based on stated preference analysis.[12]

**Table 4. Model to Estimate the Net Cost of USO from Specified Institutions (all islands combined)**

| |
|---|
| **Revenue foregone (calculated as follows)** |
| - Revenue from internet (dial-up), prevailing internet minute charge rate (for all other subscribers) multiplied by calls/minutes<br>+ Adjusted for lower demand as services are charged at standard tariffs |
| **= Net cost of serving internet (dial-up) for free to specified institutions** |

[12] Stated preference analysis, also called conjoint analysis, requires research participants to make a series of trade-offs. Analysis of these trade-offs will reveal the relative importance of component attributes – including price.

## 5. NET COST OF PUBLIC PAY APPARATUS ON ECONOMIC ISLANDS

This Section sets out how BTC is to calculate the net cost of providing public pay apparatus in public spaces on economic islands.

This calculation applies to the provision of public pay apparatus on economic islands only. This is because under the proposed methodology, costs and revenues from public pay apparatus on uneconomic islands are already accounted for in the calculation of the net cost of that island.

### 5.1 Public Pay Apparatus Relevant for the Net Cost Calculation

BTC must ensure that public pay telephones are provided to meet the reasonable needs of end-users in terms of geographical coverage, number of telephones, and the quality of services. Pay apparatus that are covered under the USO are those available on the street, and in other public areas that are available to the public at all times (i.e., unrestricted access).

BTC can include in its net cost calculation the net cost of the provision of USO public pay apparatus that has been agreed between URCA and BTC (as recorded in BTC's USO implementation plan). The BTC USO implementation plan will set out the rules that determine the number, the possible location of the public pay apparatus as required under the USO, and the actual provision by BTC against these targets on an annual basis.

Where BTC fulfils its obligations, it can calculate the net cost of the USO, of which public pay apparatus are components, for the purpose of preparing its application for compensation.

### 5.2 Level of Analysis

The net cost of the USO public pay apparatus should be calculated on an island by island basis for the economic islands only.[13] Again, this reflects the view that a new operator would choose to roll out the installation of public pay apparatus at the island level.

### 5.3 Foregone Revenues Absent the USO

In an ideal situation, BTC should have information on the actual usage and revenues of public pay apparatus by island. Absent such information, BTC may use in order of preference:

(i) the average usage of public pay apparatus on economic islands; or
(ii) the national average usage of public pay apparatus.

The number of public pay apparatus per economic island will be as stated in the implementation plan. Other foregone revenue to account for will be that from selling

[13] The net cost associated with the provision of public pay apparatus in uneconomic island is accounted for when BTC is to establish which island is economic as discussed in Section 2 of these guidelines.

advertising space on the public pay apparatus kiosks. As specified above, BTC should either and in an ideal situation use the specific amount of advertising revenue associated with each individual public pay apparatus or use a nationwide average advertising revenue.

### 5.4 Avoidable Costs Absent the USO

BTC will be expected to identify the network components and activities it would avoid absent a USO on public pay apparatus.

Should the installation costs of a public pay apparatus vary across zones, it will be for BTC to provide the statistical analysis supporting the assumed differences in installation costs for each economic island.

### 5.5 Net Avoidable Costs

The net cost of the provision of public pay apparatus should be calculated for each economic island. It will be given by the difference between:

- the sum of all avoidable costs with the withdrawal of all public pay apparatus on the island; and
- the sum of the associated foregone revenues on that same island if the public pay apparatus service was withdrawn.

The overall net cost of providing public pay apparatus to economic islands will be given by the sum of the losses from public pay apparatus on all "economic" islands.

**Table 5: Model to Estimate the Net Cost of USO Public Pay Apparatus on Economic Islands**

| |
|---|
| **Avoidable costs (calculated as follows)** |
| + Access cost, cost per line at the local exchange site |
| + Communication costs, costs per call/minute multiplied by the relevant numbers of calls/minutes for each call type |
| + Public pay apparatus-specific cost (maintenance, cleaning, coin collection etc.) |
| **Revenue foregone (calculated as follows)** |
| - Revenues from outgoing calls, calls/minutes multiplied by the unit price for each call type or average revenue per payphone on economic islands (only) |
| **= Net cost of USO public pay apparatus on economic islands.** |

## 6. ADJUSTMENTS TO THE NET COST OF THE USO

This Section sets out the treatment of both the cost of capital and cost efficiency improvements in the net cost of the USO calculation.

### 6.1 Need to Adjust for Cost of Capital

The cost of capital associated with the provision of the USO is a cost that could be avoided absent the USO. It must be accounted for in the net cost calculation.

BTC is expected to set out whether the cost data used in the net cost calculation includes an allowance for the cost of capital.

