



Guideline and principles for the pricing of telecommunications

Consultative Document Guidelines and Principles for the Pricing of Telecommunications Services

1 Purpose

1.1 The purpose of this document is to consult the telecommunications industry and the general public in Botswana on guidelines for the pricing of telecommunications services. The document states Botswana Telecommunications Authority (BTA)'s considerations and preliminary positions with regard to telecommunications pricing and related issues in Botswana. The consultation is primarily concerned with the pricing of fixed and mobile voice services offered to the public and interconnection pricing between operators. The preliminary positions raised in the document, together with the input from stakeholders in Botswana, will be the basis for establishing guidelines and principles for telecommunications pricing and interconnection.

1.2 Input from stakeholders is important and respondents are invited to submit their comments on this document. Respondents are requested to make cross-references to the paragraphs in the document. Written comments on the report are requested not later than **30 November 2000**. The comments shall be sent by mail and may also be sent by e-mail to bta@info.bw (for the attention of the Executive Chairman), at the following address:

Botswana Telecommunications Authority
206-207 Independence Avenue
Private Bag 00495

Gaborone Tel : **(267) 357755** Fax: (267) 357 976

1.3 Written comments from respondents will be made publicly available except where respondents indicate that their responses or parts thereof are confidential. The respondents are therefore asked to separate out any such material into a confidential annex, which is clearly marked as such. In the interest of transparency and an open discussion, respondents are requested to avoid confidentiality whenever possible. If BTA is of the opinion that the public should know about a respondent's comment, which has been classified as being confidential, BTA will inform the respondent. The respondent(s)

will then either choose to withdraw the comment or failing which the comment will be made public. Confidential responses should not be sent via the Internet.

1.4 A seminar is scheduled for the **15 February 2001**, at a venue and time to be decided in due course. At the seminar the BTA will make a presentation on the major issues in the study including expanding on BTA's reasons for its preliminary positions on these issues. Stakeholders will have the opportunity to raise their opinions on the issues and on BTA's preliminary positions. The written comments on the consultative document will be made publicly available on the **31 January 2001**.

2 Options for tariff rebalancing

2.1 Rebalancing refers to the process of aligning the tariffs and prices to the underlying costs of providing the services. Although Botswana could clearly benefit from telecommunications tariff rebalancing, current income levels, combined with the extent to which prices are unbalanced, mean that such an exercise should be implemented over a number of years.

2.2 The long-term objective of tariff rebalancing is to set tariffs at an economically efficient level with a view to encouraging sustainable and efficient competition. Current tariff levels are a long way from fulfilling either of these objectives. Instantaneous full rebalancing would require large price changes which would have a very significant immediate impact on the total price of telecommunications services paid by consumers. Hence a gradual rebalancing process should be considered.

2.3 BTA proposes that a rebalancing option should be implemented which has a modest impact on the smaller bills over the rebalancing period. Analysis of rebalancing options should be made under the assumption that Botswana Telecommunications Corporation (BTC) obtains sufficient positive cash-flow to maintain a high level of network roll-out, within the constraint that BTC should be self-financing (that is no external funding should be included in the analysis).

2.4 In BTA's opinion a too long projection period for the rebalancing exercise has a limited practical value due to the rapid market and technological development that characterise the telecommunications sector. It is, on the other hand, important to consider the direct effect of a more rapid rebalancing exercise on customer groups and the impact on the network roll-out possibilities.

2.5 BTA's preliminary position is that the long-term goal should be that tariffs should reflect the underlying economic costs of providing the services and that there should be gradual rebalancing of tariffs over time. However, this has to be done

taking into account that there is no definite answer as to the point the tariff structure is fully rebalanced, since costs and prices change due to technological and market developments.

2.6 BTA welcomes comments from respondents on options for rebalancing of fixed public voice services and BTA's preliminary position on this issue. More specifically, BTA invites comments on the pace of rebalancing of BTC's tariff structure.

3 Price caps and special tariff schemes

3.1 One way to begin rebalancing whilst at the same time encouraging efficiency improvements, which will lower overall telecommunications prices in real terms, is to use a system of price caps on some of the services provided by BTC. Price cap controls are used to ensure that an operator does not use its market power to raise its prices above the level necessary to achieve an acceptable level of profit, given reasonable assumptions for efficiency improvements and volume growth.

