



# **MALAYSIAN COMMUNICATIONS AND MULTIMEDIA COMMISSION**

## **A REPORT ON A PUBLIC INQUIRY UNDER SECTION 55 OF THE COMMUNICATIONS AND MULTIMEDIA ACT 1998 ON ACCESS LIST DETERMINATION**

**12 MARCH 2001**

**PIR/AL/1/01**

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## ABBREVIATIONS

AMPS	Advanced Mobile Phone System
CDMA	Code Division Multiple Access
DLS	Digital Local Switch
DTS	Digital Tandem Switch
ETACS	Extended Total Access Communications System
FDC or FAC	Fully Distributed Cost or Fully Allocated Cost
GFIA	General Framework of Interconnect and Access
GSM	Global System for Mobile Communications
IASP	Internet Access Service Provider
ISDN	Integrated Services Digital Network
LAF	Local Access Fund
LRIC	Long Run Incremental Cost
POI	Point of Interconnection
PSTN	Public Switched Telephone Network
RAS	Required Applications Service

## GLOSSARY

Access List	A list of network facilities or network services in respect of which standard access obligations apply.
CMA	The <i>Communications and Multimedia Act 1998</i> .
The Commission	The Malaysian Communications and Multimedia Commission.
Interconnection service	A facility or service (including the physical connection between separate networks) provided by a Network Operator to an Interconnecting Operator which involves or facilitates the carriage of communications between an end user connected to the network of the Network Operator and an end user connected to another network (not necessarily the network of the Interconnecting Operator).
National Policy Objectives	The national policy objectives for Malaysia's communications and multimedia industry as set out in section 3 of CMA.
Standard access obligation (SAO)	Includes the obligation to provide access to network facilities or network services listed in the Access List on reasonable terms and conditions.

## **SECTION 1: SUMMARY AND CONCLUSIONS**

### **1.1 Introduction**

1.1.1 Under the CMA, the Commission may determine that a network facility, a network service, or any other facilities and/or services which facilitate the provision of network services or applications services including content applications services shall be included in or removed from the Access List. The inclusion of a network facility or network service in the Access List means that a network facilities provider and a network service provider is under an obligation to provide access to their network facilities or network services listed in the Access List, upon written request, on reasonable terms and conditions.

### **1.2 Public Inquiry**

1.2.1 The Commission embarked on a public inquiry on 21 December 2000 and released three documents as part of the public inquiry process. The documents were:

- (a) a draft Consultation Paper;<sup>1</sup>
- (b) a draft Access List Determination and
- (c) draft Statement on Access Pricing Principles.

1.2.2 Submissions were sought on four main issues, namely:

- (a) Proposed framework on decision making;
- (b) Network facilities and network services to be included in the Access List;
- (c) Expansion of Access List to include other network facilities or network services;
- (d) Access Pricing Principles.

1.2.3 The deadline for submissions was 12 noon, 9 February 2001. At the close of inquiry, the Commission did not receive any submissions. However, there were two delayed submissions namely:-

- (a) At 2.06pm, a joint submission from Celcom (M) Sdn Bhd, Celcom Transmission (M) Sdn Bhd, DiGi Telecommunications Sdn Bhd, Maxis Communications Bhd, TT dotCom Sdn Bhd, Time Reach Sdn Bhd, Time Wireless Sdn Bhd; and
- (b) At 3.50pm, a submission from Telekom Malaysia Berhad (TMB).

1.2.4 Given the fact that both the submissions did not meet the deadline, the Commission has adopted the view that it is not obliged to consider these submissions. As such, any amendments proposed in this Report emanate from the Commission's reassessment of various positions hitherto adopted.

### **1.3 Conclusions**

1.3.1 The Commission takes the view that the Access List should include all network services or network facilities which are currently subject to interconnection

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<sup>1</sup> This paper is available from the Commission web-site [www.cmc.gov.my](http://www.cmc.gov.my) under "Discussion/Consultation Papers".

obligations under the present interconnection and access regime. The existing interconnection and access regime reflects a deliberate policy progression from a monopoly environment to an environment of greater competition, and the access regime under CMA should build on the existing policy environment.

- 1.3.2 The Commission also believes that including all network services or network facilities which are currently subject to interconnection obligations in the Access List would promote or support Malaysia's national policy objectives for the communications and multimedia industry. In particular the Commission believes that:
- (a) the inclusion of network services or network facilities in the Access List would lead to a competitive communications and multimedia industry, and this would help establish Malaysia as a major global centre and hub for communications and multimedia information and content services;
  - (b) a competitive communications and multimedia industry would bring long-term benefits to the end user;
  - (c) a competitive communications and multimedia industry would promote a high level of consumer confidence in service delivery from the industry;
  - (d) a competitive communications and multimedia industry would facilitate the efficient allocation of resources such as skilled labour, capital, knowledge and national assets;
  - (e) a competitive communications and multimedia industry would help promote information security and network reliability and integrity;
  - (f) a competitive communications and multimedia industry would help create a robust applications environment for end users; and
  - (g) a competitive communications and multimedia industry is consistent with an equitable provision of affordable services over ubiquitous national infrastructure.
- 1.3.3 In addition to network services or network facilities which are currently subject to interconnection obligations, the Commission has decided to include an origination service for Internet access in the Access List. The Commission believes that including such a service would promote or support Malaysia's national policy objectives for the communications and multimedia industry.
- 1.3.4 When re-looking the consultation paper of 21 December 2000, the Commission has reconsidered the position of Ancillary Services and has decided that it would be more appropriate to address these services under Chapter 2 Part VIII of the CMA. The Commission has decided to remove Ancillary Services from the draft Access List with view to capturing the matter under a section 192 Ministerial Determination on Required Applications Services (RAS).
- 1.3.5 In relation to Access Pricing Principles, the Commission has retained its position on the way forward as expressed in the December 2000 consultation paper, but wishes to clarify that it views a study on forward-looking costs as critical. Such a study is expected to establish new benchmark prices for cost-based interconnect but pending the study, the benchmark prices reflected in TRD006/98 shall prevail.

## 1.4 Structure of Report

- 1.4.1 This Report captures the conclusions above, and together with reference to the Commission's stand on a decision making framework, is structured in the following manner:

**Section 2** briefly provides background on the existing interconnection and access regime, and outlines the key components of the access regime under the CMA.

**Section 3** describes a framework for decision-making within which the Commission would exercise its discretionary powers under section 146 of CMA in relation to the determination of an Access List.

**Section 4** then addresses the question of what network facilities or network services should be included in the Access List.

**Section 5** deals with the expansion of Access List to include other facilities or service

**Section 6** highlights the way forward on access pricing principles, while clarifying the current arrangements that are in place.

## SECTION 2: BACKGROUND

### 2.1 Current interconnection and access regime

2.1.1 At present, there is an obligation on the part of each licensed network operator (LNO) to permit interconnection of another LNO's network with the network of that LNO. This obligation is stipulated as a condition of the LNO's licence.<sup>2</sup>

2.1.2 The obligation to permit interconnection is set out in greater detail in the following regulatory instruments:

- (a) The *General Framework of Interconnection and Access (GFIA)* issued on 17 May 1996;
- (b) TRD001/98, *Customer Access Arrangements – Implementation of Equal Access by Call-by-Call Selection*, issued on 24 May 1998;
- (c) TRD006/98, *Determination of Cost-based Interconnect Prices and the Cost of Universal Service Obligation*, issued on 15 July 1998.

2.1.3 The above regulatory instruments together form what may be loosely described as an interconnection and access regime. The key features of this regime include the following:

<b>Interconnect call conveyance services</b>	<p>1. Cost based charges apply to the following interconnect call conveyance services<sup>3</sup>:</p> <ul style="list-style-type: none"> <li>a. Fixed networks                             <ul style="list-style-type: none"> <li>i Local call termination;</li> <li>ii Single tandem origination and termination;</li> <li>iii Double tandem origination and termination.</li> </ul> </li> <li>b. Mobile networks                             <ul style="list-style-type: none"> <li>i Call termination from a Point of Interconnection (POI) in the called-party's home area;</li> <li>ii Call termination from a POI outside the called-party's home area.</li> </ul> </li> <li>c. Fixed and mobile                             <ul style="list-style-type: none"> <li>i. For fixed interconnect service that requires the use of the submarine cables between Peninsula Malaysia and Sabah/Sarawak, an additional charge will be added to the relevant interconnect charge.</li> </ul> </li> </ul> <p>2. The above services are regarded as 'well established' and utilize 'bottleneck facilities'. Cost-based prices are available to operators providing public switched telephony network (PSTN) and public land mobile network services.</p>
<b>Cost based</b>	For fixed network interconnect services, charges are set closer to Fully

<sup>2</sup> The licences also typically contain provisions requiring the provision of Equal Access.

<sup>3</sup> Para 2.2.2 TRD006/98.

