# Annexure A

## Idea Cellular Submissions on TRAI's consultation paper on "Delivering Broadband Quickly: What we need to do?"

Idea Cellular appreciates the opportunity to respond to TRAI's consultation paper on "Delivering Broadband Quickly". India's broadband penetration of ~5% is significantly below international standards[1]. It has been globally established that 10% increase in broadband penetration leads to~ 1% increase in GDP[2]. However, India broadband growth has been hampered by several impediments, notably low fixed line penetration in the access network, insufficient availability of fibre backhaul networks, insufficient availability and high cost of spectrum, limited content hosting and domestic internet peering in India and lack of sufficient domestic content and applications to drive consumer demand. Hence, the consultation paper is very timely in defining an approach to increasing India's broadband penetration and thereby playing a crucial role in the development of Digital India.

**Mobile will drive broadband penetration in India**

Idea Cellular believes that mobile networks are the best positioned to meet NTP objectives of 175 million broadband subscribers by 2017. As per TRAI's consultation paper, mobile wireless subscribers accounted for 92% (232 million out of 251 million) of total internet subscribers, and mobile broadband subscribers accounted for 75% (46 million out of 61 million) of total broadband subscribers.

GSMA[3] expects Indian smartphone connections to increase from 111 million in 2014 to 694 million by 2020 and for India to be the second largest smartphone market in the world after China.

Ericsson[4] forecasts mobile broadband subscribers to increase from 70 million in 2013 to 600 million in 2020, driven by both increasing network coverage (3G to reach ~90% population coverage and 4G to reach ~45% population coverage by 2020) as well as significant reductions in smartphone pricing.

[1] 61 million subscribers as of March 31, 2014 as per TRAI Consultation Paper
[2] World Bank, EIU
[3] "Smartphone forecasts and assumptions:2007-2020", September 2014
[4] "Broadband in India: Realizing the Vision", Ericsson White Paper, October 2014

This exponential increase in mobile broadband subscribers is being driven by significant investments by mobile network operators in expanding the reach of 3G (and soon 4G) services, reductions in device pricing due to economies of scale (especially in globally harmonised and standardised 3G and 4G spectrum bands), as well as low mobile data pricing (at less than half a cent per MB, this is arguably amongst the lowest in the world). Based on current trends and forecasts around smartphone growth, network coverage expansion and low pricing, it is our view that mobile networks will play by far the leading role in significantly increasing India's broadband user base.

**Key requirements to support growth of mobile broadband**

In order for mobile networks to meet India's broadband objectives, we believe the following are the critical requirements in this regard:

### *A. Spectrum availability*

We believe that India urgently requires more spectrum especially in globally adopted bands of 2100 MHz for 3G services and 1800 MHz for 4G services. These are globally harmonised and standardised bands with a well developed ecosystem. Specifically:

i. Need to provide yearly roadmap for availability of additional spectrum for next 5 years
ii. Immediately harmonize existing spectrum allocations in 900/1800 MHz
iii. Make available additional 2100 MHz at the earliest
iv. Allocate complete spectrum in service areas where only partial spectrum has been allocated
v. Immediately allow spectrum sharing and trading to enable optimal utilisation of spectrum
vi. Availability of internationally harmonised spectrum bands through large contiguous blocks
vii. Optimize spectrum pricing framework
viii. Policy for allocation of Microwave RF carriers including the release of E-band

### *B. Low cost devices*

Device (smartphone, tablet and dongle) pricing is likely to continue to decline given economies of scale especially in standardized bands such as 900 MHz and 2100 MHz for 3G, as well as 1800 MHz for 4G. Government can consider incentives for local manufacturing of devices which can further result in device price reduction.

### *C. Access to fibre backhaul networks*

One of the major requirements for wireless technologies to provide Broadband is the need for an extensive and robust Fibre based backhaul. If on 5 MHz of LTE, peak speeds of 45 Mbps have to be provided then atleast 45 Mbps of backhaul is required. With the current backhaul possible through Microwave, every 4$^{th}$ or 5$^{th}$ site would need to be a fibre POP. Considering the number of sites required in major cities to provide good RF coverage, the requirement of fibre becomes huge especially in the urban areas. One of the major impediments faced by mobile operators is access to fibre backhaul networks, both due to insufficient supply as well as high costs of rolling out new fibre networks. For setting up new fibre networks, it is our belief that Right of Way (RoW) policy guidelines and implementation should be uniform across all states and clear and transparent. In fact, the telecom/broadband targets for a given state should be linked with support given for Right of Way, to incentivize State Governments towards faster approvals.

### *D. Domestic internet peering*

Low domestic peering is essentially due to the fact that it is not mandatory for all ISPs to connect to NIXI and advertise all routes. Also, NIXI does not have sufficient infrastructure to meet QoS requirements of service providers. Making it mandatory for all ISPs to connect to NIXI and enable access to all content will play a major role in reducing costs for mobile operators and thereby increasing broadband penetration.

### *E. Development of local content and applications relevant to Indian market*

We believe that lack of local content and applications is due to lack of sufficiently large market for content providers and application developers to invest in this development. As broadband penetration increases, we believe there will be significant growth in this area, as already being witnessed in areas such as messaging, social media, online shopping and ticket bookings through smartphones. Further, Government initiatives to digitise services and enable access to government services will play a major role in demand generation.