3.2 BTA's preliminary position is that a price cap system should be implemented that ensures, at a minimum, no price increases in real terms for the typical residential customer and the typical business customer respectively, under the rebalancing of BTC's tariff structure. Since the tariffs for the international telephony service are not regulated under the Telecommunications Act 1996 (No 15 of 1996), it will not be possible to subject the tariffs of the international voice telephony service to price caps.

3.3 BTA proposes to introduce a price cap basket, consisting of:

- Installation charge;
- Rental charge;
- Local call tariffs;
- Intrazonal call tariffs (within zone);
- Interzonal call tariffs (between zones); and
- Fixed to mobile call tariffs (that is BTC's retail tariff minus the interconnection charge paid to the mobile operators).

3.4 BTA's main objectives for introducing a price cap regulation are the following:

3.4.1 BTC should be given reasonable freedom to rebalance its tariff structure so that the tariffs are better aligned with the underlying costs of providing the services;

3.4.2 Through a price cap mechanism, BTC can rebalance its tariffs but at the same time BTA can ensure that the weighted average prices do not increase by more than a certain rate. BTC will be restricted to increase the weighted average tariffs for residential and

business customers by no more than a rate which is related to the general development of consumer prices (that is consumer price index (CPI));

3.4.3 The price cap allows BTC to retain the profit if the company succeeds to be more efficient than the required productivity improvement factor. Customers will enjoy the benefit from the productivity improvement through decreased prices (the productivity improvement is denoted by the X-factor in the price cap formula; $CPI - X\%$); and

3.4.4 The price cap should lead to decreased administration costs to BTC and BTA and other resources involved in the reviews of tariff proposals, e.g. annual reviews of tariff proposals from BTC.

3.5 BTA's motivation for the suggested services to be included in the basket (see 3.3 above) is that they all constitute basic regulated telephone services to the customers in Botswana. The tariffs for local calls and access services are likely to increase whereas tariffs for long-distance services would decrease. The rebalancing will be allowed to take place subject to the restrictions on the prices of the services in the basket. Fixed to mobile calls are proposed to be included due to the rapid expansion of the number of mobile subscribers and hence the importance of the fixed to mobile tariffs for the customers.

3.6 The price-cap is proposed to apply to residential customers and business customers with single lines, with separate basket of services applying to each customer category. The rebalancing exercise will most likely imply higher access charges and local call tariffs and lower long-distance call tariffs (coupled with lower international call tariffs) in the coming years. The available data indicate that, on average, long-distance and especially international calls make up a higher proportion of the total calls for business customers in comparison to residential customers. This implies that business customers, on average, are likely to have more positive effects of the rebalancing exercise, as the prices of these services are expected to fall. Hence the reason for safeguarding the interest of the residential consumers during the period of a price-cap by introducing a separate residential basket of services.

3.7 In addition, a safeguard mechanism is proposed to be introduced in order to ensure that residential consumers can afford, at a minimum, access to the public voice telephony service even if this mechanism will work in contradiction to the long-term objective to fully rebalance the tariff structure. A low-user scheme forms part of the BTC licence. On the other hand, a low-income scheme has the merit of being closer connected to the main objective i.e. ensuring that citizens with limited capability to pay

standard installation and rental charge can also afford access to the telephone service. It can be argued that there is no clear relationship between a household with low usage and low income. However, a low-user scheme is easier to administer and in theory it can also be shown to be a more efficient solution to subsidise low-user customers regardless of their level of income. In BTA's opinion, the need for a low-user scheme becomes even more important when the network is further rolled out in areas where, on average, the capability to pay standard rates is lower than in areas that have already been provided with telephone services.

3.8 In BTA's opinion, the low-user scheme should be favourable to a significant proportion of the current residential subscribers.

Over time this proportion is expected to increase since many new subscribers are likely to be low-users. However, from a national interest as well as a business point of view, it will still be important to connect these customers to the network.

3.9 BTA supports the move towards long-term optimal pricing and decrease in the current cross-subsidisation between services and customers. A general price-cap scheme and a specific low-user scheme for residential customers can ensure that rebalancing towards more efficient pricing can take place without giving rise to high increases in tariffs for the typical/average residential customer.

