



## Confederation of Indian Industry

### **Response to TRAI Consultation Paper on “Implementation Model for BharatNet”**

At the outset, we thank the Authority to come out with this consultation paper on “Implementation Model for BharatNet” and providing us the opportunity to submit our response on this important issue.

CII has always been emphasizing that the unprecedented transformation in the Telecom sector has been primarily achieved through consistent reforms, innovative policies and putting together a vision of all stakeholders. The facilitating role of the Government and the Regulator, as demonstrated for mobile telephony is required for broadband services also.

The role of high-speed broadband in transforming the livelihoods of millions can hardly be over-emphasized. Various countries across the world have recognized this potential and have been actively investing in broadband infrastructure as part of the National Agenda. India is standing at a juncture when the country is well set to witness a transformative societal change, facilitated by digital tools and technological connectivity.

The Digital India Mission of the Government envisages India as a Digital Powerhouse, and the Government and the industry need to work in tandem to make this a reality. Connecting 250,000 villages through the National Optic Fiber Network is the first step in this direction.

The experience from the various broadband projects piloted across the country indicates significant potential of providing broadband-enabled services across sectors. This calls for robust Public-Private partnerships, with active involvement of the local governing bodies, for these services to be relevant and affordable to the rural masses, and commercially viable for the service providers.

This is a challenging situation that will require innovative thinking jointly from the Government and the industry. The task now is to deliberate on potential implementation models that create win-win value for all stakeholders, while factoring in all existing constraints. It is believed that these services, can significantly facilitate the Government’s inclusion agenda, while safeguarding the commercial interests of private sector participants also.

In this regard, we would like to submit our comments on the issues raised in the Paper and hope that our submission will merit your kind considerations.

**Q.1 The “Report of the Committee on NOFN” has recommended three models and risks/advantages associated with these models. In your opinion what are the other challenges with these models?**

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**Q.2 Do you think that these three models along with implementation strategy as indicated in the report would be able to deliver the project within the costs and time-line as envisaged in the report? If not, please elucidate.**

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**Q.3 Do you think that alternate implementation strategy of BOOT model as discussed in the paper will be more suitable (in terms of cost, execution and quality of construction) for completing the project in time? If yes, please justify.**

**Response:**

The “Report of the Committee on NOFN” covers most of the challenges and it is recommended to dwell into the solutions which are practical such as:

- **Execution challenge :**

- a. The execution of a project of this magnitude and size requires project management, ROW permissions, handling rolling out in difficult areas, law and order and sufficient incentive.
- b. The solution can be explored through Service providers, Electricity transmission and alternative methodologies but at the same time ensuring non-discriminatory nature of the infrastructure being built for not only fiber but associated electronics as well. A PPP route may bring down the cost of execution and also resolve many challenges like power availability in rural India, ROW challenges in forest areas, law and order problem areas and terrain areas like in J&K, HP & Manipur etc.
- c. ROW had been and will be a major challenge for the timely execution irrespective of the execution model and as per NOFN Review Committee Report dated 31<sup>st</sup> March 2015 mainly contributed by Central Government bodies such as National Highway Authority of India (NHAI), Indian Railways, Oil and Natural Gas Corporation (ONGC), Gas Authority of India Limited (GAIL) and Forest etc. State Government related issues had contributed to only 25% while 75% had been on part of Central agencies, hence Govt. should come out with right model for addressing ROW challenges.
- d. To have faster and impactful execution of BharatNet, alternative model of creating District to Block layer network on priority can be looked into since the extent of fiber laying and geographical challenges are lesser compared to Block to GP layer. Once this layer is ready, network infrastructure is ready in short span of time to 100% of the Blocks for services and also

GPs, which are already connected under NOFN. In continuation more GPs can keep on connecting to the network for services as Block to GP layer connectivity gets built. This would provide much faster footprint of network and services serving 100% of the Blocks and substantial amount of GPs to start with.

- **Demand challenge:**

- a. Creation of fiber infrastructure is not enough, until the utilization of the infrastructure is not contemplated properly. In creating demand lies motivation and development of the eco-system, content and performance linked incentives to attract investment in rural markets.
- b. To create sufficient rural demand Government should bring the cost of gadget ownership down. Policy promoting Tab/ phone manufacturing with Indirect subsidy of free land, free power supply, tax rebates on manufacturing such gadgets in India can help in the same.

