



ATSC 3.0: Efficient, Scalable, Sustainable Wireless Capacity

Enabling Continuous Efficiency Gains And Hybrid Systems
For Wireless Spectrum Demands

*“ We believe true sustainability is stewardship
in action - measurable, accountable, and
anchored in responsibility to future generations.*

This is the ATSC journey... ”

Josh Gordon

Strategic Marketing Advisor
ONE Media Technologies



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INTRODUCTION

ATSC 3.0: A Model of Wireless Stewardship in the IP Era

As global demand for wireless capacity surges, the challenge of managing finite spectrum resources has never been more pressing. While most next-generation wireless systems pursue speed through denser infrastructure and increasingly aggressive frequency reuse, ATSC 3.0 offers a fundamentally different approach: a model rooted in shared efficiency, broadcast-scale reach, and spectrum-conscious design.

ATSC 3.0 is not just the next evolution of television—it is the first wireless standard purpose-built to integrate IP-native delivery with the power of one-to-many architecture. In doing so, it enables content and data transmission with a level of spectral and energy efficiency that unicast systems—no matter how advanced—struggle to match.

Consider This: While 5G and other unicast models must replicate each data stream for every recipient—one file, one user, one request, repeated a million times—ATSC 3.0 transmits once and reaches millions simultaneously. Delivering a 1 GB file to one million users via unicast requires one million GB of bandwidth. With ATSC 3.0, it takes just one GB. This is not merely a theoretical benefit—it is a structural one, and it scales with demand, not against it.

As an all-IP platform, ATSC 3.0 integrates naturally with cloud-based workflows, hybrid 5G systems, and new models of data-driven service delivery. It is already powering applications in smart cities, emergency alerting, distance learning, and mobile content distribution—proving its utility far beyond the living room screen.

In an age where infrastructure costs are rising and sustainability is paramount, ATSC 3.0 stands apart. It does not require ever-expanding tower networks, nor does it burden broadband infrastructure with avoidable load. Instead, it maximizes the utility of every watt and every hertz, extending the reach and relevance of spectrum through intentional, responsible design.

INTRODUCTION | CONTINUED

To the casual observer, ATSC 3.0 may appear to be just another wireless standard. But to those who understand—engineers, policymakers, and forward-looking technologists—it represents a masterclass in wireless stewardship, resilience, and scalable delivery.

It doesn't consume more to grow. It converges.

It doesn't collapse under the weight of a million viewers. It thrives there.

It doesn't chase speed. It prioritizes purpose.

As nations pursue the next evolution of wireless—from India's Direct-to-Mobile initiative to Brazil's MIMO-powered TV 3.0—the path forward is becoming clearer: stewardship is not passive—it is principled, measurable, and built to endure.

ATSC 3.0 is not just a better broadcast technology. It is a blueprint for how modern wireless systems can— and should—serve the public interest.

Let us be clear: you won't find a single number that definitively quantifies ATSC 3.0's advantage over 4G, 5G, or even 6G in all use cases. This document does not claim to. It simply begins the journey—a journey not yet fully mapped, but unquestionably necessary.

As the proverb goes, *"A journey of a thousand miles begins with a single step."*

This is that step.

We invite you to take part—in your own way, at your own pace. Whether or not you've considered the implications of broadcast vs. unicast, we ask only this: reflect on the value of shared delivery, and what it means to be a steward of spectrum in an increasingly connected world.

Thank you for joining the journey.



Mark Aitken

SVP at Sinclair Broadcast Group/
President of ONE Media Technologies



WHAT MAKES ATSC 3.0 UNIQUE?

ATSC 3.0's superpower is its ability to integrate with and enhance Internet Protocol (IP) systems. It was created to ensure that terrestrial broadcasting—the oldest form of electronic media—continues to be relevant in an ever more IP-interconnected world.

As such, the ATSC 3.0 physical layer (the part of the standard that forms and sends out broadcast streams through the air) was designed to send out IP streams instead of traditional video streams that ATSC 1.0 uses. Initially, the move from ATSC 1.0 to 3.0 came with a tradeoff because there was no backward compatibility with ATSC 1.0 TV sets or TV transmission technology. Most of the early challenges to ATSC 3.0 adoption were due to this break from legacy systems. As Internet and IP communications become more pervasive, the more valuable broadcasting IP streams becomes. ATSC 3.0's IP streams are now opening business and efficiency opportunities at broadcast stations as well as with the IP systems used by telecoms, streamers, CDNs, and data transport companies.

ATSC 3.0's IP streams are enabled to do more.

The creators of the ATSC 3.0 standard understood that just enabling a TV station to broadcast IP data would not alone win new data transport business. As a result, they added a rich collection of built-in IP broadcast stream management tools. These tools gave broadcasters the ability to reshape and manage their spectrum by splitting it into multiple broadcast streams which can be video, audio, or data.

The delivery characteristics of each stream can be managed independently for data speed versus robustness, and the zones where these characteristics are applied have been extended beyond the realm of traditional TV. In addition, individual streams can be timed by when they are sent out and can be sent independently or in perfect sync.

Together, these capabilities, and others, upgrade a broadcast station's output from a single-purpose TV signal into a versatile digital pipe through which multiple streams can be customized for entertainment, information, and commercial data services.

WHAT MAKES ATSC 3.0 UNIQUE? | CONTINUED

Evidence of ATSC 3.0's integration superpower can now be found around the world as ATSC 3.0 spectrum is integrated into IP systems on three continents. Here are some examples:

Brazil: Integration of OTA broadcast TV and streaming – TV Globo, Brazil's largest broadcaster, is building an ATSC 3.0 hybrid system for Brazil's TV 3.0 system. TV viewers will go to a single app to access programming distributed by both OTA broadcast and streaming services. The consumer may not know where the programming is coming from, only that they can receive it all on the same TV set app. In addition, Brazil is mapping out its own mobile strategy.

India: Integration of OTA broadcast and mobile devices – Prasar Bharati, India's public broadcaster, is in the final test stages for its Direct to Mobile (D2M) program. In this system, OTA broadcast spectrum is sent directly to a variety of mobile-capable devices and accessories including 2G feature phones, 4G and 5G smart phones, tablets, and dongles.

USA: Spectrum integration from multiple stations – In the US, EdgeBeam Wireless is pooling ATSC 3.0 spectrum of the four largest TV station groups creating a national footprint that will offer targeted datacasting and other advanced services almost anywhere in the country. Core IP technology, originally developed in the telecom industry, will manage the initial aggregation and redistribution into customized business applications.

This report explains how the unique characteristics of ATSC 3.0 can advance the efficiency of local TV spectrum. It is divided into two parts:

PART 1 is a chronology focusing on ATSC 3.0's efficiency story, beginning when it replaced ATSC 1.0, and documenting how technological advances are increasing spectrum efficiency.

