



**Response to the Telecom Regulatory Authority of India Pre-Consultation Paper on
“Infrastructure Sharing in Broadcasting TV Distribution Sector”**

June 23, 2016

CASBAA (formerly the Cable and Satellite Broadcasting Association of Asia) thanks the TRAI for its Consultation Paper on the above topic. CASBAA, as the TRAI knows well, is a non-profit trade association of 100 companies dedicated to the promotion of multi-channel television via cable, satellite, broadband and wireless video networks across the Asia-Pacific region. Our member companies operate and invest in 17 different Asian markets, and many of them are substantial cross-border investors; those that are not international investors themselves are the business partners of foreign investors. They have extensive experience in building and creating television infrastructure and quality programming to meet the needs of this region’s more than 500 million multichannel TV households.

Specifically, CASBAA member companies include prominent content providers, satellite capacity providers, DTH operators, conditional access and middleware technology providers, and other technology providers active in the Indian market.

CASBAA and many other observers regard the Indian pay TV market as being extremely competitive – indeed some have characterised it as hypercompetitive. In such a competitive market, given that subscribers are being well served, regulatory intervention is unnecessary and unwelcome.

Indeed, it is worth recalling that Indian consumers of pay-TV, like Indian mobile telephone customers, have greatly benefitted from past government policies that have promoted competition, through decisions on licensing, spectrum allocation and satellite usage. The numbers of Indians connected to pay-TV systems, like those connected to mobile phone networks, have shown a dramatic upward trend in recent years as capable, motivated platform operators have offered services designed to successfully win consumer rupees. The investment in building out and operating these competitive networks has been enormous, but the pro-competitive policies have allowed it to be funded completely through private capital.

The Pre-Consultation Paper

CASBAA believes that the Pre-Consultation Paper is based on fundamentally flawed assumptions that infrastructure capacity optimisation across multiple competing pay TV platforms is desirable at all to subscribers, achievable in practice and of pressing urgency.

As with its recent Pre-Consultation on Set Top Box Interoperability, TRAI makes unquantified claims that a mooted course of action is unconditionally beneficial, without significant consideration of the numerous disadvantages, not least potential disruption caused to tens of millions of pay TV subscribers in the pursuit of such optimisation. **In this regard, we would recommend that any further consideration of measures of this type would be significantly improved by conduct of a full Regulatory Impact Assessment¹.** This would allow an objective assessment of all costs as well as benefits of potential policy measures.

CASBAA notes that the measures discussed in the pre-consultation are currently described as optional for India's pay TV market actors to freely choose. CASBAA welcomes TRAI's brainstorming approach, with optional suggestions. In this respect, TRAI is showing a laudable respect for the market actors, many of whom we represent, and their independent commercial decisions whether or not to pursue infrastructure sharing.

However, CASBAA and its members would strongly oppose regulator-imposed infrastructure sharing requirements for pay TV operations in the Indian market, including any application of regulatory market incentives to achieve this, and/or any application of disincentives not to pursue this.

The DTH Industry and Infrastructure Sharing

The Pre-consultation Paper states (in section 1.4) that

"This pre-consultation paper has been issued with an aim to solicit stakeholder's views on issues related to sharing of infrastructure on voluntary basis and separation of network and service provider functions so as to reduce cost of distribution of services and enhance competition in respect of all type of TV distribution platforms."

CASBAA welcomes TRAI's invitation to solicit stakeholders' views in an open and transparent process. We also welcome TRAI's recognition that infrastructure sharing could be decided as a business decision by some number of corporate players and that openly discussing potential advantages and disadvantages of such decisions is a useful approach to take, to inform their decisions.

Unfortunately, there is another Indian government department whose processes are considerably less transparent, and which apparently wishes to mandate or significantly incentivise infrastructure sharing and separation of network and service provider functions for other reasons

¹ Regulatory Impact Analysis (RIA) is a systemic approach to critically assessing the positive and negative effects of proposed and existing regulations and non-regulatory alternatives. As employed in OECD countries it encompasses a range of methods. It is an important element of an evidence-based approach to policy making. While India is not an OECD member country, the size and rapid development of India's communications industries indicate that application of "best practice" systematic analytical procedures is warranted. For more information see <http://www.oecd.org/gov/regulatory-policy/ria.htm>. And for a typical application of this process, see the UK's guidelines, here: <https://www.gov.uk/government/collections/impact-assessments-guidance-for-government-departments>.

than those given here. CASBAA opposes any regulatory action to mandate or significantly incentivise these, or to significantly dis-incentivise the status quo.

