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Mr. Arvind Kumar,
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New Delhi: 110 002

Subject: Implementation Model for BharatNet
Ref: TRAI Consultation 5/2015 dated 17.11.2015

Dear Sir,

The GSMA is pleased to provide its comments on the Consultation Paper on Implementation Model for BharatNet. It is now well recognised that a country's broadband penetration is a key competitive differentiator and a key enabler of socio-economic development and distribution of benefits, and the role of Mobile in achieving this cannot be underestimated. As per estimates¹ mobile industry's contribution to GDP in 2014 was 6.1% (INR 7.7lakh crores) which is expected to reach 8.2% by 2020.

We believe that India is at an inflexion point with mobile industry having invested INR 119,205 crores in last four years towards CAPEX². Going further, industry is committing huge investments over the next few years to deliver a world-class broadband and digital experience to the masses. With all these initiatives, the mobile broadband (MBB) connections are set to increase to 42% by 2020 from current levels of 11% (2014), and the data traffic is expected to grow at a CAGR of 66% between 2014 and 2019³.

TRAI's consultation, to deliberate an appropriate implementation model for BharatNet is thus, timely. The GSMA believes that such an important and mammoth task needs to be discussed and executed in collaboration with the operators and broader mobile ecosystem as they have the capacity to make much greater contribution towards the Digital India program.

There is a need to explore Public Private Partnerships (PPP) since there is no one size fits all model for this exercise. In-fact different countries have taken different paths to rollout national broadband

¹ The Mobile Economy Report, India 2015 by GSMA

² Ibid

³ Ibid



networks, however one aspect that makes success evident is close and high level collaboration between the government (with its various departments), and, the industry.

The GSMA believes that the following broad aspects (dealt-with in detail in the enclosed response), should be considered while formulating appropriate implementation plans:

1. Coordinate, Collaborate and Complement - Service providers and the government need to work ever closely for ushering in a Digital India
2. Market led approach in last decade has done wonders and should be continued with
3. Success of PPP models depends upon distributing the risks involved adequately and efficiently (e.g. Technology risks, Market risks, and Regulatory risks etc.)
4. Remaining technology neutral is the key, and this should be best left to the market forces
5. Last mile access - the crucial most piece, and, wireless (Mobile) will remain the dominant mode for broadband service delivery. Therefore it is important to ensure adequate quantity of globally harmonised spectrum is made available
6. The Rights of Way (RoW) challenge should be quickly resolved for hastening the fibre rollout. It also slows down BTS connectivity which impacts the last mile access.
7. Financial incentives will encourage and enhance private participation and investments, and make mobile internet affordable – one of the incentives is to reduce the regulatory levies like USO contribution, since *“Taxation can act as a barrier to improving the affordability of services, as taxes on mobile services for consumers increase their price, while sector-specific levies on operators (including the high cost of spectrum in India) reduce the funds available for investment”*⁴.
8. To encourage viability and self-sustaining business case in the long run in rural and remote areas with poor socio-economic indicators; public/government services like health, education, land records etc. should be provided as captive and committed use case
9. Digitisation and adoption of IT in government (central, state, municipalities, panchayats etc.) should be accelerated with majority of such services be made available online
10. The larger stakeholder community (Industry, the government, and eco-system players) need to collaborate to increase awareness on digital literacy, create local content development, and make public aware about the utility of broadband for enhanced quality of life.

We remain at your disposal to answer any questions you may have on the above

Yours sincerely,

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⁴ The Mobile Economy Report, India 2015 by GSMA



Consultation on Implementation Model for BharatNet: The GSMA Response

Executive Summary: At the outset, the GSMA welcomes the Authority's paper on choosing an appropriate implementation model for BharatNet, since it is of utmost importance that the vision of Digital India that also entails laying broadband highways across 250,000 Village Panchayats, is executed without cost overruns in a time bound manner.

Connectivity and Mobility have redefined the dimensions of India's socio-economy, demonstrating the success of mobile communications through a market-led model over last two decades. Along-with the competitive landscape, innovations in business practices (e.g. passive infra sharing) allowed the Indian consumer to enjoy one of the most affordable tariffs across the globe.

As per the GSMA estimates the mobile industry's contribution to GDP in 2014 was 6.1% (INR 7.7lakh crores) which is expected to reach 8.2% (INR 14lakh crores) by 2020.¹

India, spanning across 29 states and 7 UTs has topography, geography and socio-economic conditions with huge variations across its land mass, and hence, the scale of laying national OFC network across 250,000 village panchayats, and delivering affordable broadband to the masses is an effort that requires intensive collaboration between the Government, the industry and their mutually beneficial expertise.

