

Response to
Consultation Paper
On
Inputs for Formulation of
National Telecom Policy - 2018

Zee Network

Response to Consultation Paper on New Telecom Policy

Introductory Comments

The Zee Network notes that the TRAI has issued a consultation paper on Inputs for formulation of **New Telecom Policy**.

We also note that the TRAI has also issued a consultation paper on what it considers as the issues relating to up-linking and downlinking in India simultaneously with the Paper on New Telecom policy which itself deals on how broadcasting in the new environment of “Convergence” should be dealt with.

Both the Consultation papers, while issued simultaneously, seem to be charting completely different paths. While the consultation paper on Uplinking and downlinking seeks to define procedures, license fees, spectrum charges and procedures for granting of broadcast licenses for uplink and downlink, there is no mention of how OTT or IPTV services will be treated. Essentially it ignores any type of convergence issues.

In the consultation paper on Inputs for formulation of **New Telecom Policy** Vide Chapter II Para 4 , the TRAI has sought comments, including Digital Cable.

“While the telecom networks are being extensively used to deliver video services, after digitization of the cable TV networks, these are being used to provide broadband services. In order to meet the growing demand for the video, it would be necessary to encourage development of converged broadband and broadcast networks, and cloud infrastructure for Video on Demand (VoD) services...”

It is astounding that there is no correlation between the two consultation papers, i.e. if the comments provided against one consultation paper are accepted, these would be counter to the comments/ recommendations against the other consultation paper.

The industry has been responding to a wide range of consultation papers such as “Ease of Doing Business” in the broadcast sector, issues relating to spectrum, QoS, Interconnect regulations etc. wherein a single thread of conclusion has emerged from the entire broadcasting **universe that the current procedures place an unfair burden on what are termed as “Broadcasters” in the Indian parlance as against all other forms of dissemination of TV channels such as over Internet.**

The Authority has failed to take a coherent view of all the technologies which deliver the same result, albeit by different medium, of delivering the same content i.e. that of TV channels to the end customer.

The current consultation paper on uplink and downlink policy is “very offensive” in the very issues which are being offered for consultation by somehow branding Content Aggregators as those subject to the Indian telegraph Act. The Indian operators which are forced to take permissions for their “Channels” are in fact content aggregators which provide content for a TV channel , which is then distributed by a Telecom Licensed Teleport via various networks such as IPTV, DTH, Cable, Wireless and satellite to end customers.

Before the TRAI dwells into issues of convergence, we would like to invite the authority to revisit the definition of broadcasting itself which has been redefined by the FCC in USA. Traditionally only those companies were called broadcasters which had a radio station and a studio and produced as well as transmitted such content via spectrum obtained from FCC.

In a recent proclamation, FCC's announced its decision to eliminate the "Local Studio" rule on Oct 24th 2017. The FCC Chairman also proclaimed that **"Communities can interact with stations and access their files online"** which was a reference to obtaining such content online via files, download or streaming.

It showed how broadcasting has moved over the last 80 years, when the original rules were enacted. It was also an ominous pointer towards the very existence of "Television Stations" which have traditionally meant TV being transmitted terrestrially using ATSC or DVB-T, standards, which itself has been achieved after a painful process of "Digitalization". It was also a recognition of the fact that "Content Aggregators" can operate in a much more free environment, and are not essentially broadcasters. Any content generator in the USA is not called a broadcaster if it restrains its distribution to land based networks or satellite networks, and does not use terrestrial spectrum.

The only distinction which remained between the "Broadcasters" and the Internet Streaming sites was the production of original content. However this barrier was broken with Netflix producing the "House of Cards" which has been followed by similar original productions by dozens of such sites. Within a year the Netflix "original productions" soared to over 40 with the likes of "Daredevil", "Orange is the new Black", "Stranger things" etc. have been very successful matching or exceeding the ratings of the best television shows.

With "TV anywhere", there are no "Traditional Televisions" to deliver content. Nor are there any traditional "TV Broadcasters" whose content alone can be watched. Broadcasting is now just a cliché reverting to its old dictionary meaning of "blasting" content to everyone, which is what the streaming sites do. Regulatory authorities worldwide are aware of it.

The fact that these can be produced and streamed in 4K has meant that the traditional TV Networks whether on terrestrial or satellite delivery cannot match the experience online. The "OTT" services, as these are commonly called are equally accessible on large screen "Connected" TVs.

"Cord Cutting" a phenomenon which resulted, initially, merely as a compulsion to save Cable or DTH subscriptions quickly turned to "by choice". As data packages offered climb to 200 GB+ a month there was really no compulsive need to watch linear channels from "Broadcasters". It was estimated that in India alone, where there are over 600 million smartphones, over 50 million were used for viewing online content. As the population moves to Gen Z, the legacy is set to become irrelevant in a time frame shorter than anyone has envisaged.

Traditional "TV stations" have been unable to pay their license fees and many are shutting down as content moves via social networking, individualized streaming and original content production and streaming sites. Regulators (Like FCC) are keen to auction the spectrum for 5G and LTE. Radio stations, not to be left behind are more easily available on the Web without being plagued by signal reception problems.

TRAI is now engineering the same problems in India by creating a deliberate distinction between those who deliver content via a satellite network, as against that via Internet even though the content may be the same. It is unfathomable as to how the authority can ignore the fact that the level playing ground between the two segments is being vitiated by rigorous regulations on one segment while turning a blind eye to the other sector.

In our view the two consultation paper should be withdrawn and be –reissued with the full spectrum of delivery mechanisms to the customers including the use of airwaves, satellite or terrestrial, Internet and the so called “closed networks” which have commenced full-fledged IPTV operations without following the accompanying regulations or taking a license.

We believe that by operating TV over closed networks some Telecom operators are flouting the rules whereby they are not taking an IPTV license and paying for content based on current or proposed Tariff regulations and Interconnect regulations. They are also indulging in non-payment of GST and Revenue shares which would have become payable had they taken an IPTV license. The loss in such revenues to the exchequer could run to thousands of crores if networks show live TV channels, as defined currently by offsetting these against data charges or broadband which have a different structure.

However, without prejudice to the above, we are providing our comments. We would like to state that as the questions are tailored and weighted against the current operators who have the misfortune of being on satellite, we do not believe that any set of answers will set the record straight on the structure of regulations which a progressive regime such as India should follow.