To the extent that a measure of the net cost of the USO is calculated using operating avoidable cost data, the net cost would need to be augmented to account for the cost of capital for the provision of the USO.[14] BTC is expected to first identify assets used for the provision of the USO and document to what extent these would be avoided absent the USO. Then BTC is expected to estimate the avoidable cost of capital using the applicable weighted average cost of capital (WACC) which is used by URCA in other regulatory decisions for BTC.[15]

### 6.2 Need to Adjust for Cost Efficiency

In its final decision on Question 24 of ECS 01/2013, URCA concluded that where the net cost is estimated using actual cost data (as opposed to a bottom-up model) URCA may make an efficiency adjustment to the estimate of the net cost of the USO based on any annual productivity gains the USP is set to achieve. URCA would therefore carefully consider the circumstances of each case to ascertain whether efficiency adjustments to a calculated net cost of the USO are necessary.

If an efficiency adjustment is deemed to be necessary, it will be applied once the direct net cost of the USO has been calculated.

URCA may use a number of approaches to determine the appropriate level of costs that would have been incurred by an efficient operator, in order to determine the quantum of adjustments necessary to the USP's net cost calculation. These methodologies may include, but are not limited to, the use of:

- the review of BTC's business plan;

[14] For clarity, the inclusion of the cost of capital will increase the level of avoidable costs, and so islands marginally economic may become "uneconomic". Therefore a net cost of the USO accounting for the cost of capital is expected to be higher than a net cost of the USO without such an allowance, all else being equal.

[15] In its accounting system, BTC has separate WACCs for fixed and mobile telephony respectively. The former is to be used. http://www.urcabahamas.bs/download/075799800.pdf

- any indicators in relation to line faults[16];
- independent survey reports regarding the USP's efficiency; and
- regulatory decisions from other jurisdictions that provide relevant precedents and benchmarks.

Any efficiency adjustment will be applied *ex-post* to the overall net cost of the USO and be expressed as a percentage to be taken off the net cost estimate.

[16] Quality targets in relation to maintenance and repairing lines are part of the operational definitions of the USO set out in the implementation plan of BTC.

## 7. INTANGIBLE BENEFITS

This Section sets out guidance on how BTC should calculate the value of the intangible benefits arising from the provision of the USO.

Whilst the USP may face a direct net cost of the USO, this monetary amount does not capture the potential intangible benefits arising from the USO. Such benefits if they exist enhance the overall economic performance of the USP. Hence, URCA considers that the direct net cost of the USO should be netted off against the value of intangible benefits to obtain the overall net cost of the USO.

In Section 4.25 of ECS 01/2013, URCA reaffirmed that, in principle, an adjustment for the intangible benefits to the calculation of the net cost of the USO is appropriate. A number of intangible benefits arising from the USO have been identified in the literature and regulatory decisions in other jurisdictions. URCA has identified the following four intangible benefits that it considers to be pertinent in the context of The Bahamas:

1. Enhanced Brand Recognition/Corporate Reputation
2. Ubiquity
3. Life Cycle Effect
4. Marketing

In quantifying these, BTC should seek to answer the question as to what are the intangible benefits from serving unprofitable customers/islands at subsidised prices, rather than charging them at a price that reflects their true cost (and risk pricing them off the network).

### 7.1 Enhanced Brand Value

The brand image of BTC is drawn in part from the fact that BTC provides universal services throughout the country. It implants public pay apparatus throughout the country and provides telephony services to anyone upon request. From this fact, BTC may enjoy a better brand image and draw an advantage from its USO status.

Related to brand value is the notion of brand recognition.

***Core approach***

Based upon data availability and computational ease, URCA proposes that for the time being, the intangible benefit to BTC's brand image be estimated as 10% of the BTC's advertising and marketing spent on retail activities.[17]

The premise behind this approach is that BTC values and is prepared to spend resources to establish and/or maintain its brand. By providing a universal service, BTC's brand is enhanced.

[17] The 10% value as stated by URCA in Section 4.1.4 of ECS 12/2012 is reflective of the degree of corporate goodwill and brand appeal of the USP in the Bahamian communications market.

This will increase the likelihood of customers choosing BTC over competitors for non-USO services.

The amount BTC is willing to spend to maintain its brand reveals the minimum return it hopes to achieve from its brand. In these Guidelines, the advertising spent on retail activities is to be assumed a lower bound value of the brand (provided the USP's marketing is effective in at least maintaining its brand value at this level). In recognition that not all its brand might be attributable to the USO, URCA proposes to estimate this intangible benefit as 10% of the advertising/marketing budget of BTC.