The GSMA in its earlier submission in October 2014, had highlighted that a country's broadband penetration is a key competitive differentiator in the global economy, and the government and the industry need to work more closely to overcome barriers to penetration and challenges like awareness, digital literacy, availability of local contents etc.

The GSMA had advocated that the Government should consult with operators when defining targets, use of funds while at implementation of projects, and there is a need for Public Private Partnerships (PPP) to achieve it where private players are unable to reach due to genuine socio-economic challenges.

Different countries have taken different routes for national broadband objectives and many countries depended on long-term, clear policies with high-level coordination/collaboration efforts across government and industry to implement their broadband plans. Governments also extensively work on capacity building, raising awareness and extensive deployment & use of IT in government workings.

In the mid-1990s **South Korea** created a durable structure for long-term broadband policy planning by passing a law requiring publication of a national broadband strategy every 5 years (along with annual implementation plans). Since then, South Korea has published 3 master plans, some with multiple versions. The statutory obligation to produce new plans every 5 years has ensured that successive political administrations have made broadband a national priority².

Japan, another example of successful long-term implementation, created an IT Strategy Headquarters to oversee the execution of its broadband strategies, beginning with the e-Japan Strategy of 2001. Japan's Prime Minister chairs the IT Strategy Headquarters, and it is composed of ministers across agencies with responsibility for broadband policy. The IT Strategy Headquarters conducts an annual review of broadband policy priorities and directs the implementation of plan recommendations by government agencies, local governments and independent institutions.³ Also, there are good incentive mechanisms, and support initiatives, that have been explored in Japan.

¹ GSMA's The Mobile Economy Report, India 2015

² <http://www.broadband.gov/plan/17-implementation-and-benchmarks/>

³ Ibid

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As regards PPPs, “These PPPs in broadband networks are new, and governments are experimenting with different models. The key to the success of these projects will be ensuring that public investment ‘crowds in’ and does not substitute for private investment, and that the private sector has sufficient incentives to invest and operate networks efficiently.”⁴

India’s heterogeneous market with unique challenges for each state (even in the districts); it is unlikely that India can have a one size fits all approach hence a mix of approaches of public sector, private sector, and/or PPP need to be explored. Also, the **service providers have a ready learning curve of last 20 years in this complex and heterogeneous market.**

We believe that **India is at an inflexion point** with mobile industry having invested INR 119,205 crores in last four years towards CAPEX⁵. Going further, **industry is committing huge investments over the next few years to deliver a world-class broadband and digital experience to the masses.** With all these initiatives, the mobile broadband (MBB) connections are set to increase to 42% by 2020 from current levels of 11% (2014), and the data traffic is expected to grow at a CAGR of 66% between 2014 and 2019⁶.

Therefore mobile would remain the quickest, easiest and most prominent mode of broadband service delivery at the last mile level even in rural areas, and hence, to encourage MBB coverage in villages, the contribution by service providers to USO should be reduced.

As a basic premise, a light touch market led approach should be followed that allows expansion of connectivity at a faster pace. The BharatNet plan should aim at reducing costs of network deployment e.g. it is important to plan fibre networks that allow efficient Base Stations aggregation and planning, ensuring spectrum adequacy (with lower spectrum usage charges) for efficient and faster deployment of Mobile broadband (MBB), addressing challenges on Rights of Way, flexibility in products and pricing, technology neutrality etc.

With this background, we provide our comments on specific questions raised in the consultation paper.

⁴ Broadband Infrastructure Investment in Stimulus Packages: Relevance for Developing Countries Christine Zhen-Wei Qiang

⁵ GSMA’s The Mobile Economy Report, India 2015

⁶ Ibid

Consultation on Implementation Model for BharatNet: The GSMA Response

Issues for Consultation

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?
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.
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.

Ans: The DoT Committee Report does cover most of the challenges however it is required to dwell deeper into the solutions that are practical and doable, and therefore TRAI’s assessment of the proposed models deserve closer attention. E.g. an aspect w.r.t CPSU led or State led implementation model is that they may entail higher levels of subsidies across the regions whereas such measures should be targeted in areas where maximum challenges are present.

