

ISSUES FOR CONSULTATION

Overview of Telecom Infrastructure

6.1 Do you agree with the classification of infrastructure elements described in this chapter? Please indicate additions/modifications, if any, particularly where you feel that policy interventions are required.

The regulator has classified telecom infrastructure on the basis of type of network, into following categories:

- Fixed Network
- Mobile Network
- Broadband Network
- Long Distance Network
- IP Network

Regulator has from time to time intervened to finetune any policy issues related to these networks. Moving forward, we are of the view that regulator should make necessary framework to advocate infrastructure sharing amongst various service providers. Sharing of infrastructure would ensure that unnecessary burden is not imposed on service providers i.e. infrastructure users as well as cost of infrastructure will stay in check. This will in turn ensure pricing of services to stay in control which eventually would be beneficial to end-consumers.

Internet Exchange Point

6.3 Do you perceive the need for effective Internet exchange point(s) in the country to efficiently route domestic IP traffic?

6.4 If your answer to issue in 6.3 is in affirmative, please comment on the licensing framework of the entities for setting up Internet.

(Combined response to 6.3 and 6.4)

Yes, we are very much in favor of setting up internet exchange points in India. This will help routing of domestic traffic thereby saving on cost of using international bandwidth. Such measures would eventually help bring down usage price for end-consumer, thereby making its usage more acceptable.

We have noted that NIXI has tried to persuade and government has tried the strategy of lead by example for ISPs to connect to NIXI nodes (IXPs). Licensing framework should be reasonably modified so as to

instead of recommending connecting to IXPs, it should be made mandatory to connect via IXPs. This must especially be made compulsory for top-level ISPs that may be streaming/carrying traffic of lower level ISPs. Moreover, there should be compulsory acceptance of routes at IXPs. Regulator must also ensure that IXPs follow QoS in line with that laid down and followed by ISPs to ensure that service is not degraded and/or unduly affected for ISPs by routing traffic via IXPs.

Exchange Points in India

6.5 Will it be desirable to permit those Unified licensees to setup IP exchange points in the country who have no vested interest in routing of the IP traffic?

IXPs form a part of network infrastructure. We are of the view that setting up of IXPs should fall under the preview of infrastructure license. Any independent entity (whether government or non-government) should be allowed to set-up IXPs. However, to avoid undue manipulation of internet traffic, such entity should not be allowed to provide any other type of telecom service. However, existing telecom infrastructure companies should be promoted to set-up IXPs thereby providing comprehensive infrastructure solutions to its client base.

Mobile Virtual Network Operator

6.6 Please give your comments on the changes proposed in para 3.5 of Section C of Chapter 3.

We have always supported that a plain vanilla license should be mandatory for service providers to obtain before provisioning of services. Medium of providing service should be separately purchased/rented by the service provider. Hence, a unified licensee should be permitted to operate as MVNO only in the circles in which it does not have spectrum. Once a licensee owns spectrum he ceases to act as MVNO. However, this modification may cease to exist once spectrum sharing is permitted by regulator.

To a customer, MVNO is a full-fledged service provider and is front end for consumer delight/grievance. As such, MVNO must fulfill all the criteria such as QoS, continuity of service, etc as applicable on service providers. MVNOs must also ensure continuity of services and national security aspects while providing services to its customers.

Internationally, MVNO follow various business and infrastructure models. We are of the view that it must be left to MVNOs to decide the

business model best suited to its objectives. MVNOs must be permitted to take care of billing, customer care, value added service provision and infrastructure to the extent of having its own MSC. However, it must be ensured that MVNOs does not access MNO's spectrum- both directly and indirectly.

MVNO concept is based on buying of minutes and then retailing with value added services to end-user. This concept does not call for restricting number of providers providing targeted services. A MNO as long as it has adequate infrastructure to share must be allowed to associate with any number of MVNO. But a MVNO can be associated with only one MNO. This will ensure that MVNO does not undertake arbitrage.