PART 2 spotlights two large national projects where OTA broadcast spectrum is being integrated with mobile networks. These hybrid systems demonstrate major energy savings and data efficiency—results that go far beyond what broadcasters can achieve by just improving the energy efficiency of their stations. One of the ways ATSC 3.0 can reduce energy use is to integrate with larger IP systems and improve their efficiency.

In short, ATSC 3.0 was not built to just deliver broadcast television, but to provide a robust and adaptable wireless IP data delivery platform. Its design philosophy expands broadcasting into a broader role: delivering customizable data services integrated smoothly into IP ecosystems, improving the overall efficiency, and evolving with them to stay relevant in an ever more IP-interconnected world.

Let's get started!



Josh Gordon

Strategic Marketing Advisor
ONE Media Technologies



PART 1 | EFFICIENCY

ATSC 3.0 ACHIEVES A FIVEFOLD EFFICIENCY GAIN OVER ATSC 1.0 – AND IS STILL ADVANCING WITH 10X IMPLEMENTATION UNDERWAY

ATSC 3.0 is an adaptable IP standard and has been designed to improve as technology evolves. US broadcasters that have upgraded to ATSC 3.0 have already seen a fivefold boost in system video/audio throughput by switching from ATSC 1.0. This section will review the efficiency gains already achieved as well as ones in development.

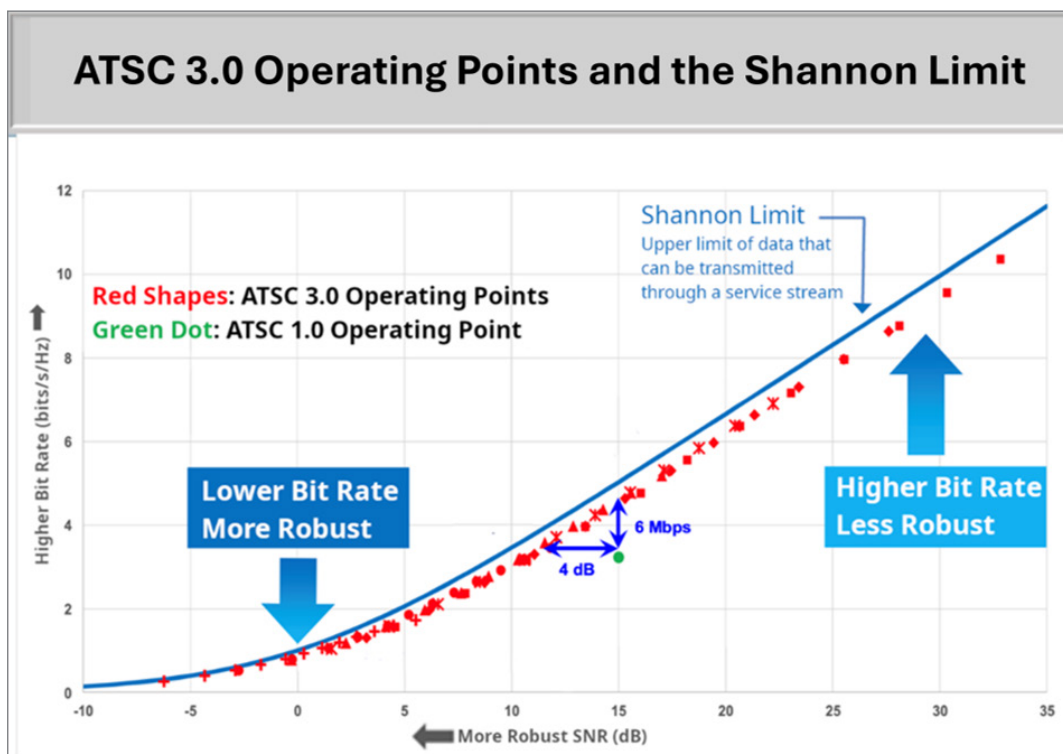
PART 1 | CONTINUED

Efficiency Gain #1: Increasing Channel Throughput Using the ATSC 3.0 Physical Layer

- A 28.8% efficiency gain over ATSC 1.0

The physical layer of the ATSC 3.0 standard manages how signals are broadcast through the air. The design of modulation and coding used by ATSC 3.0 provides the first fundamental efficiency gain of 3.0.

“In the US, a TV channel gets a 6 MHz radio spectrum allocation,” says Bill Redmann, Director of Standards and Immersive Media Technologies at InterDigital. “ATSC 3.0’s physical layer moves more data through a channel because it operates closer to the Shannon limit, the theoretical constraint on how much data can pass through a channel.”



In the graph above, the blue line represents the Shannon Limit—the maximum number of bits that can pass through a channel. Says Redmann, “The closer to this Limit, the more bits can pass through. The red dots below the blue line represent many ‘operating points,’ which are specific combinations of modulation and coding that ATSC 3.0 can use to send data through a channel.”

PART 1 | CONTINUED

Redmann continues, “Each operating point represents a tradeoff between data rate and robustness. The single green dot in the lower center of the chart represents the only operating point offered by ATSC 1.0 to send data through a channel.”

The single ATSC 1.0 green dot lies at a greater distance from the Shannon Limit than any of the ATSC 3.0 red dots, illustrating the greater efficiency of ATSC 3.0. As a broadcaster moves from ATSC 1.0 to 3.0, this results in an overall efficiency gain of 28.8%.

Efficiency Gain #2: A Leap Forward in Video Compression

- A 4x efficiency gain over ATSC 1.0 from a codec upgrade from MPEG2 to HEVC.

A codec provides for the compression and decompression of video to make it easier to transport. According to Redmann, “By utilizing algorithms to remove redundant information, codecs can shrink large video files into manageable bit sizes while maintaining quality. The implementation of ATSC 3.0 has allowed broadcasters to upgrade to modern codecs and increase efficiency.”

Redmann continues, “The MPEG 2 codec used by broadcasters under ATSC 1.0 is about 30 years old. When upgrading to the more efficient HEVC codec, images and audio need only a quarter as many bits, so 4x as much imagery and audio can pass through the same channel. This means I could send four TV programs over a single channel or send higher resolution images than was previously possible.”

The physical layer improvements mentioned in Energy Efficiency Gain #1 allow more bits to flow through a channel, and the 4x bit efficiency gain from the new codec means that fewer bits are needed to transmit imagery. These two steps complement each other, widening the pipe while decreasing the payload. Together these yield a 5x video efficiency increase over ATSC 1.0.

