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**TELECOM REGULATORY AUTHORITY OF INDIA**  
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To,

The Secretary  
Department of Telecommunications  
Sanchar Bhawan,  
20, Ashoka Road  
New Delhi

Letter No. 341-18/2011-CA

dated: 4<sup>th</sup> May, 2011

**Subject: TRAI's recommendations on "National Broadband Plan".**

Sir,

This has reference to the letter no. 4/4/2009- policy -I (Pt) dated 7<sup>th</sup> April 2011, seeking the views of TRAI on the proposals for the creation of a National Optical Fibre Network (NOFN) for providing broadband connectivity to all Gram Panchayats. This letter also contains the comments of the Department of Telecommunications on various recommendations made by the Authority regarding the National Broadband Plan. Subsequently, vide letter number 4-4/2009-Policy-I (Pt.II) dated 27<sup>th</sup> April 2011, certain additional comments as well as information were provided.

2. The Authority has given careful consideration to the various proposals contained in these two letters. The Authority notes that the Department of Telecommunications is in agreement with the proposal of the Authority for the creation of a National Optic Fibre Network and that it agrees that the National Optic Fibre Network should be an enabling network, facilitating different technologies for the growth of broadband. The Authority is firmly of the opinion that broadband should be available to all citizens of the country, both in the rural and urban areas, so as to further the ideal of inclusive growth. The Authority is, in principle, in agreement with the DOT that an effective Broadband network would be a combination of wireless and wireline / fixed line technologies at the access level.

3. However, we find that the scheme proposed by the Department of Telecommunications envisages provision of optic fibre network only upto the Gram Panchayat level. The Authority would strongly urge that, as recommended in the National Broadband Plan, the optic fibre network should be extended to all habitations having a population of more than 500 persons. The detailed rationale for this is

contained in **Annexure -A**. While the Gram Panchayats could be covered in Phase-I, the other habitations should be covered in Phase-II, both the phases being completed by December 2013.

4. It is similarly noted that urban areas are excluded from the proposed plan. TRAI would like the Department of Telecommunications to reconsider the matter. The rationale for covering the urban areas is given in **Annexure-B**.

5. It is observed that the proposal of the Authority for the creation of National Optic Fibre Agency (NOFA) is not being pursued. We would reiterate that a separate agency be created to provide the incremental network, as proposed by DOT. The rationale for this is given in **Annexure - C**.

6. Likewise, the proposal for the creation of State Optic Fibre Agency (SOFA) is also not being pursued. While the creation of SOFA may not be an imperative, the Authority would like the Department of Telecommunications to ensure certain provisions in the proposed MOU with States, for reasons explained in **Annexure - D**.

7. The proposal of the DOT to appoint BSNL as Executing Agency (EA) is fraught with serious implications. We foresee certain problems with this arrangement, which are listed in **Annexure - E**. The Authority would strongly recommend the creation of NOFA.

8. There are certain other issues which are detailed in **Annexure - F**. These may kindly be given due attention.

9. Detailed recommendations on the comments of the DoT in the letters under reference are given at **Appendix**.

10. In keeping with the transparency norms, a copy of this letter is being placed on the website of TRAI, [www.trai.gov.in](http://www.trai.gov.in).

