

Consultation and Recommendations
November 2009

**BANGLADESH
TELECOMMUNICATIONS
REGULATORY COMMISSION**



Draft Recommendations to BTRC Report on Consultation

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List of Acronyms and Abbreviations

AMTOB	Association of Mobile Telecommunications Operators of Bangladesh
BTRC	Bangladesh Telecommunications Regulatory Commission
BWA	Broadband Wireless Access
CB	Capacity building
CCK	Communications Commission of Kenya
EC	European Community
FBO	Facilities-Based Operators Licences
GOB	Government of Bangladesh
ICX	Interconnection Exchange
IGW	International Gateway
IIG	International Internet Gateway
ILDTS	International and Long Distance Telecommunications Services
IP switching	Digital signals switched using internet protocol switching
ISP	Internet Service Providers
MPTC	Ministry of Posts and Telecommunications
Mobile	Cellular Mobile
NGN	Next Generation Network
NIX	National Internet Exchanges
NTTN	Nationwide Telecommunication Transmission Network
PSTN	Public Switched Telephone Network
SMP	Significant Market Power
TIOB	Telecom Infrastructure of Bangladesh
TOR	Terms of Reference
ULR	Unified License Regime
VoIP	Voice over Internet Protocol

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Introduction

1. Introduction

1.1 Background

1. Bangladesh Telecommunications Regulatory Commission (BTRC) engaged David Butcher and Associates to lead a team to make recommendations on a possible Telecommunications Unified License Regime (ULR) for Bangladesh. BTRC is considering implementing a ULR to resolve many licensing issues and foster a renewed period of sector growth.
2. Bangladesh now has a large and vibrant telecommunications sector. Subscribers have increased from fewer than one million to nearly fifty million. The market for mobile telecommunications is particularly vigorous with mobile subscribers exceeding fixed line, by more than 47:1. In parallel with subscriber-growth, there has been a dramatic improvement in the range and quality of services.
3. Recently there has been a tailing-off of subscriber growth and a reduction of profitability among sector enterprises. With international trends away from service specific licensing, the BTRC is considering alternative systems of regulation to stimulate a new wave of growth and investment in the sector.
4. This report relates to the outcome of stakeholder consultation and a summary of our recommendations for a ULR system¹. The final section foreshadows issues that BTRC will need to deal with at the conclusion of this assignment.

1.2 Unified License Regime

5. For twenty years telecommunications regulation focused largely on licensing private operators to use specific technologies. As new technologies emerged, regulators licensed each in turn. Underpinning traditional technology specific regulation were three assumptions: it is about voice telephone calls, voice calls are a natural monopoly and the company that subscribers pay money to will deliver their call or message.
6. Broadband internet and IP switching have invalidated all of these assumptions. Now many competitive services are capable of delivery over a common digital, fibre optic platform, using internet protocol (IP) switched signals. "Convergence" describes this process of many different services previously employing unique delivery systems moving towards using similar digital technologies.
7. As distinctions between technologies and services are breaking down technology-specific licensing is widely regarded as an impediment to improvements in client service and offering of new services. Convergence has resulted in regulations in many jurisdictions moving towards flexible multi-service licensing; activities that provide services and networks respectively are licensed, not the specific means of delivery.
8. Flexible licenses allow the service license holder to offer any service and the holder of a facilities license holder to employ any technology. ULR is one variant of multi-service licensing. In most places with ULR, a single license entitles an operator to offer any service over any system. In this way, regulators can anticipate developments instead of reacting to new technologies. "Proactive regulation can

¹ See TOR Task 1

foster the development and application of new technologies in ways that will better serve network development and other policy objectives.”²

9. There are a number of variants of multi-service license. In Europe multi-service is derived from general authorizations (applied through the Authorization Directive), while in a number of other countries (such as Argentina, Botswana, India and Singapore) ULR have been implemented making explicit use of the term ULR.
10. Only very few places use a multi-service license called a unified license. However, many places have in force multi-service licensing regimes with all the features of a unified license. ULR is, therefore, a form of multi-service licensing that facilitates the uptake of technologies that are converging towards a common technology platform. ULR enables the sector to offer various telecom services, using whichever technology is most appropriate for the particular customer and situation.

1.3 ULR Strategic Objective

11. The strategic objective of a ULR policy is a leveled playing field with no operator gaining the benefit or obstruction from different conditions in their licenses. Most regulators have adopted four principal goals for their respective ULR:
 - neutrality (between respective technologies and services),
 - simplification (of moving from one technology and service to another),
 - flexibility (to offer services customers need), and
 - reduction of the administrative burden on the sector.
12. To achieve these goals BTRC resolved to seek advice on the impact of a ULR on the terms and conditions of existing licenses and amendments that will allow the creation of a ULR.

1.4 Methodology

13. The Consultant’s Terms of Reference (TOR) outlined a methodology for the assignment including a significant component of stakeholder consultation. The Consultation included:
 - literature research, including research on the internet, in particular the Info-Dev-ITU telecommunications regulatory toolbox,
 - a consultative document provided to BTRC on the 9 September 2009, circulated to all major stakeholders, and posted on the BTRC website,
 - individual meetings with stakeholder groups and individuals from 7 September 2009, including,
 - meetings with the Project Director and officials from BTRC,
 - meetings with ministry officials in Bangladesh and from neighboring countries,
 - discussions in person and by telephone with other consultants working on Bangladesh telecommunications regulatory reform,
 - invitations to major stakeholder to make presentations to the DBA team and BTRC officials,
 - written submissions from individuals and groups,
 - a stakeholder forum held on 27 September 2009,
 - attending the launch of the new Fibre@Home service in Dhaka, and
 - observations and field visits to possible sites and consumers.

² *New Technologies and their Impacts on Regulation*, ICT Regulation Toolkit, Ex Sum” ITU-Info-Dev, Module 7, March 2007

1.5 Legal Framework for ULR

14. From the Consultant's analysis of the current telecommunications legislation and from submissions from the sector, the Consultant can report that the Telecommunications Act of 2001 gives the BTRC all the powers it needs to implement a ULR.
15. Section 29 of the Act spells out the Commission's broad objectives, including encouraging the orderly development of a telecommunication system that enhances and strengthens the social and economic welfare of Bangladesh. Chapter V of the Act deals with licensing. It mandates the possession of a license by any person that establishes or operates a telecommunication system in Bangladesh or provides in Bangladesh or to any place outside any telecommunication service.
16. Section 36 gives BTRC exclusive authority to issue licenses and to specify the license in any condition consistent with the broadly stated objectives of the Chapter. It may also amend any condition, which it considers proper. Section 46 also confers the right to cancel the license for any infringement of the license conditions.

1.6 Consultation

17. Sections 86 and 87 of the Act provide for processes BTRC must follow when undertaking general inquiries and holding public consultations. The Act therefore, facilitates and provides for the BTRC to seek the input of affected parties when making major changes in its practices.
18. Similarly, the ITU Regulation toolkit recommends extensive consultation on the Implementation of a Unified Licensing Framework. In one of its Practice Notes it describes, with approval, the process used in Kenya. The next section discusses the opinions expressed by the Bangladesh sector participants during the Consultant's public consultation process.

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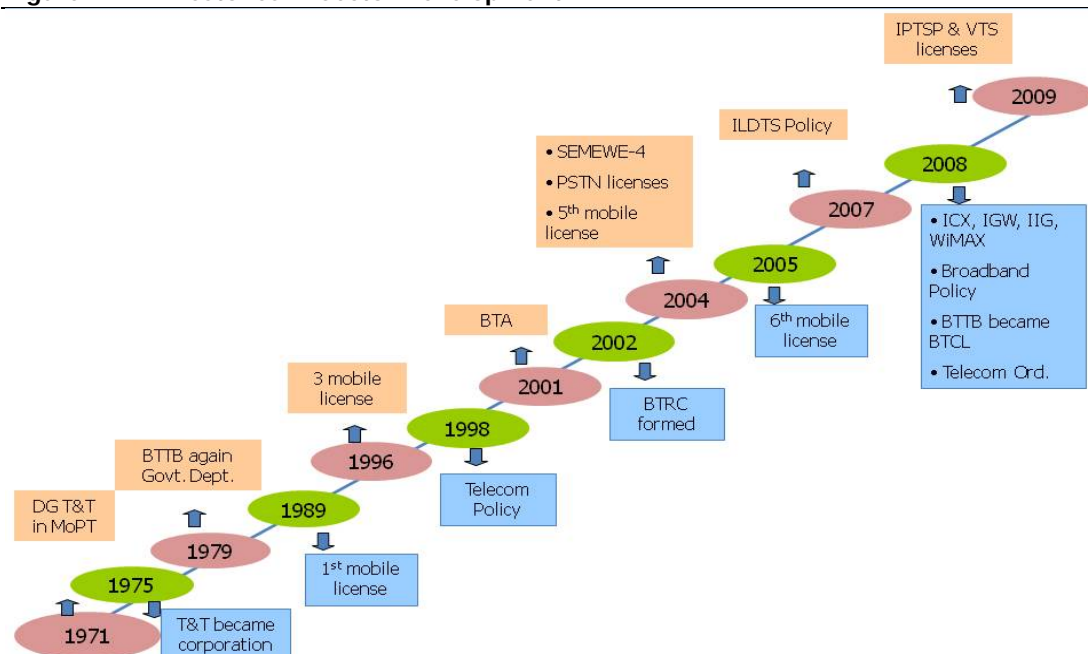
Stakeholder Consultation

2. Stakeholder Consultation

2.1 Process

19. Groups participating in Stakeholder Consultation included the Ministry of Posts and Telecommunications (MPTC), industry associations, individual operators and advisers working on other aspects of sector development, including those working on Spectrum Reform and a review of Sector Policy.
20. Submissions made mention of consultation processes in other countries. For example, the Communications Commission of Kenya (CCK) resolving to move to a ULR and announcing its intention to transition by seeking input from industry members on implementation.
21. CCK subsequently published a summary of responses received during the first phase of the consultation, an analysis of feedback and the CCK's decisions in response.³ During a second phase, the CCK published a booklet on implementation and used it to guide the transition. Operators negotiated the terms of their individual transition.
22. The consultation undertaken by this project is the equivalent to the first phase of consultation undertaken in Kenya. It comprised a consultation paper, initial draft and an outline of a proposal for the BTRC to consider as the basis of a ULR and to provide the BTRC with an initial and final draft of a license to use in its negotiations with the sector.

