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**CHAPTER- 7**

**Suggestions for**

**Issues for Consultation**

**Q1.** **What immediate measures are required to promote wireline technologies in access networks?** No comments

**What is the cost per line for various wireline technologies and how can this cost be minimised?** No comments

**Please reply separately for each technology.** No comments

**Q2.** **What are the impediments to the deployment of wireless technologies in the access network?**

Technology is not the issue, but TRAI policy is the issue.

TRAI policy of about last 6 years have killed hundreds of small ISP, who were providing ISP services in many areas.

Also from last 2 years since Stand Alone ISP have been charged 8% Licenses fees *( without giving them any facility to provide any voice telephony services)* has ensured that only the Mobile operators should grow, at the cost of standalone ISP.

Why the stand alone ISP pay 8% revenue share ?

It is this audacity of TRAI, that TRAI is doing this exercise to again give benefits to mobile operators.

**How can these deployments be made faster?** Allow as many ISP as possible, as was the case 10 years ago. Why TRAI wants only few flowers to bloom, why not thousands of flowers should bloom.

**Please reply separately for each technology.**

Technology is not the issue, but TRAI policy is the issue, as mentioned above.

**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?**

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Allow at least 200 MHz of freq band in 5.8 Ghz as unlicensed band. Which is available, but not being used.

**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?**

TRAI has to reduce the Cap further.

**Q5.** **What are the specific reasons that ISPs are proactively not connecting with NIXI?**

The Mobile operators & the few companies who control the ILD access, does not support NIXI and they have no interest to survive NIXI.

Because, if all connectivity is made through NIXI, the arm twisting by Mobile operators, will not be possible.

**What measures are required so that all ISPs are connected to the NIXI?**

**All connectivity should be made mandatory through NIXI only. No direct interconnections should be allowed.**

**This will also mean a secure India.**

**Q6.** **Would the hosting of content within the country help in reduction of the cost of broadband to a subscriber?**

Yes, it will & & this is already known to TRAI and others. It is surprising why TRAI has put this as a question ?

Also local hosting should be made mandatory.

**If yes, what measures are required to encourage content service providers to host content in the data centre situated within India?**

Making hosting mandatory in India only.

**Also please see attached Annexure-"C" in this behalf.**

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**Q7. Are PSUs ideal choices for implementing the National Optical Fibre Network (NOFN) project?**

Yes by all means, only PSU is the ideal choice and should do this work.

It may be recalled by TRAI that private operators have not fulfilled their commitments the controversies associated with the earlier USOF funded projects?

The CAG comments & case in courts ?

**Q8. Should awarding of EPC turnkey contracts to private sector parties through International Competitive Bidding (ICB) be considered for the NOFN project?**

The reasoning provided in the document with regard to the delays / non performance in the execution of the projects by PSUs is unconvincing.

The idea of involving private operators for EPC turnkey contracts on this pretext is illogical.

India has sufficient expertise and capabilities for execution.

It is not appreciated why such issues are raised by TRAI in this regard.

a. What is agenda in asking this question by TRAI ?
b. Why International competitive bidding ?
   This is not World Bank funded project! This is Govt of India funded project.

**Q9. Are there any ways in which infrastructure development costs can be reduced?**

a. Does TRAI have any benchmarking of existing costs?
b. On what basis this question is being asked by TRAI?
c. What is the intention of TRAI in asking this question & making basis for some other agenda?

**Is it possible to piggyback on the existing private sector access networks so as to minimize costs in reaching remote rural locations?**

Because of TRAI polices ( past & present) , this OLIGOPOLY of few operators has been created & now this Oligopoly has eyes on the USO funds. All this exercise is to prepare recommendations to Government to give subsidy to these private operators.

As regard the Piggybacking on private networks in rural areas, it will be better that TRAI checks it's own reports of last 3 years, where TRAI has accepted, that Private operators have not gone to rural areas.

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It is relevant to note that over the past few months, private operators have increased the rental charges for its fixed-line broadband services by upto 40% in certain plans.   Similarly mobile internet rates have raised up to 100 percent in June-September 2014 period.

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

Private sector has not shown their commitment in this regard. TRAI shall recollect that the same Operators have wriggled out of the commitments from last 18 years ( on one pretext or other ) to provide just simple telephone service in more than 60,000 Villages.