11. This letter issues with the approval of the Authority.

Yours faithfully



(R.K. Arnold)  
Secretary, TRAI

**REPLY TO DOT REFERENCE ON ‘NATIONAL BROADBAND PLAN’**

	<b>TRAI RECOMMENDATIONS</b>	<b>DOT REMARKS</b>	<b>TRAI’S COMMENTS</b>
5.65	SOFA will undertake the reinstatement work itself or will pay the reinstatement charges to the concerned agency.	Creation of SOFA for each state would not be practicable. The Executive Agency will be responsible for establishment, management & operation of NOFN. The tripartite MOU amongst DOT, Concerned state and Executive Agency would take care of various issues related to Right of Way permission and Right of Way Charges.	The Authority's views regarding SOFA may kindly be seen at <b>Annexure - D.</b>
6.21	The Authority recommends that: Broadband connection may be defined as “A data connection using any technology that is able to support interactive services including Internet access and support minimum download speed of 512 Kilo bits per second (Kbps)”.	The capacity of the proposed NOFN for providing Broadband is scalable depending on the CPE and backhaul capacity. The download speed is achievable depending on the deployment of suitable CPE and availability of required backhaul bandwidth capability.	It is universally recognised that the minimum speed as per definition of broadband in India is very low i.e. 256 kb per second. What has been proposed by the Authority as part of the National Broadband Plan is a minimum download speed of 512 Kbps immediately and 2 Mbps by 1 <sup>st</sup> January 2015. It is absolutely essential that this definition is adopted; failing which, there will be serious quality of service issues.
6.22	It is to be noted that the upload speed will at least be half the download speed. This definition of broadband (Both Wireline and Wireless) given in para 6.21 above, which will be effective		

	from 1st January 2011. The stipulated download speed of 2 Mbps will be effective from 1st January 2015.		
6.35	The Authority recommends that Government may fix and notify the charges for Right of Way in consultation with the State Governments on priority basis and ensure time bound availability of RoW to telecom service providers after due intimation to the agency concern.	Tripartite MOU amongst DOT, Concerned Agency would be executed. The work of laying Optical Fibre network in a state would be undertaken only after that state agrees to appropriate arrangements regarding Right of Way permission and levying of reasonable charges. And	For reasons explained at <b>Annexure - D</b> , the Authority recommends that the Department of Telecommunications should take a serious relook at their proposal.
7.01	ICT in general and broadband in particular contribute substantially to growth of GDP and towards poverty alleviation by improving access with equity.	Accepted	No Comment.
7.02	As per study, 10% increase in broadband penetration accounts for 1.38 percentage increase in the per capita GDP growth in developing economics.	Accepted	No Comment.
7.03	Currently in India, the penetration of broadband is 0.8% as against the tele-density of 60.99 as of Sept'2010. The number of broadband connections is only 10.3 million as against a target of 20 million by the year 2010. Therefore,	Accepted	No Comment.

	there is an urgent need to facilitate rapid growth of broadband.		
7.04	Towards this end, a National Broadband Network will be established. This network will be an open access optical fibre network connecting all habitation with population of 500 and above. This Network will be established in two phases. The first phase covering all cities, urban areas and Gram Panchayats will be completed by the year 2012. Phase II will see the extension of the network to all the habitations having a population more than 500, to be completed by the year 2013.	Accepted with modification  Network connecting all habitation with population of 500 and above in access layer in rural areas is already addressed by Rural Wireless broadband scheme of USOF. As of now taking OFC upto Panchayats will substantially meet the demand for foreseeable future.	Please see <b>Annexure – A</b> and <b>Annexure – F</b> for the views of the Authority
7.05	A National Optical Fibre Agency (NOFA) will be set up to establish this broadband network. NOFA is proposed to be a 100% Central Government-owned holding company. Besides being a Holding company, NOFA will also establish the networks in all the 63 cities covered under Jawahar Lal Nehru Urban Renewal Mission (JNURM).	Accepted with modification  TRAI in their report dated 08.12.2010 had recommended for implementation of NBP, the creation of new agency as a purely central government entity in the form of National Optical Fibre Agency (NOFA) which in turn would create state level agencies in each state i.e. State	Please see <b>Annexures – C</b> and <b>Annexure – D</b> for the views of the Authority on NOFA and SOFA.