<b>pricing principle</b>	Allocated Costs. For mobile interconnect services, charges are set closer to long-run incremental costs. <sup>4</sup> These charges are set out in Appendix IV of TRD006/98.
<b>Ancillary services</b>	In addition, emergency services, the inclusion of customer numbers in telephone directories (white pages), copies of printed telephone directories, and access to the database of all customer numbers for the resolution of directory enquiries are to be offered at cost-based charges. <sup>5</sup> The charges for directory enquiries, emergency services and operator calls are set out in Appendix III of TRD006/98.
<b>Private circuit completion service</b>	A 'private circuit completion' interconnection service is to be made available for conveyance of a private circuit between a POI and customer premises. <sup>6</sup> According to TRD006/98, private circuits are regarded as a well-established service, and the junction transmission and local loop portions of private circuits are classified as a bottleneck. In addition, the trunk network in certain areas of the country are to be considered as a bottleneck for call conveyance services. However, specific charges for the private circuit completion interconnection service have not been determined by the regulator.
<b>POI</b>	Points of interconnection (POI) are to be offered at trunk or tandem switch level installed between assigned trunk switches. <sup>7</sup>
<b>Co-location</b>	Limited physical co-location is to be allowed for establishing interconnect links, subject to negotiations between the operators. One operator is given the right to co-locate and to offer virtual co-location facilities / in-span interconnection to other operators at each exchange, given practical difficulties of allowing a multiplicity of operators to co-locate at a single exchange. <sup>8</sup>
<b>Local Access Fund</b>	A Local Access Fund (LAF) mechanism has been established to fund any increase in the net cost of universal service provision arising from the introduction of equal access. <sup>9</sup> All local access network operators receive LAF payments from interconnecting operators originating calls on their local access network. The LAF payments are based on originating traffic minutes and are billed at the same frequency as originating interconnect fees. The level of LAF charge has been

<sup>4</sup> Para 2.4.1 of TRD006/98.

<sup>5</sup> Para 2.2.6 of TRD006/98.

<sup>6</sup> Para 2.2.8 of TRD006/98.

<sup>7</sup> Para 4 of TRD001/98.

<sup>8</sup> Para 2.2.10 TRD006/98.

<sup>9</sup> Para 5 TRD006/98.

	determined by the regulator to be 10 cents a minute on all originating traffic minutes.
<b>Customer access arrangement</b>	Customer access arrangements (referred to as 'Equal Access') are to be implemented by way of call-by-call selection (from 1 January 1999) and preselection (from 1 January 2001).

2.1.4 The interconnection and access regime described above is based on regulatory instruments issued under the *Telecommunications Act 1950* (now repealed). Whilst these regulatory instruments have been preserved under the transitional provisions of CMA, it is intended that the interconnection and access regime would be replaced by the access regime established under Chapter 3, Part VI of CMA.

## 2.2 Access regime under the CMA

2.2.1 Chapter 3, Part VI of CMA seeks to establish a regime to ensure that all network facilities providers, network service providers and applications service providers can gain access to the necessary network facilities and network services on reasonable terms and conditions in order to prevent the inhibition of the provision of downstream services.<sup>10</sup>

2.2.2 CMA provides for the establishment of an Access List comprising network facilities, network services, and other facilities and services which facilitate the provision of network services or applications services.

2.2.3 Pursuant to sections 55 and 146 of CMA, the Commission may determine that a network facility, a network service or any other facilities and/or services which facilitate the provision of network services or applications services (including content applications services) shall be included in the Access List.

2.2.4 The key components of the access regime in CMA may be summarised in the following manner:

<b>Applicability of access regime</b>	<p>The access regime applies to:</p> <ol style="list-style-type: none"> <li>a. network facilities,</li> <li>b. network services, or</li> <li>c. any other facilities and/or services which facilitate the provision of network services or applications services (including content applications services).</li> </ol> <p>'Network facilities' refers to any element or combination of elements of physical infrastructure used principally for, or in connection with, the provision of network services, but does not include customer equipment. 'Network services' refers to a service for carrying communications by means of guided and/or unguided electromagnetic radiation. 'Applications service' refers to a service provided by means</p>
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<sup>10</sup> *Explanatory Statement to the Communications and Multimedia Act 1998*, para 82.

	of, but not solely by means of, one or more network services. 'Content applications service' refers to an applications service which provides content.
<b>Access List</b>	A network facility, network service, or other facilities and/or services which facilitate the provision of network services or applications services may be determined by the Commission to be included in (or removed from) an Access List. A determination by the Commission may be made by the Commission on its own accord (usually following a public inquiry <sup>11</sup> ), or on the recommendation of an access forum (where the Commission is satisfied that the access forum has consulted with persons who have an interest in the recommendation, and the access forum was unanimous in supporting the recommendation <sup>12</sup> ).
<b>Standard access obligations</b>	<p>Standard access obligations apply to network facilities providers and network service providers in respect of network facilities or network services listed in the Access List. In particular, a network facilities provider and a network services provider is required to provide access to their network facilities or network services listed in the Access List to any other:</p> <ol style="list-style-type: none"> <li>a. network facilities provider;</li> <li>b. network service provider;</li> <li>c. applications service provider; or</li> <li>d. content applications service provider,</li> </ol> <p>who makes a written request for access to such network facilities provider or network service provider on reasonable terms and conditions. A 'network facilities provider' refers to a person who is an owner of any network facilities. A 'network service provider' refers to a person who provides network services. An 'applications service provider' refers to a person who provides an applications service.</p>
<b>Access agreements</b>	A written access agreement for the provision of listed network facilities or network services must be registered with the Commission in accordance with section 91 of CMA. The Commission may direct any party to a registered agreement to comply with the registered agreement.
<b>Access disputes</b>	Where there is a dispute over the compliance with standard access obligations, a party to the dispute may notify the Commission of the dispute under Chapter 7, Part V of CMA. A dispute must first be

<sup>11</sup> Subsection 55(2) provides that the Commission may conduct an inquiry to decide whether a determination should be made, either (a) in response to a written request from a person; or (b) on its own initiative. Subsection 55(3) provides that the Commission shall not conduct an inquiry unless it is satisfied that the matter is of significant interest to either the public or to current or prospective licensees under CMA. In general, a section 146 determination is likely to be of significant interest to current or prospective licensees, and therefore a public inquiry will usually be appropriate, but not mandatory.

<sup>12</sup> Subsection 147(2).

	<p>attempted to be resolved by negotiation between the parties. The Commission may publish guidelines setting out the principles and procedures which it may take into account in resolving disputes or a class of disputes. The Commission may resolve the dispute upon such terms and conditions as it may deem fit. The terms and conditions of any resolution of a dispute by the Commission must be accompanied with reasons and be in writing. The decision of the Commission is binding on the parties.</p>
<p><b>Access code</b></p>	<p>The Commission will make a written request to the access forum to prepare an access code. The access code will provide model terms and conditions for compliance with the standard access obligations. Matters which the access code may address include, but are not limited to:</p> <ul style="list-style-type: none"> <li>a. the time frame and procedures for negotiations and the concluding of access agreements;</li> <li>b. rate methodologies;</li> <li>c. protection of intellectual property;</li> <li>d. protection of commercial information;</li> <li>e. provisioning of facilities; and</li> <li>f. sharing of technical information.</li> </ul> <p>The access code may provide for different terms and conditions for the different network facilities and network services listed in the Access List. The Commission must not register an access code unless it is satisfied that the access code is consistent with the standard access obligations.</p>
<p><b>Access undertakings</b></p>	<p>A licensee may provide an access undertaking in accordance with section 110 of CMA. An access undertaking may specify more than one set of terms and conditions for access to a particular network facility or network service listed in the Access List. The Commission must not register an undertaking unless it is satisfied that the undertaking is consistent with the standard access obligations.</p>

## SECTION 3: FRAMEWORK FOR DECISION MAKING

### 3.1 National Policy Objectives

- 3.1.1 In the consultation paper dated 21 December 2000, the Commission sought to develop a framework for decision making within which the Commission would exercise its discretionary power to make a determination to include (or remove) network facilities or network services in (or from) the Access List.
- 3.1.2 Sections 55 and 146 of CMA does not set out a criteria or test for deciding whether or not a network facility or network service should be included in or removed from the Access List.<sup>13</sup> In the absence of a legislative criteria, the Commission proposes to exercise its discretionary power in a manner consistent with the objects of CMA.
- 3.1.3 Subsection 3(1) of CMA provides that the objects of CMA are, amongst others, to promote national policy objectives for the communications and multimedia industry and to establish a licensing and regulatory framework in support of the national policy objectives.

**Box 1: National policy objectives<sup>14</sup>:**

- a) To establish Malaysia as a major global centre and hub for communications and multimedia information and content services;
- b) To promote a civil society where information-based services will provide the basis of continuing enhancements to quality of work and life;
- c) To grow and nurture local information resources and cultural representation that facilitate the national identity and global diversity;
- d) To regulate for the long-term benefit of the end user;
- e) To promote a high level of consumer confidence in service delivery from the industry;
- f) To ensure an equitable provision of affordable services over ubiquitous national infrastructure;
- g) To create a robust applications environment for end users;
- h) To facilitate the efficient allocation of resources such as skilled labour, capital, knowledge and national assets;
- i) To promote the development of capabilities and skills within Malaysia's convergence industries; and
- j) To ensure information security and network reliability and integrity.

- 3.1.4 Consequently, in considering whether to exercise its discretionary power under section 146, the Commission will seek to ascertain whether the decision in question would promote or support (rather than detract from) any one or more of the national policy objectives set out in CMA. In general, the Commission would be inclined to exercise its discretionary power under section 146 (to include or exclude network facilities or network services from the Access List) if it would promote or support one or more national policy objectives.

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<sup>13</sup> This is in contrast to the 'long term interest of end-users' criteria found in Australian law – see section 152AB of the Australian *Trade Practices Act 1974*.

<sup>14</sup> Subsection 3(2).