Figure 2-1: Milestones in Sector Development



Source: Submission from AMTOB – BTRC Annual Reports etc

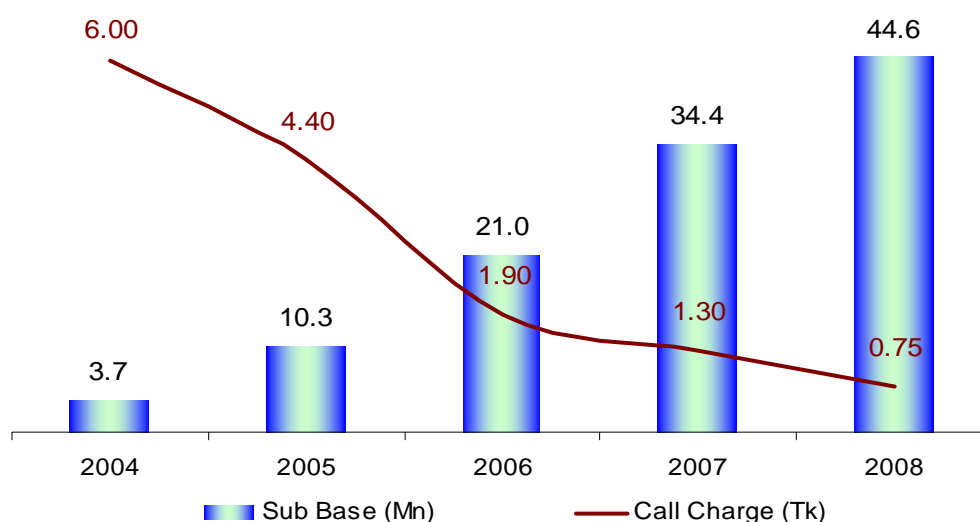
23. Stakeholders welcomed the employment of international consultants to begin the work on the new regime, but emphasised that they saw this as the first stage in an ongoing process of consultation with the sector.

³ <http://www.ictregulationtoolkit.org/en/PracticeNote.3135.html>

2.2 Background

24. In Figure 2-1, the Association of Mobile Telecommunications Operators of Bangladesh (AMTOB), provided a useful illustration of the development of the sector since 1971. This shows that after a hesitant start the process of sector development has been one of liberalization and increasing competition.
25. Submissions painted a picture of considerable success, but also deep concern at a number of sector trends. AMTOB expressed concerns about the impacts of existing, technology specific, complex, inflexible and costly licensing system. They broadly support the proposed move towards multi-service, technology neutral licensing.
26. AMTOB also showed how the number of subscribers and the increase in competition (since 2004) has led to an unambiguous decline in call charges. The trend of subscriber numbers and call charges is illustrated in Figure 2-2.
27. The analysis supporting Figure 2-2 shows that a mixture of competition and regulation has caused charges in Bangladesh to fall as the sector's subscriber base has increased. The higher the capacity utilisation by each operator the lower the unit cost of providing customer services.

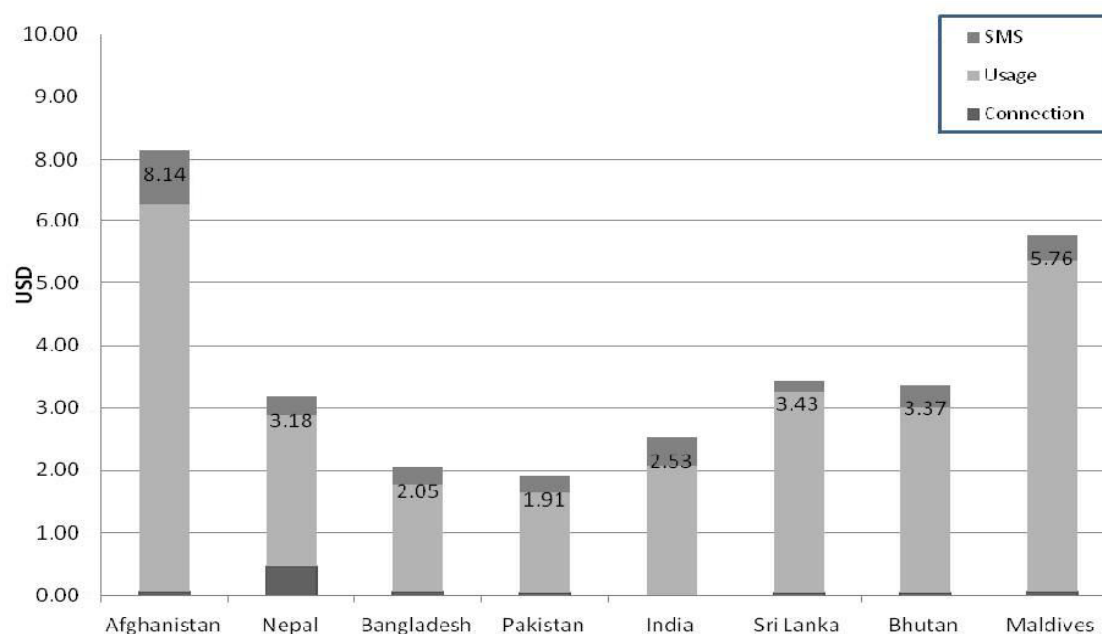
Figure 2-2: Bangladesh Subscriber Base and Trend in Call Charges



Source: AMTOB Submission Using Industry Data

28. Further evidence regarding the competitiveness of mobile pre-paid calls in Bangladesh is available from LIRNEasia, a regional ICT policy and regulation think-tank active across the Asia Pacific Region (see Figure 2-3).
29. The Mobile price baskets chart (in US dollars) for the average monthly prepaid mobile cost for a Low User (in USD) shows that Bangladesh has the lowest prices for low users of any country in the region. Similar comparisons for medium and higher level users show similar patterns.
30. Companies facing pressure from competitors and regulation have cut charges substantially, relative to counterparts in neighbouring countries. This in turn leads them to cut costs. Cutting costs improves cash flows in the short-term, but unless companies remain profitable, will lead to medium-term deterioration in services. Six of seven mobile and all fixed line operators reported that they are all loss making.

Figure 2-3: Price basket (US\$) Average monthly prepaid mobile cost - Low User



Source: <http://lrneasia.net/wp-content/uploads/2007/08/09-09-SA-Baskets-explained-v1-0.pdf> (accessed 13/11/09)

31. The fear of deterioration in quality caused by ongoing financial losses is significant because, the telecommunications sector as a whole has increased its contribution to the national budget. From 1.3 percent in 2001 it increased to 8 percent in 2007 (excluding the one-off charges US\$ 64 million in 2007, US\$ 62 million in 2008 and ignoring spectrum charges of US\$ 50 million⁴).
32. As unit costs have reduced, the sector has been required to contribute more to the national budget, while still investing capital for development. However, sustaining service quality, low tariffs, tax contributions and high levels of investment at the same time, is not possible.
33. While annual investment increased from US\$ 42 million in 1997 to US\$ 1.1 billion between 1997 and 2007, it saw a significant fall to \$929 million in 2008. Some suggest this may be the beginning of a downward trend.
34. The telecommunications sector has developed in an environment of licensing individual technologies. Now that the barriers between technologies are blurred, submissions maintain that the existing regulatory environment is too complex, inconsistent, potentially discriminatory, inequitable and inflexible to encourage sufficient ongoing investments in the sector.
35. Submissions by the mobile, fixed line and ISP operators pointed to decisions since 2007 that move away from the principles of neutrality and flexibility. These are core principles of a ULR.

⁴ AMTOB submission using National Budget Data and BTRC Annual Reports

2.3 Areas of Agreement

2.3.1 Vision for the Sector

36. No submission asked for significant changes to the 2001 Act. Some submissions expressed support for the government's "Digital Bangladesh" program and pledged partnership in making the dream come true. In respect of licensing and the work of BTRC in that regard, submissions support a planning framework that looks out 5-10 years, builds on successes and lays the foundation for continuing success and answers questions such as:

- where will the sector be in 2014 or 2012?
- how can Bangladesh sustain the flow of investment into the sector?
- what will happen to Digital Bangladesh if companies face financial crisis?
- how can Bangladesh benefit from Next Generation Networks (NGNs)?
- what is the role of licensing in ensuring that desirable developments take place?