### 7.2 Ubiquity

Ubiquity benefits are linked to customers who move from areas of high cost of service provision to areas with a low cost of service provision. Those customers are more likely to stay with the USP (i.e., BTC), who served them in the high cost area than a new customer is likely to take a service from BTC.[18,19] Ubiquity is deemed as a benefit in that BTC faces lower acquisition costs for these customers than that which would be required by its rivals. The USO status makes BTC more attractive to these moving customers.

In order to capture the ubiquity benefits arising from this behaviour, BTC should estimate a per line net contribution to profits that BTC may expect to earn as customers migrate from high cost to low cost areas. In this context, high and low cost areas refer to uneconomic and economic islands.

For example, this estimate could be done by calculating the product of (A x B x C) with:

- the number of BTC customers on an uneconomic island moving to another, albeit economic, island (A);
- the probability that a BTC customer from the uneconomic island is likely to reconnect to BTC rather than choosing another provider on an economic island (B); and
- the difference in margins of providing the same communications on economic and uneconomic islands (C).

[18] Ubiquity and life cycle effects are related. The former is about current migration from a high cost to a low cost island for a customer at a given cycle of his/her life. The latter is about the evolution of revenue spent on communications services as a customer that evolves through different cycles of his/her life. Broadly speaking, the former is about increasing contribution per line thanks to lower costs; the latter about increasing contribution per line thanks to higher revenues.

[19] For simplicity reasons URCA does not propose at this stage that another type of ubiquity benefits be evaluated. This other ubiquity benefit would seek to capture the fact that some customers may have requirements that cover multiple sites and prefer an operator who is present in all locations – which happens to be the case for a USP by virtue of its USO.

Two conditions are therefore necessary for the ubiquity benefit to materialise. First, the customers need to migrate from uneconomic to economic islands, and second, customers must choose the USP as a result of having been served by it previously.[20]

The first variable may be derived according to the number of subscribers who cancelled their lines because they are moving, adjusted for the proportion of the general population who move from uneconomic to economic islands. [21]

This variable would then be adjusted to derive an estimate of the propensity of customers to choose the same operator as before. Absent these statistics, the market share of BTC on the economic island may be used as a proxy.[22]

Regarding the third variable, the initial exercise of identifying the economic and uneconomic islands will provide information on the average revenue and average cost per island. BTC should then compare the average margin contribution for each uneconomic island with the higher margin contribution on the economic island.

### 7.3 Lifecycle Benefits

Lifecycle benefits refer to the fact that some customers may become more profitable in the future. When considering this lifelong perspective, such customers may become economically viable customers. As a result, absent the USO, BTC would choose to serve some customers at an initial loss with the expectation that these customers would turn profitable over time. This phenomenon is deemed as a potential benefit for BTC insofar as such customers remain loyal to BTC once they have become profitable.

Two conditions are therefore necessary for the lifecycle benefits to materialise. First, BTC must identify the customers who are currently unprofitable but who generate a positive net present value (NPV) over their lifetime. Second, the expected NPV of these customers must be greater if services are being provided whilst the customer is unprofitable (as a result of customers' increased propensity to stay with BTC).

URCA considers that this benefit is already captured in the estimated net cost of the USO. This is because the lifecycle benefits, if they exist, are largely accounted for as the analysis is carried

[20] Ubiquity intangible benefits may arise only when a customer moves from a high cost island (uneconomic) to a low cost island (economic). It is not considered when a customer moves from a low cost island (economic) to a high cost island (uneconomic). This is because one assumes that competitors would have chosen not to serve uneconomic islands and only the USP is present on uneconomic islands because it has a universal service obligation to be present there.

[21] For example, if 1,000 customers have cancelled their subscriptions to BTC because of a change of address, National Statistics indicate that 0.3% of population that migrate, migrate to a more prosperous island. Then at best 0.3% * 1,000 customers would be assumed to have moved to economic islands.

[22] The proxy says that if BTC holds a market share of 70% on a given island, 7 out of any 10 customers would choose BTC as they move to this island. URCA recognises that this proxy is not perfect. The implicit assumption would be that new customers on an economic island would have this (market share) propensity to stick to the USP because of its USP status. Other reasons than the USP status might explain why customers choose the same operator as before.

out at the island level. For the uneconomic customers on economic islands, their average revenue is assumed to match the average revenues of all customers. This average revenue is based on the consumption of communication services by the mix of all customers – and therefore at different stages of their lives.

Therefore, URCA concludes that this benefit should not be considered in the determination of the net cost of the USO under the approach proposed in these Guidelines (as initially envisaged in ECS 01/2013).

### 7.4 Marketing

Marketing benefits refer to the potential use and/or commercialisation of customer usage data (e.g., profile of service mix).[23]

The customers on whom data may be valuable are those on uneconomic islands. This dataset is deemed a USO benefit for BTC only if BTC is the single and unique provider to the uneconomic islands (i.e., absent the USO, no profit maximising operator would choose to serve this market). Hence this information has a value for future operators should they wish to market themselves to those customers/islands as they become economic thereby justifying entry into the market.