- **Cost Overrun challenge:**

- a. Since the solutions are not thought out in detail the possibility of cost overrun is extremely high. The three approaches are based on primarily underground fiber roll out. In the interim, a much faster infrastructure can be created with a combination of microwave or Wi-Fi backhaul, Aerial fiber and balance underground fiber depending upon the geographical challenges/capacity requirements for the Block to GP layer while District to Block fiber network has to be created due to large aggregated bandwidth capacity requirements. The Aerial fiber can provide redundant path for the high availability of the network along with underground fiber in the later stage. However, the long term objective should be there for underground fiber to the maximum extent possible even in the Block to GP layer due to high longevity of underground fiber compare to Aerial.
- b. This would require a completely different partnership models between private companies and EPC companies for execution in conjunction with State electricity transmission corporations.

#### **Q 4. What are the advantages and challenges associated with the BOOT model?**

##### **Response:**

BOOT is a good Model for achieving the objective. Some of its advantages, challenges and their suggested solutions are as under:

- A PPP mode to be adopted to form Joint Venture with private sector.
- BOOT operator should be given higher assurance annual charge in case project is completed before time.

- BOOT operator should bid for minimum tenure assurance charge to win the contract.
- Government must give demand assurance of minimum guarantee payment like in electricity transmission infrastructure. This minimum guarantee amount may be reviewed periodically.
- Any private BOOT company winning the reverse bidding would automatically be based on most optimum infrastructure creation since their money is involved & hence most innovative solutions would be thought through. It would get most efficient solution causing faster implementation also, however common guidelines should be provided by the Govt. to the BOOT company related to Network Services & SLAs requirements to ensure homogeneity of the infrastructure being created. Additionally these guidelines will make it simpler to evaluate the BOOT bidders on the basis of common ground.
- The biggest challenge associated with the boot model, beyond execution, is of demand estimation, demand risk and hence an assured return model may also be explored.

**Q.5 What should be the eligibility criteria for the executing agency so that conflict of interest can be avoided?**

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**Q.7 What measures are required to be taken to avoid monopolistic behaviour of executing agency?**

**Response:**

- Conflict of interest/ Monopolistic tendencies can be managed through sharing/ swap of fiber by BOOT players of different circles/States & thus creating at least three to four companies in each State selling same product.
- Sharing/swapping of fiber should be left to the BOOT player rather than being mandatory since it can put few bidders to the advantage compared to others depending upon the availability of resources like fiber. Also it will become difficult at the time of transfer part of BOOT where in now shared or existing resources pooled cannot be transferred.
- The swap should be based on pricing formulae that can be determined by a regulator based on cost.
- This practice can also automatically sort out the conflict of interest. In fact conflict of interest in this way would lead to more efficient creation of infrastructure as the BOOT operator would operate on marginal costing based calculations.
- The whole sale prices for swapping could have a cap in terms of the maximum price that can be offered in the market.
- To avoid the conflict of interest, sharing & usage of existing fiber etc be excluded as proved in NOFN case also that major delays happen when trying to reuse

existing fiber. The non-discriminatory fiber and electronics infrastructure should be created by BOOT player (independent of existing Service Providers) to avoid monopoly as well as undue advantage due to existing resources.

**Q.6 Should there be a cap on number of States/ licensed service area to be bid by the executing agency?**

**Response:**

- Yes we believe that there should be a cap of maximum number of States/ licensed service area to be bid by the executing agency.
- Allowing to bid for upto only 3-4 States/ licensed service area would ensure adequate capital participation, focus in execution and simultaneous development of all States.

**Q.8 What terms and conditions should be imposed on the executing agency so that it provides bandwidth/fiber in fair, transparent and non-discriminatory manner**

**Response:**

In addition to the suggestions in our responses above, we would like to further suggest that availability of the information publically online w.r.t. availability of fibre and other resources will enhance fair, transparent & non-discriminatory access to the resources.