The project of this size and magnitude requires project management expertise because of many challenges that are involved in execution (RoW, law and order in sensitive areas), demand (utilisation in rural areas, high cost of handset/PC/tablet), financials (cost over-runs), and delayed rollouts (fibre only focus on backhaul may turn out to be expensive, time consuming).

Since laying OFC is a task where service providers are already investing to make their communication networks more reliable and robust, it is natural that their expertise, suggestions and execution plans are leveraged along with government expertise. It becomes more the important in dynamic technology industry like Telecom since data traffic on the networks is growing, requiring sufficient backhaul capacities and connectivity with BTSs, through a mix of fibre, microwave.

Therefore the GSMA believes that **a market led participation should be encouraged**. The project management skills through private sector & PSU partnership can address majority of these challenges.

BOOT is one of many models under the Public Private Partnerships (PPP). While there is no single universal definition of PPP however it is well recognised that it is “the transfer to the private sector of investment projects that traditionally have been executed or financed by the public sector” (IMF, 2004).

As per Ministry of Finance *“Public Private Partnership means an arrangement between a government / statutory entity / government owned entity on one side and a private sector entity on the other, for the provision of public assets and/or public services, through investments being made and/or management being undertaken by the private sector entity, for a specified period of time, where there is well defined allocation of risk between the private sector and the public entity and the private entity who is chosen on the basis of open competitive bidding, receives performance linked payments that conform (or are benchmarked) to specified and pre-determined performance standards, measurable by the public entity or its representative”*⁷

⁷ <http://www.pppinindia.com/newFAQs.php>

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Therefore an arrangement between a state authority and a private partner to perform functions within the mandate of the state authority, and involving different combinations of design, construction, operations and finance can be termed as PPP model; and BOOT is one such alternative.

One of the **most important aspect of a PPP especially in infrastructure is fair distribution of risks involved in project**. While many PPP infrastructure projects and its variants work on definite user behaviour and demand that are more likely in mature sectors; Telecom is one such infra industry where the technology risk is highest that can easily influence user behaviours, and within short durations, jeopardise investments made; hence sufficient caution and flexibility is needed in designing and execution.

Stakeholders like Service providers, infra companies, DoT and state governments should identify areas/terrains that are toughest and require higher government support while approachable areas should be left to market i.e. service providers/EAs. This way, by clearly identifying villages/areas that are extremely difficult for private EAs, the government can bear the project risks and also commit a relatively higher level of VGF/financial support in a targeted manner.

The governments and local administrations need to grant required planning permissions in a swift and flexible manner to avoid significant delays in network roll-out that may happen due to administrative sluggishness. This will save time and resources for both the sides and also keep implementation objectively on track.

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

Ans: BOOT is one of the variants of PPP, and in PPP projects, it is extremely important to understand and adequately distribute the risks involved to the parties who are in best position to manage those. The following risks may require institutional mechanism in handling, and be clearly agreed within a contractual framework:

1. **Technology Risk** –the biggest risk in Telecom, unlike mature sectors like transport where user behaviour is predictable and technology risks limited
2. **Market Risk** – level of competition, services, usage, areas of operations and customer behaviour impact telecom
3. **Operational Risk** –RoW permissions, citizens' activism, land issues, inadequacy of access spectrum impact network rollouts
4. **Compliance Risks** – A constant tracking of the project milestones against achievements, monitoring of network performance against parameters is required but may also entail risks of regulatory interventions. High regulatory levies like USO, spectrum usage charges need to be lowered to ensure self-sufficient business viability in long term
5. **Financial Risk** – this can be managed relatively better in PPP since capital/financing can be contributed by private entities, Governments (Central/state), grants from agencies etc.

BOOT is a good model provided the BOOT operator finds it attractive. Some of the advantages and challenges of the model are listed below:

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Advantages:

1. The key advantage is that operators/vendors are better network builders since they have extensive learning curve of over two decades
2. Focus on core business, outsourcing the complete end-to-end management of the project to experts
3. Better and efficient financial management as the capital and operational expenditure can be managed over life cycle of project
4. Access to a best-in-class engineering talent pool

Challenges:

1. One of the key challenges under BOOT is that when the network reverts to government hands, the network may require intermittent technology upgrade which may not be possible for state, which makes it akin chasing a moving target
 2. Uncertain business model due to market prices: As such the affordability of services as such in India is not the real challenge (however accessibility is). The corollary to it is also that there is little pricing power in the market and so telecoms revenues and margins are too low to justify the capex needed for national broadband plans especially in uneconomical areas.
 3. Uncertain business model due to market structure: national broadband plans are difficult to build and provide services in rural/remote areas in absence of a viable business. Apart from execution, the demand estimation also poses big challenge
5. **What should be the eligibility criteria for the executing agency so that conflict of interest can be avoided?**
 6. **Should there be a cap on number of States/ licensed service area to be bid by the executing agency?**
 7. **What measures are required to be taken to avoid monopolistic behaviour of executing agency?**
 8. **What terms and conditions should be imposed on the executing agency so that it provides bandwidth/fibre in fair, transparent and non-discriminatory manner?**

Ans: We believe that service providers whether themselves or through being part of the EA/JV entity should be allowed to participate. As a basic approach to address monopoly situations, where the EA has received a viability gap funding (VGF), it should be required to provide access to other operators in a fair, open, transparent and non-discriminatory manner.

In cases wherever the capacity is offered, it should be made available at the wholesale price reflecting the production cost of the network i.e. following an approach of cost orientation or cost-based pricing.

A transparent exchange of information about public infrastructures location, network location and technical details as well as tariffs of access will ensure that all members will have access to the same information in a non-discriminating manner.

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

Ans: We believe that the selection of routes, topology and deployment of technology should be left to the EA. While ensuring that technology (whether access or backhaul) being deployed is not going to be obsolete soon, ensure that it is quickly scalable with clear growth, and is able to serve the demand on the infrastructure for good time to come. Therefore **it is important that a technology neutral approach is followed.**

It is also reasonable to ensure that technologies so deployed are interoperable and able to work seamlessly with the globally best commercial telecom networks and systems, sustainable amid the growing data usage and capable of scaling up to handle new/innovative services.

In Korea, for example, the technologies played out in the market than by interventions by government agencies/authorities.

Another crucial part is to ensure that private operators' broadband investments get complementary support with the government plan and both should not be in isolation. For example for faster proliferation of the broadband in India, the last mile connectivity will remain predominantly mobile thus its deployment and expansion should be encouraged, and BharatNet plan should aim at connecting the installed & new planned towers. For this to happen, it is utmost important to engage with operators at planning stage itself in defining rollout plans, technological investments and other such parameters.

Backhaul cost being one of the main inhibitors to mobile broadband coverage sustainability, the government may consider backhaul provisioning in markets where it is impossible to physically roll out fibre. If needed alternate mechanism like satellite providers may be explored to ensure backhaul availability at the best price possible to the operators.

As regards the construction activities a standard method for pan-India implementation, for different types of topologies/soils etc. in line with civil engineering practices can be defined in the SLAs.

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?

We recommend that these mechanisms are discussed and planned with service providers

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

Ans: An outcome based incentive model linked to rollout performance can be adopted e.g. linking the fibre/BB network rollout in rural areas with a reduction in USO levy in a phased manner would not only accelerate the rollouts but also not result any loss to the exchequer.

Financial incentives like higher rate of depreciation may also act as a good catalyst for higher investment and quicker service delivery.

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Similarly a lower rate of tax or an overall tax credit against the equipment purchased and deployed for this purpose may be considered, since the Digital India is a vision of national importance and of huge scale. However, incentives should be allowed on a technology/service neutrality basis

Any fiscal disincentive (FD) for delay in completing the project should be imposed on the EA, if the reason for the same is attributable to the EA. In case where execution delay happens due to delays in government approvals/social issues (e.g. RoW permission, RWAs resistance etc.), then there should not be any FD.

Kindly also refer our response to Q 17 in this regard.

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

Ans: As telecom is a long gestation period and traffic demand is especially tough in rural areas, the transfer period in case of PPP can be for 20-30 years, however with flexibility for extending ownership in perpetuity or an earlier revert back to government. Such flexibility is needed as technological innovations demand a constant network upgrades and O&M, and the technological/market risks may force an EA to seek early exit.

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?

Ans: Connecting the rural areas is one of the most onerous and costly exercises, and it is too early to estimate whether the EA would be able to generate a reasonable RoI. We believe that focus should be to ensure that there are no monopolistic behaviour at EA's end, and the VGF is provided in deserving cases with due diligence and within time.

As such, it is but natural that the EAs are allowed to generate return to cover their cost of capital on a long-term and sustainable basis since there may be no or little profit/turnover in the initial few years.

This way, the enthusiasm of private players can be retained and this will be incentive enough to deliver projects in time. If TRAI still thinks that there are chances of windfall profits, there are sufficient competition and regulatory frameworks exist than can take care of those, if the need arises.