ISSUES FOR CONSULTATION

Issues for Consultation

Q.1 Stakeholders are requested to give their comments on structure and contents of the proposed inputs for National Telecom Policy, 2018, clearly outlining the specifics along with justification.'

Q.2 Stakeholders may also suggest any other issue related to Policy Framework which stakeholders feel is important for growth of telecom sector, along with justification.

At the outset, we would like to draw the attention of the TRAI towards the FORTY-FOURTH REPORT OF THE STANDING COMMITTEE ON INFORMATION TECHNOLOGY (2017-18) on Broadcasting placed before the Parliament in Dec 2017 wherein the Standing Committee has recommended a separate Regulator for Broadcasting. By trying to bring in the convergence issue, whereby Broadcasting and Telecom are treated under the same umbrella in a converged manner, the TRAI would be acting contrary to the decision of the Parliament because if Telecom and Broadcasting are converged there would be no need for a separate regulator as recommended by the Committee. The attention is particularly invited to para 23 of the recommendations made by the Committee, which reads as under:

Role of TRAI in Broadcasting Sector

*23. The Committee note that TRAI was entrusted with the responsibility to regulate broadcasting services on 9th January 2004 and since then it has been discharging its functions as per the provisions of TRAI Act. During this period, the broadcasting sector has seen enormous growth in the number of satellite TV channels, introduction of DTH services, digitization of cable TV networks, setting up of independent TV rating agency and introduction of FM radio services across the country etc. TRAI has brought out several regulations to address various issues in broadcasting sector which has enabled transparency and nondiscrimination in the value chain, reduction of disputes amongst the stakeholders, improvement in quality of service to consumers and overall growth of the sector. The recommendations of TRAI have also been the basis of several key policy decisions of the Government for broadcasting sector. The Committee are, however, constrained to note that TRAI at present has got very limited powers due to which enforcement of its regulations, directions and tariff orders becomes difficult. TRAI has noticed several violations of its regulations by service providers and cases have been filed in the court under provision of TRAI Act against such service providers. The Committee do not find this as a very effective mechanism to ensure compliance of the provisions of the Act. It is learnt that TRAI has suggested some modifications in the TRAI Act, which are under consideration of the Government. **In view of the tremendous growth in the broadcasting sector and ever increasing number of satellite TV channels, the Government may undertake evaluation of the need to have a separate regulator for the broadcasting sector. Till the time the Government decide to have a separate regulator for broadcasting sector, steps may be taken to empower TRAI through modifications in the TRAI Act for effective enforcement of its regulations by the Authority.***

A perusal of the above would reveal that the Standing Committee has clearly articulated the need to examine a separate regulator for the Broadcasting Sector. Thus it would be pre-mature for the TRAI to propose itself as a convergent regulator while it is aware that the scope of the Parliamentary Panel is yet to be examined by the Ministry of Information and Broadcasting and should they decide in their wisdom to set up a separate regulator, it would have been appropriate the TRAI to recuse itself from major recommendations in the Broadcast Sector. **Secondly, the issue of Convergent Regulator needs to be**

debated and deliberated in detail by the Stakeholders in the Broadcasting Sector and for that a separate Consultation paper needs to be issued as and when the reference is received from the Ministry of Information and Broadcasting. We would like to humbly submit that Ministry of Information and Broadcasting is the nodal ministry for all the Broadcasting related issues and that it would be entirely in-appropriate for the Department of Telecommunication to propose a convergent Regulator in its policy document without taking MIB into confidence and / or without their being a major policy decision at the Government level to have a convergent Regulator to regulate both Telecom and Broadcasting. It may also be pointed out that setting up a convergent Regulator would also require a convergence bill outlining the very scope of convergent regulations and various issues associated with it.

We would also like to mention that while the TRAI is considering the inputs for the New Telecom Policy, there is little relevance for a separate consultation paper on **“Broadcasting” relating to Uplinking and Downlinking Guidelines and we suggest that it should be completely withdrawn.** The paper is completely flawed, has erroneous interpretation of Satellite services and deserves no comments.

Despite the astounding inconsistencies in the approach of the TRAI towards broadcasting as it emerges in the two separate consultation papers, its inability to follow through on Tariff orders, Interconnect and monitor/ manage cable digitization, we are still providing our comments on the consultation paper on the “Inputs for New Telecom Policy” which may please be taken on record and we expect a reasoned response from TRAI in any recommendations it issues.

Our response to the consultation paper is under the following heads:

- (i) Definition of a Broadcaster Vs a content Aggregator**
- (ii) Distinction between Linear TV and on Demand**
- (iii) Status of operator providing Live TV channels via closed Networks**
- (iv) Status of Operators providing TV channels over Internet**
- (v) Status of Operators providing IPTV services, duly licensed or otherwise**
- (vi) Policy on Terrestrial Broadcasting, Spectrum Allocation**
- (vii) Treatment of Space resources for Broadcasting and Open Skies Policy**

(i) Definition of a Broadcaster Vs a content Aggregator

This section may be read along with our introductory comments to this consultation paper where we have suggested that the TRAI should come to a conclusion on the definition of content generators and Aggregators vis-à-vis “Broadcasters” based on globally acceptable assumptions.

As outlined by us Broadcasters in USA are defined as those who use terrestrial spectrum and carry out terrestrial broadcasting.

Any other entity including those using satellite uplinks are not treated as broadcasters and do not need any license. For example Zee Network carries and delivers over 50 channels in the USA over satellites such as IS-34, Galaxy-21, Echostar and other satellites but has never applied for nor granted any license, and none is required. No questions have arisen on being a “Broadcasters from a Foreign soil” or from within USA. The same is the case for other TV channel generators such as Star, Sony etc.

There is likewise no license required to carry our channels in the UK, Europe, Singapore, Malaysia or in fact in any other country in the world except China and Pakistan.

We suggest that a similar provision should be adapted a first step in India and only the Teleport operators should be asked to apply for a satellite or DTH license as applicable.

On the other hand, regulators such as the OFCOM do not take a “Hands Off Approach” towards OTT services or content delivered over Internet. In India the TRAI has for no reason recused itself from monitoring any content on a website, or a streaming TV service, which is against the norms of regulators in other countries. The result is that all types of unregulated, uncensored, sexually explicit, offensive content can be shown via this medium.



Complain about about something you have seen or heard on the television, radio, a website or an app

What does Ofcom cover?