MVNOs must be treated as value added service providers. Since, MVNOs buy air-time from MNOs and charges only for additional services provided by it, MVNOs must not be charged for minutes or spectrum usage. Regulator must ensure that double taxation is not levied on MVNOs.

MVNO does not provide mass services but focused services. Also, MVNO is not involved in setting up of network infrastructure. As such, concept of roll-out obligation is not applicable on MVNO. Hence, issue of MNO taking into account the roll-out done by MVNO does not arise.

In- Building Solutions

6.7 What methods would you propose for reduction of the number of towers?

Telecom towers forms an integral part of wireless network infrastructure. Moreover such towers are expensive to build and operate for any service providers. To reduce number of towers, regulator must put few checks in place such as:

- regulations to ensure that every tower should transmit signals for minimum 5 or 6 service providers. Differential or steep pricing by tower companies should be avoided that may force service providers to set-up separate towers
- Tower design must support hosting of extra antenna equipment
- use of new technology antennas systems having better range and signal strength
- Some mechanism to allow having multiple towers in every cell node area in the same plot of land. This may not substantially reduce number of towers in actual sense but concept of cluster of towers will ensure that other disadvantages such as aesthetics and radiations are being taken care of to a large extent.

6.8 In what ways do you think that IBS can be encouraged for better in-building coverage, better QoS and reduction in level of radiated power from Macro cell sites?

6.9 How can sharing of IBS among service providers be encouraged? Does TRAI need to issue any guidelines in this regard?

(Combined response to 6.8 and 6.9)

One way to ensure good coverage and capacity inside a building for mobile networks is In-Building Solution (IBS). IBS should be encouraged to ensure that signals from macro cell site effortlessly reach inside a building. IBS primarily works on the concept of repeaters. For the upcoming office/commercial spaces, it should be made mandatory to have IBS in place. This will enhance connectivity while ensuring undue pressure on service providers to ramp-up network infrastructure is not created. Moreover, regulator must ensure that IBS should be such that it receives, amplifies and transmits signals from all service providers available in the circle. Regulators should come up with separate guidelines for IBS. Regulator may also look at reserving small spectrum band for provisioning of IBS.

Distributed Antennae Systems

6.10 Do you agree that innovative technologies such as 'Distributed Antenna System' (DAS) can be effectively utilised to reduce number of towers and migrate towards tower-less cities?

6.11 What are the impediments in adoption of new technologies such as DAS and how can these be removed?

(Combined response to 6.10 and 6.11)

We are fully in support of innovative and new age antenna systems such as Distributed Antenna Systems, Long range Antenna Systems, hosting of multiple service providers on single tower, etc to reduce the number of towers. We do not foresee any impediments in adoption of newer technologies especially when it leads to saving of capex and opex for service providers. However, artificial impediments may be cited by sellers of conventional equipment manufacturers.

Standardization of Tower Design

6.12 Would you agree that the design of towers can and should be standardised?

6.13 If yes, how many different types of towers need to be standardised?

6.14 What are the important specifications that need to be included in these standards?

6.15 Which is the best Agency to standardise the tower design?

(Combined response to 6.12, 6.13, 6.14 and 6.15)

Telecom towers form an integral part of mobile infrastructure. We are of the view that it is essential on part of authorities to prescribe standard specifications regarding towers. Minimum qualifying criteria such as tower height, width, design, strength of material and structure, number of antennas, wind load, etc should be prescribed the authorities. Centers of engineering excellence such as Structural Engineering Research Centre, Chennai, Indian Institute of Technologies (IIT), etc should be the nodal agencies for qualifying and grading tower designs and inspecting tower structures for future.

Reducing Visual Impact of Towers

6.16 What is the likely cost of camouflaging the towers?

6.17 Can camouflaging be made mandatory? If so, can this be made part of the design standards of the towers?

(Combined response to 6.16 and 6.17)

Rapid growth of wireless and mobile technology has stimulated development of telecommunication infrastructure in India. Installation of telecom infrastructure, in particular BTSs has resulted in environmental problems. Moreover, rapid construction and erection of cell towers has resulted in formation of tower-jungles. Such tower-jungles are eye sore and no measures are being taken to control this.