PART 1 | CONTINUED

High Efficiency Video Coding (HEVC)

- Compared to the MPEG2 codec of 1.0, for the same level of video quality, the HEVC codec (MPEG H.265) used in NextGen TV is 4x more efficient.
- In combination with the improved spectral efficiency, NextGen TV offers **5x improvement in images per bit.**

MPEG2

H.265
HEVC
High Efficiency Video Coding

The HEVC codec combines with the improved physical layer to increase efficiency over ATSC 1.0 (Credit: ATSC Planning Team #9)

Efficiency Gain #3: Pushing Boundaries with the Latest Codec – HEVC to VVC

- An additional 2x video efficiency gain on top of HEVC.
- Today's US implementation of ATSC 3.0 has 5x more efficient video delivery than ATSC 1.0. The VVC codec will double efficiency again to 10x on top of HEVC.

In February 2025, the Advanced Television Systems Committee (ATSC) published their standard for VVC use in broadcast systems. Estimates of how soon VVC will be widely in use range from two to four years.

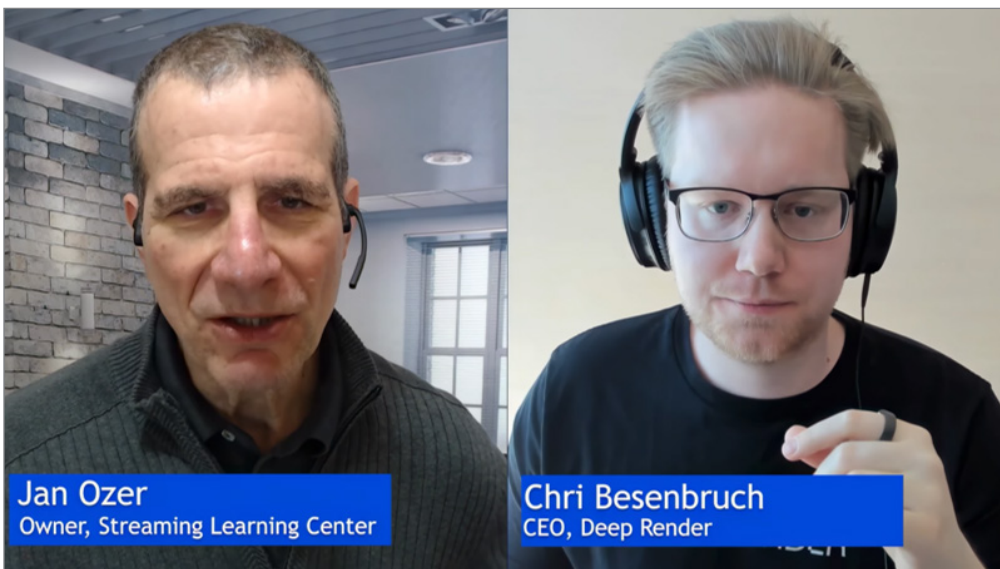
Beyond VVC, codec development continues and is of growing importance. Roughly 80% of the capacity of the Internet is taken up by video, and with streamers adding major sports events to their programming, there is greater demand for more efficient codecs.

"Codecs obviously increase efficiency," says Alan Stein, Vice President of Technology and Standards at V-Nova, "but as they get more complicated, the processors required at both ends of the receive and send ends of the process start to use more energy. Hardware based codecs use very little, if any, extra energy, but software codecs can use more."

PART 1 | CONTINUED

A Look Ahead: Could AI Codecs Advance Codec Efficiency?

This is an area of significant interest and investment. Watch a video of Jan Ozer, owner of the Streaming Learning Center and publisher of *The Encoding Trendline* newsletter, [interview](#) the founder of an AI codec startup.



The Future of Compression:
Jan Ozer interviews
Deep Render CEO Chri
Besenbruch about his AI-
powered video codecs.



Ozer publishes a weekly LinkedIn newsletter to cover new activity in codec technology. [Subscribe](#) to Ozer's *The Encoding Trendline* newsletter for free.

PART 1 | CONTINUED

Efficiency Gain #4: MIMO – Multiple Input Multiple Output Technology (Brazil implementation)

- Brazil is implementing MIMO technology through the ATSC 3.0 physical layer, making this the first commercial application of MIMO in broadcast TV
- The implementation of MIMO will help achieve a 15X efficiency gain over Brazil's current TV 2.0 system which is based on the ISDB-T (Japanese) standard

Since the 2000s, MIMO (multiple-input and multiple-output) technology has been a well-established way to improve the efficiency of wireless systems for Wi-Fi, telecom, and satellite systems. MIMO can significantly improve wireless reception by using multiple transmitters and receivers. According to Luiz Fausto, previously Technology & Regulatory Specialist at TV Globo, and currently ATSC VP of Standards Development, “Back in 2020 when Brazil's SBTVD Forum began testing candidate technologies for TV 3.0, our next generation TV system, accommodating MIMO was a requirement.”

Read a Description of MIMO on [TechTarget](#)

The MIMO plan will significantly increase efficiency while maintaining data rate and reliability. However, MIMO adds complexity, as it uses multiple antennas at both the transmitter and receiver ends. “We understand that this is a technology change,” says Fausto, “so we are working with technology suppliers and TV receiver makers to enable this to happen. Many TV 3.0 trials with MIMO have already been performed in Brazil, and we plan to have experimental transmissions running 24/7 in 2025, with commercial operations starting in 2026.”

In addition to MIMO, Brazil will use the latest codecs – VVC and an even newer one, LCEVC – for TV 3.0. According to Fausto, “The MIMO ATSC 3.0 physical layer combined with the new codecs VVC+LCEVC will create a system 15x more efficient than the current Brazilian TV system. This will enable UHD HDR free-to-air services for indoor reception at the highest possible spectral and energy efficiency.”

PART 1 | CONTINUED

A Look Ahead: Could Other Countries Adopt ATSC 3.0 MIMO?

In the wake of Brazil's innovation, other countries could much more easily add MIMO. Brazil is now working with broadcast tech suppliers to create MIMO broadcast transmission systems and with consumer TV set makers to create receiver antenna systems. When that work is done, adopting MIMO will be much easier for other countries to follow. In addition, at the 2023 NAB show, ETRI (the Korean Electronics and Telecommunications Research Institute) introduced a backward-compatible version of ATSC 3.0 MIMO. If viewers are motivated to watch 8K TV, broadcasters and the transmission service providers might consider investing in a MIMO antenna upgrade.