We deal with most content on television, radio and video on demand services, but there are some areas where we share responsibility with another regulator.

<https://www.ofcom.org.uk/tv-radio-and-on-demand/how-to-report-a-complaint/what-does-ofcom-cover>

Where did you see or hear the content?



[On television or on the radio \(https://www.ofcom.org.uk/tv-radio-and-on-demand/how-to-report-a-complaint/complain-about-tv-radio-ondemand\)](https://www.ofcom.org.uk/tv-radio-and-on-demand/how-to-report-a-complaint/complain-about-tv-radio-ondemand)

Make a complaint about something you've seen or heard on television or on the radio.



[On a website or an app \(https://www.ofcom.org.uk/tv-radio-and-on-demand/how-to-report-a-complaint/complaint-about-a-website-or-app\)](https://www.ofcom.org.uk/tv-radio-and-on-demand/how-to-report-a-complaint/complaint-about-a-website-or-app)

Make a complaint about something you've seen on a website or an app.

OFCOM displays the following on its website prominently:

“Ofcom regulates TV, radio and video-on-demand services. Our Broadcasting Code contains rules which TV and radio broadcasters must follow. There are separate rules for video-on-demand services, which include TV catch-up, online film services and libraries of archive content”.

Our observations in respect of numerous sites setting up streaming services, websites and APPs which are not monitored by the TRAI demonstrate that it has turned a blind eye to a sector which is now by viewed by hundreds of millions of viewers, and will at some time in near future will exceed that of satellite or Cable TV. But more serious is the fact that these services are not only being allowed to be operated without License but also without any Taxes and revenues unlike the case in satellite and cable TV industry.

(ii) Distinction between Linear TV and on Demand

Globally there is a distinction emerging between Linear TV and On-demand even though such Linear TV is carried on the OTT type streaming Platforms.

In USA, The Federal Communications Commission (“FCC”) released a Notice of Proposed Rulemaking (“NPRM”) proposing to classify over-the-top (“OTT”) video programming providers as **“Multi-Channel Video Programming Distributors” (“MVPDs”) - if they deliver “linear” programming.** The FCC proposes that it will facilitate the availability of cable and broadcast television programming to OTT providers and enhance consumer choice and competition in the video market. The classification would require OTT providers to carry certain programming and to comply with other regulations currently imposed on MVPDs like cable providers. The proposal would also give OTT video providers certain legacy negotiating and carriage rights with respect to both cable and broadcast programming.

The content aggregators in India fall in the same category, and cannot be categorized as broadcasters merely by virtue of being on satellite. On the other hand, Platform services which exist on different platforms and do not need licensing, fall in the same category.



The FCC is moving ahead with a formal consideration of the possibility of extending the pay TV regulations that govern MVPDs to over-the-top providers of linear channels.

The commission on Friday issued a notice of proposed rulemaking for what it described as an effort to **“modernize the definition of a multichannel video programming distributor to reflect that video services are no longer tied to a particular distribution technology.”**

The MVPD definition rulemaking process will inevitably tie in with the commission’s upcoming actions on the net neutrality issue, as those rules would come into play with any effort to more tightly regulate the activities of OTT providers offering cable-like channel packages.

The main issue is the definition of Linear Programming Vs. On demand, and if Linear Programming must be treated in an identical manner on Satellite, Cable TV and OTT media, and whether the same interconnect including “Must Provide” should apply. **As elaborated by responses to FCC NPRM, If companies providing video via the public Internet are MVPDs, they can obtain access to programming that that might not otherwise be available and vice versa.**

In India the question is very relevant to Sports rights. If an OTT provider, such as Hotstar, for example carries sports content or any other linear content, such content needs to be treated on the same lines as any other Linear TV content subject to the same rules.

In continuation, in view of the FCC- if “If a cable operator delivers video programming service over the Internet, rather than as a managed video service over its own facilities, we tentatively conclude... this entity would be... a non-cable MVPD under our proposed Linear Programming Interpretation with respect to its OTT service.”

FCC has concluded that an entity that uses IP to deliver managed video services (AT&T, CenturyLink and so on) ARE cable operators and ARE subject to cable regulations and requirements.

The question is why such regulations should not be applied in India as they are distorting the entire C&S industry and its regulations, leading to a loss to MVPDs (Indian content Aggregators) and loss to the exchequer of thousands of crores.

NCTA (USA cable TV Association) presented data showing that cable’s share of the MVPD universe has fallen from 98% at the time of the ’92 Cable Act to 53% in 2016. It also noted that the number of households without MVPD service increased from 11.4% to 17.1% between 2012 and 2016, coinciding with the growth of video content available for viewing without an MVPD subscription. The stats are based on NCTA analysis of SNL Kagan and Census Bureau data.

(iii) Status of operators providing Live TV channels via closed Networks in India

In light of the previous comments, the status of operators providing Live TV channels via closed networks needs to be examined.

In 2017, a major telecom operator commenced providing all linear TV channels on its network, which it claimed was a closed network, comprising of its data customers on its mobile network. Managed services on a closed network attract licensing in India under IPTV regulations, and content obtained by such operators is subject to the same Tariff regulations and revenue share, as well as RIO agreements. It is clear that such an operator would be classified as an MVPD in the USA in so far as linear content is concerned.

However neither the MIB nor the TRAI have questioned such provision of services, loss of revenues against a similar Cable TV service, QoS and rights or customers.

In the United Kingdom, the Office of Communications (Ofcom) regulates OTT licensing, content and consumer protection while the Advertising Standards Authority regulates advertising on such platforms.

The Korea Communications Commission and the Ministry of Science, ICT and Future Planning regulate OTT business in South Korea under the Internet Multimedia Broadcasting Business Act of 2013.

Singapore's Infocomm Media Development Authority regulates OTT business in the city-state. Such businesses are considered Internet content providers that need to comply with the Internet Code of Practice. Some of the things these regulators are concerned with are protecting children from certain material and enforcing local-content quotas.

In Thailand, THE NATIONAL Broadcasting and Telecommunications Commission is expected to roll out its model for regulating over-the-top (OTT) content providers.

We believe that these questions need to be answered by the TRAI and supported by suitable set of regulations to be applied provided to the MIB to commence such licensing.

Services operating without authority of law or any regulations do not portray the country in a favorable light, nor do they provide a fair playing field or encourage competition or FDI.