Our reasons for this stance are grounded in our belief that the goals of India's public policy should be increased choice, lower cost, and higher quality of services for Indian consumers. The Indian government's decision to have an open-market DTH framework, with multiple competitors having been licensed, has so far produced this outcome for Indian consumers. The very rapid pace with which they have adopted DTH services clearly shows that there is a substantial demand for quality services – and the success of several differentiated DTH platforms demonstrates that consumers do not have uniform desires nor a uniform ability/desire to pay. India's diversity and size mean that it is well served by a competitive market with multiple players.

As noted above, the parallels to India's mobile telephony business are striking: in both cases multiple strong competitors are vying for Indians' patronage, mobilizing very large private capital investments for the benefit of Indian consumers. It is the open and competitive market that has produced this outcome, for both telephony and television. We note that TRAI's policies with respect to infrastructure sharing in the telephony industry have been based on educating and encouraging the service providers to take action on a mutual agreement basis.

Forced infrastructure sharing for DTH television would be antithetical to this, and – in the medium to long term – would damage the interests of tens of millions of Indian consumers. As noted below, they would have fewer choices, less capable and resilient networks and – bearing in mind the high transitional costs described below – very possibly higher prices as well.

Forced sharing would also impose competitive disadvantages on the DTH industry, and have negative repercussions on commercial relationships within the broadcasting industry:

- Firstly, in relation to cable TV. Given continued growth in the number of channels licensed for distribution in India (in many different languages), and the inevitable constraints of transponder supply on any single satellite or co-located satellites, the DTH industry will be constrained from supplying sufficient locally-relevant channels to compete with local cable operators.
- Secondly, in relation to content suppliers. Many DTH operators today charge and the majority of channels pay for carriage fees to be on the platforms. Usually these carriage agreements are commercially sensitive and not open to public disclosure. If channels are distributed on a shared infrastructure, who will charge for the carriage? How will carriage fees be distributed to the DTH operators? Will they be able to maintain the same amount of revenue? The reverse issue affects those top broadcasters who are producing premium channels, who are being paid by the DTH operators. If such a channel is only on one shared DTH platform, will it be able to maintain its revenue from all the platforms? Which government entity will compensate the DTH platforms and the broadcasters the potential loss of revenue resulting from this new situation?

In sum, India is now being well-served by a growing and competitive DTH industry that features multiple private actors as well as a strong public-service platform. We do not believe that any

theoretical benefits from infrastructure sharing would warrant the costs and risks of forcing this industry under the thrall of a single, state supplier of services.

Section-by-Section Comments

Starting in Section 1.2 of the Pre-Consultation Paper, CASBAA questions whether TRAI is asking the right initial questions and setting the right objectives.

The paper starts from a rather technocratic viewpoint that optimum infrastructure utilization is the most pressing need (“need of the hour”) in the Indian pay TV market. We believe that TRAI should maintain in focus its mandate to assure provision of competitive options that expand the choices available to Indian consumers. “Optimum” infrastructure utilization is surely secondary to meeting the needs of the Indian customer base.

The focus on average service criteria levels and service commonalities is subtly but surely anti-competitive. The goal of competitors should be to attract consumers by providing excellent service levels, rather than some sort of average common denominator.

For their part, pay-TV subscribers are individuals, not “average” or “common”. Indeed, a major trend of the last decade – with much broader scope than the pay TV market – is “personalisation”. Thus, in the already highly competitive Indian pay TV environment, service criteria levels and unique or superior aspects of a particular service are what service providers use to differentiate their services to better suit their subscribers.