2.3.2 Business Friendly

37. All submissions call for a business friendly environment with stability in licensing and no mid-stream changes in license conditions, in order to create an environment conducive to business and investment stability.

38. Regulatory stability that will support a flow of long-term investment also implies a long-term scenario for regulatory reform that will support the move to converged technologies and multiple services using the same platform. The majority of submissions look for a light-touch approach for regulation and approvals in general.

2.3.3 No Less Favorable

39. There is agreement in submissions that any new Unified License should not be less favorable to the existing licensees than their existing license. "Not less favorable," is a sound principle of licensing migration, but is difficult in practice. It is not possible to move to a ULR without some adjustments.

2.3.4 Migration

40. For migration, all parties agree there should be reasonable time to adjust. Telecommunications businesses entail major investments by large investors in the telecommunications sector. Migration that is hasty or ill considered will cause disruption in investment patterns and adversely affect the whole economy.

41. There is strong sector support for voluntary migration. However, if migration is voluntary (at least at the time of license renewal) it could postpone many benefits of UL for many years and create inequalities between licensees, contrary to the goals of the Act.

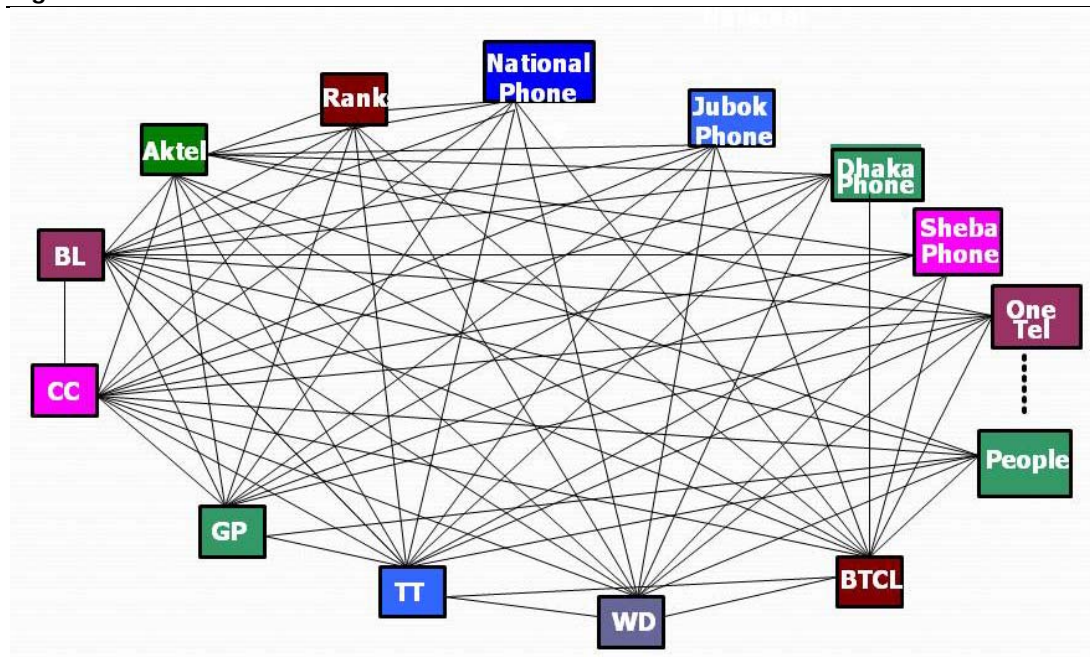
42. Submissions call for BTRC to negotiate with major industry groups and individual operators in order to achieve a consensus. This will allow the fixed operator to provide mobile services and mobile operators to provide fixed services, as the technology differences between them has become completely blurred.

2.4 Areas of Disagreement

2.4.1 Conditions for Competition

43. The principal areas of disagreement among submissions are:
- conditions BTRC should attach to PSTN operators seeking a fuller range of service offerings, and
 - interconnection between operators and the impact of current policies on access by new entrants.
44. The PSTN operators are seeking the right to offer a full range of services. Their principal submission is that IP telephony licenses, from which the PSTN and mobile operators are barred, must be available. PSTN operators submit that multi-service licensing will enable them to offer all services required by their customers.
45. By contrast Mobile operators oppose automatic full service licenses for PSTN. Some are totally opposed to opening the door for PSTN operators to enter the mobile market. Others are accepting, provided PST operators pay equivalent license acquisition and ongoing fees to those paid by current mobile operators.

Figure 2-4: Interconnection before ILDTS



Source: TIOB Submission

2.4.2 Interconnection

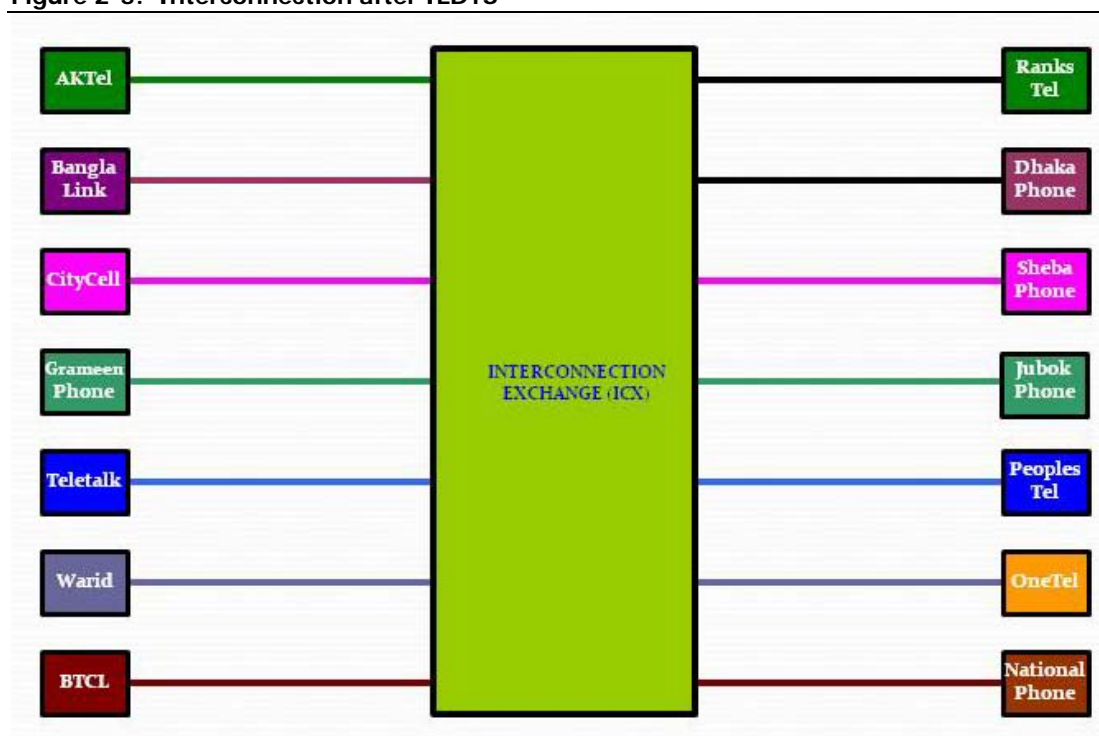
46. One fixed line operator reports that it lobbied for the implementation of the ILDTS policy because of the major problem of interconnection that it saw as a significant impediment for the entry of new operators⁵. Figure 2-4 shows the large number of interconnection agreements required among operators. Figure 2-5 shows the post ILDTS situation.
47. The same submission reports that the situation has not improved even after the deployment of ICX. New PSTN operators experience great difficulty obtaining

⁵ Ranks Telecom Ltd., submission on Questionnaire

increases capacity to sustain their businesses. The issue is access to capacity rather than interconnection. The structure of licensing alone, cannot be resolve this issue.

48. Accordingly, there are calls for changes to licensing to empower the BTRC to address the capacity issue by imposing license conditions to regulate, where appropriate, the misuse of any Significant Market Power (SMP) of certain operators. The objective is to improve the incentives for dominant mobile operators to make interconnection capacity available, as appropriate, to new entrants and to PSTN operators.

Figure 2-5: Interconnection after ILDTS



Source: TIOB Submission

2.5 Principal Findings from Consultation

2.5.1 Complexity

49. The principal finding of the consultation is that the majority of parties consulted regard the current licensing system in Bangladesh as unnecessarily complex, difficult to administer and costly to comply with. Almost all submissions agree that the large number of different licenses, frequent changes in compliance and obligations during the courses of a license and the complexities involved, all impose significant compliance costs on BTRC and operating companies.
50. There was little support for the idea of a single license for all operators from backbone networks to ISP retailers. However, submissions record strong support for two or three main categories of license, covering facilities, services and in some cases content. It is widely believed that technology specific licensing will represent an increasing impediment to the development of the sector.