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

No comments.

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

Ans: The GSMA believes that if the measures relate to intervention in the retail market, then it is too early for that as India is already one of the competitive most telecom markets. In-fact as per latest WEF⁸ rankings, under the readiness sub-index, India is at the top in affordability.

Rather what is striking is that despite being most affordable, the Usage sub-index in India is very poor which may suggest challenge around accessibility and awareness than affordability.

Therefore India should think of making services more accessible (i.e. expansion of coverage) and further affordable to the extremely poor by lessening the burden on the service providers by way of reduction in levies and taxes. A reduction in the USO levy and Spectrum usage charges (SUC) will incentivise further expansion & deeper rollout of mobile broadband into rural areas.

Duplication should be avoided and BharatNet plan should complement existing assets of the stakeholders e.g. operators already have extensive wireless network (BTSs etc.) in rural areas that can be upgraded for higher broadband capacities by linking them with fibre backhaul at key aggregation points.

Making more spectrum available for Mobile Broadband (MBB) will also address concerns on affordability. Since MBB will be core broadband delivery mechanism at last mile, spectrum pricing (including SUC) needs to address this aspect.

Cost overruns due to expensive RoW charges should be avoided, with governments and local authorities giving quick permission at nominal restoration costs.

It is important to allow development of business case and evolution of the market (including allowing differentiated pricing for different set of services/products) in the initial few years. E.g. in Korea, the Ministry of Information and Communication adopted light regulatory approach fostering competitive landscape with a technology neutral approach, focused in the early stages (e.g. between 1997-2005) in the performance monitoring schemes, announcements of connection speeds, and introduction of SLAs for broadband services⁹

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?

Ans: Timely and cost effective permission of RoW is at the core of laying entire broadband highway, and due to this being a challenge the rollout of fibre is slow even in urban areas. Therefore a national RoW law is required that allows service providers to lay fibre quickly and at nominal rates or free of costs provided the place is restored in its previous shape. This will require coordination and close cooperation with all states/municipalities.

The EA should have right of access to public infrastructures i.e. it should benefit from fair access to all relevant public infrastructures for the roll out of backhaul and last mile networks.

This includes access to ducts, sewers, roads, electricity poles, railways, public building rooftops and any other infrastructure (including at the planning stage e.g. highway/urban planning etc.)

⁸ Networked Readiness Index 2015, The Global Information Technology Report 2015, World Economic Forum

⁹ Building Broadband: Strategies and Policies for the Developing World By Yongsoo Kim, Tim Kelly, Siddhartha Raja; sourced through google books

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If the RoW permission isn't granted within a stipulated time, then it should be deemed as approved. In case there are techno-commercial concerns due to which government is unable to grant the permission, then these must be communicated to the EA well within the due timelines to enable EA plan an alternate route without any significant resource overrun.

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?

Ans: There should be opportunity for service providers to bid and participate in joint ventures with infrastructure partners, so that a complementary expertise can be leveraged for quick rollout.

As per a PwC¹⁰ report "The typical PPP project design and preparation process is still largely technically-oriented, with limited appreciation of the overall financial and commercial risk issues involved. Often information distortions in the market have led to large variations in the bids/offers received during the procurement process. Further, the procurement process is often highly prescriptive, rather than participative. The emphasis is on conforming to public sector requirements, which may not offer value for money and does not encourage innovative solutions, rather than evolving the project configuration to be delivered over the long-term in a partnership approach.

And while the public sector is dictating the terms, it is quite often not willing to shoulder concomitant risk. The current concession structure is highly asset oriented, rather than focusing on service delivery. Private sector participants are often required to assume considerable risk, including demand risk, and the apportionment of risk is in some cases quite inefficient."

Therefore the terms of participation should be collaborative with due focus on and adequate distribution of project risks. It is important to allow headroom for recovery of the cost of capital by the entity. Government may address some of the demand risks in case the desired traffic levels do not accrue, by committing an assured traffic demand through public/government services for CSCs, Primary health centres, e-health, educational institutes etc.

Market flexibility e.g. EAs may be allowed to enter into **IRU agreements** with service providers.
Fiscal incentive e.g. an entity if is able to generate higher profits beyond its cost of capital without any VGF support, the entity should be allowed to retain the profit s.t. prevailing corporate tax. This will help in long-term self-sufficient business viability.