Additional information:

ITU Workshop on “Future of television for Europe”

Energy and spectral efficiency of MIMO for Digital Terrestrial Television Broadcasting



Luiz Fausto
Technology & Regulatory Specialist -
TV Globo / Brazil

[Watch](#) a video of Luiz Fausto explaining the efficiency gains of Brazil's MIMO technology in his presentation at ITU's Future of Television Summit (November 2024)

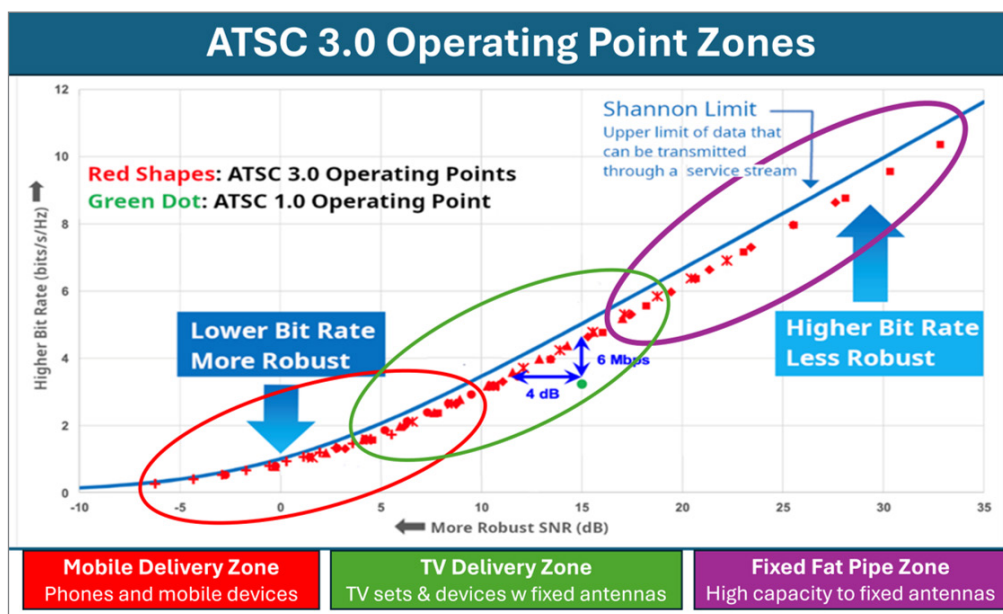
PART 1 | CONTINUED

Efficiency Gain #5: Enhancing Data Delivery by Matching the Most Effective ATSC 3.0 Operating Point to the Business Goal of Each Broadcast Stream

- Because this approach customizes the characteristics of each broadcast stream, efficiency gain will vary with each use.
- In some cases, this will result in clear energy savings; in others, the same amount of energy will be used but with a significantly improved SNR or bit rate (which would have required more energy to achieve).

Different ATSC 3.0 operating points are suited to different business use cases. To maximize the efficiency of the physical layer, it is important to consider the business goal and use the appropriate operating point.

As shown below, there are 60 ATSC 3.0 operating points, indicated on the graph below by red dots. (Note: This is the Shannon Limit chart shown earlier on page 8) Each operating point represents a trade-off between the bit rate, or speed, and the robustness of a broadcast stream. Each operating point is unique, but for business use cases they can largely be grouped into three basic zones.



Each operating point zone example on the graph is represented in either red, green, or purple.

PART 1 | CONTINUED

The following is an explanation of each operating point zone:

● **The TV Delivery Zone:**

Operating points in this zone (inside the green oval) are in the middle range of both bit rate and robustness. These may be best suited to transmit to large screen TVs or other devices with fixed antennas. TVs need a high enough bit rate to continuously refresh large screens and a signal robust enough to maintain high-quality service in real time. TV Delivery Zone applications do not need maximum robustness, as delivery is to fixed position antennas, usually in an upright position. Note that the single operating point of ATSC 1.0 (green dot) is in this zone.

● **Mobile Delivery Zone:**

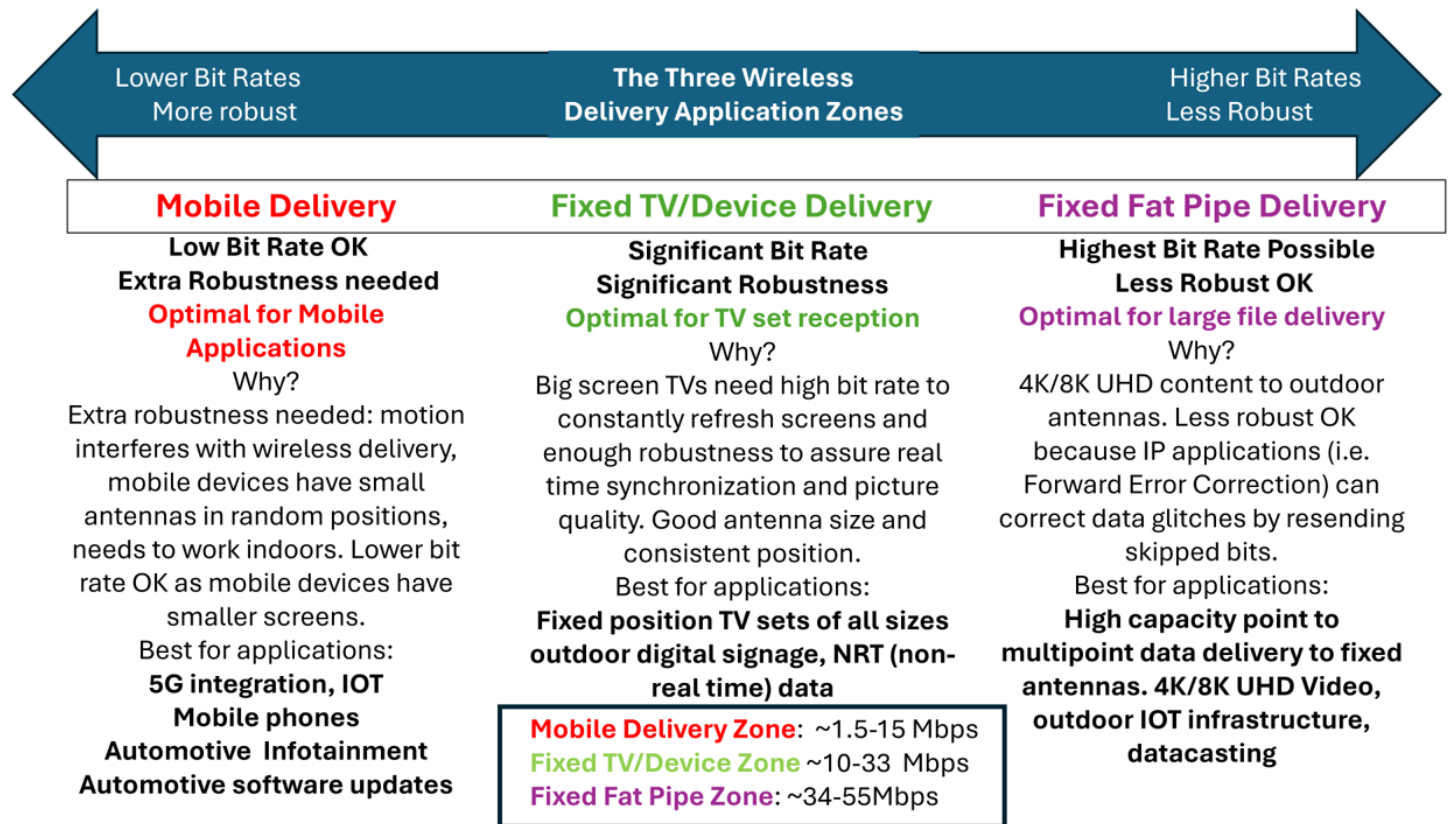
This zone (inside the red oval) has operating points at the lowest end of the range and provides the most robust signal with a lower bit rate, making these operating points ideal for delivery to mobile, portable and handheld devices. Typically, these devices have much smaller screens, so using a lower bit rate providing lower resolution is fine. However, signals delivered to such devices (example: mobile phones) need significant robustness. These devices typically need reception in a wide variety of locations and are expected to operate indoors and in moving vehicles.