3.10 The possibility to introduce appropriate price cap baskets and a low-user scheme is dependent on the availability of information on the telecommunications expenditure of different customers for different services. BTA recognises the current lack of this data, which is necessary to effectively implement and follow-up on the price-cap baskets and low-user scheme. This information therefore needs to be collected and submitted to BTA before a price cap mechanism and a low-user scheme can be implemented. The BTA has already initiated the process of requiring such data in a prescribed format.

3.11 It is proposed that the price-cap and low-user scheme be included as a part of BTC's licence conditions and that both schemes should apply for a period of three years. A review of the price cap regulation and the low user scheme should be undertaken after a period of two years from the date of implementation.

3.12 BTA welcomes comments from respondents on price caps and special tariff schemes, and BTA's preliminary position on these issues. More specifically, BTA invites comments on the composition of the price cap basket and the low user scheme,

and the proportion of customers for which a low user scheme should apply.

4 Universal Service (Access) Obligations

4.1 BTA proposes to define universal service obligation (USO) as *"an obligation to provide a service to particular areas or particular groups of customers which impose losses upon the operator, even if they are produced efficiently"*.

4.2 Economic theory indicates that welfare is maximised by setting price equals to marginal cost. However, in a situation in which a company operating with significant economies of scale has to cover its costs, prices have to be marked above marginal costs. The mark-ups that minimise the welfare loss are inversely proportional to the elasticity of demand for those goods which is known as the Ramsey pricing rule. However, there are reasons why governments or regulators might not wish to set tariffs at these levels.

4.3 There are two kinds of rationale for setting prices, which are not equal to Ramsey prices and for placing USOs on telecommunications operators. One is based on equity and the social benefits of having access to services. The other is based on market failure and the long-run dynamic effects of increasing coverage of the telephone network. The importance of these two rationales will vary according to the stage of economic development in the country. These theoretical arguments need to be considered when deciding on appropriate pricing principles for universal services.

4.4 When the existing coverage is limited and there is a high demand for the services, there are likely to be private returns to expanding networks which should provide incentives for operators to invest. In a fully open market, the financing of USOs is an important issue because effective competition requires a 'level playing field' if it is to be beneficial. In principle, failure to provide compensation for USO is inefficient because the loss-making services would require cross-subsidisation from other services which would increase the divergence from optimal prices.

4.5 BTA recognises the contradiction between ensuring wide network coverage (universal access) and striving for economically efficient pricing. In order to guarantee that, at a minimum, the public voice telephony service becomes available at affordable price on a national basis, access and rental services may need to be priced in ways that are not in line with efficient pricing rules.

4.6 BTA's preliminary position is that making the telephone services available to a wider public, that is the goal of universal access, should be given highest priority in the short term. This means that BTA supports pricing schemes that will attract new consumers to use the services but recognising the need for BTC to rebalance its tariff structure and to obtain a reasonable return from its investments.

4.7 BTA supports an introduction of regulatory instruments that give incentives for operators to provide universal services to the public. **BTA's preliminary position is that, in principle, all players who provide public telephone services should contribute fairly to an increased availability of network and services in Botswana. The obligation to contribute to an increased availability of services is proposed to be a part of the licensing framework.** There are several possible financing mechanisms such as industry levy and general taxation. BTA recognises the potential need for financing an expansion of the network and services but the actual financing mechanism should be dependent on the magnitude of the obligations.

4.8 BTA welcomes comments from respondents on universal service (access) obligations and BTA's preliminary position on this issue. More specifically, BTA invites comments on the definition, costing and financing options of universal service and access in Botswana.

5 Mobile telecommunication prices

5.1 The international evidence suggests that, on average, it is unlikely that mobile operators will require regulatory intervention to prevent escalation of prices where there is competition. However, it is uncertain how competition will develop in the future and it is therefore necessary to follow-up on the mobile price development in Botswana.

5.2 BTA does not currently favour any price-cap basket schemes on mobile prices. Instead BTA will analyse the cost/revenue relationships for the services provided and carry out international benchmark of prices in comparable countries, in order to ensure that mobile tariffs in Botswana are reasonable and internationally competitive. Based on international experience it is reasonable to expect that the mobile prices, on average, should not increase in nominal terms, and this price indicator should be analysed by BTA in the monitoring process of the market in Botswana. In the event that the mobile operators seek to increase prices, BTA will require that they provide sufficient information concerning costs and revenues before and after the proposed price

increase to enable BTA to judge whether such an increase is necessary and justifiable.