**Q.9 What flexibility should be given to the agency in terms of selection of route of laying optical fiber, construction, topology and deployment of technology?**

**Response:**

- Flexibility should be there and can be provided in terms of route selection & construction as long as defined services and SLAs are adhered to however it's highly important that common guidelines should be provided by the Govt. to all the executing agencies related to Optical Fiber, Topology, Architecture and Technology while designing and implementing the network.
- Common approach for fiber topology would ensure similar level of SLAs across the network whether services are being provided intra-State or inter-State. The second part is the technology & electronics layer being built over fiber which is going to play crucial role in ensuring seamless services delivery across networks.
- The technology layers should be uniform and consistent across networks selected based on
  1. Services required to be delivered today & in future
  2. Fully Standardized & Open with established deployments of multi-vendor interoperability to ensure maximum competition
  3. Wide Global adoption of technology for Broadband

- Leaving these points open to the agency will create heterogeneous islands of network across country bringing in inefficiencies while delivering services since the retail service provider would be delivering similar services across States and would expect similar operational model irrespective of the geography.
- More importantly under BOOT model since network infrastructure will be transferred back to Govt. meaning end of the period there will be heterogeneous networks and operational models which need to be taken care. This heterogeneity will lead to higher integration and operational costs for the Govt.
- Also the Network infrastructure should be able to provide all Government to Government (G2G), Government to Business (G2B) and Government to Citizen (G2C) Services, hence it is very critical that the capability of the Infrastructure deployed (and hence the investments from BOOT operator) should be standardized & interoperable across the country. Also the standardization should be achieved so that there is no significant gap between networks deployed across various BOOT operators across the country. E.g the capability of the Network infrastructure deployed should be similar in North Eastern States as well as States what is deployed in Bihar or Karnataka. This would ensure there is no significant digital divide among the various States within the country.
- In summary, uniformity of architecture, technology and operational model is critical for successful delivery of services over BharatNet irrespective of the implementation models. There should be incentive linked targets to be achieved for the rural penetration.
- Factors like availability of affordable handsets; readiness of the rural market; Digital readiness; expected revenue and business case etc. are the important gaps to be filled in, which requires leveraging and strengthening the existing fibre resources, considering a mix of deployment strategies and methodologies including microwave, electricity infrastructure.

**Q.10 What should be the methodology of funding the project? In case of VGF, what should be the method to determine the maximum value of VGF for each State/ service area and what should be the terms and conditions for making payments?**

**Response:**

- Revisiting the exercise on estimation of cost requirements and comparing to achieve cost saving through choice of various methodologies for outreach to the villages with the current requirement of bandwidth need as per the population density, is a recommended starting point for funding exercise.
- Project should be based on minimum tenure of Per annum assured return on investment that a company bids to win the project. The competing bids would ensure minimum cost to exchequer and also non escalating budgets.

- The only windfall advantage that any BOOT player would be able to retain would be the extra profits due to lower cost of execution due to innovations etc which anyway should be a reward for better execution. This will get negated after the BOOT transfers the property back to government after a period of time.
- Extra slab based %age return added to execute the project faster. Penalty should also be included for delayed execution.
- The method to determine the maximum value of VGF would require detailed economic analysis to prepare a viable business case for the bidder/executing agency. It would also depend on the terrain/area mix for the particular package, demographic data of the area, etc.

**Q.11 What kind of fiscal incentive and disincentive be imposed on the agency for completing the project in time/early and delaying the project?**

**Response:**

- There should be performance linked incentive built in the model, which can offer a motivation for the deployment Agency to deliver in timely manner and be cost conscious in the choice of execution methodology.
- The incentive should be enabling, rather than just the basic fiscal incentive. An outcome based model which links the performance with the reduction in USO Fund in the phased manner, while not resulting in any loss to the exchequer could be developed.
- The implementing agency should have more incentive to bid for the project in case it is able to retain ownership for a longer period & thus require less funding support from the Government.

**Q.12 What should be the tenure/period after which the ownership of the project should be transferred to the Government?**

**Response:**

The period after which the ownership should be transferred should be 20 years.

**Q.13 Do you think that some measures are to be put in place in case the executing agency earns windfall profits? How should windfall profits be defined?**

**Response:**

- It is believed that there will be very little of profit or high turnover in the first few years.
- The only windfall advantage that any BOOT player would be able to retain would be the extra profits due to lower cost of execution due to innovations etc, which

anyway should be a reward for better execution. This will get negated after the BOOT transfers the property back to Government after a period of time.

- Extra slab based %age return added to execute the project faster. Penalty should also be considered for delayed execution.