Section 1.2 states

“For optimum utilization of available infrastructure, there is a need to examine technical and commercial issues in sharing of infrastructure such as satellite transponders, Earth Station facilities, Head-end facilities and optical fiber networks. In a competitive market, it is expected that benefits of reduction in Capital Expenditure (CAPEX) and Operating Expenditure (OPEX) of operators will ultimately be passed on to the subscribers. However, for enabling infrastructure sharing is the need of the hour which may require modifications in the existing policy guidelines for various platforms.”

In the above extract, the Pre-Consultation Paper makes two unfounded and unsubstantiated statements of “need”.

The first “need” sentence is strictly correct, but does require a prior question to be raised and answered: - should optimum utilization of available infrastructure be a policy and regulatory objective in itself, or can the market be left to find the optimum overall solutions to individual infrastructure supply and demand trade-offs?

The former is surely more relevant in a market where demand clearly exceeds supply and there is a fundamental reason to expect that this will persist without policy and regulatory intervention – for example fresh water supply. CASBAA submits that this is not the case for the Indian pay TV market, nor for its underlying infrastructure. Moreover, with respect to the current dedicated

video broadcasting networks, non-optimum capacity utilization is necessary to ensure optimum service availability and enable short-term service expansion.

The second “need” sentence is unclear, but reading it without the “for”, it leaps to a totally unfounded and unsubstantiated conclusion about the “need of the hour”. **Is this claimed “need of the hour” really more important than the need to allow service providers to better differentiate their services so as to better satisfy subscribers?**

Section 1.3 states

“With the advancement in technology, the network and services are getting decoupled. The network providers can focus on efficient operations and maintenance of networks so as to ensure maximum uptime and optimal utilization of available capacities. The service providers can focus on meeting the need of consumers. The service provider’s focus on consumers may help in more efficient delivery of services and timely redressal of consumer grievances.”

CASBAA submits that the first statement is not correct for the dedicated cable, DTH, HITS and IPTV networks in India today. Even for more general-purpose, next-generation telecommunications networks, specific network functions and network services are required to support specific pay video and other commercial services. Control of these is being decoupled from data carriage – “control plane” and “data plane” respectively, using technologies including Software Defined Networking, Network Function Virtualisation and Network Service Orchestration. However, the appropriate parts of the network remain tightly configured for the specific services it is conveying to the specific subscribers it is conveying them to.

Service providers’ focus on meeting the need of subscribers requires them to demand strict quality of service from network providers across a range of parameters including uptime / availability, video encoding / transcoding resolutions and quality, and criteria related to service growth, such as how fast new channels, services and subscribers can be added in both the short and longer term. If, for example, each service provider demands video encoding / transcoding using his different preferred encoding vendor’s technology (this is closer to the current case), then the opportunity to save network bandwidth would be drastically reduced and the main saving would be on computing hardware on which the various encoder vendors’ virtualised encoders can run together.

Thus in neither the technical sense nor the commercial sense is it true that “network and services are getting decoupled”.

It should also be noted that there is a counter-trend among some major software service providers – recognising the need for tightest possible coupling to enable best possible service differentiation – to provide more dedicated network infrastructure over which to provide their services. Examples include Alphabet / Google providing fibre networks,² blimp based broadband distribution,³ and even home WiFi routers.⁴

² <https://fiber.google.com/about/>

³ <http://www.google.com/loon/>

⁴ <https://on.google.com/hub/>

Section 2.6 states

“As per the MSO registration conditions, every MSO is required to operationalise its services with necessary conditional Access Systems(CAS) and Digital addressable systems(DAS). This implies that as per the present registration conditions, the MSOs cannot use TV signal feed from other MSOs.”

CASBAA notes that, if TRAI is to permit MSOs to feed other MSOs, the “upstream” MSOs would require content providers’ specific negotiated consent and assignment of appropriate onward distribution rights to other “downstream” MSOs.

Chapter 3 - A. Sharing of infrastructure by distribution platform operators

CASBAA notes that Part A seems generally more applicable (than is Part B) to the pay TV platforms’ current dedicated networks.

Section 3.2 makes some sweeping generalisations. Such generalisations are not always helpful when they obscure significant differences.