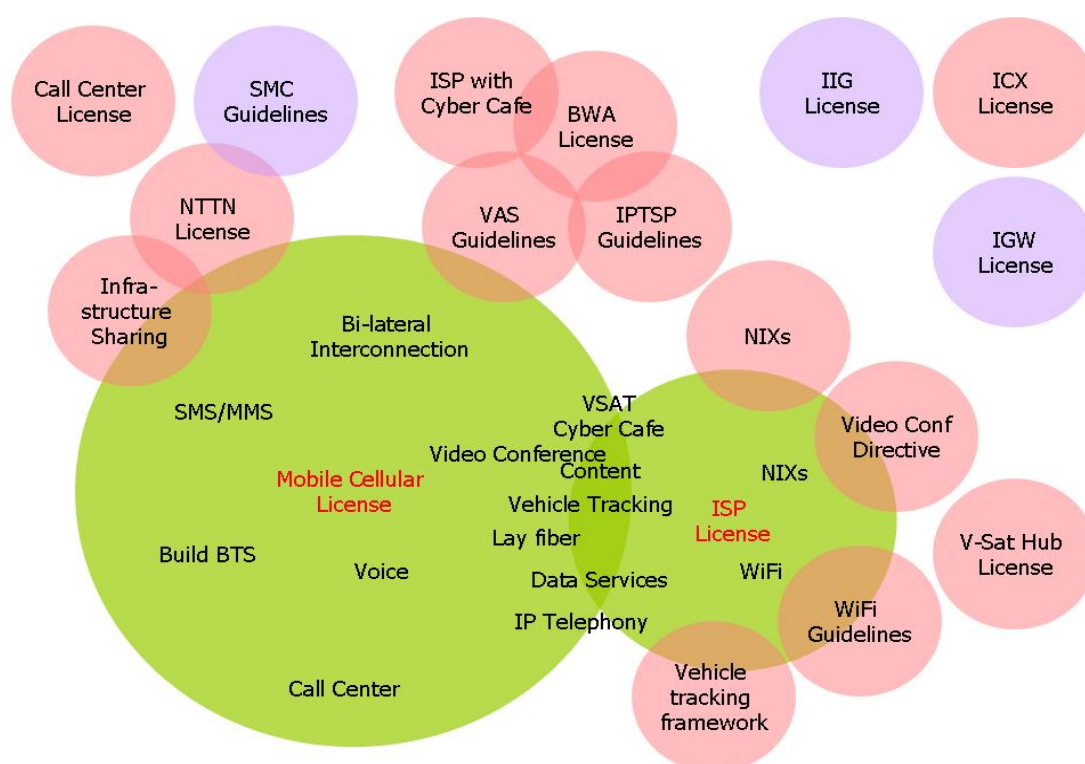
2.5.2 Inconsistent Licensing

51. Figure 2-6 illustrates the impact on a mobile operator's business of recent determinations by BTRC. The green circles describe all the business they

understood they were entitled to enter and the pink circles the business areas since subjected to additional layers of regulation and in some cases additional licenses. While one operator submitted a message in favor of no change in the licensing framework⁶, others are very critical of the trend towards additional layers of regulation superimposed on existing licenses.

52. The submission is that recent decisions have not only been inconsistent with the assurance given to licenses holders, they add complexity, are discriminatory (contrary to the goals of the Act) and inflexible. Changes in what was understood to be a settled legal document, complicates business planning, requires reworking of investment decisions and inevitably leads to reduced investment slowing growth in subscriber numbers, and lower revenue to the government. Many operators see the introduction of a ULR as a means to emphasize the principles of a competitive sector introduced in Section 29 of the Act.

Figure 2-6: Impact of Licensing Guidelines



Source: AMTOB Submission to Consultant

2.5.3 Discrimination

53. The BTRC implemented policies to improve the interconnection between PSTN and the dominant mobile operators (described in section 2.4.2). Notwithstanding the licensing of these new operators, submissions received indicate that while interconnection is now possible it is constrained by availability of capacity to handle the available traffic.
54. There are allegations of discrimination against new entrants to the sector. Some mobile operators concede that they are resisting new capacity for PSTN operators who they say are facilitating illegal bypass of the IGW and ICX operators. In the absence of particular legal powers to deal with significant market powers in the statute or regulations, there may be a need for such powers in new licenses.

⁶ Comments by Bangla Trac on ULR Presentation, October 2009

2.6 Resolving Issues

55. The consultation has raised a large number of issues that must be resolved within a ULR. This section summarizes the issues our recommendations will aim to address.

2.6.1 Simplicity

56. The critical aspect of the submissions is to simplify the number of license categories and reduce the number of licenses required. Simplicity means that:
- operators should offer any service using any system under a common license
 - the ULR should ease the regulatory burden for both BTRC and operators
57. The critical change for the sector will be to simplify the system so that the BTRC can focus its limited resources of time and manpower, addressing the major concerns expressed by operators and removing impediments to ongoing investment and subscriber growth.

2.6.2 Greater Consistency

58. Consistency means that the BTRC must deal with operators in a consistent fashion, including consistency within and between licenses. One of the largest risks of a telecommunications business is the risk that the rules will change. A common license across the whole sector will contribute to greater certainty about regulatory intentions. This in turn lowers regulatory risk, cost of capital to operators and ultimately prices paid by the end users.

2.6.3 Non-Discrimination

59. Non-discrimination means that operators will receive equivalent treatment in equivalent circumstances. The telecommunications industry literature, generally accepts that the larger and better-established firms have obligations towards new entrants in respect of interconnection and facilities sharing.
60. Similarly, it is common and accepted that disclosure arrangements and information sharing may be more extensive for the larger firms. However, a fundamental principal echoed in the submissions is that there should be equivalent treatment of all operators in similar circumstances.

2.6.4 Flexibility

61. Flexibility requires that operators can respond more quickly to market requirements. Operators exist to serve the needs of customers. The needs of customers should be the paramount consideration when making regulatory decisions. Giving priority to the needs of customers suggest that regulatory measures that inhibit the rapid meeting of customer needs should be adjusted or removed.

2.6.5 Equity and Fairness

62. Fees should be set such that current operators pay no more and no less than previously for the same rights and obligations. There is substantial support for the principle that in a ULR, fees imposed by the BTRC should be transparent and set at levels that cover the administration costs of running the BTRC.
63. Section 21 (3) of the Act sets up a Bangladesh Telecommunication Regulatory Commission Fund that shall be utilized to meet the expenses relating to the salaries

and allowances of the Commissioners and employees and other necessary expenses of the Commission⁷.

2.6.6 Moratorium on issuance of new licenses

64. Given that, a ULR regime is potentially disruptive to existing licenses, nearly all submissions agree that BTRC should consider placing a moratorium on the issue of new licenses until the wider strategic issues within the sector have been resolved, including putting in place the ULR policy.
65. Mobile company submissions support a ULR that will make licenses both service and technologically neutral, allow operators greater flexibility and will lower compliance costs for both regulators and operators. They also see this as an opportunity to resolve many problems in the sector, but submit that now is not a time to allow more mobile operators.
66. Notwithstanding vigorous enforcement activities, ICX and IGW operators are losing traffic rapidly. They too conclude that this is not the time to license more ILDTS facilities (which would overturn many of the assumptions on which their businesses were created).

2.6.7 Strategic Review of the Sector

67. Bangladesh needs to resolve a number of policy issues before it can fully implement a ULR. Many parties suggest that BTRC can best accomplish resolution of these policy issues by a strategic review of the whole sector to precede introduction of a ULR. We were informed that the MPTC is planning such a review.
68. ULRs are one step to coping with the change underway, Telecommunications is increasingly about data transmission, it is no longer a natural monopoly and the subscribers may have no idea which company delivers their call or message. Broadband internet and IP switching have created a new set of assumptions on which to base regulation.
69. Any review of the sector should focus primarily on the extent to which regulation will be required, as more and more services converge on a single delivery platform. It also needs to identify the objectives of regulation in an environment of NGNs.
70. A sector review is among the strategic issues raised in submissions. However, we understand that a strategic review of the sector is underway as a separate exercise and our recommendations focus on the narrower issue of a ULR licensing system.