**Q.14 Whether there is a need to mandate the number of fibers to be offered as a dark fiber to other operators to ensure more than one operator is available for providing bandwidth at GP level?**

**Response:**

- There should not be any need to mandate the number of fibres to be offered as a dark fibre to other operators but cap should be there in terms of maximum number of fibre pairs one operator can have to make sure it doesn't get owned by single service provider leading to a dominant position.
- The demand & supply of fibre pairs should be market driven rather than mandated because initially service providers may be more interested to have bandwidth rather than fibre pair to serve the rural markets.
- The starting point for the infrastructure being created should be on the basis of right capacity requirements and building network infrastructure to address those requirements on bandwidth basis rather than creating low capacity network assuming there would be interested players for fiber leasing and putting their own CAPEX and OPEX.
- Over a period once broadband services pick up and market becomes mature at that stage service providers may be willing to own the fibre and build their own independent active networks which involve CAPEX and OPEX on their part.
- The downside of this would be multiplication of network equipment deployed by multiple service providers which could be challenge in rural areas due to space and power requirements.

**Q.15 What measures are required so that broadband services remain affordable to the public at large?**

**Response:**

Following measures should be adopted to make broadband services affordable:

- Lowering the entry barrier for Domestic bandwidth to be used by retail service providers by infrastructure build out based on Open technologies brining in economies of scale as well as competitiveness as against closed/niche technologies with vendor lock-in issues and lower economies of scale due to lesser adoption across industry eco-system.
- Aggregation of International Bandwidth at country level by Government to reduce entry barrier since substantial amount of tariff paid by end users is contributed to the cost of international connectivity.



- Incentives for localization of content in country by building local Data Centers & Caching systems to reduce bandwidth costs further lowering entry barrier.
- Irrespective of the execution model, afresh infrastructure should be built on non-discriminatory basis rather than enabling/funding some of the existing players to upgrade existing networks to avoid monopolizing the infrastructure and lowering the prices to the public which would be then market driven rather than specific agency driven.

**Q.16 What safeguards are to be incorporated in the agreement entered between Government and executing agencies if ROW is not being granted to the executing agency in time?**

**Response:**

- ROW should be part of the responsibility of BOOT player to manage.
- The understanding and an agreement between Central Government, State Government and other bodies should enable the executing Agency with ROW and any other required contract.

**Q.17 The success of BOOT Model depends on participation of private entities, which will encourage competition. What measures should be adopted to ensure large scale participation by them?**

**Response:**

- Maximising private sector participation and investment rests on two fundamental tenets:
  - Employing public investment only in areas where the Government's broadband ambitions cannot be achieved by the market on a commercial basis; and
  - Taking measures to reduce the costs to the private sector of rolling out broadband networks such as making available spectrum at a reasonable price and reducing the costs of site approvals and rights of way.
- Government could help enabling the demand by promising an assured demand for the services required for CSC, PHC, e-health, educational institutes etc.

**Q.18 Please give your Response on any other related matter not covered above**

**Response:**

It is critical that the choice of Technology & architecture for Bharatnet is based on terms of reference which provide a holistic approach rather than choosing technology based on selective approach or partial terms of references. This is critical owing to following reasons:

- The infrastructure being created under BharatNet is the National Infrastructure which is going to be used for many years not only enabling

increased Broadband penetration but also will be backbone for Government services (e-Health, e-Education, e-Skills, PMJDY, e-Governance etc. ) being delivered under “Digital India” program. Any technology/architecture decisions we make today and investments we make today for building networks will have impact on Government’s endeavour to provide services to larger set of citizens.

- The entire BharatNet Business & Operational model is around SLAs driven Managed Services for ensuring utilization of the network to spur broadband growth, any technology with limited functionalities & flexibility of services offering will impact both the utilization and monetization options of the network being deployed.
- Worldwide, the compelling events of Cloud, Video and LTE are driving adoption of intelligent and flexible Services Oriented Network Infrastructure based to optimally deliver G2G/G2C/B2B/B2C applications & services over broadband. Accordingly the Technology or architecture should be based on the maturity & deployments across globe to ensure that lead time of deployments of all services is reduced to minimum.

The above considerations has been addressed in the previous committee report in terms of “Architecture, planning & technology choice”. The recommendations are in line with the trends globally in terms of Technology Maturity, Open Standards, Inter-operability, Total Cost of ownership and Operational Efficiency.

Any review of the recommendations owing to selective parameters (e.g. cost or power requirements alone) will be a retrograde step and will lead to sub optimal choice of technology and will lead to vendor lock-in, non-interoperability among networks and will significantly hinder seamless delivery of even existing e-governance services to all.

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