5.3 BTA's preliminary position is that the mobile operators should submit regulatory accounts in a prescribed format, subject to further directives, in order for BTA to follow-up on mobile price developments.

5.4 BTA welcomes comments from respondents on procedures to follow up on the mobile price development and BTA's preliminary position on this issue.

6 Interconnection and costing

6.1 In the context of this document, interconnection refers to the technical, economic and legal arrangements between operators to enable customers connected to one network to communicate with customers on the other network(s).

6.2 BTA wants to emphasise that the core of the discussion on interconnection costing and charging originates from a number of crucial characteristics in liberalised telecommunications markets as follows:

6.2.1 The interconnect charges paid by new fixed operators to the incumbent operator, often account for 40-50% of the new operator's cost in the initial period. Hence the interconnection charges and charging structure is very important to the development of the market;

6.2.2 At the introduction of competition, the strength and market power of the incumbent operator versus a new fixed operator is likely to be highly unequal. This imbalance in power implies that the incumbent operator wants as high interconnect charges as possible and the new operator, naturally, as low interconnection charges as possible since the traffic flows is very imbalanced and hence the revenue streams for interconnection services;

6.2.3 The incumbent operator and a new fixed operator tend to compete for the same customers. At the same time the incumbent is the provider of interconnection to the competitor;

6.2.4 Between the incumbent fixed operator and the mobile operators, the situation is slightly different. The direct competition is not as obvious, but the situation is the same in that the incumbent tends to strive for as high interconnect charges as possible and the mobile operator for as low interconnection charges as possible (that is for mobile to fixed calls). The reverse situation applies for traffic from the fixed operator to the mobile operators' networks; and

6.2.5 In a case where the mobile telephone service becomes a substitute to the fixed telephone service, the incumbent has an

incentive to act in a similar strategic way as in the case of fixed competitors. This can be expected to be the case in Botswana where increasing competition on long-distance traffic from the mobile operators constitutes a threat of decreasing revenues and profit to BTC. At the same time the interconnection traffic generates revenue for BTC that would not exist should there be no mobile traffic.

6.3 Based on the above, BTA's opinion is that there is no doubt that establishing fair and reasonable interconnection charges is of fundamental importance in creating effective competition in the Botswana telecommunications market. An appropriate costing system, based on sound principles and requirements, is highly important for monitoring purposes i.e. to ensure the interconnection charges are fair and reasonable.

6.4 Broadly speaking, two costing methodologies can form the basis for calculating the interconnection tariff of a specific service:

6.4.1 Fully Distributed (Allocated) Cost (FDC): all costs, including direct costs caused by a specific service and apportioned costs driven by a group of services are distributed to the service in question according to some accounting rule; and

6.4.2 Long Run Incremental Cost (LRIC) is a generic cost concept, defined as the increase in a firm's total costs as a result of an increase in output, or the costs avoided if output falls.

6.5 The major advantage of the fully distributed costing methodology is that it is based on reconcilable and available information. It is, relatively, simple and will ensure that BTC will recover relevant joint and common costs. The disadvantage of the FDC methodology is that it may take into account historical costs that have nothing to do with the underlying cost of providing a service. The costs may also include significant inefficiency elements. The valuation of costs and the allocation principles, therefore, need to be carefully considered and reviewed.

6.6 The major advantage of the long run incremental cost methodology is that it does not transfer inefficiencies and/or non-relevant costs to other parties. It is, usually, based on forward looking costs and therefore avoids inherent historical costs in the business. Using the LRIC methodology is in line with sound economic principles of efficient pricing. The disadvantage is that it involves complicated considerations on how to determine forward looking incremental costs of specific services. It may also neglect to take into account joint and common costs that need to be recovered by the operator.

6.7 For practical implementation of the different cost bases for interconnection charges, it is important to accurately measure the

costs to be included in the calculation of interconnection charges. Two cost modelling methodologies can be followed: the top-down approach and the bottom-up approach. Fully distributed costing systems usually, but not necessarily, use top-down modelling for deriving costs whereas the methodology of long-run incremental cost can be implemented using either a top-down or bottom-up modelling approach.