### **3.2 Methodology for analysing relevant issues: cost-benefit analysis**

- 3.2.1 In assessing whether a proposed determination under section 146 would promote or support the national policy objectives, the Commission proposes to undertake a cost-benefit analysis of the relevant issues to assess the economic case for a section 146 determination.
- 3.2.2 Broadly, this would involve an assessment of the benefits of making the proposed determination, and comparing it with the costs associated with the proposed determination. Wherever practicable, the Commission would seek to quantify the expected costs and benefits.
- 3.2.3 However, a quantitative analysis of the costs and benefits will not always be practicable.<sup>15</sup> Furthermore, the terms 'costs' and 'benefits' are to be interpreted broadly and are not limited to items which are quantifiable. Consequently, many of the issues would need to be assessed on a qualitative basis.
- 3.2.4 The Commission does not take the view that a cost-benefit analysis is the only methodology which should be used to analyse the relevant issues. Nevertheless, the Commission believes that a cost-benefit analysis usually provides a reasonably rigorous framework for analysing many of the issues relevant to a determination by the Commission under section 146.
- 3.2.5 The Commission proposes to undertake a cost-benefit analysis of a proposed section 146 determination using the following broad steps:
- (a) Identify the relevant market(s) which would be affected by the proposed section 146 determination.<sup>16</sup>
  - (b) Undertake a competition analysis of the relevant market(s) with a view to assessing the state of competition in the relevant market(s), the likely impact of the proposed section 146 determination on competition in the relevant market(s) and the likely market outcomes in terms of price, consumption/output, service quality, etc.
  - (c) Identify and, where practicable, quantify the expected direct costs of complying with standard access obligations if the proposed section 146 determination is made. This step would include an assessment of the technical feasibility of complying with standard access obligations.
  - (d) Assess the likely impact of the proposed section 146 determination on economic efficiency (including allocative, productive and dynamic efficiency). This would include taking into consideration the likely impact, if any, of the proposed section 146 determination on optimal investment incentives (i.e., incentives to undertake optimal amounts of investments).

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<sup>15</sup> In assessing the practicability of a quantitative analysis, the Commission would take account of not only the cost of any such studies, but also the need for making timely decisions and the opportunity costs implicit in any delay caused whilst the study is being undertaken.

<sup>16</sup> For instance, the relevant markets could be 'an applications market for international telephony services', or 'an applications market for national long distance telephony services'.

**Box 2: Methodology for analyzing relevant issues – relevance to the national policy objectives**

The Commission believes that the proposed methodology for analysing the relevant issues would facilitate an assessment of whether a proposed section 146 determination would promote or support the national policy objectives.

For instance, the Commission may find that a proposed section 146 determination is likely to facilitate greater competition in the market for international call services. This is likely to promote the objective of establishing Malaysia as a major global centre and hub for communications and multimedia information and content services. Greater competition can also be expected to lead to a more efficient allocation of resources, a higher level of consumer confidence in service delivery from the industry, a robust applications environment for end users, and ensure information security and network reliability and integrity. These outcomes are likely to be in the long-term benefit of the end user and enhance the quality of work and life.

On the other hand, the Commission may conclude that a proposed section 146 determination is likely to have an adverse impact on optimal investment incentives. This could detract from an efficient allocation of resources and investments in a ubiquitous national infrastructure. These outcomes are likely to detract from the long-term benefit of the end user.

The above discussion is illustrative only and is not intended to indicate the Commission's view of the relevant issues in any given matter.

### **3.3 Steps in cost-benefit analysis**

#### **3.3.1 Step 1: Identification of the relevant market(s)**

- (a) Conceptually, a section 146 determination will usually have an effect on at least two markets - an upstream market and a downstream market:
  - (i) The upstream market is the market in which the relevant network facility or network service (i.e., the facility or service which would be subject to standard access obligations following the section 146 determination) is supplied. This will usually be a network facility market or network service market.
  - (ii) The downstream market is the market for downstream services where the relevant network facility or network service is an input to the downstream services. This will usually be an applications service market (or content applications service market) but may also be a network service market. More than one type of applications service market may be affected by the section 146 determination. For instance, a determination to include a network interconnection service in the Access List may have an effect on an applications service market for international calls, and a separate applications service market for national long distance calls.
- (b) In identifying and defining the boundaries of the relevant markets, principles of substitutability (both demand and supply) will usually be relevant. In general, network services or network facilities which are

close substitutes for one another will usually be included in the same economic market. Conversely, network services or network facilities which exhibit very low cross elasticities of demand and supply will usually be treated as being supplied in separate markets.

- (c) Economic markets can be defined in product, geographic and functional dimensions.<sup>17</sup>

### 3.3.2 Step 2: Competition analysis

- (a) The state of competition, the competition effects of a section 146 determination, and the likely market outcomes following a section 146 determination can be analysed for both the relevant upstream market and the relevant downstream market(s).
- (b) At the upstream market, a section 146 determination to include network services or network facilities in the Access List would have the effect of regulating the terms and conditions (including the price) for supplying those network services or network facilities. Some of the issues which could be addressed include the following:
  - (i) To what extent can the relevant network facilities or network services be duplicated economically? Does the provision of the relevant network facilities or network services exhibit strong natural monopoly characteristics (for instance, because of large sunk costs and large scale economies)?
  - (ii) Would regulating the terms and conditions of providing the relevant network facilities or network services discourage efficient entry into the upstream market?
- (c) In general, if the provision of the relevant network facilities or network services exhibit strong natural monopoly characteristics or cannot be duplicated economically, then regulating the terms and conditions of providing those network facilities or network services is unlikely to have any effect in terms of discouraging entry into the upstream market. Indeed, by giving downstream suppliers access to these network facilities or network services, inefficient entry into the upstream market may be avoided.
- (d) A section 146 determination would also have the effect of regulating the terms and conditions on which network facilities or network services may be acquired as an input in downstream markets. Some of the issues which could be addressed include the following:

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<sup>17</sup> Please refer to the Commission's *Guideline on Dominant Position in a Communications Market* [RG/DP/1/00(1)] and *Guideline on Substantial Lessening of Competition in a Communications Market* [RG/SLC/1/00(1)] for more detailed discussions on the principles of market definition.

- (i) To what extent are the relevant downstream markets already competitive? For instance, are there high barriers to entry in the downstream markets? Are there close substitutes in the downstream markets which do not use the relevant upstream network facilities or network services as an input?
  - (ii) To what extent would regulation of the terms and conditions on which the upstream network facilities or network services may be acquired lead to greater competition in the downstream markets?
- (e) In general, if the relevant downstream markets are already competitive, then regulating the terms and conditions on which network facilities or network services may be acquired is unlikely to have any further effect on the level of competition in the downstream markets.

### 3.3.3 Step 3: Identify direct costs and assess technical feasibility

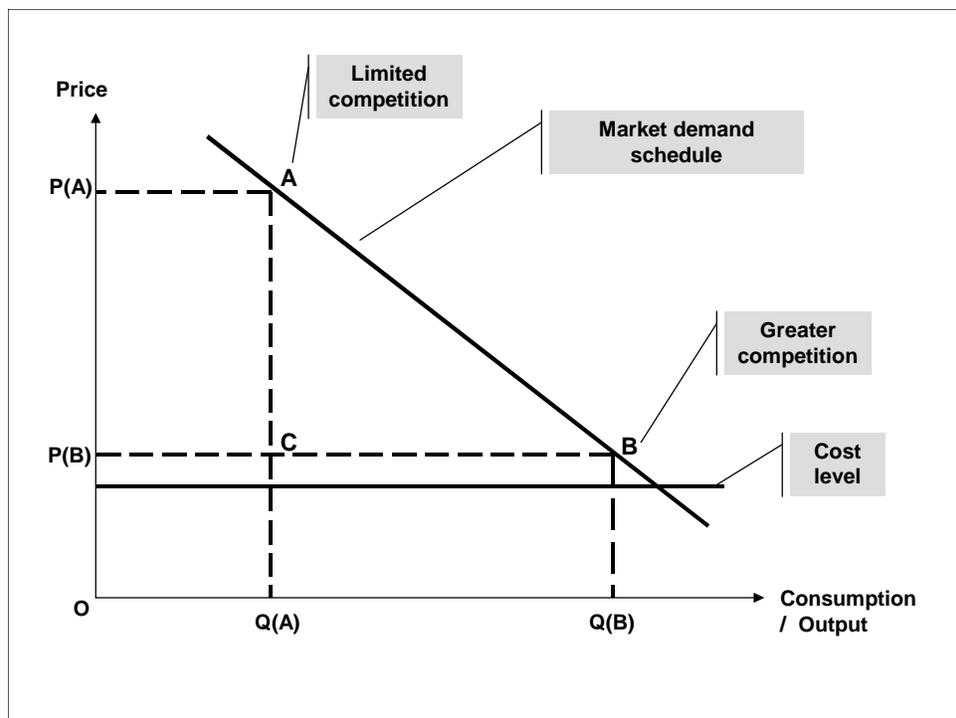
- (a) Direct costs could include, for example, any upfront modification costs to a network facility or network service which may be necessary to comply with the standard access obligations which would apply to the facility or service following the section 146 determination. There could also be ongoing operational costs incurred to comply with standard access obligations. Direct costs would also include any costs incurred to maintain information security and network reliability and integrity.
- (b) The direct costs incurred to comply with standard access obligations will, to a large extent, depend on what network facilities or network services are included in the Access List and how they are described. To a certain extent, the description of the relevant network facilities or network services can have a significant impact on the magnitude of the direct costs. Wherever possible, network facilities or network services should be described in a manner which minimizes the direct costs of complying with standard access obligations.
- (c) The Commission will also assess the technical feasibility of complying with standard access obligations.

### 3.3.4 Step 4: Impact on economic efficiency

- (a) Economic efficiency can be assessed in terms of:
  - (i) **Productive efficiency.** This is achieved when goods are produced in a technically efficient way – that is, in the way that minimizes on inputs used (capital, labour and so on). Productive efficiency also requires that the mix of inputs used is allocatively efficient. That is, when the choice of inputs minimizes cost, so that output is maximised per ringgit spent on inputs.
  - (ii) **Allocative efficiency.** This is achieved when the prices of products (goods and services) reflect their relative scarcity. When

prices are allocatively efficient, products tend to go to those who value them most (as expressed by their willingness-to-pay for them).