**Our detailed response to the questions in the consultation paper is as under:**

***Q1. What immediate measures are required to promote wireline technologies in access networks? What is the cost per line for various wireline technologies and how can this cost be minimised? Please reply separately for each technology.***

Wireless broadband currently comprises ~75% of broadband subscriptions whereas wireline technologies such as DSL, cable and FTTH comprise ~25%. The share of wireline broadband is reducing year on year as consumer adoption of wireless technologies has been significantly greater than wireline. Given high cost of rolling out fibre access networks, limited availability of copper in the access network and high capex requirements for upgrading the Copper and cable networks, it is our view that wireless technologies will be the primary driver of broadband penetration in India.

FTTH is basically dependent on OFC deployment, which is severely constrained due to high ROW charges. Any large scale FTTH deployment will require significant funding from the Government, as has been done in countries whose examples are given in the CP. Unless such funding is forthcoming, FTTH is likely to remain a premium service limited to high-end residential developments in select cities.

***Q2. What are the impediments to the deployment of wireless technologies in the access network? How can these deployments be made faster? Please reply separately for each technology.***

Wireless has the advantage of faster deployment and wider coverage but is limited by the speed it can provide. This in turn is dependent on the availability of the spectrum. With the limited spectrum that is available in India, the speeds visualized by DoT and TRAI of 2 Mbps in the short term cannot be provided.

As highlighted earlier, the following steps need to be taken at the earliest to ensure spectrum availability:

i. Need to provide yearly roadmap for availability of additional spectrum for next 5 years.
ii. Immediately harmonize existing spectrum allocations in 900 / 1800 MHz.
iii. Make available 2100 MHz at the earliest.
iv. Allocate compete spectrum in service areas where only partial spectrum has been allocated.
v. Immediately allow spectrum sharing and trading to enable optimal utilization of spectrum.
vi. Availability internationally harmonized spectrum bands through large contiguous blocks.
vii. Optimize spectrum pricing framework.
viii. Policy for allocation of Microwave RF carriers including the release of E-band.

**Need for urgent harmonization**

The spectrum allocation to the Operators at present is in a very fragmented manner, because of which operators cannot enjoy spectral efficiency that contiguous spectrum provides. Also contiguous spectrum is essential for launching new technologies like 3G and 4G. Another advantage of harmonisation would be that some additional contiguous blocks could be created and auctioned.

Moreover, BTS equipment supplied by vendors have an Instantaneous Bandwidth (IBW) of 35MHz in the 1800 MHz band. Thus operators are not able to use the spectrum allocated to them when it is spread over more than 35MHz by use of a single BTS. They perforce have to deploy two BTS to use the total spectrum allocated to them. Case in example is the spectrum allocated to Idea Cellular in Delhi where the two blocks of 1800 MHz spectrum allocated to them have a separation of over 62 MHZ.

We therefore feel that there is an urgent requirement to carry out harmonisation so as to get maximum contiguous spectrum for launch of new technologies. For this we feel following actions need to be taken upon priority.

a. Declaration of the Defence Band for 1800 MHz as planned.

b. Based on this, readjustment and harmonisation of spectrum. This should include both the administratively allocated spectrum and the spectrum won in auction. It may be noted that the use of the administratively allocated spectrum for new technology would still be governed by the DoT.

c. COAI has already made detailed suggestions LSA wise for the harmonisation of spectrum for all Operators to the DoT even before the Feb 14 auctions. We strongly recommend that this be done before the proposed renewal auctions, as it would result in some additional contiguous spots in 1800 MHz being available for the next auction.

d. Another benefit of creating the Defence Band would be that all the partial spectrum allocations in the Feb14 auction and even the administered spectrum, would get regularised and available across the LSA.

**A similar activity needs to be carried out in case of 900 MHz, where we find some 200 KHz gaps in the allocation of spectrum to BSNL. If these users are shifted to one end of the 900 MHz spectrum then an additional contiguous spectrum in 900 MHz would be possible.**

**Need for rationalizing taxes and duties**

1. Usage of spectrum results in payment of SUC to the Government. As mobile broadband penetration increases, this will result in more spectrum requirements by operators, which in turn will result in higher SUC charges. In order to promote broadband penetration, SUC should not be linked to amount of spectrum used and should be a flat charge.

2. Government has levied 10% customs duty on telecom equipment used for LTE in Budget 2014. As LTE is likely to be an important technology for broadband penetration, this increase will result in higher input costs for operators leading to higher costs for consumers, which in turn will be a deterrent for increasing broadband penetration. We believe this additional levy should be done away with.

**Wireless technologies are the best means to provide last mile connectivity to customers, and need to be supported by fibre backhaul networks for onward connectivity to national and international backbones.**

**Licensed Wireless Technologies**: - Typically the 3G & 4G technologies are data oriented technologies which can be used for leveraging the expansion of broadband penetration. However the current nature of the spectrum allocations with fragmentation leave little options open. Most technologies would require spectrum in excess of 10MHz or beyond to address such needs. 3G would require around 10-15 MHz/Operator to realistically address such needs. Similarly, 4G with 20 MHz (FDD) would perhaps be a realistic approach to address the broadband segment.

**Unlicensed Wireless technologies**: - Due to the sheer nature of the USM band these technologies are useful only in localized area of about 50-100mtrs. This technology is not pursued globally for home broadband & used pre-dominantly for indoor hotspot applications and data offloads. It can be used selectively in cities to supplement other wired broadband technologies coverage gaps.

Large scale deployment in unlicensed band is un-realistic and should not be considered, as with the limited band available, if the number of Service Providers increase, then there will be a lot of interference and telecom grade services would not be feasible.