“A 36 MHz transponder is generally able to carry 17 SD TV channels using MPEG 4 compression and DVB S2 transmission methods and thus 20 to 25 transponders are required by each operator.”

Across the different DTH platforms, there is currently a mixture of transponder bandwidths. Not all services are delivered with MPEG-4 / DVB-S2. The service providers offer very different numbers of SD, HD and UHD channels and have different opinions and strategies on what mix of these to offer their subscribers both now and in future. That is competitive service differentiation in action.

Section 3.3 goes on to state

“It may be noted that most of the satellite TV channels re-transmitted by DTH/ HITS operators are replicated which results inefficient use of satellite transponders. The basic premise of transponder space sharing is that popular satellite TV channels could be retransmitted using common transponder space on a satellite by multiple operators voluntarily.”

Superficially the TV channels may appear “replicated” – but a given channel provided on the six different DTH platforms almost certainly differs in practice in one or more of the following:

- DTH operator logo – important for service branding, and also as an anti-piracy measure
- encoding vendor
- encoding technology (MPEG-2, H.264/MPEG-4 AVC, H.265/HEVC)
- resolution and format: SD, HD (various resolutions possible including 720p, 1080i, 1080p), UHD (currently “4K” 2160p, with other resolutions possible)
- assigned bit rate (if statistical multiplexing not used)
- statistical multiplexing mode (if statistical multiplexing is used): variable bit rate, capped variable bit rate, available bit rate or constant bit rate

- average bit rate achieved (if any statistical multiplexing mode other than constant bit rate is used)
- peak bit rate permitted (if statistical multiplexing capped variable bit rate is used)
- quality target priority assigned compared to other channels (if statistical multiplexing is used)
- number and composition of this and other channels in same statistical multiplex group (if statistical multiplexing is used)
- a number of visual quality performance metrics
- audio languages carried
- audio technology
- audio bitrate
- subtitling languages carried
- modulation technology (DVB-S or DVB-S2) – not all standard definition DTH set top boxes deployed in India currently support DVB-S2

These technology and operational choices have been made over many years and very large investments have been made according to those choices. It is unlikely that service providers will wish to relinquish control of them lightly or be able to do so swiftly.

CASBAA reiterates that it is not opposed to operators choosing to merge service delivery platforms if they were to do so by their own independent mutual agreements. DTH operators may now or later be considering mergers or acquisitions, which would require them seriously to consider how best to merge two populations of subscribers' equipment over time.

Section 3.3 continues

"Since different DTH/ HITS operators may use different CAS systems, simulcrypt technology may be used for encryption of these common channels."

Simulcrypt is not widely used as a long-term measure, usually being used during a transition from one CAS system to another – even if that transition takes a number of years. As a long-term measure, it would permanently reduce the level of security for all the common channels to that of the weakest CAS. Service providers who have invested in higher levels of security have done so in the belief that this will help them attract the most premium levels of content and avoid revenue leakage. Forcing them into a simulcrypt arrangement would vitiate these investments and impede competitive differentiation.

In addition, if the quality of premium video and audio provided for the common channels were higher than that offered today on whatever platform is using the weakest CAS, then there would be an increased incentive for commercial hacking of that CAS.

CASBAA notes that there is also a need to carry different programme guide information (DVB Service Information and MPEG-2 Programme Specific Information) for the different services. Such information plays a key role in helping consumers "discover" content they wish to watch and is an essential part of competitive program offerings. Electronic programme guide schedule information may require significantly more capacity than CAS data.

Section 3.3 continues

“In addition, each DTH/ HITS operator may also have a number of channels which are not common. For retransmission of these operator specific channels, additional transponder space may be hired on the same satellite or on co-located satellite by each DTH/ HITS operator separately.”

There is a limit to how many satellites can be co-located or even closely located due to spectrum availability and the need to minimise interference.

Multi-focus reception antennas (for reception of signals from closely located, but not co-located satellites) are not a panacea, being harder to align and offering lower availability than single focus reception antennas of comparable size. Whether requiring one complex or two or more simple dish antennas and installations, this could be a rather costly solution for consumers.