		Optical Fibre Agency (SOFA) in partnership with state governments. During the deliberations in DoT, it was felt that while the creation of NOFA merits serious consideration, the creation of one SOFA for each state would not be practicable. Instead a suitable MOU amongst DoT, the concerned State Government and the executive agency may serve the same purpose. The brief regarding the implementation strategy and the institutional mechanism being proposed for creation of National Optical Fibre Network (NOFN) is placed below at Annexure 'A'.	
7.06	A State Optical Fiber Agency (SOFA) would be formed in every State with 51% equity held by National Optical Fibre Agency(NOFA) and 49% by the respective State Government. NOFA would be the holding company of all the SOFAs.		
7.07	All the SOFAs, under the overall guidance of NOFA will establish the networks and backhaul in the rural areas and in the urban areas other than those cities covered under Jawahar Lal Nehru Urban Renewal Mission (JNURM).		
7.08	The optical fibre network would support backhaul bandwidth requirement for provision of broadband and facilitate broadband growth.	Accepted	No Comment
7.09	This network will be established at a cost of about Rs 60000 crore. It will be financed by USO fund and the loan given/guaranteed by Central Government.	Accepted with modification  The cost for establishing and maintaining the NOFN will be borne by the USOF as per actual bids received by the EA. The administrative expenses (centage) of the EA will be borne, on a	Please see <b>Annexure – C</b> for the views of TRAI. It is emphasised that intention of creation of USO Fund was to generate fund through cess on AGR of telecom licencees and support deployment of Telecom services in rural Areas. It does

		<p>normative basis, which will be approved by the Telecom Commission.</p> <p>USOF would fund the entire Capex, Revenue streams would be shared with USOF, first charge being the Opex. Suitable incentives would be provided to EA for maximizing revenues. However Opex gap will be funded initially for a period of 5 years as traffic growth in the initial period may not be adequate to meet this expenditure.</p>	<p>not envisage generation of revenue through use of such infrastructure created in rural areas. Therefore, sharing revenue stream by USOF from National Optical Fibre Network is not in line with objective of creation of USOF. The Authority has also noticed that BSNL has been identified as Executing Agency. The Opex gap is proposed to be subsidised for 5 years. It is apprehended that this may become indirect method to subsidise operations of BSNL.</p>
7.10	<p>The National Broadband Plan envisages provision of 75 million broadband connections (17 million DSL, 30 Million cable and 28 million wireless broadband) by the year 2012 and 160 million broadband connections (22 million DSL, 78 million cable and 60 million wireless broadband) by the year 2014.</p>	<p>Accepted with modification</p> <p>Targets will depend on issues being resolved at demand supply level. DoT's mandate is to resolve and address the issues related to supply side. The demand side issues will be addressed through various initiatives taken by other Ministries such as Department of Information Technology, Ministry of Panchayti Raj, Ministry of Rural development, Ministry of Human Resources development etc. At this stage it may not be feasible to indicate the targets.</p>	<p>Targets are necessary to concentrate efforts to reach the goal post. Broadband penetration in India is low. Targets will ensure that a focused attention is given to address all related issues to achieve the goal in the given timeframe.</p>
7.11	<p>Right of way will be issued to the</p>		<p>Please see <b>Annexure – D</b> for</p>

	executing agency without delay and without any charges but subject to reinstatement by the concern agency. The work related to national broadband network will be taken up in a state only on an undertaking to this effect.	Accepted with modification  The work of laying optical fibre network in a State would be undertaken only after that State agrees to appropriate arrangements regarding right of way permission and levying of reasonable right of way charges.	the views of the Authority
7.12	Government may notify the charges for Right of Way in consultations with the State Governments on priority basis and ensure availability of RoW to telecom service providers to provide various telecom services.	For ensuring this, a suitable tripartite MOU amongst DOT, concerned State and EA would be executed. This MOU would be drafted by the High Level Committee (HLC) which would be set up by DOT.	
7.13	The program is expected to bring immense benefit when fully operational. The estimated revenue of NOFA and all SOFA is expected to be Rs 26000 crore per year.	Accepted	No Comment.
7.14	The Network will provide easy access to high speed data and information to citizens, promoting thereby the efforts in the field of education, health etc.	Accepted	No Comment.
7.15	The optical fibre network would	Accepted with modification	The views of the Authority are