Apart from the Wireless Spectrum availability, another big factor which needs to be addressed for the deployment of these wireless technologies is “Connectivity/Backhaul”. Typically broadband speeds requiring 2Mbps per user would require fibre presence very close to subscriber, roughly around 300-400mtrs from the

subscriber density zones in cities and around 1-2 km for rural areas. This will in turn mean the huge investment layouts in terms of fibre deployment almost to the vicinity of each small population zones.

There needs to be some incentive mechanisms and cost-sharing mechanisms between the operators & Central/State govt. and its agencies for such enablement of the data services for the wireless broadband.

The paper also mentions the roadmap for 100Mbps for subscribers; typically such speeds are not possible in the current wireless technologies of 3G & 4G for reasonable number of users.

Another impediment in the faster roll out of Broadband using Wireless technologies is the reluctance of building owners to give their premises for a site due to the Radiation scare created by some Activists. This is compounded by the various Regulations being issued by the States / Municipal Authorities restricting locating sites at various locations. Moreover, the DoT norms on EMF radiation compliance are very stringent and process of measurement is complex & time consuming. There is a need for a common policy to be laid down by all States on deployment of BTS based on the DoT guidelines. The current EMF policy & reporting process need a relook to facilitate expansion on wireless network by deploying more BTS throughout the length & breadth of city & state.

***Q3. The recommendations of the Authority on Microwave backhaul have been recently released. Are there any other issues which need to be addressed to ensure availability of sufficient Microwave backhaul capacity for the growth of broadband in the country?***

A3. The recommendation of TRAI on release of MW higher frequency band of E & V band needs to be expedited to support expansion of high speed wireless network with the help of small/micro layer to ensure required broadband user throughput.

Idea Cellular submits that the preferred basis of assignment of MWA/MWB carriers to the TSPs should be "exclusive assignment" and the same should be assigned "administratively".

The microwave allocation and charging mechanism should conform to the DoT order of 18.04.2002. The Order pegged the charges at a reasonable level while striking a fine balance between the Government revenues and operator needs. The fact that the policy has continued to be in vogue since 2002, albeit with the intervention

of the TDSAT, itself speaks of its robustness and ability to account for the changes and challenges that came in with the passage of time.

***Q4. The pricing of Domestic Leased Circuits (DLC) have been reviewed in July 2014. Apart from pricing, are there any other issues which can improve availability of DLC?***

The DLC market is already very competitive and customers are getting good rates and services. However the reach of DLC is limited to the Copper network penetration in India, which is limited and in a bad condition as brought out in the Consultation Paper. Also since the cost of laying copper vis a vis the bandwidth available from it is very high, this is not being taken up any more by any operator.

***Q5. What are the specific reasons that ISPs are proactively not connecting with NIXI? What measures are required so that all ISPs are connected to the NIXI?***

The main drivers of IXP are:

1. Economic factor – Peering at a national IXP reduces tromboning, which translates into a reduction in payment to upstream transit providers residing outside the country. Also, the price of regional connectivity falls dramatically with increase in traffic thus making regional traffic even more affordable.
2. Network performance factor: by exchanging traffic at an IXP for intra regional traffic or locally hosted contents, ISPs are able to reduce the length of traffic routes leading to efficient packet transfer and reduction in latency.

There are two distinct situations for any country as regards to IXP exchanges as the internet traffic and local content in the country grows.

1. IXP 'spoke' – A small IXP is operated in the country, and several national backbones and ISPs use the facility to connect to each other and to the internet, in order to avoid tromboning.
2. IXP hub – A large IXP is operated in the country, to which most of national backbones and ISPs are connected, as well as major international carriers, content providers and backbone from other country of the region gets connected to ISP.

India has partially achieved IXP 'spoke' by the formation of NIXI.

Following are the reasons why ISPs do not connect to NIXI:

i. The three to four major ISPs are directly or indirectly connected to Tier 1 ISPs internationally. These ISPs, being also Data centers providers, control close to 90% of Indian content and have direct peering among them.
ii. These ISPs thus have little incentive to connect fully with NIXI for remaining 10% content. Therefore these ISPs do not necessarily advertise their full domestic routes in NIXI. Major ISP use NIXI link only for connecting with Government/ PSU sites. The remaining content remains unaddressed through NIXI.
iii. NIXI is a limited liability company and thus cannot be mandated to provide required QoS. QoS is the most important requirement in a hyper competitive environment thus smaller ISPs prefer to connect with Tier I ISP hosting substantial content.

On the measures needed to ensure ISPs connect with NIXI:

i. IXP/NIXI should essentially be a licensed entity with mandate of providing and ensuring requisite QoS by improving and scaling up infrastructure and facilities available at NIXI locations.
ii. NIXI should be a state-of-the-art setup capable of handling huge data speeds and volumes. with 24x7 NOC, monitoring tools, web portals and attention to aspects such as security.
iii. It should be made mandatory for all Indian ISPs to advertise full domestic routing table on the NIXI nodes and ensure provisioning of requisite bandwidth. Such mandate needs to be enforced by DOT/Regulator and should be subject to audits.
iv. It should also be mandatory for all Data Centres to peer with NIXI and advertise all their content and routes to NIXI.
v. Make NIXI locations easily reachable for all ISPs. These locations should ideally be in well-known data centers that have easy and reliable availability of connectivity. Also all NIXI locations should be interconnected such that if one ISP/content provider connects to one location it is accessible from other NIXI locations also.

As a step two, government should incentivize implementation of neutral IXP's to act like an ISP hub for the country with all the national and international backbone providers, Category A ISPs and major content (including international content) hosted/connected to it.