Not only this the same Private operators have got funding from USOF also & <mark>then</mark> did not deliver, paid the penalty for non delivery & in few cases the matters are in courts.

**For questions Q7, Q8,Q9 and Q10 – Please also see a brief note at Annexure – "A" "NATIONAL OPTIC FIBRE NETWORK ROLLOUT"**

**Q11.  What are the major issues in obtaining right of way for laying optical fibre?**

Government has already signed with most of State Governments so this is relevant.

**What are the applicable charges/ constraints imposed by various bodies who grant permission of right of way?**

**Charges do vary from State to State. The States have a valid argument that when Government of India is charging hefty license fees, spectrum fees, revenue sharing, USO charges, other taxes and levies ( Sales Tax, Service tax, Income Tax, Custom Duties, Import Cess etc) and also when mobile operators are making profit, then why should not the State Govt. also charge for the right of way and other services. The argument of State Govt. is if the cost has to be brought down, it is first for the Govt. of India to reduce various payments/charges to them.**

**The contention is true.**

**In your opinion what is the feasible solution?**

Answer lie in above reply.

**Q12.  Should the Government consider framing guidelines to mandate compulsory deployment of duct space for fibre/ telecommunications**

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**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, this is how it is done in many countries. Also the rates should be fixed by TRAI for equal access by any user.

**For questions Q11 and Q12 - Please also see note at Annexure – "B" "RoW CHALLENGES & SUGGESTIONS"**

**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.**

i) Asking this question is like sprinkling salt on the wounds ( kate per namak chirkna).

ii) First TRAI made recommendations to put 8% revenue share, making statements, that only few operators are needed etc etc. Not fixing the correct BW rates of Internet.

iii) The biggest impediments is TRAI policy initiatives of asking 8% fees. Also cable operators are not recognized as broadband providers and are treated as 2$^{nd}$ class citizens.

iv) Digitalization of the Analog TV transmission network of CATV to provide digital media and broadband services has multiple challenges as the digitalization will drive the Bandwidth demand for access and backhaul requirements which the present ecosystem of CATV providers are finding hard to manage.

Also the lack of IP capability and support on the CMTS platforms poses further challenges on fuelling the growth as it becomes difficult to integrate the CMTS networks with present evolved

IPMPLS networks to gain cost and scale advantage to create a cloud based Multicast backbone for effective video delivery

**Key challenges in case of the HFC network found in Indian CATV environment are:**

a. Unstructured Cable deployment with low redundancy, as most of the deployment is on spur with no protection

b. Wide use of amplifiers to increase signal strength which in turn increases the noise level in the CATV signal. In case of the CATV signal this can be removed by rectifier, but in case of the Internet delivery amplifiers have to be specialised so that they can improve the signal quality in both directions (As internet requires upload and download).

c. Quality of Coaxial cable deployed is susceptible to power interference and lower quality of services.

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d.        Lack of device ecosystem for IP ready implementation

**Recommendation:**

Coaxial cable is generally present in all the homes and hence it will be easy to access and efficient to use the available infrastructure for the broadband deployment. However some key initiatives required as follows:

a.        Coaxial cable to used only in the last mile within the building rest all should be OFC.

b.        Optical fiber cable ensures less susceptibility to power interference and will improves
quality of signal, with lower usage of the amplfiers.

From regulatory prespective flexibility in sharing and colocation regulations and framework shall be put in place to reduce the cost for incremental built-up. This will also require bringing fiber access network closure to the building and creating an effective converged content delivery network.

**Q14.  What measures are required to reduce the cost and create a proper eco system for deployment of FTTH in the access network?** No comments

**Q15.  Are there any regulatory issues in providing internet facility through Wi-Fi Hotspots?**  No comments

**What are the reasons that installation of Wi-Fi hotspots has not picked up in the country?** No comments

**What type of business model needs to be adopted to create more Wi-Fi hotspots?** No comments

 **Please also see note at Annexure – "D"**

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

Existing unlicensed spectrum in 2.4GHz &  5.8 GHz should be enhanced by 200 MHz to accommodate expanding requirements of Wi-Fi in urban and rural areas.

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**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?** Just de-license 200 Mhz in 5.8 ghz & 60 Mhz in 700 Mhz.