- (iii) **Dynamic efficiency.** This is achieved when incentives exist for resources to move over time to their highest value uses, in particular by encouraging efficient investment, research and development, and the diffusion of new ideas and technologies.
- (b) Reflecting the strong relationship between economic efficiency and competition, the Commission’s assessment of the likely effect of a section 146 determination on competition will usually form the Commission’s analysis of the impact of the section 146 determination on economic efficiency.
- (c) The relationship between economic efficiency and competition, and the notions of productive efficiency, allocative efficiency and dynamic efficiency can be illustrated with the aid of Figure 1 below.



**Figure 1: Relationship between economic efficiency and competition**

- (d) Figure 1 contrasts two possible positions along the market demand schedule – ‘A’ and ‘B’. At ‘A’, competition is relatively limited and the market price ‘P(A)’ is correspondingly higher while consumption ‘Q(A)’ is relatively lower. Position ‘B’ can be thought of as corresponding to a

situation where there is greater competition.<sup>18</sup> Consequently, the price 'P(B)' is relatively lower while consumption 'Q(B)' is relatively higher.

- (e) The economic benefits to end-users where there is greater competition can be represented by the area within triangle 'ABC'. This area can be thought of as the benefits from the *additional* consumption at *lower* prices which end users enjoy as a result of greater competition in the market.<sup>19</sup> In this respect, the price and consumption outcomes at position 'B' is allocatively efficient relative to position 'A'.
- (f) Competition (including the threat of competition) can also lead to greater productive efficiency as firms compete with one another to search out for efficiencies in production. In terms of Figure 1, productive efficiency can be illustrated by a downward shift of the cost schedule.
- (g) The link between competition and dynamic efficiency is less clear. In theory, some degree of competition can be expected to stimulate greater innovation – for instance, firms would compete with one another to introduce innovative products into the market place which cater to changes in consumer taste. The effects of dynamic efficiency is harder to depict using Figure 1. In some instances, innovation and technological changes could lead to the development of new markets, or convergence between existing markets.
- (h) In assessing economic efficiency, the Commission will also take into consideration the effect of a proposed section 146 determination on optimal investment incentives (i.e., incentives to undertake optimal amounts of investments). Optimal investment incentives can be assessed for both the upstream market and the downstream market(s):
  - (i) A decision to regulate the terms and conditions on which products and services in upstream markets are supplied is likely to have an impact on efficient 'build or buy' investment decisions in that market. In principle, access pricing methodologies could be developed which address the need to foster optimal investment incentives by providing for a normal commercial return on prudent

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<sup>18</sup> In general, competition can be expected to lead to lower price outcomes (assuming everything else, including the underlying cost structures, are equal). Firms which attempt to charge prices at a significant margin above cost are likely to find themselves undercut by competitors or new entrants. As prices fall, consumption tends to rise.

Conversely, where competition is limited, profit maximizing firms tend to find it worthwhile restricting output and charging above cost prices. This is because the increased revenue from higher prices (which is charged to all the firm's customers) tend to be greater than the reduction in revenue due to lower sales (since some customers cannot afford the higher prices).

<sup>19</sup> The lower price, P(B) applies across the entire consumption range from O to Q(B). Thus the benefit to consumers is, strictly speaking, represented by the parallelogram constituted by the points P(A), A, B, and P(B). Of this, the rectangle constituted by the points P(A), A, C, and P(B) is a straight transfer from producer surplus to consumer surplus. Consequently, the net benefit to society is the triangle 'ABC'.

investments. Nevertheless, where the upstream market is competitive or potentially competitive, the risk that regulated prices could be set incorrectly may have an adverse effect on optimal investment decisions. However, if the upstream market has strong natural monopoly characteristics, then the risk of regulatory error is likely to have a smaller impact on optimal investment incentives.

- (ii) Where a proposed section 146 determination leads to greater competition in downstream markets, it is likely to foster optimal investment incentives in those markets. However, an underlying assumption is that the price of any regulated inputs is cost-based. If the regulated inputs are priced below cost, this may generate inefficient entry in downstream markets. If the regulated inputs are priced above cost, this could induce inefficient bypass.

### **3.4 Context of the proposed cost-benefit methodology**

The cost-benefit methodology outlined above should not be taken as the only way in which the Commission would assess the issues relevant to a proposed section 146 determination. The Commission's responsibility, ultimately, is to exercise its discretion under section 146 in a manner which promotes or support the national policy objectives under CMA. Where there are relevant issues which are not adequately addressed in the proposed cost-benefit methodology, the Commission will consider these when exercising its discretionary powers under section 146.

## **SECTION 4: NETWORK FACILITIES OR NETWORK SERVICES TO BE INCLUDED IN THE ACCESS LIST**

### **4.1. Basic approach**

- 4.1.1 In deciding what network facilities or network services should be included in the Access List in an Access List determination, the Commission takes, as the starting point, the existing interconnection and access regime. The Commission believes that the existing interconnection and access regime reflects a deliberate policy progression from a monopoly environment to an environment of greater competition, and the access regime under CMA should build on the existing policy environment.
- 4.1.2 Consequently, in deciding what network facilities or network services should be included in the Access List, the Commission proposes to, in the first instance, include in the Access List all network facilities or network services which are currently subject to interconnect obligations under the present interconnection and access regime. The Commission would then examine if, on a cost-benefit analysis, there is an economic case for expanding the Access List to include other network facilities or network services.
- 4.1.3 The discussion below, while not a comprehensive analysis of the relevant issues, serves to support the Commission's decision to take, as the starting point, current interconnection rights and obligations. Additionally, the Commission believes that there are specific matters that will need to be addressed within the ambit of the terms and conditions of access.

### **4.2 Proposed Access List to maintain existing interconnection obligations**

- 4.2.1 The network facilities or network services to be included in the Access List are as follows:
- (a) Fixed Network Origination Service
  - (b) Equal Access (Fixed Network) Service
  - (c) Fixed Network Termination Service
  - (d) Mobile Network Origination Service
  - (e) Mobile Network Termination Service
  - (f) Interconnect Link Service
  - (g) Private Circuit Completion Service
  - (h) Domestic Transmission Service
- 4.2.2 The policy rationale for including the above network services and the network facilities in the Access List is briefly outlined below:
- (a) **Fixed Network Origination Service and Mobile Network Origination Service**

The relevant downstream services appear to be the markets for 1800 number, 1300 number and other similar services which require any-to-any connectivity. Access to these interconnection services can be expected to lead to greater competition in the downstream markets by giving subscribers of these special number services a choice of competing

service providers who can supply the any-to-any connectivity required to support the special number services. Greater competition can be expected to lead to allocative, productive and dynamic efficiencies. Optimal incentives in fixed and mobile networks can be maintained by adopting an appropriate access pricing methodology.

(b) **Equal Access (Fixed Network) Service**

The relevant downstream markets appear to be the markets for domestic long distance and international fixed calls. Access to this interconnection service can be expected to lead to greater competition in the downstream markets by giving end users a choice of competing service providers for long distance and international calls. Greater competition can be expected to lead to greater allocative, productive and dynamic efficiencies. Optimal incentives for investments in fixed networks can be maintained by adopting an appropriate access pricing methodology. In this respect, it is generally accepted that the local loop exhibit strong natural monopoly characteristics.

(c) **Fixed Network Termination Service and Mobile Network Termination Service**

The relevant downstream markets appear to be the markets for fixed telephony services and mobile services to directly connected customers. In the fixed telephony market, fixed network operators compete with one another to attract end users to be directly connected to their respective networks. In the mobile services market, mobile network operators compete with one another to provide mobile services to end users. Fixed network termination services facilitate competition in these markets by ensuring that end users who choose to be directly connected to a given network (fixed or mobile) will continue to enjoy any-to-any connectivity with end users connected to other fixed networks. Similarly, mobile network termination services facilitate competition in these markets by ensuring that end users who choose to be directly connected to a given network (fixed or mobile) will continue to enjoy any-to-any connectivity with end-users connected to other mobile networks. Greater competition in these markets can be expected to lead to greater allocative, productive and dynamic efficiencies. Again, optimal incentives for investments in fixed and mobile networks can be maintained by adopting an appropriate access pricing methodology.

(d) **Private circuit completion service**

The relevant downstream market appears to be the market for end-to-end private circuits. End-to-end private circuits are in turn important for the development of further downstream communications services such as Internet access, private networks and other multimedia applications. There is a view that local loop and junction networks are difficult to reproduce on a widespread basis for leased lines because of the high

sunk costs involved.<sup>20</sup> The provision of private circuit completion services can be expected to facilitate competition in the market for end-to-end private circuits by enabling competing operators to provide end-to-end private circuits to end users between locations where services are provided by different operators. Greater competition in the end-to-end private circuits market can be expected to lead to economic efficiency benefits both in that market as well as further downstream markets. Optimal incentives for investments in private circuit infrastructure can be maintained by adopting an appropriate access pricing methodology.

(e) **Domestic Transmission Service**

The relevant downstream markets appear to include markets for end-to-end local permanent circuits, narrowband digital end-to-end transmission, broadband digital end-to-end transmission, e business, and dial-up domestic long distance calls. Whilst the Private Circuit Completion Service allows the operation of private networks, a Domestic Transmission Service allows competing operators to develop their own public networks. Although there may be parts of the transmission network which can be, and has been, duplicated, in other parts of the network it is still unfeasible for there to be duplication. For instance, the junction transmission network, which connects local exchanges to other local exchanges, is a very extensive network of low-to-medium capacity routes. For much of the country, it is not feasible for this to be duplicated because of the high sunk costs involved. Greater competition in the downstream markets can be expected to lead to economic efficiency benefits in those markets. Optimal incentives for investment in transmission networks can be maintained by adopting an appropriate access pricing methodology.