● **Fixed Fat Pipe Delivery Zone:**

This zone (in the purple oval) has very high bit rates and much lower robustness. A lower robust signal is best received by fixed position outdoor antennas, making it ideal for 8K fixed point delivery. Applications that use operating points at the very highest bit rates are often B2B, where reception antennas do not need to fit into a consumer's mobile phone or living room. Because the ATSC 3.0 physical layer has unique operating points at the extreme upper end of this zone, this makes it ideal for wireless applications where a lot of data needs to be moved quickly.

PART 1 | CONTINUED

The extended range of ATSC 3.0 at the outer reaches of both Fixed Fat Pipe and Mobile Delivery zones increases the efficiencies of both mobile delivery and datacasting business applications.



A Summary of the Three Wireless Delivery Zones and the Business Applications They Serve

In summary, the ATSC 3.0 physical layer introduces a new system with 60 operating points, each one representing a different tradeoff between bit rate and robustness. By matching the best operating point with the goals of the business application, broadcasters can help maximize efficiency for data delivery.

PART 1 | CONTINUED

Additional Information:

ATSC 3.0 Physical Layer Functionality – presentation by Luke Fay



Watch a 30-minute technical video presentation by Luke Fay explaining the ATSC 3.0 physical layer. Fay chaired the ATSC committee that developed it.

[The ATSC Transition and Implementation Guide.](#) Inside the 81-page guide is a section called “Trade-offs between services, robustness and bandwidth” that offers specific examples using operating points for different business applications.

[Pearl TV’s Host Station Manual.](#) This informative manual can provide insight into the multiplicity of operating points and capability of ATSC 3.0.



PART 2 | INTEGRATION

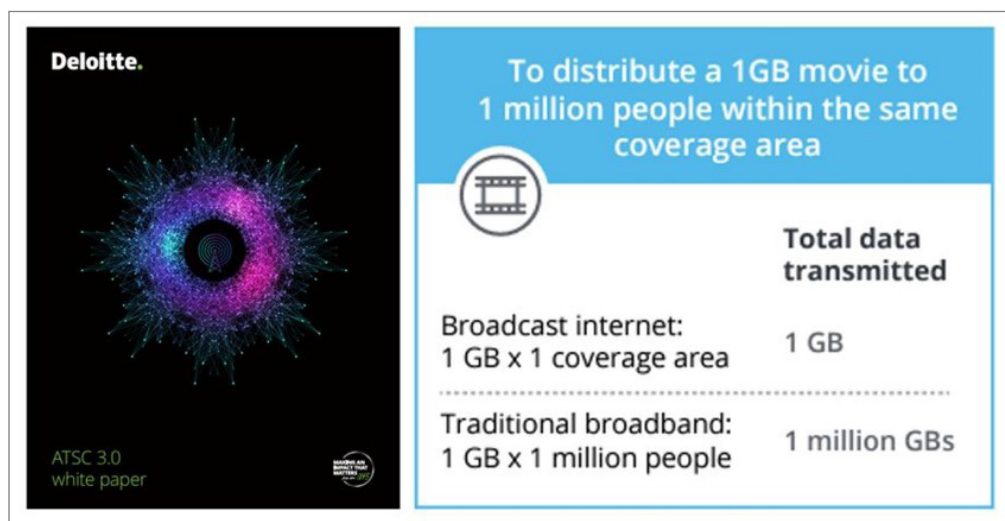
HYBRID BROADCAST AND 5G SYSTEMS SHOW SIGNIFICANT EFFICIENCY GAINS AND REDUCED CAPACITY SPIKES

The ever-increasing demand placed on spectrum is a challenge throughout the world. British Telecom (BT) in the UK, and the Modi government in India, have invested in hybrid video/data delivery systems. These systems integrate terrestrial broadcast, mobile networks, and satellite networks to improve efficiency and reduce demand peaks on terrestrial mobile networks.

Terrestrial broadcast spectrum has the biggest impact on energy efficiency when it can leverage its one-to-many architecture at the largest scale. A regular US (high power) TV broadcast signal can reach TV sets or data targets within a +/- 50-mile radius from the transmitter site. This means that video or data can be simultaneously delivered to data targets in a 100-mile diameter circle. The broadcast signal can reach all data targets at once.

Broadcasting excels at mass “one-to-many” delivery, but the signal is one way, so interactive features are limited by a small return path through an Internet connection. By contrast, a mobile network establishes a one-to-one distribution connection called unicast. A unicast signal establishes a two-way channel for every connection made, enabling robust interactive features. While these networks excel at one-to-one interactivity, they can struggle when delivering identical video or data payloads to a mass audience. A live major sports event, or video game software update, can overload a mobile network and the content delivery networks (CDN) they rely upon, causing slow downloads and poor-quality video streams. Energy is wasted when these networks need to operate at higher levels to anticipate usage surges, driving cell densification and capitalization, and power consumption. For both unicast mobile networks and multicast terrestrial TV operators the core strength of one is a weakness of the other. Why not integrate them to work together? To wirelessly send a 1GB file or movie to one million viewers through one-to-one architecture, one GB of data must be sent one million times. By contrast, when sending 1 GB through one-to-many architecture, 1 GB is sent only once.

PART 2 | CONTINUED



ATSC 3.0 can provide a solution for the continuously increasing demand for wireless capacity

[Download](#) the Deloitte white paper on ATSC 3.0.

The technology to integrate broadcast with mobile and fixed internet providers has only recently been possible, enabled by the new IP-based broadcast standards like ATSC 3.0 and DVB T2.

Today, two ambitious nationwide projects--one in India and one in the UK, are finding significant efficiency gains at scale by combining wireless multicast (broadcast/satellite) and unicast spectrum (5G/telecom). Both involve massive investment and cutting-edge technology and have shown significant gains in spectrum efficiency.