(iv) Status of Operators providing TV channels over Internet

A number of operators including Mobile operators are now providing Linear TV channels over the Internet. These channels can be accessed by http live streaming using a web link (URL).

The Director General of ITU has pointed out (REGULATORY APPROACHES Over the Top (OTT) Services) that while such OTT services are inevitable, there is a serious regulatory void which needs to be filled appropriately.

Regulatory Imbalances		
Regulatory Obligations	Operators	OTT Players
Licensing	Must purchase license to operate	Often not subject to specific licensing
Accessible Market	Only serve customers within the regulated jurisdiction	Serve any user, any where
Taxes	Subject to local and national taxes	Locating operators in low cost locations and tax heavens
QoS	License includes requirements for SLA's	No QoS guarantees
Pricing Regulations	Regulators' approval is needed in advance	No need for authorization. Loose agreement subject to change at any time

Regulatory Imbalances

Regulatory Obligations	Operators	OTT Players
Interconnection	Required as part of regulatory regime	no interconnection requirements
Net neutrality	Best effort data transport without discrimination, independent of source or nature of data	No obligations
Number portability	Obligation to offer number portability between providers	OTT service independent from mobile number
Infrastructure /Network	Unbundling, open access to Infrastructure obligations,	Proprietary Infra with no obligations
Privacy	Strict data protection and privacy requirements by Law	Practiced on a limited and generally voluntary basis

In the ITU paper it has further been suggested that Policy need balance innovation, investment and Competition.

Providing TV channels over Internet (Linear content) is not an unregulated activity in most jurisdictions. An example is the direction by the FCC that such content also carry closed or open captions.

Both the ITU recommendations and its implementations in the USA by FCC require that the Internet programming including Netflix, Hulu and streaming Video Services such as Sling TV need to have closed captioning. According to Section 203 of the CVAA,(FCC) captioning standards for IP video require end-user controls with the ability to change text color, opacity, size, font, background color, opacity, character edge attributes, window color, and other attributes. However the report prepared by Nirmita Narasimhan, Senior Fellow and Program Director, G3ict is silent on this aspect. We should raise the question of the definition of broadcasters as the said report has stated that the meaning of broadcasters in India needs to be defined.

An increasing Number of customers in India are watching programs on streaming services such as Hotstar, Jio TV, Airtel TV, Hooq, Alt Balaji, Sony and others. As claimed by them they have over 100 million customers on broadband from various services. However the TRAI has adopted an ambiguous attitude towards these networks whereas they should be classified as IPTV networks as they are streamed via Internet and these should be licensed. Introducing closed captions on DTH/ Cable programs will not help if most viewers watch on Internet unless they are required to implement these in the IPTV decoders. This can be done by the MIB only if they are licensed.

(v) Treatment of Space resources and their availability to Space Players

Many of the uplinking services from India need the use of space resources such as C-Band uplinks for contribution feeds and Ku-Band for DTH. At present the licensing of these services and the space resources required for the operation operate on completely independent tracks.

The broadband services delivered via satellites have been in vogue on USA and many European countries since over 2 decades. They have entered a new level of capabilities in delivering satellite based Internet via the use of High Throughput Satellites as well as low earth orbit satellites. Such satellites which can deliver from 140 Gbps to 1000 Gbps now compete with fiber based services and are instrumental in delivering new innovative services including IoT and enterprise connectivity.

In India the licensing for DTH and uplinks has lagged decades behind any of the advanced countries. Despite there being India's Space Policy of 2000 and also a mechanism for launch of Indian satellites under the CAISS, so far there have been no operators from the private sector who have been able to come to a stage where they could launch space objects.

ISRO, of course has done a wonderful job of leading India's Space program and making available Satellite capacity to a variety of users by its own launches to the exclusion of private sector owned spacecraft. There have been many reasons for this including the unavailability of an inductive framework for private players to make orbital filings.

It has also univocally introduced policies for compulsory use of Indian satellites which previously were being implemented in the Ku-Band (though not substantiated by the DTH license agreements) and now extended to C-Band capacities.

As such the role of ISRO as a leading player in Space Industry and at the same time as a regulator for space Industry and Space policies has come into question in various forums.

Industry observers have also pointed out the India's space policy 2000, policy of permitting private players (ISS) and policies governing the use of C-Band and Ku-Bands were discriminatory and one sided and put commercial operating entities at a disadvantage specially where C-Band and Ku-band capacities were available at lower rates for longer durations of lease and with better footprints. The observers have also pointed out that such policies though implemented in a one sided manner never had any constitutional backing and could have been challenged before a court of law, CCI or other bodies and tribunals. The TRAI which is the sector regulator for Telecom and Broadcast has openly advocated the "Open skies policies" for the lease of spectrum for commercial usage. In this instance ISRO's acting in contravention to a sector regulator has been without any constitutional and legal backing.

The question is whether the extant space law, which is proposed to put before the parliament has the implicit purpose to make ISRO as the absolute regulator and implementer of space policies and space programs.

We would be opposed to any such concentration of powers as at its very root lies a conflict of interest in India's space Agency vis-à-vis India's premier Satellite manufacturer, launcher and operator (ISRO). In addition ISRO also has the function of determining tariffs in the Indian Space sector, which we believe is anti-competitive as ISRO does not operate in an independent commercial manner, where its space segment costs can be related to any profitable or loss making operations.

It has also in a unilateral manner decided on the use of various spectrum bands for satellite services which may in future place it in conflict with the sector regulator TRAI. Previously the spectrum in the lower C-Band which is being used for LTE in many countries was a cause of conflict where ISRO has prevailed on the use of the same for C-band satellite services. But there are cases of other spectral bands such as Ka band and E-band which may have dual use.

As such while it can be debated that the actions of ISRO have been in national interest, it cannot assign to itself spectrum bands which might have dual use in Telecom, Broadcasting for space activities and we question this likely position in future, particularly where ISRO gets a constitutional backing for making Space policies, Space program participant and implementer/ overseer of Space law purely based on principles of creating such a body/ position. So far as the International Space law is concerned, United Nations' (UN) Treaties and principles evolved under UN Committee on Peaceful Uses of Outer Space (UNCOPUOS) date back to 1967 (United Nations Outer Space Treaty of 1967). Subsequently over time, action in Space management has shifted to Private players.

Over the next decade, the private sector will become the dominant player in space globally (16,000+ satellites planned for launch) and they have been setting norms/behaviors without waiting for governments to act.