Loans at lower rates to deploy BB networks can be one of the incentive mechanisms. For example, **the Korean government introduced a "Loan Support Policy for Constructing High Speed Public Network Development"** providing low-interest loans to service operators for an early establishment of the high-speed internet service market. In early 1999, the entire nation received support from the government so as to maximize the ripple effect of the industry.

¹⁰ Infrastructure in India - A vast land of construction opportunity, PwC

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However, after 2000, the loan policy was limited to middle and small-sized cities, and fishing and agrarian regions to promote balanced informatization and narrow information gaps.”¹¹

Equipment tax waiver: another incentive could be to ensure that the network equipment destined to be used as part of mobile broadband coverage expansion benefit from a tax waiver.

18. Please give your comments on any other related matter not covered above.

Ans:

1. **The Last mile / Spectrum:** While fibre will be crucial for higher capacity carrying, backhauling of traffic, the real test will be connecting the last mile at access level with true broadband experience. In rural/remote areas, **Mobile Broadband (MBB)** will play crucial role in diffusion of affordable broadband services in an efficient, cost effective manner. Therefore adequate, and globally harmonised spectrum should be made available. The spectrum pricing should focus on affordable broadband services to public at large, as supply constraints and/or high spectrum prices can impact the pace and effectiveness of mobile broadband delivery.

Since India has a readily available infrastructure of towers (~585,000 towers¹²), it should be the parallel aim to connect these Towers (at aggregation points) under the BharatNet deployment plan. It offers a ready traffic base and a quickly scalable opportunity for upgrading wireless subscribers to broadband services including in the rural areas.

International experiences also show that the quickest way of ushering in broadband is by way of technology neutral approach and along-with wireless technologies.

In Finland for example, “The Finnish government expects mobile broadband to play a significant role in realizing the short- and longer-term access goals articulated in the 2008 national broadband strategy. Penetration of wireless telephony reached 50 percent in 1998, prompting an early and precipitous decline in fixed wireline subscriptions. Interestingly, the latest data also suggests that DSL connections are now in decline, as a result of mobile broadband substitution.”¹³

Germany’s Digital Agenda¹⁴ states that “Our objective is for all citizens to be able to take advantage of the benefits of digitisation. For this to happen, Germany needs ubiquitous high-speed networks. The Federal Government aims to use an efficient mix of technologies to provide ubiquitous broadband infrastructure delivering download speeds of at least 50 Mb per second by 2018. This will simultaneously lay the foundation for equal standards of living in rural and urban areas. The construction of high-speed networks relies on government stimulus: by focusing on framework conditions, we are creating optimum incentives for market-driven expansion. Adequate frequencies are being made available to support high-speed access in very rural areas, while intelligent mobile services are helping

¹¹ Analytic Study on Korea’s IT Infrastructure Development Policies: Young-Ro Lee, Byong-Cho Kim, Seong-Wook Na, Jung-Hwae Hu

¹² Para 2.34, TRAI Recommendations on Delivering Broadband Quickly: What do we need to do? 17 April 2015

¹³ Building broadband: Strategies and policies for the developing world Yongsoo Kim, Tim Kelly, and Siddhartha Raja, Global Information and Communication Technologies (GICT) Department World Bank (January 2010)

¹⁴ Digital Agenda 2014 – 2017, The Federal Government



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to expedite penetration rates. Government support is directed towards those areas where commercial development is not viable.”

2. **USO contribution:** The involvement of service providers/private entities will lead to sharing of project risks, efficient financing (government budget, private capital, bank loans, World-bank/IMF grants etc.) and faster rollouts; the dependency on USO should be very limited to the areas (and for a limited period) that are likely to remain financially unviable despite these efforts.

The GSMA is of the view that Governments should phase out universal service funds (USFs) and discontinue collecting universal service levies. This is particularly the case in India which has a very large accumulated USF which is lying highly underutilised.

Should BharatNet be largely funded out of the USF, the GSMA would be concerned by the inherent inequity this involves. That is, there is a large disparity between the mobile industry’s contribution to the USF and the level of benefit that the mobile industry receives. While it might be argued that the mobile industry would benefit from the backhaul capacity that BharatNet may provide to mobile operators, this is very much dependent on the terms on which access is offered. That is, unless access to BharatNet is offered to mobile operators on open, non-discriminatory and cost-based terms, there is no effective benefit. In-fact a reduced USO levy will act as a much needed stimulus for the industry to accelerate rollouts.