***Q6. Would the hosting of content within the country help in reduction of the cost of broadband to a subscriber? If yes, what measures are required to encourage content service providers to host content in the data centre situated within India?***

Hosting of content within the country will definitely help in reduction of the cost of broadband to a subscriber. Following measures are required :

i. The cable landing station charges should be made 'cost plus based' from the current scenario where very high charges are being levied on international bandwidth.
ii. There should be policy incentives granted by Government to major global content holders/ aggregators (especially the top 10 or 20 mostly used sites) to build/ host their content in India through their own data centers or through third party data centers. Again, these content providers should be mandated to peer with Indian ISPs. The potential of high data traffic to these sites emanating from India should be used by the Regulator/DoT to get the top sites to deploy their content in India. It would also improve the user experience on data.
iii. As pointed out above, Data Centers should be encouraged as an industry with adequate incentives.
iv. There should be policies/ incentives that push content nearer and nearer to end user if the volumes are huge. Also, the content should be hosted at NIXI or neutral IXPs for easy and reliable access.

***Q7. Are PSUs ideal choices for implementing the National Optical Fibre Network (NOFN) project?***
***Q8. Should awarding of EPC turnkey contracts to private sector parties through International Competitive Bidding (ICB) be considered for the NOFN project?***

We do not feel that the PSUs are the ideal choice of implementing NOFN project. The track record of PSUs in being able to build the networks at a good speed e.g. the Network for Spectrum (NFS) which was to be built for Defence to vacate the spectrum has been inordinately delayed. Because of lack of incentive for faster rollout and quality adherence, long term ownership is not there and whether the project is delayed or fails, has no bearing on PSU.

Another aspect that needs to be looked into in detail for projects like NOFN is the subsequent maintenance of the huge amount of OFC laid. Unless, this is also made part of the responsibility of the organization executing this project, the country may not get all the advantages of executing such a massive project. O&M organization

should be the most critical component of the NOFN project as projects execution is only one part of the activity but maintaining the same assets with high availability and quality will ultimately deliver the intended benefits.

- The Consultation Paper has itself given an accurate comment on the decision making processes in PSUs being cumbersome and time-consuming.
- The CP has itself mentioned citing media reports that the ongoing speed of laying cable by the BBNL happens to be currently 1/60$^{th}$ of the required rate.
- Further, as quoted by media reports, the progress against the issued Purchase Order for lying of ONT and OLT has also been tardy.
- At the current rate, the vision laid out in the NTP 2012 would not be easily achievable and the country is most likely to pay the cost for it by way of not achieving the possible rate of development and growth.
- The poor track record of the PSUs in matter of implementation of USOF projects is another case in point.
- Currently, under the USF scheme though thousands of towers are already installed, however lack of basic infrastructure, such as site availability , diesel, etc has severely impeded optimal utilization of these sites due to recurrent uptime issues and downtimes of more than 20% resulting in high customer dissatisfaction and churn for the service providers.
- **We thus agree with the suggestion given in the CP for award of EPC turnkey contracts by BBNL to private sector parties through International competitive bidding (ICB) as a futuristic model. Such contracts can be given region-wise with clear requirements for interconnection with other networks, as well as infrastructure sharing with other operators who would like to utilize this network. The commercial models around this will need to be suitably developed.**

***Q9. Are there any ways in which infrastructure development costs can be reduced? Is it possible to piggyback on the existing private sector access networks so as to minimize costs in reaching remote rural locations?***

It is known that higher cost of infrastructure is mainly due to unreasonable ROW cost. If the same is controlled and made reasonable, it can lower down the infrastructure development cost to a huge extent. The benefits that would accrue to the country in terms of development and consequent associated revenues by extensive roll out of fibre would be far higher than the immediate benefits to Municipal Corporations on account of high RoW.

While principally we are OK with use of existing resources of private sector, as this would prevent duplication of network and save expenditure, what needs to be analysed is the quantum of spare capacity (in terms of fibre pairs) available with private sector and how it dovetails into the NOFN plan. It may be noted that there has already been sharing of fibre resources amongst operators, so the remaining capacity available would need to be examined.

***Q10. What can the private sector do to reduce delivery costs? Please provide specific examples.***

***Q11. What are the major issues in obtaining right of way for laying optical fibre? What are the applicable charges/ constraints imposed by various bodies who grant permission of right of way? In your opinion what is the feasible solution?***

A11.

- We agree with the Authority's observation in the CP that the issue of clearances for infrastructure deployment from local Authorities and ROW has been a major constraint in proliferation of OFC network in the country.
- It is also correctly pointed out in the CP that in the absence of uniform, clear and enforceable guidelines for various processes such as ROW, civic clearances, etc, different state governments have adopted different rules, criteria, costs and time frames causing huge effort and delays to the operators in getting the requisite clearances.
- We have in the past also submitted that ROW should be free of cost, and reinstatement charges levied on operator should not be looked at as revenue resource by any Govt. local authorities, to help operator to keep its services cost low for the end customer.
- In this regard, the NTP'12 has already recognized the problem and set out a clear objective "***Address the Right of Way (RoW) issues in setting up of telecom infrastructure*****".**

  **Our detailed submissions (encapsulating the issues impacting the RoW policy and our suggestions) on the issue of RoW Charges for Laying of OFC are as under:**

  **I. Issues impacting the Right of Way policy**

  A. In early days, the telecom usage was merely limited to Voice traffic and hence the bandwidth requirement of each 2G BTS was limited to 1 E1 Only ( 2 MBPs). However, with changing human life styles

and shifting of telecom usages to application hungry high speed data services, in addition to Voice call, the Telecom technology has evolved from 2G – 2.5 G and now 3G/ 4G & LTE.