⁷ Telecommunications Act 2001

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Summary of Recommendations

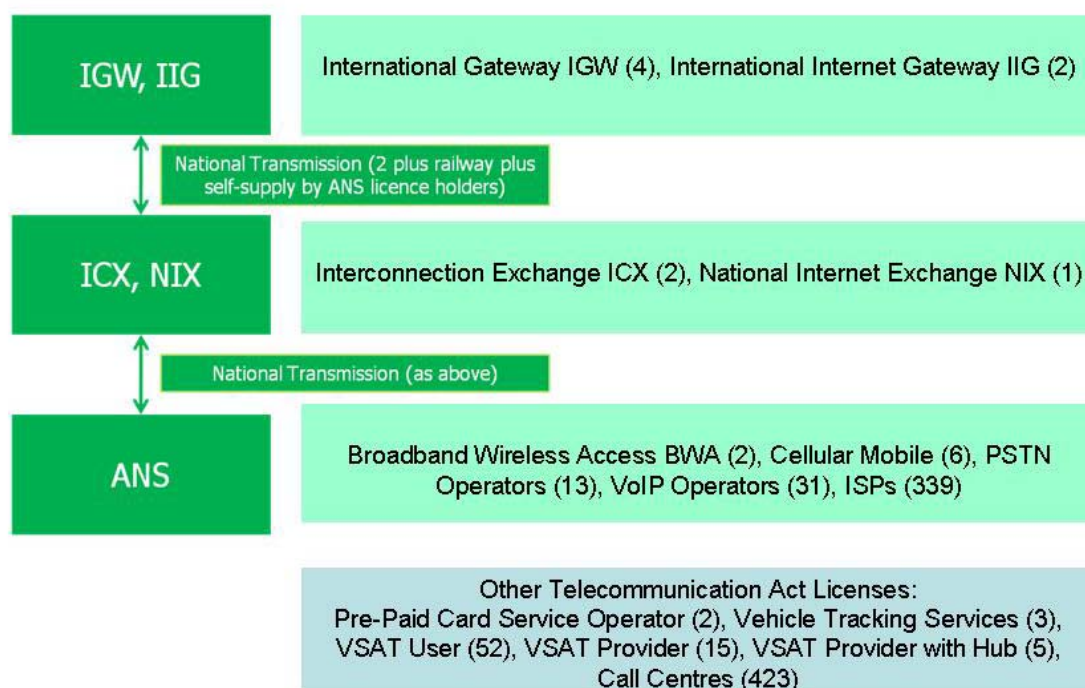
3. Summary of Recommendations

3.1 Current Telecommunications Licensing Regime

3.1.1 Current Distribution of Licenses

71. Before reforming the licensing system, it is necessary to analyze the existing structure and identify its weaknesses. The diagram in Figure 3-1 shows the distribution among the three principal layers of licensing currently regulating the telecommunications system in Bangladesh.
72. The Access Network Service (ANS) service level comprises Broadband Wireless Access (BWA) Cellular Mobile (Mobile), Public Switched Telecommunications Networks (PSTN), Voice over Internet Protocol (VoIP) and Internet Service Providers (ISPs). These operators are all required to interconnect to the Interconnection Exchange (ICX) and National Internet Exchanges (NIX). These in turn are connected to four International Gateways and one International Internet Gateways. In addition, there are two national transmission licenses one for Nationwide Telecommunication Transmission Network (NTTN) Service Provider and one for Nationwide Optical Fibre Telecommunication Transmission Network. In addition, the railway operates an unlicensed nationwide transmission network and other operators operate their own self-supply.
73. Other Telecommunication Act licenses issued by BTRC include Pre-Paid Card Service Operator (2), Vehicle Tracking Services (3), VSAT User (52), VSAT Provider (15), VSAT Provider with Hub (5), Call Centres (423).

Figure 3-1: Current Distribution of Licenses by Category

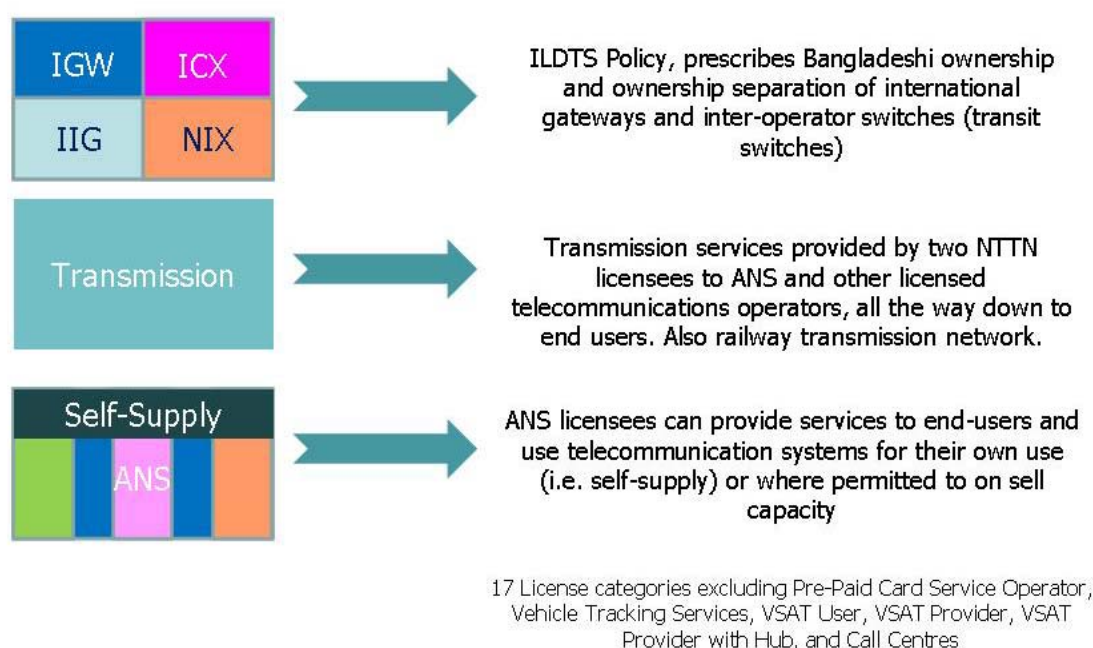


Source: DBA Mission

3.1.2 Current License Rules

74. Each level of licenses is subject to particular rules. Figure 3-2 summarizes the principal differences. ANS licensees can provide services to end-users and use telecommunication systems for their own use (i.e. self-supply) or where permitted, they can sell surplus capacity to other operators.
75. Two nationwide licensees (one for fibre) provide transmission services to ANS and other licensed telecommunications operators. Transmission may extend all the way to end user premises. Mobile operators currently use the railway transmission network as part of their self-supply.
76. The rules applying to the IGW and ICX are quite different. The ILDTS Policy prescribes Bangladeshi ownership and ownership separation of international gateways and inter-operator switches⁸ (e.g. transit switches).
77. These three layers of operators represent no fewer than seventeen licenses categories, but exclude Pre-Paid Card Service Operator, Vehicle Tracking Services, VSAT User, VSAT Provider, VSAT Provider with Hub, and Call Centres.

Figure 3-2: Current License Rules



Source: DBA led mission

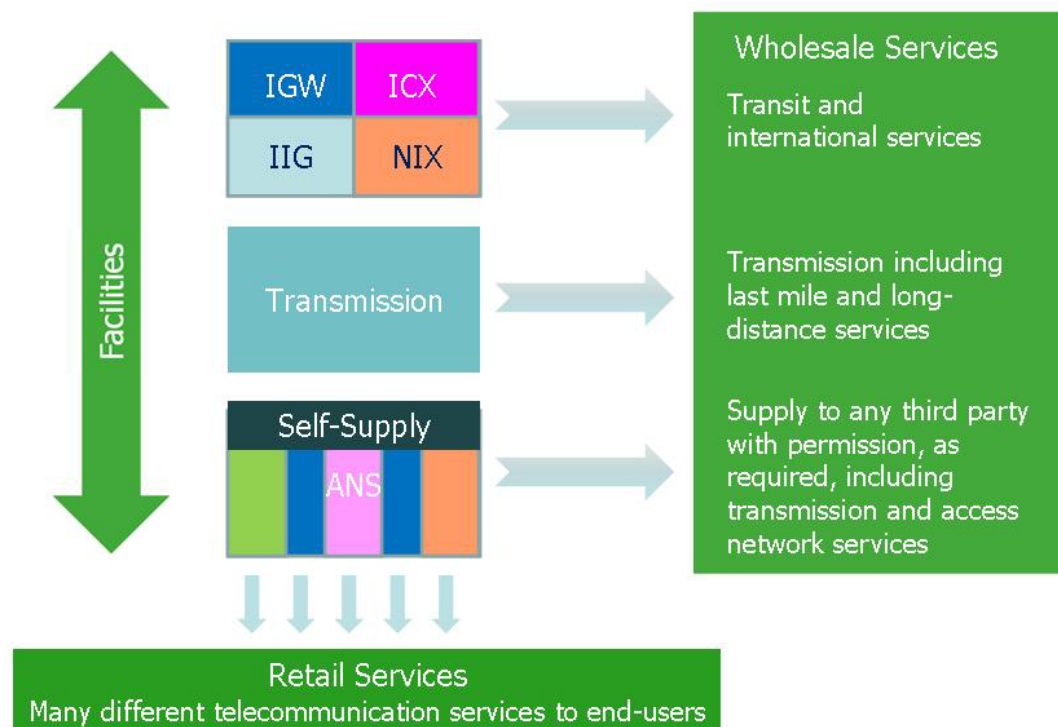
3.1.3 Market Structure

78. The licensing rules create a market structure where each layer contains elements of each of wholesale, retail and facilities. At the ANS or Retail Services level, operators provide many different telecommunication services to end-users, but also wholesale transmission to other operators.
79. Facilities operators are predominantly those in the transmission system, but facilities also include the transit and international services, and also in the retail ANS self-supply. Transmission operators provide transmission services that include the last

⁸ "Inter-operator switches" is a generic term to describe gateways and transit switches supplying services to wholesale customers: e.g. other operators.

mile up and until the end-user premises (but not the services they carry). This market structure is illustrated in Figure 3-3, below.

Figure 3-3: Current Market Structure



Source: DBA led mission

3.1.4 Regulatory Issues

80. The market structure described in Figure 3-3 creates a number of regulatory issues. Firstly, facilities are scattered among all levels of the sector. From a regulatory perspective, this complicates the determination of issues surrounding access to facilities. It is notable that it was complaints over access that gave rise to the ICX issue, a matter that for the same reason has yet to be resolved.
81. The market structure also complicates regulation of tariffs, because while the costs incurred by facilities operators are relatively well known and quite easily determined, the costs of associated services are less easily determined and are highly confidential. Bundling these two sets of costs together complicates regulatory tariff investigations during the settling of disputes.
82. The supply of transmission and access network services to third parties by ANS licensees raises a related set of problems. Issues that were cited in the consultation process included:
 - refusal to deal (with access seekers),
 - discriminatory terms (between self-supply and supply to third parties), and
 - leveraging market power to poach customers.
83. Our recommendations propose changes to licensing that will address these problems and move the whole system closer to the goals of a ULR.