Section 3.5

As per our comment on Section 2.6, CASBAA notes that, if TRAI is to permit mode one HITS operator(s) – those essentially acting as MSOs in their own right – to feed other MSOs, such HITS operator(s) would require content providers’ specific negotiated consent and assignment of appropriate onward distribution rights to other “downstream” MSOs or pay TV operators.

Section 3.8 states

“Indirectly it {sharing of HITS/ MSO infrastructure} may also solve the issues relating to limited or practically ‘nil’ competition in the last mile access of the cable TV networks.”

This only applies with respect to MSO bundle choice, not to last mile infrastructure choice, which is increasingly important as cable infrastructure offers a significant means to provide high speed, high availability broadband services as well as pay TV.

Section 3.10 asserts

“Similarly, in DTH, the transponder space saved due to sharing of infrastructure may be utilized for meeting requirements of other important communication needs including provision of broadband services especially in hilly and remote areas.”

CASBAA believes that transponders better suited to provide such services, including telemedicine etc, are or are shortly to be available, provided by Indian operators, but political, institutional and bureaucratic difficulties are holding up their use for such purposes.

The DTH transponders that would be freed are not best suited to provision of such services, as:

- broadcast satellite design is not consistent with broadband satellite design – e.g. practically all broadcast channels are run with a single carrier at close to transponder saturation; supporting broadband internet requires support for thousands to hundreds of thousands of individual connections

- inefficient frequency re-use / small numbers of broader coverage beams compared to broadband-dedicated satellites
- lower power (EIRP) in the direction of the broadband internet antennas, requiring larger antennas or reducing service availability and/or bit rate
- delay/latency of geostationary orbit satellite links (up to 260ms earth-satellite-earth propagation delay, excluding all processing delays) which degrade use of such links for some time-critical applications.

The last point may favour alternative non-geostationary satellite solutions or non-satellite solutions, such as Google Loon – the blimp-based broadband solution for these applications.

Section 3.10 continues

“The saving will also reduce the outgo in the foreign exchange as the most of satellite capacities are provided by foreign satellite operators.”

CASBAA submits that such action would remove an outgoing recurring item, but most probably add a significant outgoing non-recurring item for foreign technology components and systems used in Indian provided satellites.

Moreover, if foreign satellite operators are able to provide superior broadband communications solutions to meet India’s needs, there might not be such a notional saving, especially if India does not have enough of the right type of capacity to meet this requirement now or in future.

Finally, we note that any outflow of foreign exchange is compensated by tax payments made by foreign operators to the Indian Finance Ministry. (The Indian satellite operator does not make such payments, so any move of DTH operators to all-Indian satellites would reduce central government tax revenues.)

Section 3.11 states

“In addition to the above, the infrastructure sharing will pave the way for competition in the sector.”

It is not clear which sector is being referred to here. As stated earlier, CASBAA and many other observers believe that the Indian pay TV market is already extremely competitive. We believe that mandated infrastructure sharing would be anti-competitive, not pro-competitive, and we strongly urge the TRAI to engage in a full Regulatory Impact Assessment of this.

Section 3.12 states

“The challenges in achieving the infrastructure sharing can be categorized into Operational, Commercial & Regulatory. In the DTH sector, in case of a DPO desires to share the satellite capacity with the other DPO, it may require alignment of existing dish antenna at the premises

of the subscribers due to change in the satellite actually providing the service.”

The cost of realigning satellite dish antennas would likely exceed that of the transponder saving. The following example is not intended to refer to any particular DTH platforms, satellite capacity or known scenario, but it demonstrates why the realigning cost would likely exceed that of the transponder saving.

The following assumptions are very favourable to the transponder-sharing scenario – in the event, CASBAA considers that the reality would be significantly less favourable:

- 25 transponders are used on each of two platforms deciding to share satellite infrastructure, but not merge or share operations
- 15 of these (60%) could be saved by merging two platforms
- USD4 million per transponder per year
- Smaller of two existing platforms has 10 million active subscribers
- Smaller of two existing platforms has larger or equivalent G/T receive antennas, all of the antennas can economically be reused and realigned, common transponders are in a frequency band supported by their low noise block down-converters (LNBS) and set top boxes can be reconfigured for new frequency mapping with software download or manual configuration method not requiring hardware modification⁵

In this hypothetical favourable scenario, the annual transponder saving after the transition is complete would be 15 x 4 = USD60 million.