B. In 3G & 4G (LTE), the bandwidth requirement per a typical NodeB (3G/ 4G BTS) is very high - to the tune of 100 MBPS. Backhauling such huge capacity can only be done through high capacity OFC network. This huge bandwidth requirement has made the OFC laying more essential in Telecom Infrastructure development.

*C.* **The telecom operators have been guaranteed the Right of Way (RoW) under Section 10 of the Indian Telegraph Act, 1885** but various municipalities and other State agencies have stipulated their own norms across the country for granting permission / access. As per the Act, *the charges that can be levied for granting RoW* ***shall be limited to the restoration charges*** *or any other thing connected with or related to any work undertaken for laying of cable.*

D. However, State Governments have started levying exorbitant charges not commensurate with restoration charges of the particular area. There is no uniformity/ rationale in charging by various states/ municipalities and within a state.

E. The situation is worsening as many Government authorities and municipalities impose additional levies and arbitrary charges such as **permission fee/lease rentals/license fee/free bandwidths** to govt. establishments and other Institutions etc. as a condition precedent for installation/ laying of infrastructure and grant of RoW permission.

F. Some of the major Govt bodies, which plays a crucial role in building OFC infra, are also making their own bye-laws and asking the Telecom operators to execute various agreements for RoW Permission, the terms and conditions of which are more often not similar to what the operators execute with Govt. of India for obtaining telecom license.

G. **The RoW Charges levied by various authorities in various states are given in a separate Annexure-1. From the referred table, it can be seen that:**

**i. There is huge variation in RoW charges ( Rs 1 Lakh per Km to Rs 70 Lakh per Km) from state to state and within state as well, based on Municipal area being served.**

**ii. No Single uniform policy Intra State as well Inter State.**

H. Vide its revised circular dated 02/04/2014 (enclosed as annexure-2), NHAI has decided to charge land rentals which are in addition to the currently levied restoration charges. The proposed rates for RoW charges are highly exorbitant. The Per Km Charges are Approx. Rs 1 Cr in Metros and major Cities, Rs 48 lacs in State Capitals ( Population > 1Mn), Rs 4 lacs for Municipal Areas, Rs 12 Lacs in Rural Areas. These charges are naturally a high deterrent to telecom operators who are planning to lay major Backbone OFC network across NH and major road networks of India.

I. Further, **the issue of multiplicity of agencies to be coordinated** remains a major issue. For example, Forest permission requires internal approval of forest offices at various stages, Most of the telecom OFC route requires passage through protected forest region and the approval of same comes from Regional forest offices. The approval to lay telecom cable in National parks/ Wildlife Sanctuaries is to be taken from Forest Ministry, Delhi. The approval process is time consuming and takes very long time in most of the cases.

J. Similarly, Railway ROW Charges are exorbitant, to the tune of Rs 20 lacs – Rs 1.5 Crore for a less than 100 Meter Crossing including the supervision charges and land rent. Also the approval process takes lot of time. Attached sample Demand Notes received from the Western Central Railway, Bhopal office. Rs. 98 Lacs & 1.45 Cr respectively charged for two Railway Crossings less than 100 meter of Bhopal City.( Annexure : 3a & 3b).

K. The ROW Charges in some of the cities like Mumbai are exorbitant, Sample Demand Notes of Mumbai are attached as Annexure 4a, Annexure4b, Annexure 4c where the ROW charges are Rs. 29.2 lacs for 237 meter, 24.5 Lacs for 199 meter, 17.2 Lacs for 140 meter.

L. **Damage to telecom infrastructure** - Theft or Damage of Telecom Infrastructure has been increasing rapidly. Today, any anti social element one can damage telecom installations and generally avoid any punitive action. There are numerous instances of theft from the Sites, damaging site equipment and Site burning. This issue and the Govt. intent to protect the Telecom installations by Legislation was part of the draft Convergence Bill 2000.

M. We have also observed that due to restrictions in forest area and long lead time & complex and costly process of providing permission, operator tries to bypass the forest area via very long routes to connect two cities by Optical fibre cable. As OFC laying work doesn't require any uprooting of trees or any kind of damage to environment, we can have simple process and with reduced cost of permission. This will minimize the cost of reaching remote locations.

**II. Idea Cellular's suggestions on Right of Way policy**

1. Ideally, the **RoW should be treated as the right of telecom players**, and there should not be any charges for the same, as operators are already paying license fees for running the services.

2. Since the RoW is basically meant for increasing the reach of telecom networks and enabling subscriber connectivity, **the RoW charges ought to be reasonable**. **Simply stated, the RoW charges should not be beyond the cost of maintenance and repair of the road.** Inflated RoW charges make the telecom services costlier and that cannot be the intent of Government policy.

3. **Stipulated time frame (with accountability) for RoW clearances** will enable timely implementation of telecom networks.

**4. Single Window Clearance for all RoW agencies/Authorities at State and Centre levels,** in a time bound manner to telecom service provider / infrastructure provider is essential. **Single window clearance should be administered online with a defined turnaround time.**

5. The **RoW approval permission should be for 20 years** (co-terminus with telecom license) and the same should be explicitly agreed to by all authorities.

6. **Telecom operators should not be required to execute various agreements for RoW with various local agencies**, since these are generally non-uniform and local authority tend to put unreasonable demand through such agreements. All Terms and condition should only be part of the overall license issued to telecom operators to run its services.

7. **Make RoW "smart" – the NHAI, NH, Major State Road Authorities should lay utility tunnels across the roads of their jurisdiction for use of all the Utility companies including Telecom, This is similar to the concept of proposed Smart Cities.** This will avoid multiple time digging of the roads and infrastructure, and

should charge a nominal fee for proper maintenance of OFC infrastructure and should take responsibility for maintenance for utility tunnels, which will save a huge cost of maintenance by operator, which in turn will reduce effective cost a consumer pays for telecom services.