3.2 Underlying Principles

3.2.1 Terminology

84. To clarify our recommendations it is necessary to define terminology used as the Bangladeshi terminology does not necessarily follow the practice in other jurisdictions.
85. A pure multi-service Unified Licensing Regime using the title “Unified” implies any service using any system under a common license. As has been noted above, these jurisdictions are rare and most multi-service regimes make use of two further terms to clarify the usage.
86. Services may refer to telecommunication services provided to consumers (end-users, other licensees and operators). But the term “services” can be qualified and divided into two further categories:
- Retail Services are supplied to end-users and are provided by Access Network Service (ANS) operators (e.g. mobile telephony services),
 - by contrast Wholesale Services are supplied to other licensees and operators, and provided by ANS operators (e.g. leased lines), NTTN operators (e.g. leased lines/dedicated capacity) and Inter-operator Gateways IGW, IIG, ICX and NIX (e.g. interconnection services, international telephony and data services).
87. There are often references to “transmission services.” These are services in the broad sense, but are in reality a subset of wholesale services. The consumers of transmission services are other operators and not final consumers.
88. A System is a combination of telecommunications apparatus (equipment), including transmission (whether by microwave, co-axial cable, optical fibre, etc.). The application of these categories to particular pieces of equipment and particular facilities depends on the actual role they play in the systems and whether the purchase is a final user or a supplier to other parties.

3.2.2 Principles

89. The principles on underlying the recommendations are as follows:
- **Simplicity:** Any final user service provided using any system should be licensed under a common license with the objective of easing the regulatory burden for both BTRC and operators.
 - **Consistency:** decisions made by the BTRC should be consistent from time to time. A decision made today should be similar to one made in three months and similar to one made several years ago; consistency lowers regulatory risk and cost of capital.
 - **Non-discrimination:** license conditions, fees charges and tariffs should not discriminate between operators or groups of consumers; there is a level playing field where the operator that prevails is the one with the best prices and services, equivalent treatment in equivalent circumstances operators providing similar services in similar situations should be treated the same.
 - **Flexibility:** Rules and processes should be flexible so that operators can respond more quickly to market requirements without needed to seek fresh regulatory approvals.

- Equitable or Fair: fees and charges should be set such that current operators pay no more and no less than previously, for the same rights and obligations.
90. From our reading of the operators' submissions, the principles outlined above are what the majority are seeking. Unless BTRC follows such principles, it will find itself inundated with requests for special deals and favours, exemptions and concessions. Each operator will have an incentive to seek regulatory protection from its competitors. This is contrary to the law and to international best practice.

3.3 Proposed Market Structure

91. We propose creation of a new market structure based on only two licenses: a common Facilities License and a common Retail Services License. Figure 3-4 illustrates the proposed structure.

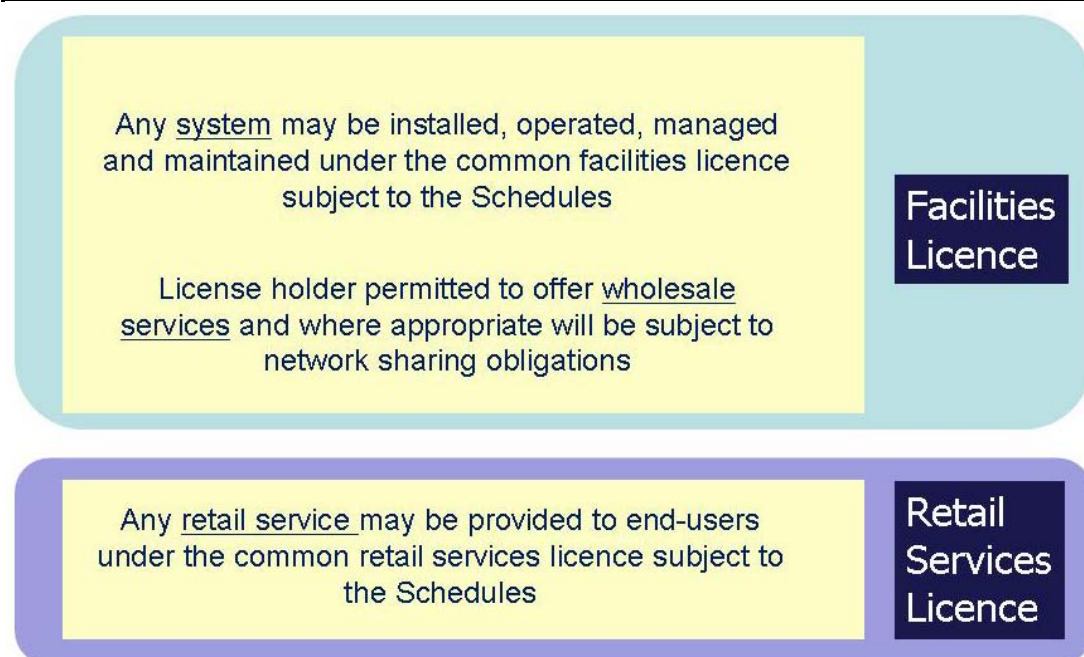
3.3.1 Facilities

- The first is a common Facilities License that will allow the holder to install, operate, manage and maintain any system, under the common facilities licence subject to schedules contained in the license. The schedules will carry over any special conditions in the holder's existing license (such as ILDTS restrictions and any others that are not removed in negotiations with the BTRC).
- The Facilities License will permit the license holder to offer wholesale services and where appropriate will be subject to network sharing obligations in the existing guidelines.

3.3.2 Services

- The second is a common Retail Service License. Under the common Retail Services License any retail service may be provided to end-users subject to the attached Schedules.

Figure 3-4: Proposed Market Structure for ULR



Source: DBA led mission

92. The purpose of this change is fourfold. It will achieve the four principal objectives of the ULR strategy:
- neutrality (between technologies and services),
 - simplification (of the process of moving from one technology and service to another),
 - flexibility (to offer services customers need), and
 - reduction of the administrative burden on the sector.
93. The use of schedules to the licenses will also enable the BTRC to carry over of existing rules and distinctions. It will enable these to be modified in the process of change that will accompany the migration from the existing situation to the proposed, and will enable the BTRC to implement the proposed principles of: simplicity, consistency, non-discrimination, flexibility and fairness and equity.

3.4 Transition for Current Licenses

3.4.1 Mapping Current Licenses

94. Transition will be simplified by moving from a complex structure to a simple one. Transition is essentially mapping the existing licenses into the categories created by the proposed new license structure.

Table 3-1: Mapping Current License to new Categories

Licenses Issued as of October 2009		
No.	Category of License	Number
1	International Gateway (IGW) Services (*)	4
2	Interconnection Exchange (ICX) Services (*)	3
3	International Internet Gateway (IIG) Services (*)	2
4	Broadband Wireless Access (BWA)	2
5	Cellular Mobile Telecom Operator	6
6	Public Switched Telephone Network (PSTN) Operator [National: 06, Zonal: 06, Rural: 01]	13
7	Nationwide Telecommunication Transmission Network (NTTN) Service Provider	1
8	Nationwide Optical Fibre Telecommunication Transmission Network	1
11	Internet Protocol Telephony Service Provider – Nationwide	25
12	Internet Protocol Telephony Service Provider – Central Zone	4
13	Internet Protocol Telephony Service Provider – Zonal [South-East: 02, South-West: 00, North-East: 00, North-West: 00]	2
14	Internet Service Provider – Nationwide	93
15	Internet Service Provider – Central Zone	79
16	Internet Service Provider – Zonal [South-East: 27, South-West: 06, North-East: 09, North-West: 11]	53
17	Internet Service Provider – Category A	95
18	Internet Service Provider – Category B	15
19	Internet Service Provider – Category C	4
21	VSAT Provider	15
22	VSAT Provider with HUB	5

* Ongoing public consultations to award new licenses

95. The principal objective should be to make a success of the transition while simultaneously minimizing disruption to the sector. To ensure success, all current licensees should have equitable treatment during the transition to the ULR. There are currently 26 license categories with over 900 individual licenses issued.

96. Of the twenty-six categories, nineteen will need to transition to one or both of the two ULR licenses. These are listed in Table 3-1. Seven categories should be exempted from the proposed ULR (a large proportion of existing licenses). The principal reason for exemption is that the licenses currently relate to final user activities and therefore it is in an unusual practice to licence them. However, like car drivers, it is appropriate that they should register so that the BTRC can compile sector statistics and contact service providers in an emergency.
97. The effect of mapping existing licenses into the proposed ULR will be that the licenses highlighted in yellow will be common Facilities Licenses and the Green will be common Service Licenses.