	<p>support following bandwidths:</p> <ul style="list-style-type: none"> <li>❖ 10 Mbps download speed per household in 63 Metro and large cities (covered under JNURM) for every wireline connection by the year 2014.</li> <li>❖ 4 Mbps download speed per household in 352 cities for every wireline connection by the year 2014.</li> <li>❖ 2 Mbps download speed per household in towns and villages for every wireline connection by the year 2014.</li> </ul> <p>* Upload speed would be half of the download speed.</p>	<p>The proposed network is scalable and robust to cater to higher bandwidth requirements as an aggregation layer/backhaul. Bandwidth requirements for Panchayats will be higher due to sharing of connectivity and extensive use of audio/video applications on account of low literacy level, hence it is envisaged to take the optical fibre upto the Panchayats to ensure broadband connectivity with adequate bandwidth is made available.</p>	<p>contained in <b>Annexure –A</b></p>
7.16	<p>The objective of national broadband Network is to provide fibre to home in 63 cities covered under JLNRU, Fibre to curb in all other cities (0.5 Km from any residence).</p>	<p>Accepted with modification</p> <p>The urban areas are already covered by OFC as far as aggregation layer is concerned and requirements of access layer could be met by market dynamics.</p>	<p>Please see <b>Annexure – B</b> for the views of the Authority</p>
7.17	<p>In order to enable cable industry to go fully digital, the recommendations of TRAI dated 5<sup>th</sup> august 2010 on “Implementation of Digital addressable system in India” will need to be implemented on priority basis.</p>	<p>Action to be taken by Ministry of Information and Broadcasting</p>	<p>No Comment.</p>

7.18	In order to ensure affordability of Customer premises equipment cost, Government may review the duties levied on inputs and finished products used in providing broadband and Internet services.	Accepted with modification  The Department agrees in general as incentive to CPE and other equipments will give further impetus for acceleration of Broadband penetration.	TRAI's concern is to ensure affordability of CPE by common people. DOT is requested to draw up a time-bound schedule for decision in the Government.
7.19	Customer premises equipment including modem and routers used for Internet and broadband may be considered for 100% depreciation in the first year.		

**Provision of optical fibre network in the rural areas**

1. Broadband has been identified as most important tool to usher in growth. Economic growth of the country and ICT have a recursive relationship. The inclusive growth of the society can only be ensured if villagers also have easy and affordable access to information highways as available to urban people.
2. There are 250,000 Gram Panchayats while there are nearly 600,000 inhabited villages. The size of a Gram Panchayat varies from State to State and may include in its jurisdiction one or several villages.
3. The requirement of bandwidth, particularly in the rural areas, is inversely proportional to the levels of development. The computation power of the devices is doubling almost every year. Similarly, miniaturisation of devices has created enormous storage capacity in handheld devices. As a result, large number of applications are being developed which require huge bandwidth. If we have to reach the benefits of education, health etc to the rural areas, it is more than likely that the medium will be video, which requires comparatively larger bandwidth. Given the falling prices of the end devices, the ease of handling a video medium, as well as the possibilities that Gaming and Entertainment hold, it is reasonable to expect that at least about one third of the households, if not more, would be accessing broadband facilities. Currently, about 40% of the towers are in the rural areas, which puts their number around 170,000. Since each tower can only provide 14.4 Mbps per sector at present, there would be a need to establish more towers to meet the requirements of the entire rural population. In the recommendations on the National broadband plan, it has been estimated that the backhaul requirement would be of the order of 20 Mbps. 85% of even the existing towers being dependent on microwave for backhaul, it becomes even more essential to provide optic fibre connectivity to these new towers.
4. Internationally, countries are trying to reach 90 to 95% of the population adopting optical fibre to a great extent. Despite having a relatively more comfortable spectrum availability and high wireline penetration, countries are making huge investments for creating country-wide optical fibre broadband networks. The Table below indicates some International initiatives in this regard:

**International initiatives to create Optical Fibre Infrastructure to support broadband**

<b>Name of Country</b>	<b>Brief of National Broadband Project</b>
Australia	<ul style="list-style-type: none"> <li>• Government plan to invest USD 38 billion in national broadband plan.</li> <li>• 90% of population shall be provided broadband access of 100 Mbps speed with fibre based network.</li> </ul>
Singapore	<ul style="list-style-type: none"> <li>• Next Generation Broadband plan started in 2006 with government subsidy of USD 0.7 million.</li> <li>• Open Access wholesale to 95% population by 2012 with initial speed 100 Mbps rising to 1 Gbps using FTTH network.</li> </ul>
Malaysia	<ul style="list-style-type: none"> <li>• High speed broadband network to connect 1.3 million homes in major cities on FTTH/FTTC network by 2012.</li> <li>• Government to invest USD 0.7 billion out of total cost 3.2 billion USD.</li> <li>• Government to invest additional USD 250 million in rural areas.</li> </ul>
Sweden	<ul style="list-style-type: none"> <li>• Local municipals to invest more than 180 million USD to deploy 1.2 million km of fibre in and around Stockholm.</li> </ul>
United Kingdom	<ul style="list-style-type: none"> <li>• Government invested 1.6 billion USD for development of NGA in rural areas.</li> <li>• Aim is to bring the superfast broadband to 90% of population. Private investment is expected to 70% of optical fibre cost by 2017.</li> <li>• Part funded by proposed landline duty of USD 0.8 per month on all fixed line in country.</li> </ul>
United	<ul style="list-style-type: none"> <li>• There is a national broadband plan to provide the</li> </ul>

States	<p>nationwide broadband including rural areas. Government to provide USD 11.6 billion under various broadband programs.</p> <ul style="list-style-type: none"> <li>• Further USD 2.5 billion is made available for grants loan and loan guarantees.</li> </ul>
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5. The Rural Wireless Broadband Scheme, as is proposed, aims at providing funds for setting up of active infrastructure for wireless broadband. Currently, 3G has limited capability while BWA can only provide predominantly data services only. The technology in broadband services is evolving rapidly and the world is progressing towards 4G/LTE services. Any investment by the government in wireless broadband services would necessitate additional investment as and when technology evolves. The Authority is therefore of the opinion that an optic fibre network is preferable since it can support any speeds for future networks. It may be noted that with the help of such optic fibre network at the application layer, the service providers can at low cost, setup and upgrade the access network for wireless broadband among other technologies.
  
6. The cost of provision of optic fibre network will also be much lower than the subsidy for the rural wireless broadband scheme besides having the advantage of future proofing. This will also have the advantage of using the available spectrum more efficiently since the wireless networks will then be highly localised in nature.
  
7. The objective of TRAI as well as that of the DOT is to ensure that broadband connectivity is available through different technologies. Unlike the Rural Wireless Broadband Scheme, the optic fibre network has the advantage of enabling different technologies to provide the broadband, once it is provided in every habitation. This would include Cable, copper, as well as wireless connectivity.
  
8. The optic fibre network also has the advantage of supporting several initiatives by service providers such as cable TV operators, ISPs, all telecom service providers as well as by various application providers who can directly access, after taking the unified license, the consumers for promotion of different services. This would not be possible in case of a wireless broadband scheme where the application providers are totally at the mercy of two telecom service providers. This is particularly significant considering that the growth of applications holds the key for the growth of broadband services.

9. The optic fibre network in all habitations serves the advantage of the telecom services being subject to the market forces whereas the Rural Wireless Broadband Scheme can induce and sustain an anti-competitive behaviour either vis-à-vis the other service providers or the consumers.
10. Having bid for the spectrum, either for 3G or BWA services, it is the responsibility of the service providers to go to the rural areas. The rural wireless broadband scheme effectively subsidises the telecom service providers and that too only two of them. Considering that the costs of the scheme have not been finalised and given the possibility of additional investment from time to time, effectively it means underwriting the cost of these two service providers in serving the rural areas. This has the potential of the cost of the scheme being a significant portion of or even exceeding the revenues that have been realised from the auction of 3G and BWA spectrum.