Suggestions for New Telecom Policy

Suggested Inclusions:

The Central Government will put in place the structure for promoting space activities by private players which inter-alia shall include the following:

- **The constitution of a Sector Regulator**
- **The Constitution of a Sector Appellate Authority**
- **The Constitution of a Licensing and Compliance Authority designated to promote space activities, frame space policies and ensure compliance of International Treaties.**

The space policies so framed shall be after public consultation by the sector regulator.

Any space policies so framed will remain subject to the Competition Commission of India guidelines and any disputes including with the licensing authority subject to the Sector Appellate authority.

-Satellite Policies framed or Licenses Granted will remain unchanged over the life of the satellite/ Constellation.

High Throughput satellites

Recently **mu Space** (Thai startup company) announced that it has acquired a satellite license from Thailand's National Broadcasting and Telecommunications Commission. It allows the company to operate satellites, and provide services based on those satellites, through the year 2032. mu Space is the first Thai startup company to acquire such a license. mu Space will launch a Ku-band High Throughput Satellite (HTS) using Blue Origin's New Glenn rocket which will operate in Geosynchronous Earth Orbit (GEO), will be used to provide satellite backhaul in Thailand for broadband and mobile connectivity, broadcasting, Internet of Things (IOT) devices, and smart city applications. The biggest draw for mu Space to partner with Blue Origin was the low cost afforded by its explicit focus on reusable rockets.

The question is how such activities can be quickly enabled in India. The Mu Space could take off as the NBTC Thailand permitted them the use of foreign satellites and orbital license. However If the intention of ISRO is to fully indigenize the space industry then the achievement of such objectives could be questionable. It is recognized that ISRO has by itself launched a HTS and will be launching a few more in the 14 Gbps class in GEO orbits. However the situation could be superseded by HTS launches such as OneWeb which will operate around the globe and will eventually have over 1000 satellites with 1000 GBps capacity and higher.

A number of High Throughput satellite Constellations are being planned which will start launching from 2018 onwards and will come into service by 2019-20. The HTS satellites are in three different configurations:

(i) Geostationary satellites- Viasat-2,3, Intelsat EPIC, GSAT-19 (ISRO), GSAT-11 (ISRO) and others

(ii) MEO and LEO satellites- OneWeb, O3B etc

(iii) Very Low Earth orbit Satellites (VLEO) with 300 Km altitude like SpaceX. These systems claim that due to proximity of the satellite to earth coordination with other countries systems is minimal, and they would work in free bands universally adopted by all countries.

The Geo Satellites of Viasat-3 class have 100 times the capacity of systems which ISRO is launching (1000 GBps per satellite against 10 Gbps of ISRO) and will offer tariffs which are projected to be below 1\$ per mbps per month as compared to \$500 per mbps per month estimated from ISRO satellites. GEO satellites have higher delay and the terminals need to have higher power such as 4 W.

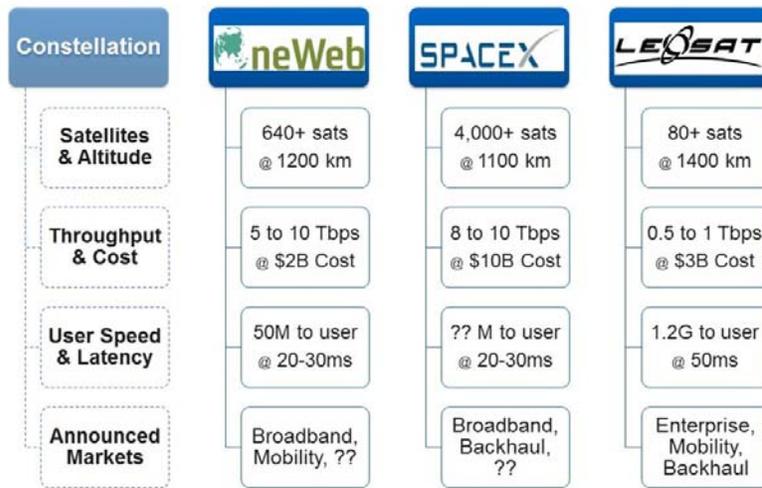
LEO and VLEO systems will work with very small terminals of 30 cm or below and at a few milli-watts.

The LEO and VLEO constellations are programmable, and satellites will change beams and coverage as required.

One has to view the upcoming satellite systems with the view that while the space systems have a lifespan of 15 years, there will be advancements in terrestrial fiber, Wi-Fi and 5G, 6G technologies which could make their offerings to be outpriced and slow enough to be unacceptable.

However the systems like Oneweb and SpaceX with programmable satellites may continue to be useful.

LEO HTS Systems Proposed



The table below provides a snapshot of the satellites being launched.

S.No	Constellation/ Satellite	Type	Capacity	Year of Op	Satellites	Coverage	Price/ Mbps/Month	Terminal	Application
1	O3B (SES)	LEO	16 GB/Satellite 200 GB for 20 Satellites	2016 (Operational)	9	All Globe	\$450-700	2 Antennas, 1.2 M, Trackable, Cost \$750	Business, SME, Aero, Flights
2	OneWeb	LEO	20Gbps/satellite 720=2880 GB or 14.4 TB	2018-2019	720	All Globe	\$1-5 /Mbps/Month	2.4 M Phased array \$300	Consumer Broadband
3	Viasat-2,3	GEO	1 TB/satellite (Total 3TB)	2018(Viasat-2) 2019 (Viasat-3)	3	All Globe	25Mbps-50Mbps priced at \$50-\$75 a month – or \$2/Mbps/Month	0.3 to 0.8 M Phased array \$200	Consumer Broadband
4	Intelsat EPIC	GEO	10 GB/ Satellite Total 30 GB	2016 onwards (Operational System)	3	All Globe	\$700 /Mbps/Mon	1.2 M \$ 100	Business, SME, Aero, Flights
5	SpaceX-StarLink	LEO,VLEO	Over 300 TB	2019 (Tests) 2024 Operational	LEO-4425 VLEO-7518 Total 11943 Satellites	All Globe	\$0.5/Mbps/Mon	30 Cm Omni \$30	Consumer Broadband
6	GSAT-19	GEO	10 TB	2017-Operational	1	India	\$500 Per Mbps/Mon (Estimated)	1.2 M \$ 100	SME,VSA Ts
7	GSAT-11	GEO	14 TB	2018	1	India	\$500 Per Mbps/Mon (Estimated)	1.2 M \$ 100	SME,VSA Ts