As such in limited cases of utilisation of the USOF for BharatNet, the service providers should be consulted with, to find out best ways to deploy existing money for network rollout.

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International Experiences:

Korea: Korea has one of the best broadband infrastructure globally, not just in terms of fibre but mobile as well. The success in growth and development of the Korean experience is a testimony of a symbiotic relationship between the state and the private sector participation especially on the awareness and demand stimulation aspect.

The Korean government established a comprehensive Korea Information Infrastructure (KII) policy in 1995, with the aim to establish an advanced nation-wide information infra. The project is an excellent example of government's integrated, ecosystem-oriented approach to broadband than working in silos. Further, the government followed it through with multiple plans (indicated below) over the next 10-15 years.¹⁵

1. 1st National Informatization Plan (1996-2000)
2. Cyber Korea 21 (1999-2002)
3. E-Korea Vision 2006 (2002-2006)
4. Broadband IT Korea vision 2007 (2003-2007)
5. U-Korea Master Plan (2006-15, Ph-1 2006-10, Ph-2 2011-15)

South Korea's Prime Minister chairs the Informatization Promotion Committee (IPC), the entity responsible for implementing South Korea's broadband plans. The IPC's membership includes 24 ministerial-level representatives, thereby fostering intragovernmental coordination. Member ministries submit annual implementation plans to the IPC for approval.¹⁶

The KII project fostered PPP, supported network rollouts through certification programs. Additionally, the government created an informatization promotion fund to finance projects that fostered use of information. It also encouraged private firms to make long-term investments. Support of the government and participation of the private sector played a crucial role on this success. Recognising the high cost of deploying new local access networks as barrier to broadband rollout, the government provided a seed funding of over \$900mn between 1999 and 2005. The focus of funding shifted from metro areas to rural areas and small towns where operators were reluctant to invest.^{17 18}

The main goal of the fund is to ensure that profits from the ICT industry remain in the industry. The money from the fund is used to support ICT related R&D, develop and diffuse standardisation in ICT industry, train ICT workers, promote network rollout and e-governance. The contribution to the fund wasn't from the private sector/operators alone (revenue share/spectrum license fee), but included financing from the government and proceeds from fund's operations including loans.

¹⁵ Building Broadband: Strategies and Policies for the Developing World (Yongsoo Kim, Tim Kelly, Siddhartha Raja); reference through google books

¹⁶ <http://www.broadband.gov/plan/17-implementation-and-benchmarks/>

¹⁷ Building Broadband: Strategies and Policies for the Developing World (Yongsoo Kim, Tim Kelly, Siddhartha Raja); reference through google books

¹⁸ Management of Broadband Technology and Innovation: Policy, Deployment, and Use: By Jyoti Choudrie, Catherine Middleton; reference through google books

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The government intervened in the market in a very focused and strategic manner, following a holistic approach to develop a Broadband ecosystem. The BB standards /technology sorted out itself primarily in market than because actions or interventions by authorities.

It may be noted that at the end of each master plan, achievements are assessed and goals are revisited to update the plan for following year. There has been intense cooperation between the government and industry. Some of the success factors of Korea's BB experiment are¹⁹:

- A. Government implementing consistent and strong policies
- B. Government promoted market competitions
- C. Narrowing Gap between ICT Infrastructures and Services:
 - a. A variety of ICT services utilizing the network were emerged continuously, improving the quality of people's lives.
 - b. The government consistently built national ICT infrastructure with a long-term perspective, and based on this infrastructure, diverse ICT services developed and popularized, again driving the advancement of the infrastructure.
 - c. Many government ICT projects including e-government, health, and national ICT education were implemented in line with the development of ICT infrastructure
- D. Virtuous Investment Cycle:
 - a. The government actively supports the businesses building the network by creating the regulatory framework and making a lead investment.
 - b. The government bore the risk and reduced the uncertainty of building new infrastructure and adopting new technologies by making a lead investment. Such government leadership attracted the businesses to quickly adopt and diffuse new technologies and infrastructure

It is important to highlight that the Korean government took the leading role in guiding the KII, from start to finish. The KII project represents a newer developmental state model, which is characterised more by the collaborative ties between the state and the private sector.²⁰

¹⁹ Details can be accessed in presentation on "Korean Broadband Policies and Recommendations for the Asian Information Super Highway" 25 September 2013, Dr. Kim, Hyong-Soon, Director, Digital Infrastructure Division National Information Society Agency