**Provision of optical fibre network in the urban areas**

1. Optical Fibre network in the cities is primarily used for meeting the backhaul requirements. Even though the Optical Fibre network in aggregation layer is available in many cases, the Optical fibre has not reached the homes. Today out of 11.47 million Broadband connections, only 0.28 million are working on Fibre. Therefore, it is desirable that Fibre is extended to homes at least in 63 cities where bandwidth requirement is high.
2. With increasing growth in the economy, and a globalised world, the need for increased bandwidth cannot be overemphasised. Many cities in the world are already working towards provision of speeds of 100 Mbps. Such high speeds are better provided through optic fibre network rather than wireless broadband. It should also be noted that currently, the world over, 65% of the bandwidth consumption is indoors, either at home or in office. This being the case, using only wireless broadband spectrum also constitutes a waste of precious spectrum. Yet another feature is the growing trend towards multi dwelling units in the metros and large cities, rendering the provision of broadband easier. It is therefore necessary for the large cities to be provided with a ubiquitous and efficient broadband network capable of delivering high speeds. This should be an inherent aspect of the urban development process in our country.
3. Currently, growth of broadband in urban areas is low due to non-availability of fibre both in the aggregation and access networks. Wireless in access network may provide wider coverage but lacks high capacity bandwidth support. Scarcity of spectrum and required number of BTS to support the increasing demand is a key constraint. It is difficult to provide high speed broadband with good quality of service using only wireless technology.
4. Futuristic networks can only be created by deploying the deeper fibre networks within the close proximity of the users. The robustness of any

fibre networks can be achieved with well structured Optical Fibre Network extending as close to the user as possible.

5. In remarks against paragraph 7.16 of the recommendations, DOT has stated that "the urban areas are already covered by OFC as far as aggregation layer is concern and requirements of access layer could be met by market dynamics". It must be pointed out that in so far as aggregation layer is concerned, this is currently met by wireless broadband network. Barring an occasional city like Jaipur, large cities as well as metros do not have an optic fibre access network. This is because of the difficulties being faced by service providers in obtaining right of way. In the recommendations dated 12 April 2011, the Authority had recommended stipulation of time limit as well as fixation of charges for providing the right of way. Secondly, insofar as market dynamics are concerned, it is desirable that a centralised agency undertakes this work so that it is truly accessible to all service providers, be they Telecom service providers or otherwise. Such an aggregation layer would also facilitate the provision of access layer by the service providers. As indicated above, the need for high-speed bandwidth to an optic fibre networks in the form of FTTH cannot be overstated.
  
6. Yet another reason for lack of provision of optic fibre network in the urban areas is that the USO fund cannot be used in the urban areas. This would be true if the source of funding for the optic fibre network is only the USO fund. The recommendation of the Authority in the National Broadband Plan is to utilise the USO fund to leverage additional funds in the form of loans etc, in which case such funds could always be applied to the urban areas along with additional funding to the rural areas.
  
7. In view of the above, it is suggested that the provision of an optic fibre network in the urban areas should be undertaken immediately with a view to provide FTTH in the metros and large cities and FTTK in other cities, as recommended in the National Broadband Plan.



**Rationale for Creating National Optic Fibre Agency  
(NOFA)**

1. Creation of an optical fibre network in the country requires a dedicated agency for planning, operation and provision of required bandwidths to its users. In the remarks against paragraph 7.05 and 7.06, the DOT have stated that during the deliberations in the Department, it was felt that the creation of NOFA merits serious consideration. Yet, the scheme that is formulated does not make any provision for this. Instead, the institutional mechanism for the National Optic Fibre Network (NOFN) envisages the setting up of a high-level committee as well as an advisory body with BSNL being the executing agency. It is only at stage two, the timing of which is to be decided subsequently, that an SPV is proposed to be formed. The Authority is of the view that the present proposal runs the risk of being dependent on the release of USO fund by the Government and therefore being subject to the normal budgetary processes. There is a possibility that it will be functioning more like a 100% centrally sponsored scheme. On the other hand, constitution of a National Optic Fibre Agency (NOFA) has the merit that the Agency can manage the availability of funds as per need without having to depend on the government. Besides, it can also cover the urban areas as mentioned in **Annexure B**.
2. The matter has been considered in detail and the Authority is of the view that the Department of telecommunications should reconsider its proposal regarding the institutional mechanism. The NOFA should be headed by a person of eminence. The role of the HLC as well as the advisory body, could be reviewed as appropriate.
3. Paragraph 2.0 of the scheme formulated by the Department of Telecommunications recognises that in implementation and usage of the NOFN, a large number of agencies and organisations of Central and State Governments as well as private sector would be involved. It recognises the multiplicity of agencies and complexity

of the work involved coupled with the need for overall aggregation and integration at the national level. This is admittedly a complex task requiring a day-to-day oversight and can only be done by a dedicated agency.