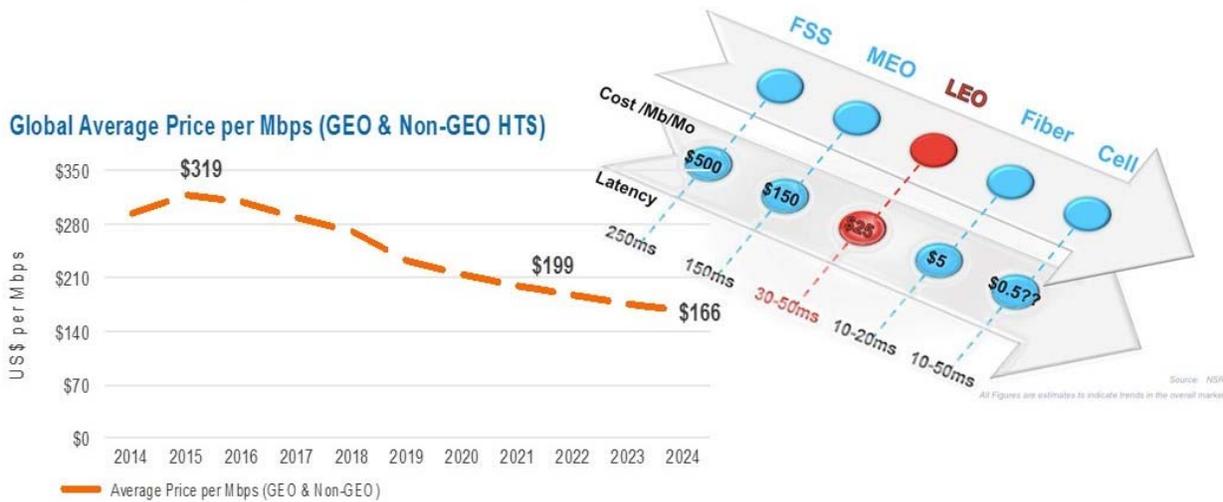
The constellations planned show that the ISRO approach of self made satellites is far behind the global developments such as Viasat which have 100 times more capacity, power and consequently low cost. However even more threatening are the LEO and VLEO systems.

The risk, if the global systems are permitted in India, (which eventually will be the case), the prices will fall so much that existing systems will become redundant.

HTS and Average Bandwidth Pricing



- From Widebeam → GEO HTS → MEO HTS → LEO HTS-
- **Price per Bit** to End User coming down to match terrestrial
- **Cost per Bit** for Operator to launch reducing because of scale
- **Revenue per Bit** rather than Fill Rates



In fact India has been lagging in not using the Ka band spectrum available to it for use over the country, a practice common in almost all countries. While a traditional Ku Band system with a beam which covers all of India can deliver only about 1 Gbps of data services even if all the transponders on the satellite are used for data, the High Throughput Satellites (HTS) such as Echostar-17 and Viasat-1 used in the Americas can deliver 14 Gbps via satellite at affordable costs. This is done via multiple spot beams which allow the spectrum to be used multiple times in different beams.

Satellite Broadband Operators in Europe and USA					
Company	Excede Internet	dishNET	HughesNet	WildBlue	Tooway
Satellite Used	Viasat-1, Spot Beam, Ka	Echostar-XVI, Ka (Jupiter-1)	Echostar-XVI, Ka (Jupiter-1)	Wildblue-1	KA-SAT 9E
Satellite Category	High Throughput 100 Gbps	High Throughput 140 Gbps	High Throughput 140 Gbps	10 Gbps	High Throughput Satellite
Price/ Month	\$49.99-\$129.99	\$39.99-79.99	\$49.99-\$79.99	\$49.95-\$79.95	Euros 55
Max Download Speed	12 Mbps	10 Mbps	15 Mbps	1.5 Mbps	10 Mbps
Max Upload Speed	3 Mbps	2 Mbps	2 Mbps	256 Kbps	2 Mbps
Max Monthly Cap	25 GB to Unlimited	30 GB	40 GB	17 GB	26 GB
Other companies Using Service or Owner	DirecTV	HughesNet		Owned by Excede	Owned by Viasat



Figure- Beams of Viasat-1 (Excede-12).

Open Space Policy and Permissions for Ka-Band

ISRO has launched GSAT-19 (8 KaxKu band) with a capacity of 10 Gbps and will be launching GSAT-11 with a capacity of 14 Gbps in 2018. However these fall far behind the current moves in Industry of constellations of 1000 Gbps under implementation.

The TRAI recommendations are very specific that India should opt for an open skies policy where Indian operators should be able for sign up for satellite capacities even for foreign operators. In fact the use of Ka bands which provide a large per transponder bandwidth of 250 Mbps (against 54 Mhz in Ku Band) is the only technology which can make broadband via satellites affordable and practical However, there is a need, adequately articulated ,of a” no barrier” opening up of broadband satellite space for India which would include foreign satellites.

New Generation Internet Satellite Constellations

New generation of satellite constellations are now going into operation with an objective of reducing the cost of internet delivered at today’s satellite Internet levels by a factor of at least 100.

Two Approaches

There are broadly two approaches to delivering Internet or data via satellites.

High Throughput Satellites-Operating in Geo orbit have a large number of beams and high bandwidth transponders to deliver up to 20 Tbps of total capacity via a single satellite. Many of these are already in operation, while others are coming on stream.

The disadvantage of GEO orbit is the round trip 500 ms delay, which can be irksome in many applications.

LEO and MEO Satellites

LEO and MEO satellites are not stationary, and a large number of such satellites is needed to provide continuous coverage. However with the fall in prices of small satellites and launches, these systems are now gaining prominence and provide data/ internet at equal footing to fiber in many cases. The delays can be as small as 15-30 msec which are insignificant. Terminals can be small sized and low uplink powers are possible.

In some cases unlicensed spectrum use may be possible as the Ka beams have very small footprints.

High Throughput satellite constellations –Enabling via the New Telecom Policy

It is inevitable that the new Telecom Policy should look at the High Throughput satellite constellations as a means of furthering India's New Telecom Policy. This is not only to keep India abreast of global developments but also to effectively deliver broadband internet and associated services across India and the Globe.