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

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

Why Government agencies should be even asked to surrender the spectrum, which they have ?

Asking security agencies to surrender the spectrum amounts to an act of treason?

In the sovereign interest of the nation, the existing assignment in the frequency band 698-806 MHz (700 MHz band) should remain assigned to them because of the national security interests.

In no way they should be forced to surrender such spectrum for IMT applications.

The remaining spectrum in the frequency band 698-806 MHz should be made unlicensed and assigned for broadband backhaul applications, especially for connecting rural areas.

This frequency band has good propagation characteristics which will enable connecting rural/remote areas economically.

IMT bands have been created by the countries, which have not fought any war on their own soil. All US & European defence forces use this band, but they operate outside of Europe. (Iraq, Afghanistan, Libya etc). So they have this spectrum free for use in their own country.

Whereas, every day, we are using this spectrum all over the country.

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

No need to auction the 700 Mhz band (outside the defence spectrum). It should be just unlicensed for use of backhaul in rural areas.

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**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.** No comments


**Q22. Please give your comments on any related matter, not covered above.**

Be Indian & stop promoting foreign agenda. Promote Indian Innovation & Indian companies.

# National Optic Fibre Network rollout

## (A) HISTORY

The Indian government approved a cabinet note on the scheme to create the National Optical Fibre Network dated 25 October 2011. The implementation framework, budget, technology architecture and other issues related to NOFN were worked out by a high level committee constituted by the Department of Telecom (DoT) under the chairmanship of an adviser to the Prime Minister and Chairman UIDAI (constituted on 26 April 2011). The Special-Purpose Vehicle Bharat Broadband Network Limited (BBNL) was incorporated to execute the project, implemented by three prominent telecom PSUs (BSNL, RAILTEL & PGCIL) in the ratio of 70:15:15. To grant right of way, a draft tripartite memorandum of understanding (MoU) among the government of India, the SPV and the State governments of India was sent to the state governments and Union Territories for their concurrence. Eventually, all the states signed the MoU (Except TN) and charges towards RoW were waived for the NOFN Roll-out.

It's a noble vision of the Government to reach out to the village population where private networks have very scarcely deployed till today because of lower ROI. Moreover, most of the presence of these private networks in rural is through microwave radios which are serving their base stations (2G BTS). A 'Social Fibre' commissioned through this USOF initiative will give permanent and scalable connectivity of Rural Population which is almost contribute 60% of country's population and help buiding Digital India in true sense.

## (B) CURRENT EXECUTION STRUCTURE

In the current execution structure, the special Purpose Vehicle, BBNL is the implementing and monitoring authoity of NOFN network with 3 Central PSUs ( BSNL, Railtel and PGCIL) takign the responsibility of laying & maintaining the fibre optic network in their respective areas. Accordingly BBL has procured OFC and GPON equipment directly through the tender and the work of execution is given to three CPSUs (BSNL, RAILTEL &PGCIL). In-turn, these PSUs will call smaller tenders (at district & state levels) for the procurement of HDPE Duct and trenching/Laying of the Optical Fibre Cables.

The process is so multi-tiered that hundreds of tenders are floated by PSUs for procurement of PLB ducts and execution but most of them are not concluding due to intrinsic issues. Moreover, there is a clear lack of ownership for the execution of work which has led to unprecedented delay in meeting the initial targeted timelines.

## (C) CURRENT PROJECT STATUS

The NOFN Project for connecting 2.5 lac Gram Panchayats across India to their respective Blocks for high bandwidth connectivity and delivering citizen services had following major milestones.

| Sl.No | Milestone | Status |
|---|---|---|
| 1 | Central Procurements (OFC & GPON) | 1. OFC - In Control<br>2. GPON - Supplies yet to start |
| 2. | De-centralized Procurements (Duct) | ~10,000 Km Procured |
| 3. | Execution Work Orders | ~5000 Kms |
| 4. | Cable Laying | ~2000 Kms |
| 5 | GPON Installation | None except Pilot sites |
| 6 | Gram-Panchayat Commissioning | Nil |

Evidently, there is a big push from the Government to complete the project expeditiously but the urgency is not getting shifted to the field due to lack of effective implementation model and strategy. The primary reasons for this disconnect are:

1.  Lack of common NOFN project goal amongst all stake holders

2.  Cumbersome procurement process of PSUs

3.  Vendor/contractor community engaged with present scope of tenders for PLB and laying services is of very small scale.