A major difference between the two examples is the role that the telecom provider plays in each. In the UK, BT (the UK's largest telecom) originated the project and invested nearly a billion dollars to get it started. In India, the Modi government is championing the initiative, but India's telecom industry is lobbying against it.

PART 2 | CONTINUED

Business Case #1: MAUD (Multicast-Assisted Unicast Delivery System)

Country: UK

Organization: British Telecom (BT)

Briefly: MAUD is using existing multicast terrestrial broadcast and satellite spectrum to enhance a 5G system and reduce capacity peaks

Challenge: Year-over-year rising capacity peaks are taxing 5G distribution and will force a costly system-wide technology upgrade

Key Benefit: MAUD can reduce capacity peaks by up to 50%

Additional Benefit: BT projects that if capacity peaks continue to rise, all UK telecoms will need to upgrade their systems, at an estimated cost of £16.5 billion. MAUD can eliminate the need for upgrades and solve the “peak” problem at minimal cost



MAUD can cut peak demand by up to half.

“MAUD is a far more efficient way for ISPs to deliver linear TV,” said Ian Parr, Broadband Engineering Director at BT, in an [interview](#) with CSI magazine. “For example, it will reduce the amount of network peak capacity needed for distribution. As a multicast technology, it is already up to ten times more efficient than unicast. This efficiency does not simply help with managing the growing traffic, but it also means we’re using less energy to deliver the same amount... We can expect MAUD technology to use up to 50% less bandwidth during peak events, reducing energy usage through the use of fewer caches, and network equipment scale. What is more, next generations of equipment will use even less power and drive down carbon emissions of media distributions.”

PART 2 | CONTINUED

BT's Significant Investment

As the largest telecom in the UK, BT has invested close to a billion dollars to create MAUD. Iain Morris, International Editor of the telecom publication *Light Reading*, commented on how unusual this investment is: "What's especially interesting about MAUD is that it is the rare product of research and development (R&D) by a telco rather than a vendor." Morris continued, "Including capitalized development costs, BT pumped about £683 million (\$859 million) or 3.3% of revenues into R&D in its last fiscal year. And while that is a small amount compared with spending by the likes of Ericsson and Nokia, it puts BT ahead of most peers."

See the full graphic including the live production part of MAUD [HERE](#).

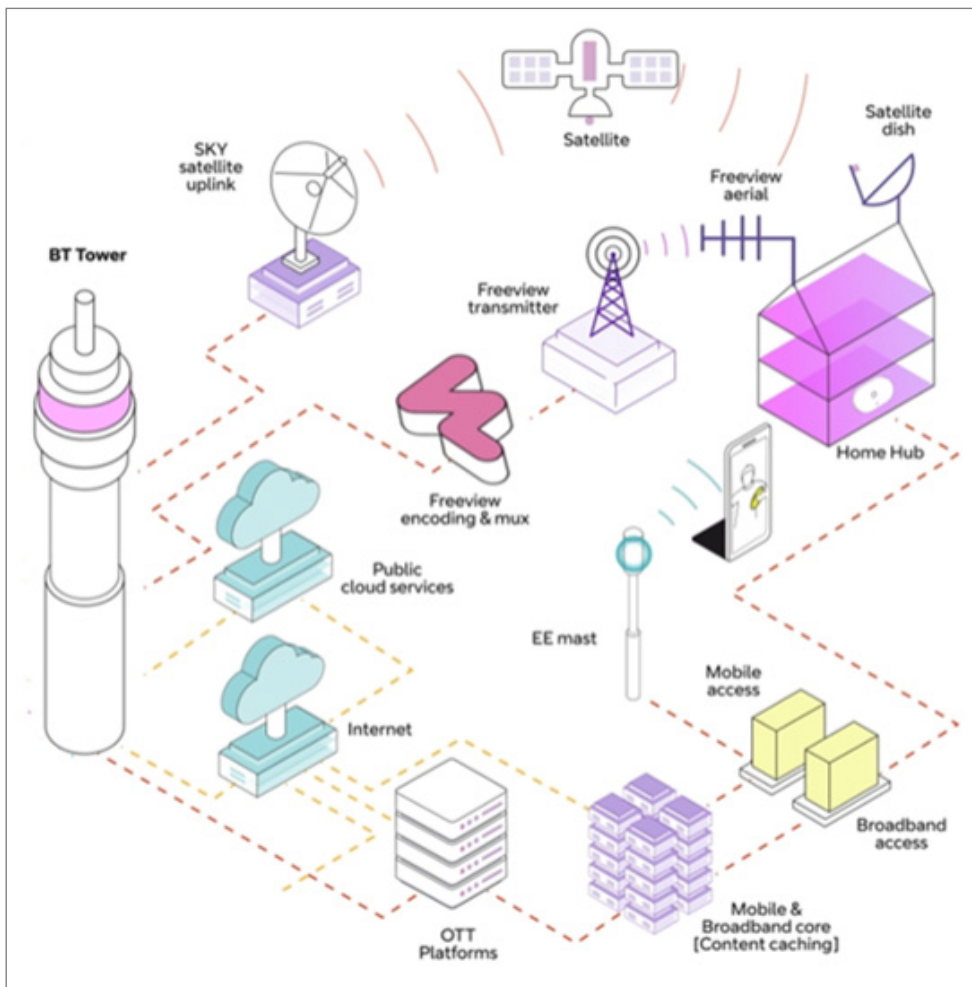


Illustration showing the distribution part of the MAUD system. Live TV production feeds are sent to a BT Tower (far left) where they are processed and then distributed to viewer homes (far right) via broadband, terrestrial broadcast, and satellite.

PART 2 | CONTINUED

Up to US \$20.8 Billion Savings in Telecom Upgrade Costs

While spending nearly a billion dollars on the MAUD system may seem expensive, it could be a bargain compared to the expense that would be needed to bolster UK broadband networks if broadcast delivery shuts down in the UK.