6.8 The two cost modelling methodologies are characterised by the following:

6.8.1 The top-down methodology is based on a highly disaggregated version of the management accounts for the business as a whole. The model reflects actual business performance rather than some theoretical ideal; and

6.8.2 The bottom-up approach involves the development of engineering economic models which are used to calculate the costs of particular network elements and in turn particular services.

6.9 Since the BTC network is relatively new and will be expanding, a bottom-up modelling system is probably the best option for establishing interconnect prices as it excludes inefficiencies that may not be a part of the network operations.

6.10 In BTA's opinion, BTC cannot so far provide accurate and sufficiently transparent data on costs, revenues and traffic for the basic telephone services and the interconnect services. The costing system currently used by BTC is based on fully allocated historical costs and lacks sufficient data for sound allocation procedures. It is a major exercise to ensure that the costing system provides transparent, objective and non-discriminatory results. It requires accurate information on how different services use different components of the network and to what degree a proposed tariff change is in line with the movement towards cost based tariffs.

6.11 In the long run, BTA supports the merits of moving towards an LRIC methodology, but it needs to be recognised that this exercise requires a great amount of expertise and resources from BTC as well as the BTA.

6.12 In the short to medium term BTA seeks to set requirements on BTC to improve its data collection procedures, cost management system and allocation principles. **BTA's preliminary position is that for the coming 3 years, BTA will accept a costing methodology based on FDC, but that should take account of possible inefficiencies in BTC's operations. The accounting information collected by BTC should be prepared in such a way that in the long term it should allow a reasonable calculation of the long-run incremental cost of providing the services.** Provided that BTC produces reliable costing, revenue and traffic data according to

agreed principles and formats, BTA will accept a modified FDC system.

6.13 BTA recognises that it is likely to regulate the telecommunications market more effectively if guidelines are established according to which the licence conditions for telecommunications operators would be enforced. This would make the responses to various actions undertaken by the operators clear from the start and would probably mean that disputes and anticompetitive behaviour could be kept to a minimum.

6.14 The following principles, as defined by BTA, should be applied by BTC and the two mobile operators namely Mascom Wireless and Vista Cellular:

6.14.1 The calculation of interconnection charges should be **transparent**, that is, it should be possible to follow what costs have been allocated to what service or network element, how the cost allocation has been done and ensure that only relevant costs have been allocated to the service;

6.14.2 The interconnection charges should be based on **objective** criteria and be **non-discriminatory**, that is, the operators should not offer themselves or any other operator better conditions/lower charges than another operator for the same interconnect service, and

6.14.3 The interconnect services should be sufficiently **unbundled** and be **based on underlying costs**, that is, it should be possible to trace which network elements make up the total cost of the service in order to ensure the other operator does not pay for inefficiency or elements that are not needed for providing the interconnection service.

6.15 **BTA proposes to initiate a study, with the main objective of setting detailed information and data requirements on BTC. The short-term aim is to ensure that BTC will be able to produce preliminary calculation results by the end of the financial year 2001 according to the prescribed format and requirements that have already been communicated to BTC.** BTA proposes that other operators should be consulted in this study, as the outcome of the exercise may have effects on the pricing of interconnection. It should be noted that this work is an ongoing process and will not be finalised by the time the preliminary results are presented.

6.16 BTA welcomes comments from respondents on interconnection pricing and costing principles and BTA's preliminary positions on these issues

7 Access deficit contributions (ADCs) and universal service obligations (USOs) within the context of interconnection

7.1 Until rebalancing has been fully carried out, BTC's Access Business will run at a deficit (to an extent, alleviated by expected efficiency improvements) which will be covered, at a corporation-wide level, by continuing (although decreasing) excess profits from the Calls Business (i.e. national and international calls).

7.2 Proposals for increasing and expanding the network roll-out and availability of services mean that USO costs are likely to increase. Thus, in BTA's view, the recognition, estimation and possible financing of justifiable net costs for BTC need to be considered. However, this should be done taking into account that the mobile operators also have network roll-out obligations according to their licences. **BTA's preliminary position is that an objective and transparent estimation of the net costs to BTC of its universal service obligations and BTC's access deficit should be done.**

7.3 In principle, BTC should be given freedom to rebalance its tariff structure so that it better reflects the underlying costs for each service. However, the availability and affordability of telephone services to a wider part of the population should be the primary goal.