The value of this knowledge base does not go beyond the cost savings BTC may make in consumer research. The commercialisation of consumer data to a third party is not allowed under data protection legislation in the Bahamas.[24]

On this basis, URCA concludes that this benefit should not be considered in the determination of the net cost of the USO under the approach proposed in these Guidelines (as initially envisaged in ECS 01/2013).

[23] In this approach, the benefits arising from the possibility of selling advertising space on public pay apparatus are accounted for in the net cost of the USO public pay apparatus on economic islands.

[24] Both the Data Protection (Privacy of Personal Information) Act, 2003 and Condition 25.6 of BTC's Individual Operating Licence (IOL) suggest that there are restrictions in reselling customer information to third parties, unless the data is collected specifically by the licensee for the purposes of commercialisation and the licensee has actively obtained the customer's consent to disclosing the customer's personal information to third parties (for the purposes of the customer receiving unsolicited communications from such third parties).

## 8. BEYOND THE NET COST CALCULATION: NEXT STEPS

### 8.1 Format of Application

As previously stated in Section 1 of this document, URCA expects BTC to make its own assessment on the unfairness of the burden. That assessment must be presented to URCA as part of its application for compensation from the USF. In that regard, BTC must therefore provide its estimate of the net cost of the USO with and without intangible benefits and the net cost for the components of the USO.[25]

These overall figures must be presented to URCA with evidential support and the underpinning assumptions together with a description of the approach followed by BTC. The spreadsheet model used for the calculations is also to be provided to URCA.

URCA accepts that BTC may adopt slightly different approaches in implementation to those suggested in these Guidelines because of data availability or technical requirements. However, BTC must ensure that its approaches are consistent with the principles set out in these Guidelines. The quality of BTC's documentation will be crucial for URCA's assessment of the robustness of these estimates. URCA may request further clarification under section 8(1) of the Comms Act and/or Condition 5.1 of BTC's Individual Operating Licence if the information provided by BTC is deemed insufficient in scope and quality. BTC may also be required to take part in meetings with URCA to provide clarification or further information in relation to its submissions.

### 8.2 Timing

An application for compensation for the net cost of the USO is to be submitted within six (6) months of URCA approving BTC's separated accounts for that year or within six (6) months of the publication of BTC's statutory audited accounts if separated accounts are not required under the prevailing regulations.

### 8.3 Unfair Financial Burden

If, after having completed its assessment of BTC's submission, URCA accepts the estimate of the net cost of the USO (inclusive of intangible benefits), URCA will then consider BTC's assessment of whether the net cost of the USO constitutes an unfair financial burden. For the avoidance of doubt, URCA will undertake its own analysis of an unfair financial burden where necessary and appropriate.

Where such analysis is required, URCA will employ a two stage approach to the possible determination of an unfair financial burden. The first stage relates to the

[25] Components include: Uneconomic islands, uneconomic customers, public pay apparatus on economic islands and special tariff for specified institutions.

market share threshold at which URCA will commit to undertake an analysis of whether an unfair financial burden exists. The second stage is the actual analysis of unfair burden and the approach discussed below.

The market share threshold for the determination of an unfair burden will be set at 80%.[26] Where the USP's market share is 80% and greater, the presumption is that no unfair burden exists. The USP would have to demonstrate to URCA that it faces an unfair burden whilst having a market share of 80% and above.

Where the USP's market share is less than 80%, URCA will assess whether an unfair burden exists. This analysis will take place if the net cost of the USO is not disproportionate to the administrative cost of running a USF. If so, URCA will look at a number of indicators.

First the impact of a USO can, in principle, undermine the profitability of a USP or endanger its financial viability. It is relevant and necessary, therefore, to take into account whether or not a positive net cost significantly affects BTC's profitability and/or ability to earn a fair rate of return on its capital employed in the prevailing market circumstances. URCA will therefore consider how and to what extent BTC is able to achieve a fair rate of return on capital employed (ROCE) across all its licensed activities.

Profitability can indicate a USP's ability to bear a USO in the short term. However, a static view of a USP's revenues and profitability may only provide a weak indicator of a USP's ability to continue paying cross-subsidy revenues into the future. In this regard, an assessment of a number of dynamic and somewhat interdependent criteria can also inform the USP's ability to sustain a positive USO net cost. Among these, URCA will consider:

- changes in prices over time;
- changes in market share and/or changes in related markets; and
- barriers to market entry.

BTC is expected to produce its own assessment against these various criteria.

[26] See URCA's final decision under Section 4.27 of ECS 01/2013.