8. In fact all new roads construction should have **designated corridor/duct space for laying utility services** so as to avoid irregular digging by any operators and should be part of any new construction

9. During development of a sector/town, all roads/bridges should have utility ducts provisioned to lay OFC at a later stage. This will avoid unnecessary damage to newly laid roads and utilities.

10. All buildings/towers should be provisioned with vertical conduits for carrying out last mile building wiring for FTTH services.

11. Similarly, **Railways should have provision of pre laid Utility tunnels** at the major railway crossings, which can be shared by Utility companies at nominal charges proportionate to the total build out cost.

12. **Amendment to building bye-laws** which currently deem only electricity, water, and fire safety as necessary infrastructure for the issue of a completion certificate. These could **include mandatory inclusion of either ducts /optical fibre** with well-defined access mechanisms in all upcoming office complexes, commercial spaces and residential complexes would have a measurable net positive impact on the goal of constructing national broadband highways.

13. Development authorities should **mandate city developers and builders to have properly demarcated sections** within buildings and on rooftops for housing broadband infrastructure and antennae. These areas should have uninterrupted power supply for reliable, always-on services.

14. A tower and a common transmission/ equipment room should be mandated in every Panchayat in the village

15. Policy for mandating the power companies for deploying fibre along the transmission Lines.

16. Places where digging is not possible and RoW is not available, there should be proper overhead space for pulling fibre and associated infra with reasonable ROW permission charges.

17. The ROW permission during OFC laying should be considered for Operation & Maintenance (O &M) of the OFC routes and no further ROW charges should be applicable during O&M.

18. **To protect the damage caused to telecom infrastructure, Telecom services to be defined as " essential service"** so as to enable and protect the infrastructure made by service operator, from the damages done by various other authorities such as the damage caused due to laying of water pipe , electricity and gas pipe lines.

19. The cost of repairing and relaying is very high and the capital required for the same can be used by operator in building better and cheaper communication services to uncovered population of India. The cost of repairing such telecom assets is a national waste of resources and strong laws are needed to protect this OFC infrastructure by other utility agencies involved in digging work.

20. As highlighted in earlier section, the damage to telecom infrastructure is also being caused by anti-social elements at various times. In order to address this issue, **Theft or Damaging or disabling of Telecom Infrastructure should be accorded with suitable punishment so that the same act as a deterrent. Further the TSPs should be permitted to publish Prohibitory Warning signage at the Sites.**

21. Supporting trenching activities of USOF through Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) as discussed in TRAI consultation paper on "National Broadband Plan" released on 10th June 2010.

22. **Share existing Fibre backbone infrastructure among all operators to reach up to the block level.**

23. Telecom/ broadband targets for a given state should be linked with support given for Right of Way, to incentivize the State Governments towards faster approvals.

***Q12. Should the Government consider framing guidelines to mandate compulsory deployment of duct space for fibre/ telecommunications cables and space for telecommunication towers in all major physical infrastructure construction projects such as building or upgrading highways, inner-city metros, railways or sewer networks?***

Yes, we feel that this would be a very good measure. It will not only help to avoid wastage of resources but also improve speed of OFC build out and increase the fibre penetration across the country. OFC is to be treated as essential service like water and electricity to overcome current crippling challenges in broadband deployment.

***Q13. What are the impediments to the provision of Broadband by Cable operators? Please suggest measures (including policy changes) to be taken for promoting broadband through the cable network.***

The impediments to the provision of Broadband by cable are:

1. Cable operators have limited operations and are largely from unorganised sector
2. They generally have capital scarcity while this area requires high capex
3. Costly ROW

Quality and guarantee of service will be the major challenge in broadband over cable.

***Q14. What measures are required to reduce the cost and create a proper eco system for deployment of FTTH in the access network?***

Present cost structure for laying fibre connecting individual households is not cost effective. One approach could be common infrastructure utilized by multiple providers. This infra can be shared with multiple service providers for giving FTTH service to end customers to bring in competition. This project ideally should be run by an independent infra provider preferably from private sector (not connected to offering any telecom service to end customers). Also, to expedite rollout, permissions for ROW required from local various govt. authorities, private societies, municipalities etc can be facilitated through central and state govt. notifications**.** In addition, ROW costs need to be significantly revised downwards to make the business case viable for FTTH rollout.

Second hindrance factor is cost of customer premise equipment (ONT), which is expected to go down once scale is achieved. Local 'make in India' can be encouraged with adequate incentives.

***Q15. Are there any regulatory issues in providing internet facility through Wi-Fi Hotspots? What are the reasons that installation of Wi-Fi hotspots has not picked up in the country? What type of business model needs to be adopted to create more Wi-Fi hotspots?***

There are various open issues in terms of the Wi-Fi Hotspots.

**Technical**. EIRP values needs to be relaxed to provide higher coverage to the subscriber. The Indoor EIRP should be increased from 26dBm to 33dBm, Outdoor EIRP should be increased from 36dBm to 40dBm
For the outdoor Hotspot deployment, the current 5.8 GHZ bandwidth is limited from 5825 to 5875,

- The BW is limited to 50MHz , which means only 1 HT40 channel can be accommodated
- Full 5700 to 5875 band should be allowed for the outdoor transmission.
- The beam widths of such transmitters/antennas shall be lower than 10deg, to allow other operators to use it.