3.4.2 Transition

98. The appropriate approach is to create a full-time taskforce with the mission to execute a successful transition. The BTRC taskforce will need to:
- review current individual licenses within the nineteen categories to be transitioned:
 - work out how to transition relevant provisions into proposed ULR license schedules, including legacy issues from existing policies,
 - ensure that schedules capture, where appropriate legacy license terms and conditions including policy issues such as restrictions imposed by the ILDTS,
 - current license holders will need:
 - copies of the draft common ULR licenses for the two new categories: Facilities and Retail Services
 - draft Schedules
 - preliminary consultation, on which issues need to be transitioned and final negotiations leading to agreements

3.4.3 Fees

99. It will also be necessary for the taskforce to recommend to the BTRC an appropriate methodology to ensure equitable fees and non-discrimination so that when the BTRC issues the new UL, licensees pay no more than they did before, but a formula ensures that licensees in similar circumstances pay similar amounts.
100. Given the wide disparities in fees currently charged to different operators, this will be the most complex of the tasks, but will also be essential to achieve simplicity, consistency, equivalent treatment and equity.

3.4.4 Possible Transition Paths

101. To illustrate the proposed transition path, there is the example of the two licensed NTTN operators and one unlicensed NTTN operator (the railway national link). After due notice and negotiations the BTRC will revoke the NTTN licenses and replace them with the new common Facilities License. The Bangladesh Railway will receive a new common Facilities License as with the other operators. Because of the ILDTS Policy and other policies, the common Facilities License will contain schedules authorising who may operate international telecommunications gateways, inter-operator transit switches and who may interconnect with such operators. The current NTTN licenses prohibit the supply of telecommunication services to end-users so a schedule will be attached to the new common Facilities License to capture this prohibition.

102. Similarly a transition path for the wholesale operators can be illustrated by the example of an IGW operator that holds an IGW license, under the ILDTS Policy. After due notice and negotiations, BTRC will revoke the IGW license and replace it with the new common Facilities License. However, because of the ILDTS Policy, the common Facilities License will contain schedules authorising which parties may operate an international gateway. Under existing policies, current licensed IGW operators will be the only ones under the new common Facilities License able to provide IGW services. As policy develops and changes over time, possibly as an outcome of a sector review, following proper notice and good faith negotiations, schedules can be amended and/or revoked as required without the need implement a new common Facilities License.
103. In respect of ANS licenses, the example of Grameenphone illustrates the transition. The company currently holds two ANS licenses, a Cellular Mobile Telecom License due to expire in November 2011 and an Internet Service Provider Nationwide License due to expire January 2010. It holds permits to lease capacity to third parties. After due notice and appropriate negotiations the BTRC will revoke Grameenphone's two ANS licenses and replace them with the common Retail Services License. Permits issued for non-ANS services will fall within the new common Retail Services License (where these are retail services) or the new common Facilities License (where these are wholesale services). Each cellular mobile telephony operator will need the new Facilities License conferring rights and obligations in respect of their current system.

3.4.5 Common Features

104. The common feature of all the transitions proposed above are due notice, meaningful negotiations, existing rights preserved by the new licenses and schedules and greater flexibility to offer new services by empowering the offering of facilities and services respectively to all wholesale or retail users not prohibited by existing policies.

3.4.6 Preliminary Migration Recommendations

105. From the consultations undertaken so far the Consultant is certain that the BTRC has the capacity and the resources to undertake the transition effectively. In accordance with international best practice, the BTRC may wish to appoint internationally expert advisers to supplement its own team.
106. In addition to preparing the administrative resources to undertake the transition, the BTRC should adopt the following outline of a migration strategy:
- Issuing new licenses in the middle of a conversion to ULR is inconsistent, so there shall be an immediate cessation of all current license award processes until ULR is implemented,
 - The proposed Unified Licensing Regime should incorporate anti-competition provisions, such as Significant Market Power (SMP), pending the introduction of any proposed anti-competitive regulations promulgated by the BTRC,
 - The proposed Unified Licensing Regime be designed so that it can accommodate future policy, in particular taking account of the reviews to ILDTS policy, wider ICT Sector Policy, and the proposal to issue additional licenses at the inter-operator level,
 - The ULR process is appropriately resourced, including the appointment of international expert advisers to assist the transition process,
 - The BTRC create a fully resourced project team dedicated to the ULR Process led by a programme director in accordance with international best practice.

3.4.7 Negotiation Guidelines

107. In addition to adopting the above suggestions regarding the framework for the transition, the actual conduct of negotiations should be guided by the following principles:

- Negotiation objectives with current licenses should include the incorporation of the principles of simplicity, consistency, non-discrimination, flexibility and equity in the final licensing outcomes,
- To achieve this end, the draft common Facilities License and common Retail Services License should be circulated to all affected license holders,
- Reasonable time should be given to the stakeholders to review and make meaningful and helpful comment on draft common Facilities License and common Retail Services License
- Stakeholders will need copies of a complete report describing the operation of the ULR, and draft common Facilities License and common Retail Services License, including schedules tailored to the needs of each individual license holder,
- The Law provides at least 15 days for the license holder to respond (Section 39) Telecommunications Act 2001, but the BTRC should anticipate considerably longer periods for responses,
- Based on responses the BTRC may want to engage in a further round of drafting and discussions,
- The BTRC will negotiate with each licensee final terms and schedules to be attached to the respective common Facilities License and common Retail Services License
- The BTRC will need to revise its licensing guidelines to remove conflicts with the new structure.

4

Anticipated Outcomes

4. Anticipated Outcomes

4.1 Questions about ULR

Topic	Questions	Responses
Impact of ULR	<ul style="list-style-type: none">Bangladesh has achieved strong growth in telecommunications over the last five years, introducing a ULR may run the risk of jeopardising these gains.	<ul style="list-style-type: none">An impact assessment would need to be performed during the detailed implementation. At this stage the best that could be achieved is a qualitative impact assessment noting the advantages and risk factors (disadvantages).The impact assessment would also consider how ULRs have performed in other countries.
Examples of ULR in Operation	<ul style="list-style-type: none">We need examples of ULRs in practice; how they are applied and the issues tackled by the regulators and operators.	<ul style="list-style-type: none">The consultant has reported on the ULRs results in other countries and this will be amplified in the draft and final reports. The consultant will assess practical issues over conceptual issues. Assessment of time taken to implement will be attempted. Appendix 1 provides more detail.
Number of Licenses	<ul style="list-style-type: none">If Mobile, PSTN, ISP and BWA all get service licenses there will be many ANS operators.	<ul style="list-style-type: none">Many operators have two licenses at present e.g. PSTN and ISP. One Retail Services license will cover ALL services. The total number of ANS licenses should be less than at present.
Achievements of ULR	<ul style="list-style-type: none">What have other countries achieved by introducing ULR?	<ul style="list-style-type: none">Simplicity, flexibility – essentially the principles we have outlined.
Reaction of Investors	<ul style="list-style-type: none">Need to assess carefully the reaction of investors, has this been done?	<ul style="list-style-type: none">1st round stakeholder consultation revealed endorsement with questions in respect of timing and process

Topic	Questions	Responses
License Fee Principles	<ul style="list-style-type: none"> How do we propose to apply licence fees? 	<ul style="list-style-type: none"> In accordance with the current Act, fees must be based on (cost recovery) and revenue neutrality (achieve revenues currently raised).
Revenue From the Sector	<ul style="list-style-type: none"> How will the ULR affect revenue in the sector? 	<ul style="list-style-type: none"> ULR should stimulate more investment, services and traffic, therefore more revenue. ANS enterprises will need two licenses not one (Facilities and Retail Services).
Infrastructure and Teledensity	<ul style="list-style-type: none"> What impact might it have on infrastructure rollout and teledensity? 	<ul style="list-style-type: none"> Investment effect ought to stimulate more infrastructure rollout and greater efficiency in infrastructure planning. If the private sector welcomes ULR in practice as well as in principle, it should stimulate teledensity
Existing ANS licenses	<ul style="list-style-type: none"> Should all existing ANS operators get licenses? 	<ul style="list-style-type: none"> Yes. There is no choice. However, convergence will provide more choices. Successful operators will expand, less successful will shrink or leave. BTRC will continue to control the issue of new licenses.
Anti-Competitive Conduct	<ul style="list-style-type: none"> How does the ULR deal with anti-competitive conduct, both its application and threat? 	<ul style="list-style-type: none"> The two proposed licenses will each contain sections applying the concept of dominance or Significant Market Power (SMP). This will have two effects: <ul style="list-style-type: none"> BTRC can apply existing remedies and sanctions in the event of prohibited conduct; Through the operation of the proposed ex ante remedies regime (i.e. the SMP Test) – BTRC can impose additional obligations (e.g. greater transparency) on an operator in the event it is found to hold a dominant position (it has significant SMP) and is exercising that SMP inappropriately.