4. While NOFA can leverage USO fund to raise the loan for implementing National Optical Fibre Network, the proposed scheme of DoT runs the risk that BSNL cost may be offloaded on NOFN, BSNL being Executing Agency. This will result in high cost of broadband provisioning to the customers.
5. NOFA will be lean agency and minimize the cost of operation.
6. NOFA can receive fund from leasing the network for further growth of the optical fibre network whereas all revenue collected by USOF will go to Government and may not be reinvested in the network.
7. For the above reasons, the Authority strongly reiterates its recommendation for the creation of the National Optic Fibre Agency.

**Creation of State Optical Fibre Agency (SOFA)**

1. In the remarks against paragraphs 7.05 and 7.06, the Department of Telecommunications has indicated that "*during the deliberations in the Department it was felt that the creation of one SOFA for each state would not be practicable. Instead, a suitable MOU amongst the DOT, the concerned State Government and the executing agency may serve the same purpose.*"
2. The Authority has considered this observation. The idea in suggesting the formation of a State Optic Fibre Agency (SOFA) is to ensure the participation of the state government even as the program is controlled and directed by the National Optic Fibre Agency (NOFA). There are two areas where the formation of a State Optic Fibre agency may be useful. Firstly, there are several issues of right of way which can be sorted out with the active participation of the state government. The right-of-way issues concern the local governments more than the State Governments themselves. A large number of Municipalities and Gram Panchayats would be involved. The State Governments may not have the authority to issue any specific direction to the local governments on ROW issues. Secondly, in terms of the execution of the programme, there will be several issues which are local in nature and which would require regular and close intervention. The formation of the State Optic Fibre Agency (SOFA) would enable some local officials to be drawn from the State Governments, who could facilitate the processes.
3. In the proposed framework of DoT, the term "appropriate arrangements regarding right of way permission" needs more elaboration. In its recent recommendations on "Telecommunications Infrastructure Policy" dated 12<sup>th</sup> April 2011, TRAI has recommended the laying down of specific charges for Right of Way as well as a time bound clearance of the applications from the service providers including the infrastructure providers. If the Department of Telecommunications would like to proceed with the MoU, then they must ensure that these recommendations are given a shape in the form of a specific agreement including the ability of the State Government to issue directions to the local bodies. These recommendations must include specific reinstatement charges as well as clearance of the right-of-way issues

within 45 days of the application for grant of permission by local authorities for establishing telegraph line/post/laying of cable. The reinstatement charges proposed by the Authority in its recommendation on “Telecommunications Infrastructure Policy” are as follows:-

<b>Size</b>	<b>Reinstatement charges [Per Km in Rs. Lakh]</b>		
	<b>Black top/ cement road</b>	<b>Metal road</b>	<b>Earthen road</b>
Above 1 million	5	3	1
Above 1 lakh to 1 million	3	2	0.5
Above 10000 to 1 lakh	2	1	0.25
Villages with population			
10000 and below	1	0.75	0.25

4. Subject to the above, the Authority has no objection to the non-Constitution of SOFA in each state at this stage. However, if the MOUs do not yield the desired result, the Department of Telecommunications would be well advised to revive the idea of SOFA.

**Problem of BSNL as Executing Agency**

1. As per clause 3.1.4 of the draft scheme of the DoT, BSNL has been indicated as the Executing Agency with a dedicated project implementation team. It would be the vehicle for implementation of the National optic fibre network at this stage. Significantly, the policy decisions, supervision and control of BSNL will be carried out by the HLC/USOF.
2. While the objective appears to realise speedy and efficient execution of the programme, the Department of telecommunications would need to consider whether the Public Sector Undertaking, given its autonomous status, can be controlled in terms of decisions and supervision by the HLC or USO fund. The possibility of severe criticism in this regard is to be considered.
3. It is noticed from the composition of the high-level committee given in paragraph 3.1.1 of the draft scheme that BSNL would be a Member of the committee. Since crucial decisions -- the scope of work, execution strategy, funding requirement and timeframe -- would be decided by the High-level committee, the possibility of a conflict of interest between BSNL as executing agency and as a member of the HLC needs to be considered.
4. BSNL is essentially a Telecom service provider. Given the extreme importance of the project and the close supervision by two high-powered bodies, it is possible that the energies of the senior management of BSNL would be diverted away from its core task of managing Telecom services. Already, BSNL has been registering losses in the last few quarters and there is need for BSNL to utilise all its energies in restoring the health of the enterprise.
5. BSNL is currently one of the service providers. If it is the executing agency including the maintenance of the network, there is a serious problem of the lack of level playing field vis-a-vis other service providers. This would be critical since the optic fibre network is envisaged as providing non-discriminatory access. There is a serious risk of anti-competitive behaviour setting into the network management.