Due to sheer nature of the USM band, there are many players which use higher power than recommended. There shall be mechanism for the 3rd party audit on yearly basis in a circle to ensure that this "OPEN" band is used effectively.

**Public hotspots** should be responsibilities of local municipalities, who are likely to influence hotspot location, policies, maintenance, operations including tariffs etc. besides expecting free service and not sharing any costs. Hotspot model would vary in each city and economies of scale would be missing. Hence it would be essential to give a central policy directive to all municipalities covering definition, location, cost of setting up hotspot, maintenance, role of municipalities etc.

We do not believe that Wifi hotspots can play a major role in increasing broadband penetration. Global experience suggests that such hotspots are primarily used in areas with high capacity requirements. As such, while these hotspots can play a role in offloading mobile data traffic in certain areas, they are unlikely to increase broadband penetration. Additionally, Wifi hotspots also require fibre backhaul networks to carry the traffic. Therefore, in the absence of last mile fibre, it is unlikely that such hotspots can play a significant role even in mobile data offload.

Given that wifi hotspots operate in unlicensed spectrum bands, increase in such hotspots is likely to cause interference and result in QoS issues.

***Q16. What are other spectrum bands which can be unlicensed for usage of Wi-Fi technology or any other technology for provision of broadband?***

- **We do not agree to unlicensed spectrum being made available for wireless broadband services.** Any operator wishing to provide commercial service that requires use of spectrum would have to be subject to the same rules and regulatory principles of spectrum allocation that have been currently defined and followed by the policy makers.
- **De-licensing some bands also leaves a significant loophole to be exploited** because similar services would then be provided by one set of operators at zero or no regulatory cost while another set would be loaded by license fee and spectrum usage payments. This could create serious competitive distortions

***Q17. How much spectrum will be required in the immediate future and in the long term to meet the target of broadband penetration? What initiatives are required to make available the required spectrum?***

A17. The ambition to deliver 2 Mbps download speeds to users on mobile broadband by 2015, with speeds of 100 Mbps or more, available on demand, will have an impact on both network and spectrum requirements. Across all currently available 3G mobile networks in India, the average data speed is less than 1 Mbps and same is going to drop further with increase in the 3G customer penetration. Hence there is clearly a large gap to be filled.

In most of the countries, entire 2*60 MHz spectrum in 2100 band has been assigned to 3G services. In India only 2*20 MHz of spectrum in 17 service areas and 2*25 MHz of spectrum in remaining 5 service areas have been assigned to service providers in 2010.

Fuelling and sustaining mobile broadband growth will require access to additional radio spectrum. It is the basic resource required for building efficient networks able to serve large number of subscribers generating large amount of traffic.

**Immediate Spectrum Requirement:** It is likely that the single 5 MHz 3G carrier currently available to the operators in the 2100 MHz band will only be sufficient to meet data growth for the next year. By 2015, operators will need additional spectrum to serve fast growing data needs.

At least 2*20 MHz 3G spectrum in the 2100 MHz band is required to deliver credible 3G services. Moreover, if operators need to deliver 2 Mbps speeds from 2015 then this additional spectrum requirement will become vital and same needs to be put up for auction immediately at affordable prices to enable affordable services.

**Long term Spectrum Requirement:** The broadband target of 600 million connections by 2020 can only be achieved if sufficient spectrum is made available in a timely manner in globally harmonized bands. In future, as operators improve 3G network coverage and launch of 4G services, subscriber's usage pattern is likely to change from present 700MB to 1.6GB in 2020. Hence spectrum strategy is going to play critical role in mobile broad band growth.

- At least 2*55 MHz of spectrum in 1800 band to be made available for commercial use across 22 service areas. This will help operators in enhancing their LTE networks to meet the expected user experience and data growth

Present 1800 MHz spectrum to be harmonized across the operators to get the contiguous spectrum allocation so that operators can use the available spectrum more efficiently across the technologies in their networks to serve their growing subscriber by providing a superior data experience.

***Q18. Are there any other spectrum bands apart from the ones mentioned in Chapter-2 to be identified for provision of wireless broadband services?***

As indicated in response to question 2, the larger pair or un-paired spectrums should be released which can be used for the broadband services.

- LTE band 41 2496-2690 MHz (194 MHz bandwidth)
- LTE band 42 3400-3600 MHz (200 MHz bandwidth)
- LTE band 43 3600-3800 MHz(200 MHz bandwidth)

These bands can be considered for limited hotspot deployments to cater for capacity required there.

Also 3GPP has been exploring Supplementary –DL band i.e. L band which can be used as DL only add-on band to support the broadband services.

***Q19. What are the measures required to encourage Government agencies to surrender spectrum occupied by them in IMT bands?***

In our earlier submission on the TRAI CP on "Valuation and Reserve Price of Spectrum: Licenses expiring in 2015-16" dated the 7th Aug, 2014, we have made the following submissions with regards the sources for additional 900 MHz spectrum–

- Other non-telecom users of 900 MHz spectrum

- E-GSM spectrum: The TRAI, in its earlier recommendation dated 09.09.2013 had already recommended to DoT on need to check the feasibility for adoption of E-GSM band. In fact we had submitted earlier that with declining CDMA subscribers/ usage and in order to address issues of continuity of 900 MHz subscribers as also for providing opportunities for growth of broadband, the E-GSM band should be immediately put up for auction. In this regard submission of COAI to DoT was done vide their letters dated 19.09.2013 and 30.10.2013. We re-emphasize that E-GSM band can go a long way in addressing the issues of spectrum shortage in 900 MHz while ensuring optimum utilisation of this scarce spectrum.