This would not be possible unless measures are taken to provide an easy licensing framework of such resources, and this should form an integral part of India's new telecom policies.

Examples of some satellite constellations are given in Annexure-1. Our purpose of placing this information is that while the world is moving ahead rapidly in satellite constellations/ satellite delivered broadband, India lacks such initiatives, has no policy for their use and there are no licenses/ permissions which are available either to use or launch such satellites.

3. Concluding Comments

The Consultation paper on Inputs for New Telecom Policy 2018 lacks in substance on the inputs needed.

The objectives of the Telecom Policy are undisputed, in that it seeks to a certain no of Broadband connections, Wi-Fi hotspots, providing connectivity to IoT and M2M etc.

However in relation to the changes needed in the sector for Licensing of services, alignment with Global Telecom and Regulatory infrastructures, use of new spectrum bands, furthering of High Throughput Satellites etc. the paper does not seek any comments, and it is likely that very few specific comments may be received.

Further the TRAI should have created a draft vision of how Fixed line, Mobile and broadband operators will coexist in the coming decade and its co-relation to licenses granted and revenue shares garnered.

Our responses placed above address largely the broadcast sector as the field is vast, and the ground rules need to be defined for detailed inputs.

Annexure-1-Examples of Satellite Constellations for Delivering Broadband

1. O3B MEO Satellite Constellation-16 Gbps per Satellite (Operational)

The first four satellites of O3B were launched on 25 June 2013, and eight more in 2014. There are plans to extend this to twenty satellites in 2018. The constellation is owned and operated by O3b Networks, which is a wholly owned subsidiary of SES S.A. The O3b constellation began offering service in March 2014. The satellites were deployed in a circular orbit along the equator at an altitude of 8063 km. Each satellite makes 5 passes per day and has 12 steerable Ka spot beams, (2 for gateways and 10 for user terminals).



Each beam is 700 Km in diameter. At present services are available in more than 180 countries. It operates on a B2B model in feeding Wi-Fi Hot Spots, 4G-LTE networks, Internet to many Island nations and maritime.

Capacity: (2x216 MHz per beam) throughput of 1.6 Gbit/s per beam. Total capacity of 16 GBit/s per satellite. Constellation capacity with 12 satellites is 200 Gbps. Future Capacity will get enhanced with 24 More Satellites Ordered.

Next Generation of O3b satellites (mPower MEO) has been ordered in Sept 2017 with a total of 30,000 spot beams which will deliver 500 Mbps to 10 Gbps at any location with Software defined power routing.

Configuration

O3B satellites are bent pipe satellites and operate in the Ka-band. The typical configuration involves a gateway providing Internet or Fiber connectivity points. The Gateway Antennas are 7.3 M in Ka-Band and located at two diverse locations.

Terminals

In O3B configuration, one satellite is in active use, and before it goes over the horizon the second Antenna picks signals from the next upcoming satellite. The set up requires two Antennas, either 1.2 M or 1.8M. Since the frequency of handover between satellites is 20-40 minutes, the design incorporates seamless "make before break" handover from one VSAT to the other in order to maintain constant flow of traffic and maintain IP sessions.



Tariffs

O3B offers different packages to customers based on networks and connectivity (Bit rates). It sets up its own gateways in the country (or outside) and provides the terminals free of charge.

The rates vary from \$450 per Mbps per month (Connectivity at 100 Mbps) to \$700 Per Mbps per month (20 Mbps customer).

As the services are primarily for B2B, or SMEs in remote areas, the take up has been very high. Services over India will be available only when the next three satellites are launched.

The tariffs will come down over time.

India Regulatory Approvals

O3B has filed for regulatory approvals in India with commitment to set up a gateway in India at its own cost. The proposal is pending with ISRO but O3B is confident of approval in its case as it is taking help of PSUs, Govt. entities and other Government customers including in sensitive areas to push the case with ISRO.

2. OneWeb

OneWeb is promoted by Web Wyler (Founder & Chairman), with further funding of \$1.7 billion from Virgin Group, SoftBank, Coca Cola, Bharti Group, Qualcomm and Airbus.

Satellite Constellation

The satellite constellation will comprise of 720 satellites (Plus orbital spares), interlocking with each other to provide an integrated footprint over the planet. Small, low-cost user terminals (30 to 75 cm) will talk to the satellites in the sky, and emit LTE, 3G and WiFi to the surrounding areas, providing high-speed access for everyone.

Timeframe: In early 2018, 10 of the production satellites will be launched to provide pilot service, followed by full launch campaign and low latency global broadband by 2019.

Regulatory Approvals:

In June 2017, OneWeb has received FCC approval to launch 720 low earth orbit satellites.

The satellites for the OneWeb constellation are 175–200 kg in mass. The 720 operational satellites will operate in 18 polar orbit planes at 1,200 kilometers altitude. Hence there will be 40 satellites in each orbital plane.

After the initial launch for proof of concept, one launch vehicle will launch 32-40 satellites for one plane. Thus 18 launches will be required for 18 planes, and these will be shared amongst various launch providers to provide for a quick build up time of 18 months.

Because the OneWeb satellites are at a much lower altitude than GSO satellites, users on OneWeb's system experience round trip latency of less than 50 milliseconds, which is 1/13th of the latency of GSO satellites.

How approach of Oneweb is different:

In the satellite industry each satellite is built with certain transponder configurations, antenna patterns, frequencies preset for each beam and satellites are individualized. This requires a long manufacturing cycle of individual satellites and an identical replacement is needed in case of any problems. However Oneweb will launch all identical satellites, which will get programmed in the orbit by a Geo satellite. It has the largest manufacturing facility (Assembly line) for manufacture of these satellites. Any failed satellite can be replaced in orbit by another with just programming.