Even before considering in detail the costs of a repointing exercise, it can be seen immediately that the cost saving per subscriber per year of sharing DTH capacity would be just USD6. This must be offset against the cost of repointing dishes, as well as the transitional cost of dual-satellite transmission during the transition period.

Such a transition would likely take several years at least, more likely four or five. There is a limit to the number of daily repoints achievable, given that the DTH operator would want also to keep adding subscribers and thus require approximately double its usual rate of dish installation.

As a “reality check”, we note that Tata Sky at the beginning of July 2013 announced a complete migration of its MPEG-2 set top boxes to MPEG-4 set top boxes⁶. This required no intervention by skilled field technicians – subscribers returned one box and were issued with a new one to self-install. This was therefore a considerably less field-labour-intensive operation than repointing satellite dishes. It completed by the end of October 2015, taking 2 years and 5 months

⁵ We note that this assumption in particular is unlikely to be realistic. Any repointing campaign would require installation of a high number of new dishes and ancillary equipment. Based on its members’ detailed knowledge of Indian customers’ preferences and demands, the DTH Association of India told the TRAI last year that antennas are installed out in the open at consumer premises, they inevitably deteriorate in the course of use, and “un-installed antennas cannot be re-used and provided to a new customer.” See at <http://www.trai.gov.in/WriteReadData/ConsultationPaper/Document/201503190616450055943DTH%20Association.pdf> This submission, and those of the individual DTH operators, detail the high costs and difficulties associated with consumer premise interventions such as re-pointing satellite dishes.

⁶ <http://www.indiantelevision.com/digital/y2k13/july/juldig7.php>

to upgrade 6 million set top boxes and reportedly costing around Rs 1,000 crores or approximately USD149 million⁷. Of course, that included new set top box equipment rather than field labour, so the cost is not directly comparable, but the timescale is indicative of how long a mass-migration project would likely take in the Indian DTH market.

(There would be additional costs due to remaining committed lease period(s) of the existing satellite capacity involved, meaning that there may be relatively cheaper and relatively far more expensive times to attempt such transitions.)

CASBAA would also note that forced infrastructure sharing would substantially worsen the reliability and resiliency of Indian broadcasting. In the extreme scenario where all DTH operators might be forced to operate from a single satellite, the entirety of broadcasting to in excess of 60 million Indian DTH households would be jeopardized by a single space incident.

Even the best networks can experience major failures. On 2 February this year, a core router failure in BT's broadband network in the UK caused hours of outages to several hundred thousand subscribers all across the United Kingdom⁸. Services provided by broadband service providers through their own built networks were not affected, but services provided by broadband service providers using BT's network and reselling its capacity were affected to the same degree as BT's own services⁹.

Regarding business continuity and disaster recovery planning, it does make sense for existing DTH operators to consider privately negotiating with their competitors for future emergency arrangements should one or more transponders fail on one platform. Indeed, such arrangements were made about six years ago between Sun Direct and Reliance Digital TV after the failure of six out of seven transponders leased by Sun Direct on INSAT-4B¹⁰.

Conversely, it does not really make sense from a business continuity and disaster recovery planning point of view to put two (or more) platforms' "eggs in one basket" on one shared satellite.

B. Separation of network and service provider functions at distribution level.

CASBAA notes that Part B generally seems more applicable to next-generation telecommunication networks; we have no comments on these.

Sections 3.14 to 3.16

CASBAA refers TRAI to its comments on Section 1.3 earlier, which largely cover these.

⁷ <http://telecomtalk.info/tatasky-fully-mpeg-4-dth-operator/144949/>

⁸ <http://www.bbc.com/news/technology-35472198>

⁹ <http://www.telegraph.co.uk/technology/2016/02/02/bt-broadband-suffers-major-outage-across-uk/>

¹⁰ <http://www.thehindubusinessline.com/todays-paper/sun-direct-reliance-big-to-jointly-beam-free-channels/article1004676.ece>