4.  A single commodity or service if purchased through various tenders all over India will come at different prices. With a precedence of lower price, finalistion of the other tenders may face difficulties.

5.  Project execution and operation requires lot of resources and involves opex costs. Present model have inherent disadvantages addressing these needs to deliver project implementation as per targets.

To complete 2.50 Lac GPs by 31.12.2016, a run rate of laying and integrating 10,000 Kms of Fibre is required from now on, which translates into ~350 kms every day. By this standard just a very insignificant portion of work is completed in last 18 months with the present status ordering and actual execution on ground.

**(D) Suggested NOFN Execution Model to address key challenges**

To complete the Project in the stipulated time lines, a radical shift from the current model is required. The focus need to shift from physical network deployment in piecemeal approach to service delivery

expectations. Then proposed changes in model should not only bring-up the network rollout faster but also ease DoT / BBNL from the present time and efforts it is currently putting up in executing this project.

Present model will address deployment upto 100k Grampanchayats and increased attention by DoT/ BBNL in monitoring the project progress as we experience now will help delivering revised targets for first 100k GP. For the balance 150K Gram Panchayats, DOT/BBNL may examine the option of "Lumpsum Turnkey Solution" with service delivery accountability. The scope may include,

1.  Supply, laying , instattiona & commissioning of OFC, GPON Eqpt at the sites

2.  Deliver SLAs (mpbs availability, up-time etc) and QoS as per tender scope

3.  Operation & Maintenance of the network for 3-5 years

India has sufficient turnkey expertise availability in Private &PSU sector and industry is already actively participating in infrastructure building for airports, seaports, roads, industrial corridors and power transmission lines in big way.BBNL may divide 150K GPs in four zones (geographically) to increase participation of prospective turnkey solution providers and award the tender using transparent tender selection mechanism.

Key benefits that one can see form proposed turnkey solution approach will be...

> Quick decision making & faster network rollout

> Improved accountability of end deliverable of NOFN

> Attract competent large scale private / PSU sector

> Private sector / PSU with turnkey approach can bring best industry practices towards planning, delivering and maintaining network and yet cost effective.

> Frozen project costs once awarded for entire execution and O&M

> Minimum resources from BBNL to monitor project implementation so that BBNL can invest more resourceful time towards network usage with content delivery

# RoW Challenges & Suggestions

RoW plays a very critical role in the timely execution of the project. It is a key facilitator for the faster rollout of the Broadband network.

There are many impediments in getting the RoW clearances.

**Some of the challenges are:**

> Lack of Uniformity and no information in the process of getting the clearance and the rates of RoW -both Interstate nor Intra State

> Since there is no single window for clearance, the process is long, cumbersome and takes lot of time

> Lack of Legal, Administrative & Regulatory framework to oversee the issue of RoW permissions

> The local authorities/state government /other authorities levy charges/permission fee/lease rentals/license fee/free bandwidths etc. for grant of RoW permission.

> There is no central body to resolve disputes between service providers and local authority for refusing permission or prescribing stringent/restrictive conditions to get RoW (Even though provision exists in the Sec 15 of the Indian Telegraph Act 1885).

**Applicable Charges/constraints**

> The variation in RoW charges have huge variation which may range from Rs 1 Lakh per Km to more than Rs 50 Lakh per Km from state to state

> There is a variance of RoW charges even within State, being charged by local bodies

> Reasonableness of rates - discrimination & variances in ROW Vs Restoration

> The local bodies are framing restrictive policies, procedures and bye-laws etc. in the pretext of regulating the grant of RoW permission

> There are also varying type of charges - in terms of free bandwidth provision, giving away duct space, annual rental or one time RoW charges

**Feasible solutions**

**RoW - process simplification approach**

> Unified rates - States should be advisedto adopt uniform  "Restoration costs".