- From BSNL, which currently has 6.2 MHz of 900 MHz band spectrum in all circles. It may be noted that BSNL currently has only 0.33 million VLR Subscribers / MHz in the 18 LSAs where licenses are expiring as compared to 1.33 million VLR Subscribers / MHz for 29 licensees whose licenses are expiring in Dec'15 and early 2016. One of the stated objectives of the last auction was efficient use of spectrum and avoid hoarding. BSNL subscribers can be easily serviced by remaining 4.5MHz of 900 MHz and 1.8 MHz of 1800 MHz. In fact if BSNL's spectrum is reduced to 6.2 MHz (900+1800) in each circle, they will still have only 0.49 million VLR subscribers / MHz, which is significantly lower as compared to 1.33 million VLR subscribers / MHz for the expiring licenses based on their current full spectrum allocation.

***Q20. What should be the time frame for auctioning the spectrum in 700 MHz band?***

Most networks are currently deployed in 900 & 1800 MHz. We have seen the fierce competition in the recent auctions and major blocks of 900 Mhz will also be in auction shortly. The major component of the network radio base station radio modules are frequency dependent. Due to very high cost commitment in 1800/2100 MHz recent spectrum auction, there is likely to be constraints on the capex expenditure in the network infrastructure to cover the target population.

Opening of new 700 band will additionally lock a lot of investments in buying the spectrum and this could become a limiting factor in network rollout including expansion of the existing 3G network.

It is thus suggested that there is no pressing need for 700MHz deployed in the timeframes for next 3-5 years or so. In fact in many class A & B cities, the number of sites required to provide coverage and capacity in 900 & 1800 MHz are almost equal. So, from the network prospective, the gains of sub-GHz bands are very short-lived.

We would specially like to draw attention of the Regulator to the fact that despite winning spectrum in the BWA auction and paying to DoT over US $7.5 billion, being saddled with Debt, still no operator in the country has been able to launch 4G services due to lack of eco-system & lack of economic viability.

We thus are of the view that before opening any further bands, the regulator shall maximise the allocations of the current allocated bands for the auctions. For e.g. in 1800MHz (full 55 MHz), 2100 MHz (60 MHz), 2300 MHz (100MHz) shall be auctioned. For these approaches to translate into reality it will require harmonization of the various spectrum allocations in these bands across service providers. Similarly regulator shall look at allowing 800MHz band (E-GSM) band for LTE in sub-GHz band before opening up 700MHz.

Before opening further bands, it is important for the 4G services to flourish in the already allocated bands. 700MHz shall be option only when all the other bands have been completely allocated and there are further capacity needs required by subscribers.

We may add in case 700 band is opened right away, Consumer will be riddled with confusions over devices across various bands supporting 4G and with some service provider networks only. This will also introduce artificial blockages to the spread of the 4G services.

700MHz was standardised on in the 3GPP bodies only last year. Being new band, the eco-systems of the handset manufactures and the equipment manufacturers will remain weak for next 3-5 year. It will take time for market to mature and provide affordable devices in this spectrum range for the subscribers.

Under these circumstances, any untimely auction of spectrum in 700 MHz band may accrue revenue to the Govt., but the commercial exploitation of such scarce resource for the larger interest of the society may be permanently impaired if the operators are forced to bid for such auction ahead of its commercial viability & in the process they may become sick & unviable.

In our assessment, it will take another 1-2 years for 3G UMTS to stabilize & reach the mass market. 3G after stabilizing will co-exist with LTE for a couple of years & the real commercial scale volumes for mobile broadband using LTE technology will be achieved only around 2016-2017.

In view of this, it is submitted that the auction of 700 MHz band should be delayed by at least 3-5 years.

***Q21. Do you agree with the demand side issues discussed in Chapter 5 and Chapter 6? How these issues can be addressed? Please also indicate any other demand side issues which are not covered in the CP.***

Yes, we agree with the issues in demand side in adoption of Broadband.

While the paper talks majorly about fixed wireline services and issues concerning PC penetration, we believe that broadband growth in rural and urban markets will be driven by Wireless Internet technology and not so much by Fixed Wireline based services, and the primary access device will be mobile phones and not PC. Wireless Broadband and Smartphones will be the key to growth due to easier accessibility, price differences, lower computer literacy, and the ability to carry the internet device anywhere.

We classify demand side issues in adoption of Mobile Broadband in 2 categories:-

1. Awareness, Relevance of internet and computer literacy
2. Affordability

Awareness**,** Relevance of internet and computer literacy: Our view is very similar to what is mentioned in the consultation paper.

Affordability is very critical to broadband growth- it is divided into 2 parts- affordability of devices, and that of services.

***Affordability of Devices:-***

Currently, the low end 3G smartphones cost around Rs.5000 due to the impact of heavy taxation, octroi, and import costs involved. Govt should create friendly policies for smartphone manufacturing and drive 'Make in India' concept for smartphones. Till the time manufacturing starts in India, Govt will have to ensure a smartphone- friendly tax structure in order to further revolutionize the growth of Internet in India. If a new range of smartphones emerge, with a pricing of sub- Rs. 3000, the rural markets and low-income and less-educated segment will also start adopting internet usage.

***Affordability of service:-***

To make internet services more affordable for people, government should supply spectrum at affordable prices and in sufficient quantity. Govt should come with friendly policies on spectrum sharing, spectrum trading,

active infra sharing and simple policies for rolling out fibre. These initiatives will help operators to make internet services more affordable.

For delivery of services, development and Maintenance of Subject Matter/Application/ Database should be done via third party experts/ research organizations to ensure optimization of efficiency and competency in catering towards these growth programmes.