Topic	Questions	Responses
Determining the Number of Licenses	<ul style="list-style-type: none"> How do you determine the number of licenses? In particular will all holders issued with the Retail License be able to provide mobile cellular services? 	<ul style="list-style-type: none"> There will only be 2 licenses – Facilities and Retail Services. The number of licensees will be determined by the market – save for separate licenses for radio spectrum issued under the Wireless Telegraphy Act and other legal constraints. All Retail Service licensees will, in principle, be able to offer cellular services. In PRACTICE the limitation on spectrum awards will limit the number of mobile operators. BTRC can adopt a policy with respect to the awarding of additional spectrum.
Excluded Categories	<ul style="list-style-type: none"> Explain and describe the excluded categories, what are the licenses? 	<ul style="list-style-type: none"> The excluded categories are 7 in total (VSAT user, call centres, vehicle tracking). These services are not central to the development of the sector and the Commission may continue with its current licensing policy with regard to these services or adopt a registration scheme. We recommend registration, a simpler form of keeping some oversight so that the Commission can focus on its main functions.
Length of Transition	<ul style="list-style-type: none"> The Consultant's project must end by 31 December 2009, but that the ULR process will continue into 2010. 	<ul style="list-style-type: none"> Agreed. Barrister Stevens pointed out that a similar process in New Zealand took several years to complete. Essential elements should include: <ul style="list-style-type: none"> advanced warning of all proposals for each licensee, detailed options, genuine consultation and plenty of notice for companies to adjust their businesses.

Topic	Questions	Responses
What will happen to Self-Supply?	<ul style="list-style-type: none"> There are too many ANS operators with Self Supply at present. What will happen to self-supply by ANS operators? 	<ul style="list-style-type: none"> All existing PSTN and Mobile Licenses give the operator the right to self-supply presently. A principle of migration is that no one should be worse off, therefore, they must have a Facilities License for self-supply. However, ULR could give BTRC tools to help it resolve the problem.
Integrate Self-Supply into ULR	<ul style="list-style-type: none"> How to integrate self-supply into the ULR? 	<ul style="list-style-type: none"> With a separate Facilities License BTRC can have greater control over the roll out of facilities, it can: <ul style="list-style-type: none"> choose an appropriate mix of Service and Facilities licences from time to time, negotiate conditions on Facilities License renewals, and extensions, discourage extensions where there is adequate capacity in place, insist on disclosure of existing capacity.
Similarity with Malaysia and Singapore	<ul style="list-style-type: none"> Noted that the recommendation bore a resemblance to the Malaysian and Singapore models of ULR. 	<ul style="list-style-type: none"> Agreed. There are similarities, but each country has to adopt slightly different designs to cope with the differing histories and practices.
Market Definition	<ul style="list-style-type: none"> How does the ULR deal with market definition? 	<ul style="list-style-type: none"> Adopting the concept of SMP necessitates market definition. The consultant proposes the adoption of best practice and recommend the use of the hypothetical monopolist test (or SSNIP - Small but Significant Non-Transitory Increase in Price test). The EC Three Criteria test for market suitable for ex ante regulation shall also be described and recommended: <ol style="list-style-type: none"> entry barriers, dynamic effects, sufficiency of competition law.

Topic	Questions	Responses
Consultation	<ul style="list-style-type: none"> Stakeholders and current licensees need sight of the two ULs proposed 	<ul style="list-style-type: none"> Agreed.
Indian Approach	<ul style="list-style-type: none"> How similar is it to the approach taken by TRAI in India? 	<p>In a number of respects the proposed approach is similar. The principal similarity is that both involve a common Facilities License and a common Retail Services License. The principal difference is that India does not have any equivalent of an ILDTS policy. Operators can use their own gateways for example and use of ICX is voluntary. This is not possible in Bangladesh so the model has been modified to take account of this and other differences.</p>

5

Appendix

5. Appendix

Appendix 1: Examples of ULR in Other Countries

Country	Drivers for Multi-Service ULR	Measures	Impact on Tariffs	Impact on Investment	Impact on Services Quality	Comment
Argentina ⁹	State owned utility privatised as monopoly, liberalised	2000, Argentina introduced a UL authorising all services, whether FL or mobile, line or wireless, local or international, with or without infrastructure. Spectrum obtained separately.	Initial fall in tariffs. However, uneconomically low price controls undermined finances of the companies	Affected by general economic collapse. Strict price controls inhibited inward investment.	ULR resulted in improved and deepened services.	Infrastructure is modern and fixed-line (FL) teledensity high. Incumbents, dominate FL. Long distance (LD) is a competitive market; VoIP strong.
Bhutan ¹⁰	Telecommunications is a new industry in a country with few communications and no national network.	Converged regulatory framework since 2006. InfoComm & Media Authority as regulatory body.	Tariffs are low, but so are incomes.	Not much foreign investment in a crowded and very small market.	Convergence Policy sees FL teledensity from 2.8% in 2002 to 5.9% in 2004. Mobile teledensity 42% since 2003.	Neighbouring country. Very small market but spectacular increases from a small base.
Botswana ¹¹	To open market to effective competition and efficient operation. To create compatibility to full liberalisation	Platforms, deploying advanced technologies, carrying all forms of communication: FL mobile, voice, data etc	Local FL increased, off-peak decreased with discounts. LD decreased average 11% to Europe and 17% to America.	Two mobile companies are joint Botswana and foreign owned.	High quality services and wider range of services becoming available	The regulator in Botswana is ranked world class and praised for multi-service policy 12

⁹ <http://www.ictregulationtoolkit.org/en/PracticeNote.3121.html>

¹⁰ Bimal Suberi presentation at Strengthening ICT Policies and Applications to achieve MDGs and WSIS goals in the Asia and the Pacific 21-22 November 2009 - UNESCAP, Bangkok

¹¹ <http://www.ictregulationtoolkit.org/en/Publication.3398.html>

Country	Drivers for Multi-Service ULR	Measures	Impact on Tariffs	Impact on Investment	Impact on Services Quality	Comment
Chile	Market is still characterised by service specific regulation although entry liberalised and competition introduced.	Gradual move to liberalise the sector. As of 2005 multi-services licensing applied only at the services level.	Lowest prices in the parts liberalised, e.g. international. Several companies offering triple play (telephone, internet and TV).	Investment levels are high driven by political stability and strong institutions.	Qualities of services are good in those aspects of the market liberalised.	Internet and broadband penetration rates are the highest in South America. VOIP and triple play established. ¹³
Hong Kong¹⁴	Three consultations in Hong Kong showed general support for multi-service Unified Carrier License (UCL)	Validity period of 15 years for all types of services which may be authorized under the license.	Tariffs in Hong Kong among the lowest. Benefit sought is services and quality	Substantial inward investment has continued.	Too early to analyse impact, but overall reaction to the policy is positive	Big issue is the validity period of license and rules. Multi-service system works well.
India¹⁵	Disputes between FL and Mobile over use of fixed facilities offering mobile calls was the driver of change.	India introduced a Unified (multi-service licence system). Unlike Bangladesh, India already liberalised inter-operator services.	Innovations have reduced the cost of ownership of mobile phones. Increase in subscribers driven by lower cost of buying handset.	No adverse impact on investment. Over seven operators in each zone and five new operators to start in the near future.	India is now acknowledged as a leading country for ICT services.	India is the now the second largest for mobile subscribers 32% teledensity adding 10-12 million subscribers per month.
Malaysia¹⁶	Driven by the 2020 Government Policy in favour of an innovation driven IT sector. Policy focused on technology convergence.	1998 MCMC Act set out a framework that has served as a model for convergence policies in many countries. Standard licenses with special conditions.	Between years 1999-2002 seven operators rationalised into 3. Reduced tariffs.	Too many licenses for mobile led to ad hoc market and several government bail outs by savings funds.	52 % teledensity. However, broadband is very small and fixed line has ceased to expand due officially sanctioned monopoly.	Close link between Malaysia Telecom and the government inhibited policy. No competitors in the local loop. TM moving into wholesale and retail divisions

¹² <http://www1.american.edu/initeb/jn9779a/regulatory/index2.shtml>

¹³ <http://www.totel.com.au/argentina-telecommunications-research.asp>

¹⁴ <http://www.ofta.gov.hk/>

¹⁵ <http://www.telecomcircle.com/2009/06/india-telecom/>

Country	Drivers for Multi-Service ULR	Measures	Impact on Tariffs	Impact on Investment	Impact on Services Quality	Comment
Singapore ¹⁷	A competitive telecoms market built over 3 decades. Its location and infrastructure an opportunity. One of the first countries with a fully digital telephone network.	Government's strong commitment to and bold action in the ongoing deregulation of the industry. FBO and SBO system. Multi-service licensing since 2000.	Tariffs are low and continue to fall, driven by competition from VoIP	No restrictions on foreign investment. No shortage of investors.	+74% of households own computers, +60% broadband +90% FL. Mobile penetration +100%, Early adopters of technologies.	Bold policy to encourage competition to SingTel provided the impetus for the development of the sector.

Summary

All the countries listed above have introduced variants of convergence regimes and multi-service licensing (as opposed to service specific). India and Argentina call these ULs.

The benefits of Argentina's policy have been undermined by unrealistic price controls. Malaysia's system and broadband rollout are affected by protection for the incumbent, but the country has seen vigorous mobile competition after the number of companies has reduced.

Singapore has advanced mainly because of multi-service liberalisation introduced to enhance competition and greater efficiency.

India has focused on reducing the cost of purchasing a new handset. This has led to +30% teledensity, similar to Bangladesh, with an increase in subscribers: adding 10-12 million per month.

¹⁶ http://www.ndaventures.com/Malaysia_Telecom_Brief.pdf

¹⁷ <http://www.nzte.govt.nz/explore-export-markets/market-research-by-industry/Information-and-communication-technologies/Documents/Telecom-market-in-Singapore.pdf>