(f) **Interconnect Link Service (Physical Co-location, Virtual Co-location and In-span Interconnection)**

Co-location enables potential cost reductions and quality improvements in the provision of interconnect links by making this service competitive.<sup>21</sup> Interconnect Link Services facilitates interconnection required to access a range of Interconnection Services (including fixed network termination and origination, mobile network termination and origination, equal access, private circuit completion) and can be expected to facilitate competition in their respective downstream markets.

### **4.3 Ancillary Services and the Access List**

4.3.1 While the Commission's position has been the preservation of existing interconnection obligations and rights, it is found that this position cannot be

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<sup>20</sup> See Analysys, *Interconnection and Universal Service: Arrangements for a Competitive Market*, 11 December 1997, page 31.

<sup>21</sup> See Analysys, *Interconnection and Universal Service: Arrangements for a Competitive Market*, 11 December 1997, page 40.

defended with regard to Ancillary Services. These services relate to directory inquiry call services, emergency service call services, operator assistance services, printed telephone directories, the inclusion of customer numbers in telephone directories, and access to customer numbering databases. They are typically required to support effective multi-operator markets.

- 4.3.2 The Commission has undertaken a holistic review of Ancillary Services, having regard to Chapter 2 Part VIII of the CMA. It has adopted the view that a more appropriate manner to address the Ancillary Services would be via the provision for Required Applications Services (RAS), as defined in section 192.

## **SECTION 5: EXPANSION OF ACCESS LIST TO INCLUDE OTHER NETWORK FACILITIES OR NETWORK SERVICES**

### **5.1. Internet Access Origination Service**

5.1.1 The Commission has decided to include an Internet Access Call Origination Service in the Access List. If included in the Access List, this service would require a network service provider to originate calls made by end users directly connected to the network of that service provider in order to access the services of Internet access providers. This would involve the carriage of communications between an end user and the point of presence of an Internet access provider.

5.1.2 The Commission has had a limited opportunity to undertake a comprehensive analysis of the costs and benefits of including an origination service for Internet access. Nevertheless, the Commission considers that including an origination service for Internet access would promote or support Malaysia's national policy objectives for the communications industry. The reasons for this view include the following:

- (a) There are only a limited number of Internet access service providers in Malaysia at present. In this respect, the Commission notes that there are presently only two major Internet access service providers in Malaysia – Jaring and TMNet. The Minister has indicated that the provision of Internet access services in Malaysia should be liberalized and in this regard, the provision of Internet access services is now a class license activity. In order for other Internet access service providers to compete effectively, it is necessary for them to have access to end users who are directly connected to the networks of network service providers such as Telekom Malaysia. In this respect, an origination service for Internet access would give Internet access service providers access to these end users.
- (b) The Commission considers that an origination service for Internet access is unlikely to be provided to Internet access service providers on a competitive basis. This is because the local access network (over which the origination service for Internet access would be provided) exhibits strong bottleneck characteristics. It is not economical for the local access network to be duplicated. Other forms of access to end-users are unlikely to be satisfactory substitutes to the local access network. In particular, mobile networks do not presently have the capacity to deliver data at the minimum rates required by end users to access the Internet. Furthermore, mobile call charges are significantly higher than fixed call charges. Satellite services may be an alternative form of access to the end user; however the cost of installing set top boxes and other instruments required to access satellite services suggest that satellite services are likely to be a poor substitute for the local access network.
- (c) Given the Commission's findings that the local access network is not economical to duplicate, it is unlikely that mandating access to an origination service for Internet access would have an adverse effect on optimal investment incentives in the local access network. Furthermore,

the Commission expects that the access price would be set at a level which takes into account a reasonable commercial return on investments in the local access network.

- 5.1.3 The Commission initially envisaged that the Internet access origination service would carry calls to a point of interconnection associated with a switch (at the local switch or tandem switch levels). However, the Commission has since received information that the call traffic can also be carried to a point of presence associated with the access seeker's modem bank or router co-located at the access provider's switch, or at the access provider's modem bank or router.
- 5.1.4 Under these situations, the dedicated circuit would be limited to the access loop, line card and a small part on the switch. All other equipment is shared because the Internet protocol can handle multiple calls at the same time. The Commission understands that these alternative ways of routing Internet calls are likely to be more efficient than through a point of interconnection. Consequently the Commission proposes to describe the Internet access origination service in a manner which accommodates these alternative ways of obtaining access to end-users.

## **5.2 Other Services**

- 5.2.1 However, apart from the Internet Access Call Origination Service, the Commission is not yet in a position to form a view on whether Malaysia's national policy objectives would be promoted or supported if the Access List is expanded to include other services and facilities. The Commission believes that further consultation is required before the Commission is in a position to form a view on the inclusion of other facilities and services.
- 5.2.2 In general, the Commission would expect proposals to include network services or network facilities in the Access List to be discussed at the access forum before the matter is referred to the Commission for consideration. That said, the Commission is conscious that there has been considerable delay in setting up an industry body for designation as the access forum. To date no industry body has been designated as an access forum.
- 5.2.3 Notwithstanding the above, the Commission is committed to ensure that Malaysia's national policy objectives are supported by an effective access regime. Consequently, the Commission is minded to continue close consultations with industry on what measures need to be implemented to ensure that the access regime is effective.
- 5.2.4 The Commission believes such consultation is consistent with, and supportive of, the self-regulatory nature of the access regime. Amongst others, it anticipates holding further consultation on the following matters as regards their inclusion on the Access List:
- (a) payphone conveyance service;
  - (b) DSL services; and
  - (c) unbundled local loop service.

## SECTION 6: ACCESS PRICING PRINCIPLES

### 6.1 Broad principles on the way forward

- 6.1.1 The access regime under CMA envisages that the terms and conditions of access will, in the first instance, be a matter for commercial negotiations between the access provider (i.e., the network facilities provider or network service provider who is subject to standard access obligations) and the access seeker (i.e network facilities providers, network service providers, applications service providers or content applications service providers who request access from the access provider).
- 6.1.2 In developing broad principles on the way forward in relation to access pricing, the Commission's consultation paper of the 21 December 2000 had extensively discussed key issues such as:
- (a) The criteria for the application of cost-based prices
  - (b) Methodology for determining cost-based interconnection charges (including the position with regard to Access Deficit and Local Access Funding (LAF) mechanism;
  - (c) Price-setting approaches
  - (d) Other matters such as the position of access seekers who are not network facilities or network services providers, charging structure and reciprocity of charges, amongst others.
- 6.1.3 Against the background of a discussion aimed at deepening the understanding of the economics of access pricing (**Appendix A**), the Commission wishes to share with the public its position on the broad principles of access pricing. This position is detailed below and is further reinforced through the *Statement on Access Pricing Principles (version March 2001)* set out in **Appendix B**.

### 6.2 Criteria for the application of cost-based prices

- 6.2.1 Consistent with the recommendations of Analysys in their report *Interconnection and Universal Service: Arrangements for a Competitive Market* (11 December 1997), the Commission is of the view that cost-based interconnect charges shall apply to services falling within the category of 'well-established services utilizing bottleneck facilities'.
- 6.2.2 According to Analysys:

*Where bottleneck facilities exist, those controlling the bottleneck possess excessive negotiating power in any commercial negotiation for interconnect service that requires the use of the bottleneck. There is a danger that this negotiating power will be used to achieve excessive profits, or to exert control over the market. To prevent this, it is necessary to regulate, or have the possibility of regulating, the price of interconnection to such facilities at a price which represents a reasonable, but not excessive return. This price is based on*

*the cost of providing the facility, but must also include a reasonable rate of return on capital employed.*<sup>22</sup>

6.2.3 The Commission concludes that it is appropriate to rely on the concept 'bottleneck facility' for the purpose of assessing whether access prices should be based on cost. However, this does not mean that there is no role for other economic concepts in shedding light on the issues at hand.

6.2.4 In relation to the concept 'well-established', Analysys explained that:

*One criticism levelled at cost-based regulation of pricing for all possible bottleneck services is that it may deter network operators from investing in expensive new infrastructure which is required to deliver new services. A requirement to offer cost-based interconnect prices for such services would deny operators the ability to benefit, in the form of higher than normal returns, from their innovation or risk investment. However, once a service becomes **well-established**, it is reasonable to expect cost-based, price-regulated interconnection to be made available to other operators...*<sup>23</sup>

*... the 'well established' criterion was introduced to encourage innovation and risk taking. [Analysys does] not believe that such protection from cost-based interconnection is required for all investments; rather, it should be reserved for high-risk investments.*<sup>24</sup>

6.2.5 The Commission accepts the rationale for the 'well-established' criteria and the need to encourage innovation and optimal risk taking. However, the Commission also notes that, in theory, it is possible to compensate an operator making a high-risk investment by allowing a higher rate of return than would be included in a cost-based interconnect price.<sup>25</sup>

6.2.6 Consequently, for services which are not yet 'well-established' some form of cost-related charging for that service may be appropriate, provided that it includes a rate of return or mark up which is commensurate to the risk. However, the Commission believes that more work needs to be done before it is in a position to form a view on what pricing methodology should apply in the case of services that are not yet well established.

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<sup>22</sup> Analysys (December 1997), p 13.

<sup>23</sup> Analysys (December 1997), p 13.

<sup>24</sup> Analysys (December 1997), p 14.

<sup>25</sup> Indeed, Analysys notes that 'if the definition of 'cost-based' includes an acceptable rate of return on capital ..., then an operator whose new investment is made available at 'cost-based' interconnect prices will indeed be receiving an acceptable rate of return for that investment.' Analysys (December 1997), p 14.