7.4 **To the extent that the national goals of universal service (access), efficient services and regional balance are not considered to be possible to achieve when relying solely on market initiatives, BTA supports a solution where different players in the market may contribute to these goals. However, in BTA's opinion, this cannot be done when the Government still has an active role in directly funding BTC's network rollout. BTA's position is that these two mechanisms should not work in parallel. A future funding mechanism needs to be discussed and agreed with the Government of Botswana, more especially in the advent of privatisation of BTC.**

7.5 BTA welcomes comments from respondents on access deficit contributions and the financing of universal service obligations within the context of interconnection and BTA's preliminary position on these issues.

8 Information and data requirements

8.1 Based on what has been said in this consultative document, it is clear that accurate and transparent data needs to be produced in order for BTA to effectively monitor the rebalancing exercise and be able to act with certainty in regulatory pricing and costing issues.

8.2 **BTA's preliminary position is that detailed information is needed from BTC and that cost and revenue information should**

be required from the mobile operators as well, but in a more limited scope.

8.3 In BTA's opinion it is crucial that the data required is produced in a transparent and prescribed format and that costs are allocated in a non-discriminatory manner. If the information submitted does not meet regulatory requirements, it will be of limited value to BTA's monitoring and decision making process.

8.4 As stated above, BTA proposes to initiate an exercise, with the aim that BTC, at the end of financial year 2001, will be able to produce preliminary cost, traffic and revenue data according to prescribed formats and requirements.

8.5 BTA welcomes comments from respondents on regulatory information requirements and BTA's preliminary position on this issue.

Annexure I

A.1 Preliminary structure of guidelines on tariffs and interconnection

A.1.1 The following provides a suggested preliminary structure of relevant issues to include in BTA's guidelines on tariffs and interconnection.

A.1.2 BTA welcomes comments from respondents on the preliminary structure of guidelines on tariffs and interconnection, and especially if there are other aspects and areas that should be included in the guidelines on tariffs and interconnection

A.2 Tariff guidelines

A2.1 Objectives of the tariff guideline document:

- explanation of how the guideline document is intended to be used and what it is based on.

A.2.2 Definition of basic principles:

- transparency;
- unbundling;
- cost orientation;
- non-discrimination; and
- objectivity.

A.2.3 Definition of price regulated services.

A.2.4 Determination of the price-cap basket:

- definition;
- the services to be included in the price-cap basket;
- the X-factor (i.e. productivity improvement); and

- for which customers it should apply.

A.2.5 Determination of the low user scheme:

- definition;
- the services to be included; and
- for which customers it should apply.

A.2.6 Cost accounting principles:

- statement of cost allocation and accounting principles to be followed in order to ensure that the basic principles are met.

A.2.7 Billing information:

- determination of what needs to be included; and
- what should be available on demand.

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? A.2.8 Requirements on publication of information on tariffs and tariff changes.

A.2.9 Reporting requirements to BTA on tariffs and, where relevant, on price-cap basket and on low-user scheme.

A.2.10 Monitoring rules and follow-up procedures on tariffs, the price-cap basket and the low-user scheme.

A.3 Interconnection guidelines

A.3.1 Objectives of the interconnection guideline document:

- explanation of how the guideline document is intended to be used and what it is based on.

A.3.2 Definition of basic principles:

- transparency;
- unbundling;
- cost orientation;
- non-discrimination; and
- objectivity.

A.3.3 Definition of interconnection.

A.3.4 Definition of basic interconnection services (services that have to be provided on cost based conditions).

A.3.5 Definition of value-added interconnection services (services that should be available on demand to an interconnecting party, but that are not price regulated).

- A.3.6 Specification of quality standards.
- A.3.7 Specification of technical standards.
- A.3.8 Determination of (minimum) points of interconnection.
- A.3.9 Definition and principles of co-location.
- A.3.10 Specification of (minimum) billing information.
- A.3.11 Methodology and basis for setting charges/tariffs.
- A.3.12 Principles for cost accounting and accounting separation.
- A.3.13 Clarification with regard to when BTA settles interconnect disputes and procedures thereof.
- A.3.14 Specification of initial/minimum data requirements in case of dispute.
- A.3.15 Specification of reporting requirements to BTA.