> Unified RoW policy - standardization of process in terms of the maximum timeline to be fixed for attaining ROW from different agencies

> Central agencies like Railways, BRO, NHAI, National forest etc can be issued with guidelines on ROW for time and cost

> Single window clearance and Simplified approval process and clearance within stipulated timelines

> Legal & Admin framework enforced upon State Govt/ MCs to facilitate faster Infrastructure build

**RoW - basic infrastructure approach**

Government should mandate compulsory deployment of utiility duct space for all essential services which include fibre/ telecommunications cables in all major physical infrastructure construction projects such as building or upgrading highways, inner-city metros, railways or sewer networks. The move is set to benefit to all Telecom & broadband service providers and reduce their capex / opex cost as these players incur millions in repairs, repeated digging of trenches and maintenance. This initiative will help to create robust network which fuels broadband connectivity. This is proven successful concept worldwide.

# Annexure – "C"

## Hosting of Contents within Country -
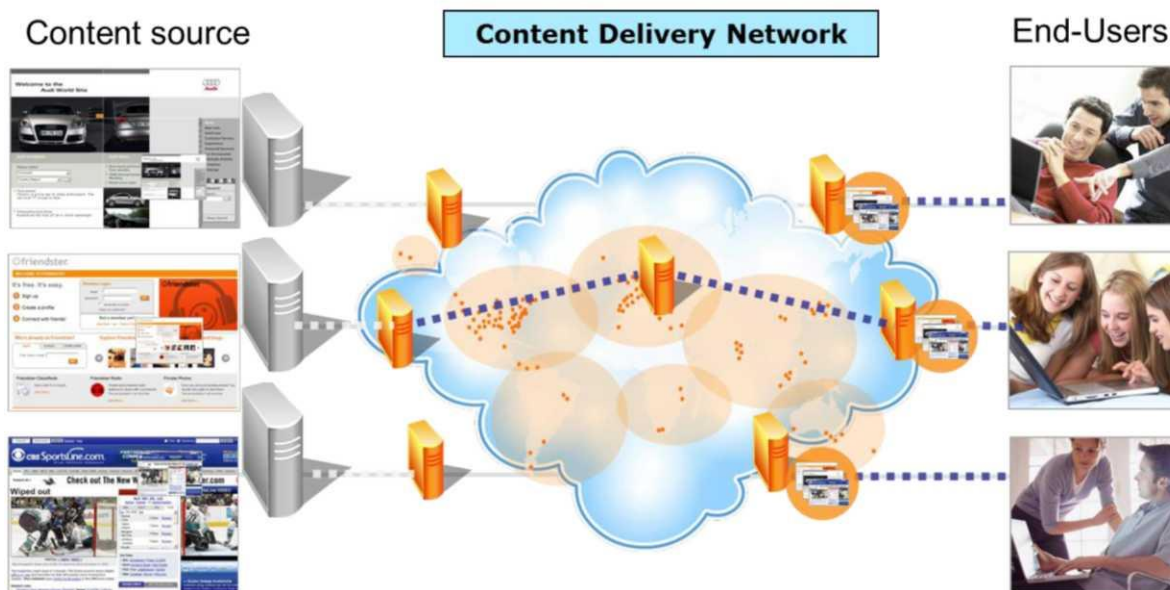


Above picture depicts how user access content from different sources and the role content plays in the users internet behaviour.

### _Benefits of content closer to the user enable the following advantages:_

a. Less latency in accessing the content
b. Better Quality of services
c. Reducing the reliance on international bandwidth

The content localization can help in reducing cost and improving the Quality of the services. Most of the content can be categorized in to three parts:

1. Basic internet services
2. Value added services
3. HD content and video based services

Enabling local internet services enable the service providers to provide localized content at cheaper rates and charging the VAS and HD content for additional revenue models.

Thus basic internet services can be made available on flat charges model while additional amount will be charged depending upon the Quality of services and the type of content that a user wants to be provided with.

As these contents are to be hosted in the Data centre it is important that we need to address the challenges in setting up data centres in India first.