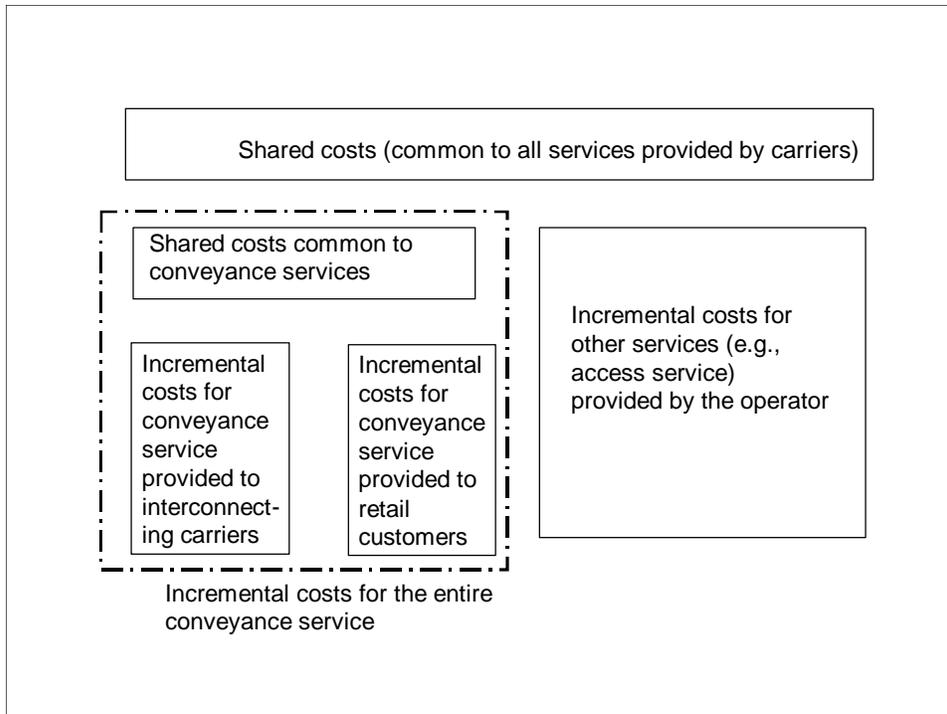
### 6.3 Methodology for determining cost-based interconnect charges

- 6.3.1 The Commission's key concern on this matter is that cost-based prices should be set at a level which promotes efficient build or buy decision on the part of new entrants to downstream markets, whilst at the same time maintaining optimal incentives to invest in network facilities or network services which are subject to cost-based pricing. The Commission believes that the choice of the costing methodology and the application of that costing methodology should address these principles.
- 6.3.2 To promote efficient build or buy decisions whilst maintaining optimal investment incentives, the Commission believes that cost-based access prices should be set in the following manner:
- (a) As far as possible, access prices should be set equal to incremental cost – i.e., the change in total costs (including capital costs) resulting from an increase in output by a discrete increment. For a conveyance service, this would be the additional cost incurred by the access provider to accommodate the increase in demand associated with the conveyance service. For an access service, this would be the additional cost incurred by the access provider to provide the access service.<sup>26</sup> (See Figure 2 for a depiction of the relevant cost categories.) Setting access prices equal to incremental cost would promote efficient build or buy decisions.
  - (b) The relevant costs should be the ongoing costs of providing the relevant service in the future using the most efficient means possible and commercially available. In practice this often means basing costs on the best-in-use technology and production practices and valuing inputs using current prices.<sup>27</sup> Cost valuation based on the best-in-use technology (rather than historical costs) provides stronger incentives for appropriate investment decisions through rewarding/penalizing the access provider for good/poor investment decisions.
  - (c) However, access prices should include a contribution to joint and common costs that are causally related to the conveyance or access service in question – i.e., costs which would need to be incurred if the service was provided on a stand-alone basis.

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<sup>26</sup> Note that the term 'access' used in this discussion has two different meanings depending on the context. The term 'access price' refers to the price an access seeker pays to acquire access to network services or network facilities included in the Access List. However, the term 'access services' refers to services which enable retail customers to gain access to, amongst others, conveyance services provided by the access provider and the access seeker.

<sup>27</sup> Best-in-use technology may often be best-in-commercial-use.



**Figure 2 : Depiction of incremental and common costs**

- 6.3.3 On the question of Access Deficit and Access Funding, the Commission notes that the cost-based access pricing approach outlined above has not addressed the question of what is generally referred to as the access deficit. This refers to the deficit that arises when the incumbent operator is constrained by retail tariff regulations from increasing rental and connection charges to cover the incremental cost of access services. The deficit must therefore be recovered from call revenues. This may include revenues from retail services (such as local calls, long distance calls, fixed to mobile calls, international calls, toll free calls) as well as wholesale services (including interconnection services). The theory of multi-product pricing implies that efficient recovery of the fixed cost entails spreading of the burden on all services (wholesale as well as retail). Each service should contribute towards the coverage of the fixed cost in a way that minimizes the economic distortion from the markups.
- 6.3.4 The Commission notes however that Analysys has argued against the notion of an access deficit. In part, this seems to arise from a concern that including a contribution to an access deficit in interconnection charges may have the effect of entrenching the current retail tariff structure. Analysys also argues that the notion of an access deficit is predicated on the principal that individual 'lines of business' within a telecoms operator should be able to, individually, make an identifiable profit. According to Analysys, this does not take account of the fact that many of the customers on which the access loss is made are highly profitable for other lines of business, such as long-distance and international calls. Analysys recommended instead a Local Access Funding (LAF)

mechanism 'to fund any increase in the net cost of universal service provision arising from the introduction of indirect and equal access'.<sup>28</sup>

- 6.3.5 Analysys however points out that this increased cost of universal service provision is not the same concept as, nor of a similar value to, a notional loss on local access services (i.e., the access deficit). The increased costs of universal service provision relate only to customers that become loss making as a result of equal access and to customers in loss-making areas, whereas an access deficit would include notional access losses relating to customers that are in fact profitable overall.
- 6.3.6 As such, the Commission does not, at this stage, have a view on whether there should be a contribution to the access deficit, or whether the LAF mechanism should be retained. In the interim, the Commission believes it may be appropriate for the LAF mechanism to continue; however there should be no contribution to the access deficit while the LAF mechanism is in operation.

#### **6.4 Price Setting Approaches**

- 6.4.1 On the question of benchmark prices at forward-looking costs, the Commission notes that modelling forward looking costs is a complex exercise and involves a degree of subjective judgment, particularly in relation to forecasts about future traffic levels.<sup>29</sup> However, the Commission also notes that various well developed forward-looking costing models are available internationally and have been used in many jurisdictions around the world. The Commission believes that the economic benefits of using forward-looking costing approaches (in particular, promoting efficient build or buy decisions while fostering optimal investment incentives) outweigh the costs of undertaking such cost studies.
- 6.4.2 The Commission also believes that it is important for any such costing exercise to be undertaken in an open and transparent manner, subject to the incumbent operator's legitimate expectation that its commercial interests in respect of confidential information is protected. In the Commission's view, this would give market participants and potential new entrants confidence that interconnection charges are being set in a competitively neutral manner. The Commission believes that confidence in the costing process would promote efficient build or buy decisions and foster optimal investment incentives. The Commission intends to hold discussions with Telekom Malaysia and other interested parties on what processes should be instituted to cost the incumbent operator's network.<sup>30</sup>

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<sup>28</sup> Analysys (December 1997), p xxii.

<sup>29</sup> The lumpiness of investments in telecommunications networks implies that it is often efficient to install equipment and use it below capacity for some extended period of time. If one were to approximate forward looking incremental cost by some form of cost average, one must foresee its likely usage over the element's lifetime.

<sup>30</sup> For mobile interconnection services, the costing exercise would not necessarily be based on any one operator's network.

- 6.4.3 The Commission envisages that the costing process would result in a set of benchmark prices for some (or perhaps all) network facilities or network services included in the Access List. These benchmark prices could then be used as a reference point in commercial negotiations over the terms and conditions of access. The costing process may also include costing a contribution to the access deficit and costing the designated universal service provider's cost of providing universal services to uneconomic customers and uneconomic areas.
- 6.4.4 The benchmark prices could be reviewed every two years or so (with a costing exercise at every review); alternatively they could be set for an extended period subject to an adjustment mechanism to take account of inflation and expected technological progress. The Commission believes further consultation is required on this matter.
- 6.4.5 The Commission is aware of the utmost importance of undertaking a comprehensive costing study with view to setting the aforesaid benchmark prices. However, until such a study is undertaken and completed, network facilities and network service providers shall continue to derive certainty from the benchmark prices currently provided for in TRD006/98.

## **6.5 Other issues**

- 6.5.1 Various issues such as the position of access seekers who are not network facilities or network services providers, charging structure and reciprocity of charges has been raised in the consultation paper of 21 December 2000. The Commission does not believe it is necessary to form a view on all of these issues at this stage.
- 6.5.2 However, with respect to the first issue, ie the position of access seekers who are not network facilities or network services providers, the Commission accepts that it is possible that the terms and conditions of access need not be the same for all access seekers. This is subject to the standard access obligation that access should be provided on an equitable and non-discriminatory basis.
- 6.5.3 With respect to the charging structure, the Commission's view is that the charging structure should generally reflect the underlying cost structure, and this may mean that any call set up costs should be reflected in the charging structure. The Commission would seek to consult further on this matter, and would approach this on a case by case basis, depending on the service or facility in question. The charging structure would not necessarily be the same for all network services or network facilities.