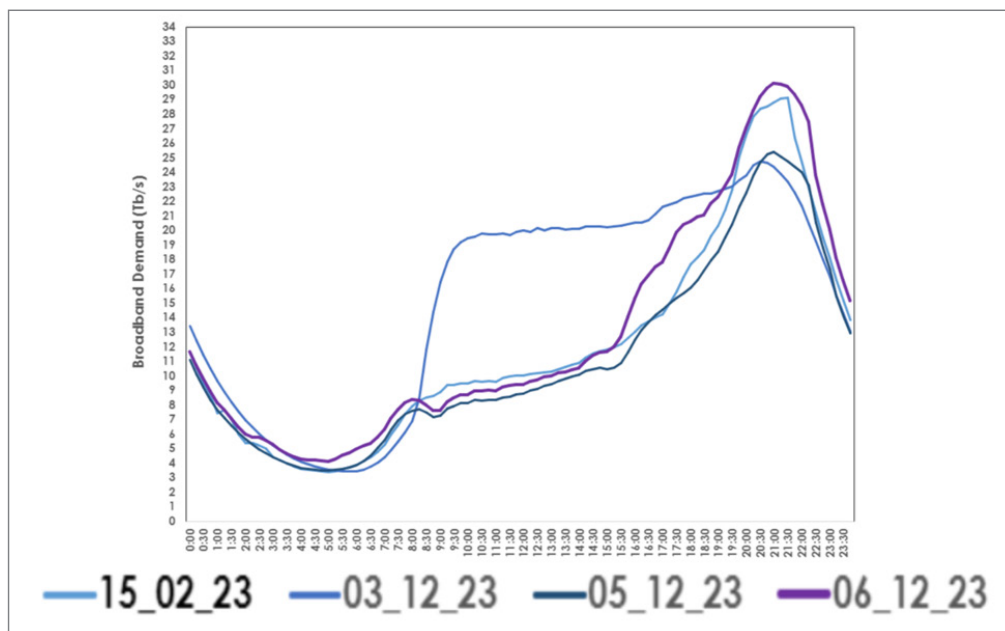
According to Chris Bramley, BT's Managing Director of network applications, services, and group network architecture, "the UK-wide industry could face investments of up to £16.5 billion (US \$20.8 billion) if broadband networks fully replace broadcasting technologies and the current trends persist."

What the BT Usage Peaks Look Like

To illustrate the challenge being faced, the BT graph below was published in [Mobile Europe](#) magazine. As stated in *Mobile Europe*:

"The graph below shows the shape of things to come, with BT recording its highest ever data traffic peak at 30.1 Tbps at around 9pm on Wednesday 6th December (in purple)..."

The spike [was] driven by six Premier League games streamed live on Amazon Prime and major updates to Call of Duty Modern Warfare."



BT graph showing
the capacity peak on
December 6, 2023

PART 2 | CONTINUED

The graph shows the highest peak on December 6, 2023 (purple line), as well as the unpredictability of other capacity surges. If the UK shuts down terrestrial broadcast, as it indicates it may, BT projects the cost to the UK to upgrade telecom infrastructure to accommodate sports-driven usage spikes will be about 20.8 billion US dollars. BT'S MAUD could repurpose existing UK broadcast and satellite facilities to deliver lasting results for a fraction of that cost.

For more information, click [HERE](#).

Additional Information

Watch an explainer video about MAUD [HERE](#):

Business Case #2: Direct to Mobile (D2M)

Country: India

Organization: Prasar Bharati – India's public broadcaster

Challenge: India's 5G network sometimes gets clogged by video content. With mobile data consumption doubling every three to four years, a new solution is needed that can be deployed and scaled for a billion strong user base.

Key Benefits: D2M could shift 25-30% of video traffic off 5G, improve user experience, and help operators moderate 5G network expansion. D2M can also meet heightened national priorities for emergency broadcasts and alerting.

Additional Benefit: About 25% of Indian households do not own a TV set, so mobile phones are their only way to access TV content. Many in this group cannot afford an adequate data plan. D2M will serve lower-income citizens with free educational and entertainment TV.

PART 2 | CONTINUED



[WATCH](#) a short explainer video on D2M technology.

The D2M initiative has gained traction in India because it aligns with key goals of Prime Minister Narendra Modi. From the start, Modi's government has been using advanced digital technologies to power socioeconomic growth. Special emphasis has been placed on technology developed in India. Two rounds of D2M technology testing have already been completed by the public broadcaster. Field tests were completed in 2023 in Bengaluru and continue in Delhi.



Apurva Chandra, India's Secretary of Information and Broadcasting (I&B)

During the testing, Apurva Chandra, then India's Secretary of Information and Broadcasting (I&B) said, "The government expects the D2M technology to find a market in India as currently there are 800 million smartphone users in the country and 69% of content accessed by these users is in the video format. Further, the D2M technology would also help the government reach nearly 80-90 million 'TV dark' homes across the country. Of the 280 million households in the country, only 190 million have television sets."

Educating and connecting citizens living in "TV dark" homes is a very high priority of the Indian government. Chandra's statement estimates an average of 85 million TV dark homes.

PART 2 | CONTINUED

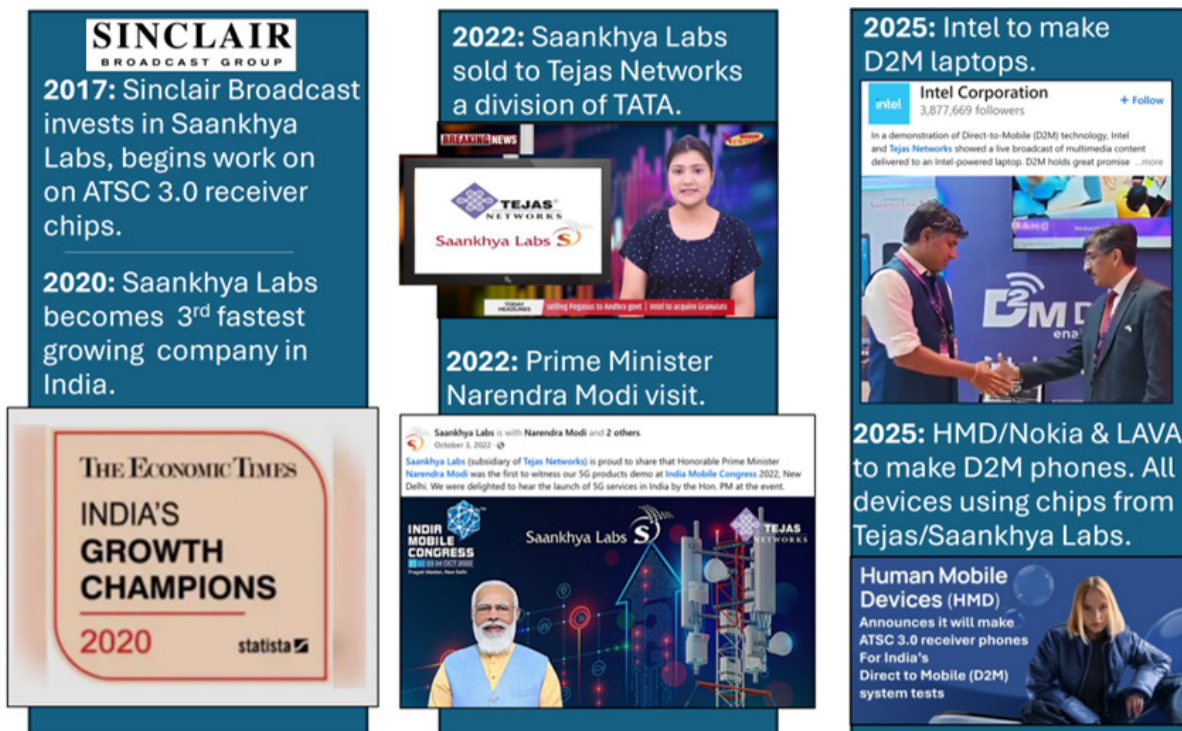
Multiplying by 4.44 (the average number of people living in an Indian household), means that approximately 375 million people -- or about 30 million more people than now live in the United States -- live in TV dark homes.