²⁰ IT Development in Korea: A Broadband Nirvana? By Kwang-Suk Lee; reference sourced through google books

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International Experiences:

Japan: Japan also followed a set of multiple policies that worked on demand and supply side as well. To highlight, the following policies have been put in place by the Japanese government to proliferate broadband in Japan:

An IT strategy HQ was established with the Prime Minister being its DG and vice DGs from various other technical ministries. The HQ has made couple of strategies since 2001 with an emphasis on competition policies, refer below²¹:

1. National IT strategy 2001 (e-Japan strategy): broadband infrastructure deployment through competition
2. e-Japan strategy II – 2003: Competition and special measures for non-profitable areas
3. IT new reform strategy 2006: fair competition and private sector incentives
4. Strategy for bridging the digital divide 2008
5. i-Japan strategy 2015 (July 2009)

A collaboration²² model has been in existence between the public and private sector for establishment of broadband in rural areas. Areas were identified where broadband services were not available. In rural areas where private sector did not invest much due to very poor returns, the central government supported local government installing broadband networks. The national government provided financial support for local governments constructing broadband networks with the grant program (1/3 of the total constructing cost). Local governments make those broadband networks available to the private sector by means of the IRU scheme, and the private sector provides broadband access services to users. About 80% of broadband projects in rural areas adopted this scheme.

Support measures for deploying Infrastructure:

Infrastructure in undeployed areas etc.: For the purpose of accelerating the realisation of the “New Broadband Super Highway” initiative, by which ultra-high-speed broadband service is provided to all households by around 2015, the national government provides financial support for part (one third) of the cost of the project to local governments, etc. that will deploy ultra-high-speed broadband infrastructure with the premise that they will introduce public application in the field of education and medical care, etc.

Among regions where ultra-high-speed broadband is not made available, this financial support targets the projects that include disadvantaged regions, such as depopulated areas, far-off places, isolated islands, etc.

²³Frequencies Allocations (2007 -): With high penetration rates for 3G (IMT-2000), the Ministry of Information and Communication (MIC) allocated frequencies for broadband wireless access (BWA) and so called 3.9G. MIC allocated 1.5GHz and 1.7GHz bands for LTE (3.9G) in 2009.

²¹ Presentation on “National Broadband 1999-2009, Japan”, October 2009, FUJINO M , Masaru Counselor for Communications Policy Embassy of Japan

²² Broadband Competition Policy in Japan November 4, 2011 Ministry of Internal Affairs and Communications JAPAN

²³ Presentation on “Law & Policy for Broadband Deployment in Japan” April 2010, FUJINO Masaru , Masaru Counselor for Communications Policy, Embassy of Japan

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Financial Incentives and support²⁴:

- (a) For the provision of FTTH services, it is necessary to construct new optical fibers at an enormous cost. Therefore, in accordance with the Act on Temporary Measures concerning Telecommunications Infrastructure Improvement (enacted in 1991), the government promoted infrastructure development by stimulating private-sector incentives to invest in broadband including optical fibers, through providing low-interest loans, guarantee of liabilities, interest subsidies, and tax benefits for the facility development of fiber optic networks by private carriers
- (b) In addition, the government carried out support projects to provide a grant (Subsidy for Promotion of Development of Telecommunications Infrastructure in Rural Areas) to the municipalities of areas under disadvantageous condition, such as small populations, for the development of broadband by private carriers.
- (c) In the future projects, the document mentions that the government is also carrying out projects such as providing subsidies for the costs of developing the base transceiver station and maintaining the transmission lines in areas with unfavourable conditions such as rural areas, upon the development of facilities for the transmission lines required for the establishment of a base transceiver station by wireless communication carriers (Wireless System Expansion Support Project).

Capacity Building: Experience of Korea and Japan, and many other countries clearly indicate that apart from infrastructure, there has to be significant efforts by the government through its departments, state government and even local/municipal agencies to increase and drive IT usage the entire workforce, and also holding IT skill development trainings for larger adoption.

Through these initiatives, and initial connectivity assurances connecting government agencies, departments, facilities and developing services and application around those (education, health, land records etc.) the adoption of broadband can be accelerated.

²⁴ Financing of the Roll-out of Broadband Networks (Note by Japan) 16 June 2014, Working Party No. 2 on Competition and Regulation, Directorate for Financial and Enterprise Affairs Competition Committee.
Weblink: http://www.jftc.go.jp/en/int_relations/oecd.files/OUTOFBROADBANDNETWORKS.pdf