## APPENDIX A: ECONOMICS OF ACCESS PRICING

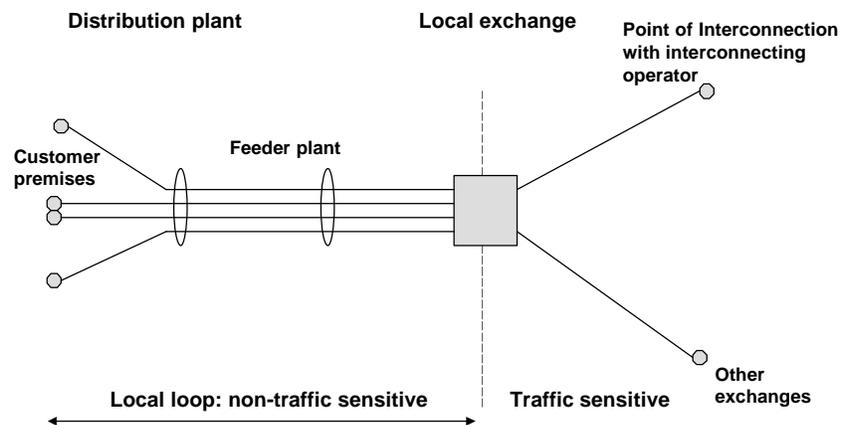
The following is a discussion of a number of issues relating to the economics of access pricing in the communications sector.

### 1. Recovery of incremental and non-incremental costs

The choice of the overall *level* of access prices is delicate. High access prices may erect barriers to entry and prevent the development of competition in downstream markets. They may also induce inefficient bypass or duplication of bottleneck facilities in the upstream market. Conversely, low access prices may generate entry by inefficient entrants. They may discourage the network facilities providers in the upstream market from maintaining and upgrading their networks, and dissuade entrants from building their own facilities.

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#### Traditional representation of the local loop



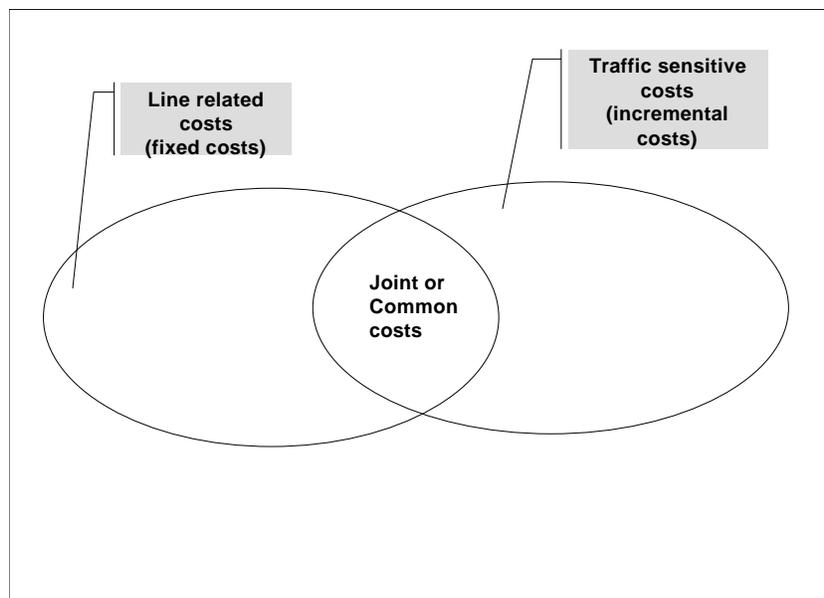
Starting from the end users, the individual connections from the interface at the customer premises form the distribution plant. The cost of the distribution plant is by and large non-traffic sensitive; that is, at current usage levels it does not vary much with the customer's communications usage. The feeder plant then gathers the lines of the distribution plant and thus consists of concentrated bundles of cables that terminate at the local exchange. The feeder plant too is rather traffic insensitive. Altogether, the cost of the transmission from the customer to the local exchange is non-traffic sensitive. It really involves a (large) fixed cost and no marginal cost. Or, putting it differently, the marginal cost relates to the decision of connecting the customer (or creating a new line for a customer) rather than the traffic this customer generates.

Then comes the first switch. Part of the cost of the local exchange is non-traffic sensitive (existence of exchange, design of software, etc); part (the interface) depends on the number of connecting lines; and the third part (the switches themselves) varies with traffic. Further transmission facilities then take the call from the local exchange to an interconnecting operator or to another exchange. There is in general a trade-off between the number of exchanges and the cost of the distribution and feeder plants.

[Adapted from Laffont and Tirole (2000), *Competition in Telecommunications*, Cambridge, Massachusetts: MIT Press, pp 12, 13.]

A starting point in the determination of efficient access prices is recognition that the costs of the Public Switched Telephony Network (PSTN) can broadly be divided into two groups:-

- a. Traffic sensitive costs: These are mainly the additional cost of switching brought about by the originating or terminating traffic, and the transmission of the call between the local and trunk switch. These calls vary with the number of calls being made on the PSTN. Traffic sensitive costs are recovered from call charges (including charges for local calls, national long distance calls and international calls).
- b. Line related (non-traffic sensitive) costs: These are costs of the lines that connect customers to the network. Line related costs vary with the number of users connected to the PSTN. They do not vary with the number of calls made or received by end-users. They are not incremental cost and are treated as the fixed cost of the PSTN operator. At least some of the line related costs are recovered from line rental and connection charges. Any shortfall may be termed as the access deficit.



**Figure 3: Relationship between traffic sensitive and line related costs**

In reality there are cost items which fall into both groups (i.e., joint or common costs), while other cost items can be attributed solely to a specific group. Figure 3 illustrates the overlap between traffic sensitive costs and line related costs.<sup>31</sup>

In a first-best world, access prices would be set equal to the marginal (i.e., incremental) cost of the incumbent's network. 'Marginal cost' (or 'incremental cost'), in the context of access to interconnect services, refers to the traffic sensitive costs of the local access network. By setting access price equal to marginal cost, new entrants would be internalising the marginal cost of the incumbent's network. Retail prices for call services would therefore also reflect marginal costs. The line related costs would (in the first-best world) in turn be recovered from line rental and connection charges.

To the extent that the incumbent operator is constrained from increasing line rental and connection charges by retail price regulations and does incur an access deficit, it must recover these costs from call revenues. This may include revenues from retail services (such as local calls, long distance calls, fixed to mobile calls, international calls, toll free calls) as well as wholesale services (including interconnect services). There is thus a need for mark-ups above marginal costs. The theory of multi-product pricing implies that efficient recovery of the fixed cost entails spreading of the burden on all services (wholesale as well as retail). Each service should contribute towards the coverage of the fixed cost in a way that minimizes the economic distortion from the mark-ups.<sup>32</sup>

## **2. Forward looking costs versus backward looking (i.e., historical) costs**

In principle, costs (whether incremental only, or with a contribution to fixed costs) can be determined either on a forward-looking basis, or a historical basis:-

- a. Forward-looking costs are the ongoing costs of providing the relevant service in the future using the most efficient means possible and commercially

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<sup>31</sup> It should be noted that 'costs' refers to economic costs and, in the long run, includes capital costs as well as operational costs.

<sup>32</sup> According to Ramsey-Boiteux pricing rules, it would be inefficient to charge high markups on those services for which consumers are not willing to pay much above marginal cost. Cost recovery should place a higher burden on those services with relatively inelastic demands. (Elasticity of demand refers to the extent to which demand for a service varies in response to a unit change in price for that service.) The structure of markups must thus reflect the structure of demand elasticities. Furthermore, the cross-elasticities (ie, the extent to which demand for a given service varies in response to a unit change in the price for another service) must also be accounted for. (Boiteux, M. "On the Management of Public Monopolies Subject to Budgetary Constraints." *Journal of Economic Theory*, 3:219-240, 1971. Ramsey, F. "A Contribution to the Theory of Taxation." *Economic Journal*, 47. Ramsey-Boiteux pricing rules are discussed in Laffont and Tirole (2000), *Competition in Telecommunications*, Cambridge, Massachusetts: MIT Press, at pp 60-65.)

available (i.e., best-in-use technology<sup>33</sup>). In practice, this often means basing costs of an element (eg, a switch) on the best-in-use technology derived from an engineering model, on a forecast of the likely usage of the element, and on a rule for treating depreciation. Estimating forward looking costs can be difficult and time consuming, often involving bottom-up studies based on the cost of replicating the functionality of the network on the basis of its most efficient use. Bottom-up analyses entail reconstructing the PSTN operator's costs based on prevailing conditions on equipment costs, technology and capacity requirement forecasts. They require the formulation of an abstract, and necessarily simplified, depiction of the incumbent operator's network and operations. They also involve decisions on the topology of a hypothetical efficient network, which may be difficult to justify.

- b. Historical costs are the incumbent operator's actual (embedded) costs. It is measured using a top-down approach based on actual traffic, and on the historical procurement decisions of the incumbent operator, in terms of both quantity and capacity of network units purchased. This approach can use either historical cost accounting, where assets are costed at historical price, or current cost accounting, which uses replacement asset costs. Top-down models offer the advantage of readily available data (generally consistent with the operator's accounts) and can be reproduced easily every year. However, the top-down approach lacks transparency (cost causation is not always explicit), and is locked into past procurement decisions for the quantity of assets, and may result in new entrants paying for the incumbent's inefficiencies.

The main appeal of historical costs (particularly if fixed costs are fully allocated) is that it commits the regulator to allow the incumbent operator to recoup its investments and to break even. Thus, to a large extent, it solves the problem of regulatory takings. For instance, an operator who incurs a large fixed cost to install fibre optics in the local loop or to endow switches with new functions need not be concerned that this investment will later be expropriated by the regulator setting low access charges. However, historical costs has well-known flaws. In particular, it does not encourage cost minimization since cost increases are automatically passed through in the form of higher access prices without any assessment as to the efficiency of the relevant investment.