### *Major factors affecting data centre creation in India:*

I.   Cost of Internet bandwidth which is attributed to following two factors:
   a.   Cable landing charges
   b.   2-3 major players who own the cable landing stations in India resulting into less competition

II.   Rising cost of real estate and power in India

III.   Licensing for managing large data centres also needs to be regularized.

IV.   According to Cushman and Wakefield recent study India is ranked $29^{th}$ in the global list of setting up data centers in India. Considering this India is $2^{nd}$ riskiest country in the world to setup data center

V.   Regulatory flexibility and long terms policy stability are other concerns

### *Drivers for local content hosting:*

•   Faster delivery
   S Content and Applications are served from locations near to end users

•   Reliability and scalability
   S No single point of failure
   S Sizing in Service providers control

•   Cost Efficiency
   *S* International BW reduction
   S No over provisioning
   *S* Simple to manageand Monitor

### *Measures that can attract content providers for local content hosting are as follows:*

a.   Infrastructure availability for creating regional data centres
b.   Backhaul availability and scalability
c.   Government support in licensing clarity for managing data centres
d.   IT Systems and Technology to manage the DRM rights and providing hassle free wallet share for user consumption

# Annexure – "D"

## Wi-fi Hotspots -

**WiFi hotspots can be categorized into different segments based on the below diagram:**
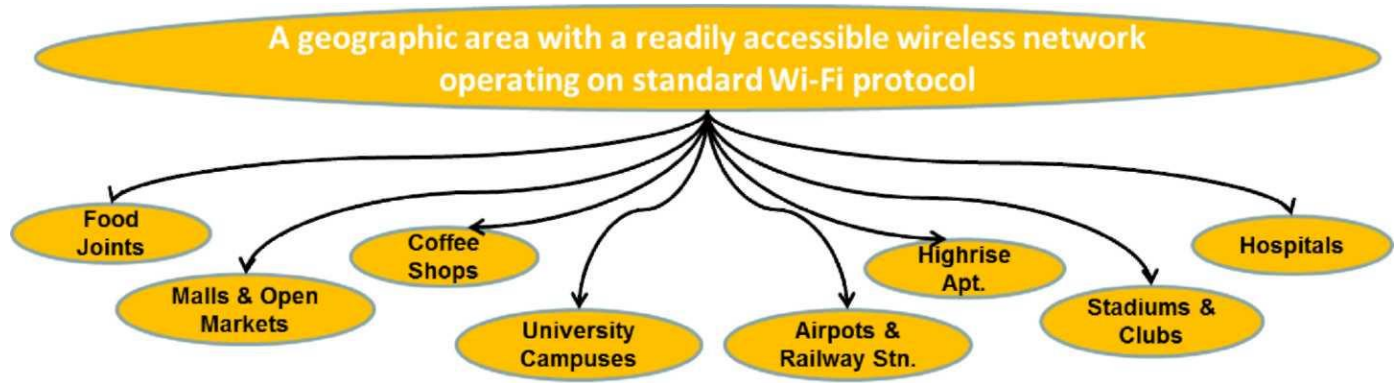


| Type | No. of AP | Area (sq.ft.) |
|---|---|---|
| Small | 1-2 | <10000 |
| Medium | 2-8 | 10K-40K |
| Large | >8 | >40K |

**Major Drivers for the WiFi hotspot services are as follows :**

   a. Carrier-grade operation
      a. Wireless performance
      b. Interference mitigation
      c. Reliable coverage
      d. Robust capacity and throughput
      e. Control of security, management, mobility, authentication, billing, policy
      f. Standards-based
   b. Seamless end-user experience
      a. Intra-network & inter-network
      b. Roaming/mobility
   c. End-to-end scalability
      a. Network design to support millions of users and exponential traffic growth

From worldwide WiFi hotspot deployments can be seen that Europe & North America contribute to greater than 80% sessions.

By venue Airports, Hotels & cafes contribute over 80% of usage worldwide.

**Regulatory and security:**

a. Free band possess lots of interference challenges

b. Radio signals are susceptible to jamming and interference
c. Lack of security due to protocol vulnerability and lack of end to end ecosystem for central authentication
d. Limited mobility support
e. Issues in handoff and roaming,
f. Lack of devices ecosystem to facilitate enhanced handoffs in heterogeneous network environment
g. Painfull login and authentication process flow as the standards for seamless authentication and discovery still evolving

**Recommendation:**

a. Wifi hot spots shall not be seen in isolation. They are perfect solution for allowing Mobile Data Offloading, hence increasing coverage and capacity on the existing wireless infrastructre
b. Fiber based Distributed Antenna System as the technology must be made madatory for all future tower deployment as it reduces the overall radition and power requirement. This is technology allows BTS hotelling and is scalable and future proof.
c. The network infra must be designed as fiber based converged infra, allowing off and on loading of data anywhere anytime
d. There is no stand alone business model for wifi hotspots