Chandra continued, "The technology has already matured... Some lab trials and field trials have been done. Now we have to do city-wide pilot trials so that its potential can be demonstrated. In the next year or so, we can actually launch this technology with an indigenously developed system."

Read the full article [HERE](#)

Chandra's reference to indigenously developed technology reflects another priority of the Indian government, which is to develop new technologies in-country. The D2M program began in 2017 when the US-based Sinclair, Inc. invested in an innovative Indian tech company called Saankhya Labs to create ATSC 3.0 receiver chips, core network and broadcast radio heads. (Follow this story in the graphic below.)

By 2020, Saankhya Labs' business was growing so rapidly that it was named the third fastest growing company in India by *The Economic Times of India*, and Statista, the German online platform specializing in data gathering and visualization.



PART 2 | CONTINUED

In 2022, Saankhya Labs was acquired by Tejas Networks, a subsidiary of TATA, one of India's largest conglomerates. (TATA holdings include companies that could one day use ATSC 3.0 spectrum: the IOT mobile network MOVE, the US-based data transport company The Switch, and Jaguar and Land Rover Automotive (JLA). Later that year, the Prime Minister visited the Saankhya Labs exhibit in the Tejas booth at the 2022 India Mobile Congress event in New Delhi.

Currently in 2025, the third and final round of testing is ongoing. These tests are expected to move India's public broadcaster, Prasar Bharati, beyond proof of concept and into a tendering process. For the tests, Intel Corporation built a reference D2M laptop while HMD/Nokia and India-based LAVA are building D2M mobile phones. All these devices will use the ATSC 3.0 receiver chips originally developed at Saankhya labs...which is where the story began.

In May 2025, *The Economic Times of India* expressed optimism for D2M's chances for approval for the final testing. To read the whole article, click [HERE](#).

The screenshot shows the homepage of The Economic Times India website. At the top, there are market indices like Nifty 24,853.15 and a featured fund UTI Aggressive Hybrid F... with a 34.44% return. The main header includes the site's name, 'English Edition', and 'Today's ePaper'. A navigation bar lists various sections: Home, ETPrime, Markets, Market Data, AI Masterclass, News, Industry (highlighted), SME, Politics, Wealth, MF, Tech, AI, Careers, Opinion, NRI, and Panache. The featured article is titled 'D2M broadcast moving closer to launch in India' and is dated 'May 07, 2025'. The article text states: 'India appears to be moving closer to a commercial roll-out of the direct-to-mobile (D2M) technology, having completed significant preparatory work, including pilot projects, tech development and compatible devices, industry executives said, adding that final regulatory approvals, particularly from the information and broadcasting ministry, are still awaited.' It further speculates on a full commercial deployment next year and quotes former Prasar Bharati CEO Shashi Shekhar Vempati expressing confidence in policy clearance.



IN CONCLUSION

ATSC 3.0 is more than an upgrade of a broadcast standard. It is a path for broadcasters to modernize their TV distribution and open new data delivery business opportunities. ATSC 3.0 enables terrestrial TV stations to broadcast IP-native streams and supports them with a rich array of customization tools to manage their characteristics, scheduling, distribution, and synchronization. In addition, ATSC 3.0 can create streams that deliver data beyond zones where traditional TV streams are effective, opening new opportunities for data delivery.

Broadcasters that adopt ATSC 3.0 advance responsible stewardship of their broadcast spectrum by both raising the efficiency of TV delivery, and by adding efficiency to IP systems they integrate with. In short, ATSC 3.0 transforms the output of a terrestrial TV station into a series of multipurpose streams that can natively integrate with digital infrastructure.

This shift not only enables traditional broadcasters to provide more relevant local TV services for their communities, but positions them as key contributors to the efficiency and sustainability of global data delivery networks. The ATSC 3.0 standard received a boost on August 27, 2025 as President Lula of Brazil signed a decree making TV 3.0, which uses the ATSC 3.0 standard, the official TV standard of his country going forward. Brazil's transition will be mandatory, in contrast to the US transition which has been voluntary. Brazil is the world's seventh most populous country with the world's eighth largest economy. As consumer electronics manufacturers make TV sets with ATSC 3.0 receive capabilities for Brazil, this will lower both costs and market resistance, paving the way for other countries to follow.

IN CONCLUSION | CONTINUED



President Lula of Brazil stands behind the decree he has signed making TV 3.0 the official next generation TV system of Brazil's future.

Brazil and the US have led TV standard development and evaluation in the Americas since the beginning of commercial broadcasting back in 1939. During all that time, the two countries have never used the same TV standard. With Brazil's adoption of ATSC 3.0, for the first time in the history of TV broadcasting, both countries will use the same standard. In time this could pave the way for the entire Western hemisphere to share a common TV standard.

IN CONCLUSION | CONTINUED



Raymundo Barros, Chairperson
of the SBTVD Forum and CTO
of TV Globo, Brazil

In a recent interview, Raymundo Barros, Chairperson of the SBTVD Forum (which oversaw the four-year evaluation of TV standards for Brazil) and CTO of TV Globo, Brazil's largest TV broadcaster, said he envisions the use of ATSC 3.0 throughout the Americas, "from Alaska to Patagonia." Barros added, "A unified standard across the Americas would streamline product development for consumer electronics companies by reducing the need to create multiple versions for different regions... This harmonization could lead to economies of scale, reducing costs and accelerating the development of new, innovative products. Manufacturers would have a broader market to serve with uniform specifications, which would likely drive down costs for consumers while encouraging investment in cutting-edge technologies."

As global regulators and technology planners evaluate spectrum policy and infrastructure modernization, ATSC 3.0 should be recognized as a reference model: a convergent architecture capable of reducing network load, increasing resiliency, and minimizing spectrum capacity use.

Additional information:

The EBC, Brazil's public broadcaster, [reports](#) on the Presidential TV 3.0 Decree signing.

How will TV 3.0, Brazil's next generation TV standard, [impact consumers?](#)



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This study began in 2023 with a mission to document the efficiency of ATSC 3.0 broadcast spectrum and how it can support the responsible stewardship of spectrum. At the start, we pursued several research approaches and conducted two surveys, all of which came up short to the task. Finally, it was the nature of the standard itself and its abilities that came to define the narrative of this report. It took longer than expected and many people helped.

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