Mode of Operation:

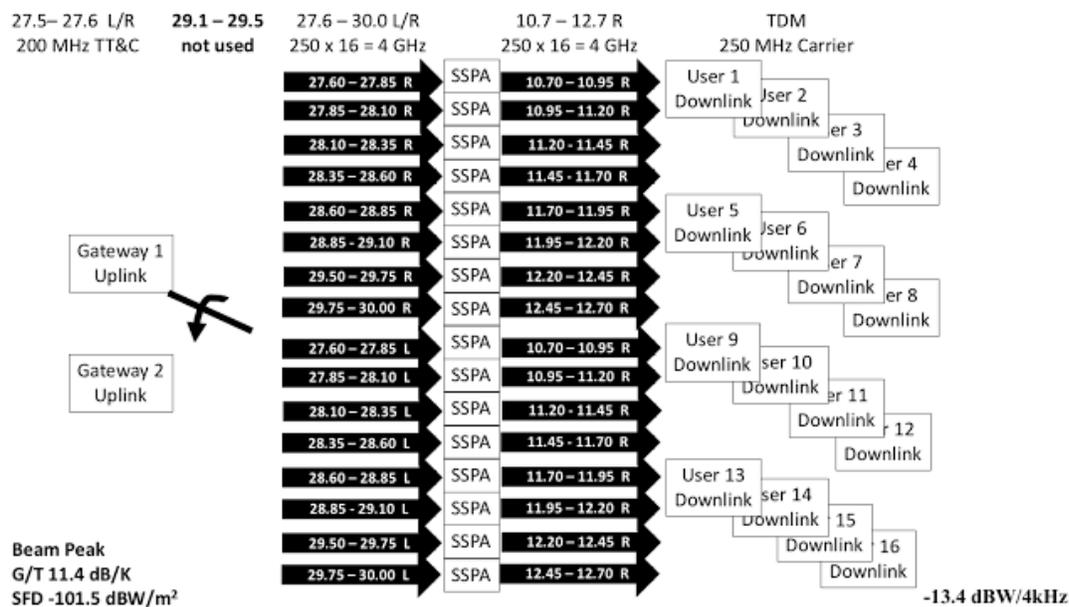
Each OneWeb satellite will have 16 nominally identical user beams, operating in Ku-band, each consisting of a non-steerable highly-elliptical spot beam.

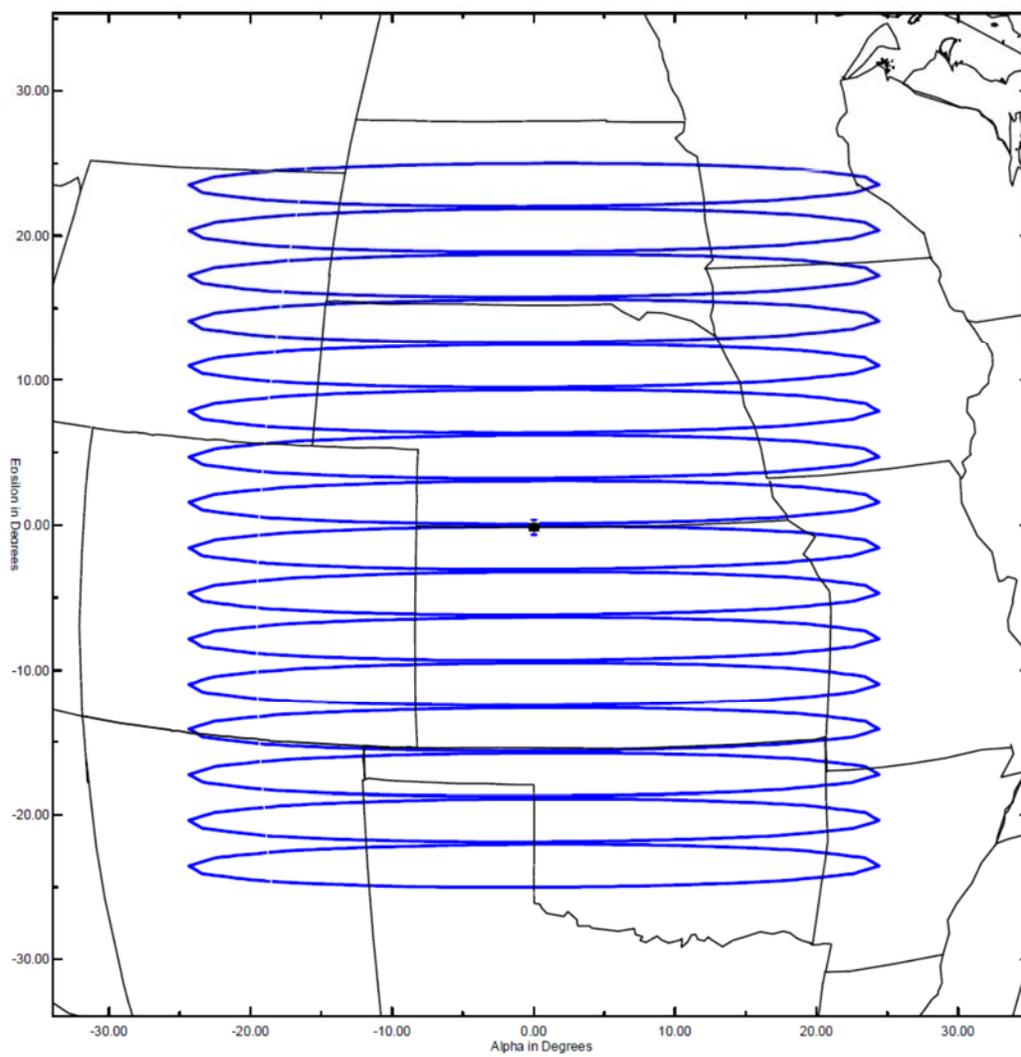
There are also two identical steerable gateway beam antennas, operating in Ka-band, on each OneWeb satellite, and each of these antennas creates an independently steerable circular spot beam. The 16 Ka-

band uplink channels in one gateway receive beam (the one tracking the servicing gateway) are converted to 16 Ku-band downlink channels, each one routed to one of the 16 user beams (“forward links”), nominally at 250 MHz bandwidth.

Additionally, 16 different Ku-band uplink channels from the same 16 user beams are converted to 16 Ka-band downlink channels and sent back to the same gateway transmit beam (“return links”), each having a nominal channel bandwidth of 125 MHz. The second gateway beam is tracking the next gateway earth station for handover procedures.

The movement of the satellites in their orbits means that a user will be progressively handed over from beam to beam within a OneWeb satellite and then handed off to the beams of the next satellite in the same orbital plane, or as required to a satellite in the adjacent orbital plane. This regular handover will occur seamlessly so the user experiences continuous service, much like cell phones get handed off from one cell tower to another.





Band of Operation:

Onweb is designed to operate in the Ku-Band for downlink to terminals and Ka-Band from Gateways to the satellite.