We are of the view that camouflaging of towers should be made mandatory. Towers should not be visible disrupting the aesthetics of the nearby area.

Clearances From Local Authorities

- 6.18 Do you consider that the existing framework of different civic authorities to grant permission for telecom towers is adequate and supportive for growth of telecom infrastructure?**
- 6.19 Is there a need to set-up a single agency for approval and certification of towers? Is there an existing agency that can do this work? If a new agency is proposed, what should be its composition and framework?**
- 6.20 Is it feasible to have a uniform framework of guidelines including registration charges, time frame, single window clearance etc for granting permission for installation of telecom towers and laying of optical fibre cables? If so, can it be prescribed by the Licensor or the Regulator?**
- 6.21 What can be an appropriate time frame for grant of permission for erection of towers?**
- 6.22 How can a level playing field be ensured for telecom service provider's vis-à-vis other utility service providers especially in reference to tower erection?**
- 6.23 Which agency is best suited to inspect the buildings and certify the structural strength of the buildings in case of roof based towers?**

(Combined response to 6.18, 6.19, 6.20, 6.21 and 6.22)

Existing framework and process followed by civic agencies is quite cumbersome and time consuming. We are of the view that a single window clearance entity should be set-up to take up all the matters related to installation and operation of towers with various civic bodies. Tower companies should apply to such agency which in-turn will seek approvals/permission on behalf of tower companies. All the civic bodies should revert within 30 days of receipt of application with their decision alongwith reasons for denial.

Given the wide and varied geography of India, we do not think that it would be advisable to put a threshold or cap on fees charged by civic bodies. A prime location in a metros central business district will certainly demand higher fees than a residential area in suburb. It will not be fair to municipal and other bodies if regulator set fees on their behalf.

Centers of engineering excellence such as Structural Engineering

Research Centre, Chennai, Indian Institute of Technologies (IIT), etc should be the nodal agencies for qualifying and grading tower designs and inspecting tower structures for future.

Infrastructure sharing

6.24 Should sharing of mobile towers be mandated?

6.25 Should sharing of active infrastructure, created by themselves or infrastructure providers, be allowed?

(Combined response to 6.24 and 6.25)

We are of the view that regulator must ensure conditions conducive to ensure sharing of infrastructure. Sharing of infrastructure will help in lowering stress on service provider's resources to ramp-up infrastructure as well as lower usage cost for end-consumers. Sharing of mobile towers and fixing base value for number of service providers hosted on a tower should be made compulsory by the regulator. Sharing of all the components of telecom infrastructure (whether active or passive) except spectrum whether set-up by service providers themselves or via infrastructure providers should be permitted. Moreover, regulator must ensure that circumstances conducive to such sharing is ensured.

IPv6

6.27 What measures are required to encourage the deployment and adoption of IPv6 in the country?

6.28 In your opinion, what should be the timeframe for migration to IPv6 in the country?

(Combined response to 6.27 and 6.28)

We fully support government's take on 'lead-by-example' for deployment and adoption of IPv6 in India. Timeframe given in 'National IPv6 Deployment Roadmap' are reasonable. However, give the fact that top-level IP addresses are already over, government must stringently follow timeframes of Roadmap at the same time making it mandatory for top-level ISPs to shift to IPv6 within a period of 18 to 24 months.

IPTV

6.29 What measures do you suggest to enhance provision of IPTV services by various service providers?

6.30 Should there be any restriction on ISPs for providing IPTV services?

(Combined response to 6.29 and 6.30)

IPTV is an example of convergence of broadcasting and telecom networks. We are of the view that ISPs should be allowed to provide IPTV services. Since core network of ISPs is usually shared, regulator may look at reducing network requirements. However, since ISPs will become key interface for end-consumers, maintaining network requirement will ensure seriousness and continuity of services on behalf of ISPs.