6. In the light of the above, the Department of telecommunications would be well advised to review its proposal to make BSNL the executing agency. It would be worthwhile setting up a special purpose vehicle for execution of the programme.
  
7. No clarity is given in the DoT proposal regarding handing over of traffic to other service provider by the executing agency after incremental network. There is need to make the provision for handing over traffic to other service providers at least at district level to maintain level playing field and competition.

**Other Issues**

1. There are certain other issues which seem to be against the statutory provisions. The user charges are proposed to be fixed by USOF/ DoT. However, as per the provisions of TRAI Act 1997, TRAI should fix the charges for provision of various telecom services which includes leasing of the bandwidth. TRAI's recommendation vide Para 5.64 proposes that Optical Fibre Capacity may be leased out to service providers on demand at predetermined rates prescribed by the regulator.
2. Attention is also drawn to Para 2.1.2 of DoT reference, wherein user charges for the incremental infrastructure would be determined by USOF/DoT. As explained earlier TRAI Act envisages fixation of charges for provision of various services by TRAI. The framework may be revised to strictly conform to the provisions of the TRAI Act.
3. It is noticed that the draft Tender document stipulates QOS parameters. Since the QOS parameters are determined by TRAI, the QOS parameters may not be detailed in the tender document except to state that they shall be in conformity with the parameters laid down by TRAI from time to time.
4. An analysis of the provisions in the tender document for the Rural Wireless Broadband Scheme brings out the following concerns:
  - a. The scheme proposes to provide subsidy support as a percentage of capital recovery for setting up and management of wireless broadband network. It does not provide any details for number of connections to be provided or the time frame to meet the broadband requirement of various villages. Any effective network planning is done based on the projected traffic requirement within certain period. Even with modest target of 100 million connections by 2014, the bandwidth requirement per village will be substantially high and will be difficult to be met by wireless network.

- b. The Rural Wireless broadband scheme of USOF has proposed a contention ratio of 1:20. Most of the broadband in villages will use high video content for use of different services like e-education, e-health, gaming and entertainment. Such applications generally use video streaming and bandwidth requirement in such cases is much higher. Therefore, to ensure good quality of service the contention ratio cannot be more than 1:10.
- c. The Rural Wireless broadband scheme of USOF proposes subsidy to universal service providers (BSNL+1) to create wireless broadband network. No obligations of Unified Service Providers (USPs) have been prescribed nor rates have been fixed at which broadband connection has to be given to village users. In such a situation the Unified Service Providers (USPs) can use the subsidy provided by USOF to create wireless broadband network and adopt anti-competitive behaviour resulting in an issue of non level playing field. While the rates can be fixed by TRAI, the possibility of anti-competitive behaviour would still be large.
- d. Ensuring quality of service even after such huge investment will be a challenge in the absence of a definition for broadband.
- e. The Rural Wireless broadband scheme of USOF has not made any projections for subsidy support. However, such networks so created will be confined to concern USP without increasing competition in that area. The need is to create a robust future proof infrastructure which can meet the backhaul bandwidth requirement and create competition. Keeping this in view, TRAI has recommended provision of Optical Fibre upto the villages so that broadband requirement of the end customers can be met by different service providers such as ISPs, Cable TV operators, Wireless Broadband Providers using BWA technologies as well as Wi-Fi using unlicensed band.
- f. As already discussed the USOF scheme envisages promotion of broadband through 3G/BWA, which has limited capacity to support high bandwidth requirement.