The main appeal of forward looking costs is that it eliminates the 'cost pass through' feature of backward looking cost-based pricing, thus providing much better incentives for static cost efficiency. In theory, the in-built benchmarking ensures that if an operator does not adopt best-in-use technology, it cannot expect to recoup any inefficiencies in production through access prices. Conversely, if an operator engages in cost-cutting measures, adopts more efficient production technologies or practices than that commercially available, it will be appropriately rewarded. However, in practice the determination of forward-looking costs using bottom-up studies is highly discretionary. For

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<sup>33</sup> Best-in-use technology should be comparable with the existing network design, and may often be best-in-commercial-use.

instance, what constitutes efficient equipment in general depends on a forecast of the future usage of the elements.<sup>34</sup>

### 3. Price setting approaches

Whilst in theory the regulator could direct that access prices should be based on the incumbent's cost (whether forward looking or historical), in practice access prices are set for a specific period (eg, quarterly, yearly, or longer) and reviewed at the end of each period. This is in part because cost studies take time to undertake, and also because they can be expensive. A complicating factor is the presence of incomplete information about the firm's costs. This gives rise to a trade-off between maximising incentives for the regulated firm to minimize costs, and ensuring that prices are in fact cost-based. The following discussion illustrates this trade-off, using the example of a procurement contract.

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#### Trade-off between incentives and rent extraction

The regulation of interconnection services is comparable to a procurement contract. Suppose a government wishes to procure a public good (for instance, an interconnection service). Only one firm has the know-how or capacity to supply this public good. However, the government has imperfect information about the cost that will be incurred by the firm. The expected cost of supplying this public good depends on exogenous and endogenous variables.

Exogenous variables refer to the technological requirements that the firm faces in producing the public good. To the extent that the firm is better informed about its production costs than the government (as is likely to be the case), the government faces an *adverse selection* problem. The government does not know whether a low payment will suffice to convince the firm to undertake the project. The firm will not be eager to reveal that its production cost is low even if this is the case, since it is in its interest to persuade the government that only a high price will do.

Endogenous variables refer to those post-contractual decisions taken by the firm that, together with the exogenous variables, determine the firm's final production cost and that cannot be contracted upon because they are not verifiable<sup>35</sup>. These discretionary choices by the firm create the scope for poor cost performance on the part of the firm. Only if the firm is made accountable for a large fraction of its realized cost will it not abuse this discretion.

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<sup>34</sup> The lumpiness of investments in telecommunications networks implies that it is often efficient to install equipment and use it below capacity for some extended period of time. If one were to approximate forward looking incremental cost by some form of cost average, one must foresee its likely usage over the element's lifetime.

<sup>35</sup> That is, the government is not in a position to assess whether the post-contractual decision is justifiable.

Suppose the government wants to buy the public good but would like to pay as little as possible. The government could offer a high-powered incentive scheme – for instance, a fixed-price contract in which the firm receives a fixed payment. Thus any endogenous cost savings or overruns would be fully internalised by the firm, hence increasing the firm's incentives to reduce its production costs. Alternatively, the government could offer a low-powered incentive scheme – for instance a cost-plus contract in which the firm's endogenous costs are fully reimbursed. Here the firm is not made accountable for its cost savings or overruns.

In the presence of incomplete information, the government faces a trade-off between giving good incentives to the firm to minimize its production costs, and paying a low price to the firm. A fixed-price contract, which allows the firm to keep any endogenous cost savings, also allows the firm to keep any cost savings for exogenous reasons. This potentially generates substantial rents. In contrast, a cost-plus contract, while providing poor incentives to keep cost down, is efficient at capturing the firm's potential rent.

Thus there is a basic trade-off between incentives, which call for a high-powered incentive scheme, and rent extraction, which requires low-powered incentives.

[Adapted from Laffont and Tirole (2000), *Competition in Telecommunications*, Cambridge, Massachusetts: MIT Press, pp 38-41.]

A regulatory scheme in which access prices are reviewed regularly is comparable to a low-powered incentive scheme. Here, there is little incentive to minimize production costs since any cost overruns due to endogenous variables<sup>36</sup> will be passed through in the form of higher access prices at the next review. On the other hand, regular review of access prices are efficient at ensuring that access prices are kept close to costs since any cost savings will be captured by the regulator in the form of lower access prices.

In contrast, a regulatory scheme in which access prices are reviewed only at the end of an extended period (of say 5 years) is comparable to a high-powered incentive scheme. Here, any cost savings are internalised by the firm, and therefore the firm will strive to minimize its endogenous costs particularly when the next review is still some years away. On the other hand, access prices will not be cost-based to the extent that the firm is successful in minimizing its endogenous costs in between reviews.

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<sup>36</sup> For instance, a decision install equipment with excess capacity to cater for future growth would be an endogenous variable as the regulator is usually not in a position to determine whether the excess capacity is efficient.

## **APPENDIX B: STATEMENT ON ACCESS PRICING PRINCIPLES (VERSION MARCH 2001)**

### **1. Introduction**

- 1.1 This statement may be referred to as a *Statement on Access Pricing Principles* (version March 2001).
- 1.2 This statement sets out the Commission's views on broad principles relating to the determination of access prices. In particular, this statement seeks to address the way forward on the following issues:
  - a. Under what circumstances should access prices be based on cost?
  - b. Where access prices are to be based on cost, what costing methodologies should be used to determine cost?
- 1.3 This statement has no effect in terms of creating legal rights or obligations. This statement does not, and cannot, bind the Commission in relation to any decision the Commission makes in respect of an access dispute. However, it may be taken as an indication of the Commission's views on broad principles relating to the determination of access prices.
- 1.4 This statement is intended to be an 'evolving' document which may be reviewed by the Commission from time to time, either on its own accord, or in response to a request for a review made by an interested party.

### **2. Criteria for the application of cost-based access prices**

- 2.1 Cost-based access prices should be applied to all **well-established** interconnection services where that interconnection requires the use of **bottleneck** facilities:
  - a. If the facilities required for interconnection are not a bottleneck, then the interconnection should not be subject to cost-based pricing for any service;
  - b. If, however, the facilities required for interconnection are a bottleneck, then they should be subjected to cost-based pricing for well-established interconnect services that require the use of those facilities, but not for interconnect services which are not well established.
- 2.2 A **bottleneck** may be defined as:

The control by a single or limited number of producers over the supply of an essential input or over the process used to produce an output. Those controlling the bottleneck asset or process cannot be challenged by those who do not have access to it.

- 2.3 Box 1 below identifies a number of facilities which are considered as a bottleneck.

**Box 1: Facilities which are considered as a bottleneck**

**Local loop**

For call termination, the local loop should be classified as a bottleneck. The local loop is likely to remain a bottleneck for call termination for the foreseeable future. The deployment of multiple local loops does not reduce the bottleneck nature of local loops with respect to call termination.

For call origination, the local loop should currently be considered a bottleneck. However, this may be reviewed for subscribers who have a choice of three or more access providers with number portability between them.

For leased line services, the local loop should be considered a bottleneck, except for customers where there is a choice of three or more local loop providers which are capable of delivering the type of leased line in question.

**Transmission network components**

Transmission network components that connect tandem exchanges to local exchanges, or between local exchanges (i.e., junction transmission) and tandem exchanges to Mobile Switch Centres (MSCs), should be classified as bottlenecks.

Trunk transmission – defined as transmission between tandem exchanges, between tandem exchanges and an international gateway, or between MSCs in mobile networks – should be classified as a bottleneck in all areas except the following states (and federal territory):

- a. Perlis, Kedah, Pulau Pinang, Perak, Selangor, Kuala Lumpur, Negeri Sembilan, Melaka and Johor (collectively referred to as the listed states).

Nevertheless, trunk transmission between tandem exchanges, MSCs and international gateways in the listed states should not be considered as a bottleneck, provided that the switch in question is available as a point of interconnection (POI). Transmission to and from any switch which is not available as a POI is a bottleneck, regardless of the location.

- 2.4 A service should be considered as **‘well-established’** if it has a well-established demand characteristic, and the investment required to provide it is therefore legitimately regarded as not being an unusually high-risk investment.
- 2.5 This well-established demand characteristic may be determined by the existence of similar services in Malaysia, or by the known success of those services in other markets comparable to Malaysia. A service which is initially

not classified as being 'well-established' should be classified as 'well established' once the demand characteristic is well established.

- 2.6 The widespread introduction of the services for which the bottleneck is required by other operators in the market can be regarded as an indication that the service has a well-established demand characteristic.
- 2.7 Box 2 below identifies a non-comprehensive list of services which should be regarded as well established.

**Box 2: Services which are considered as well-established (not comprehensive list)**

**Advanced services**

Integrated services digital networks (ISDN), virtual private networks (VPNs) and Centrex should be regarded as 'well-established'.

**Private circuit completion**

Private circuits should be regarded as a well-established service.

### 3. Methodology for determining cost-based interconnection charges

- 3.1 Cost-based interconnection charges should be set at a level which covers:
  - a. The additional economic cost (including the cost of capital, economic depreciation, and operating and maintenance cost) which the access provider can reasonably be expected to incur in the long run because of the increase in demand (referred to as 'the increment') which the access provider must accommodate in order to provide the relevant service or class of services; and
  - b. A reasonable contribution to the joint and common costs of the access provider which have a causal relationship to the increment.
- 3.2 Cost-based interconnection charges should not exceed the fully distributed cost to the access provider of providing the relevant interconnection service.