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DTT Roadmap

Digitalize Trinidad & Tobago by 2026

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DTT Roadmap Agenda

- Welcome & Introductions
- Recap and Rationale
- ATSC 3.0 Overview – Amy Lodes, ATSC
- DTT Signal Distributor Models
- DTT Economic Analysis
- DTT Roadmap and Next Steps
- Open Floor and Discussions

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Recap of Industry deliberations to date

- TATT has been in dialogue with the industry since 2010 on DTT
- Meeting held in 2018 on DTT standard and economic viability of a single signal distributor (SD)
  - Preference expressed by industry on ATSC 3.0 standard
  - Need to review economic viability
  - TTPBA submitted comments on behalf of the broadcasters for TATT to address
- TATT undertook to review economic viability of the single SD
- Work on DTT has resumed after a pause to focus on FM radio matters which are now resolved

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Objective

The Authority endeavours to provide an enabling environment for industry sustainability, consumer benefit and technological advancement. In respect of DTT this includes, but is not limited to:

I. Providing clarity to the industry on the roadmap to DTT adoption

II. Accommodating flexible and sustainable arrangements that enable the transition to DTT and the accrual of its benefits

III. Collaborating with the industry to ensure a suitable environment is fostered to make the transition beneficial to consumers and broadcasters

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Rationale

FTA TV Market Status Quo

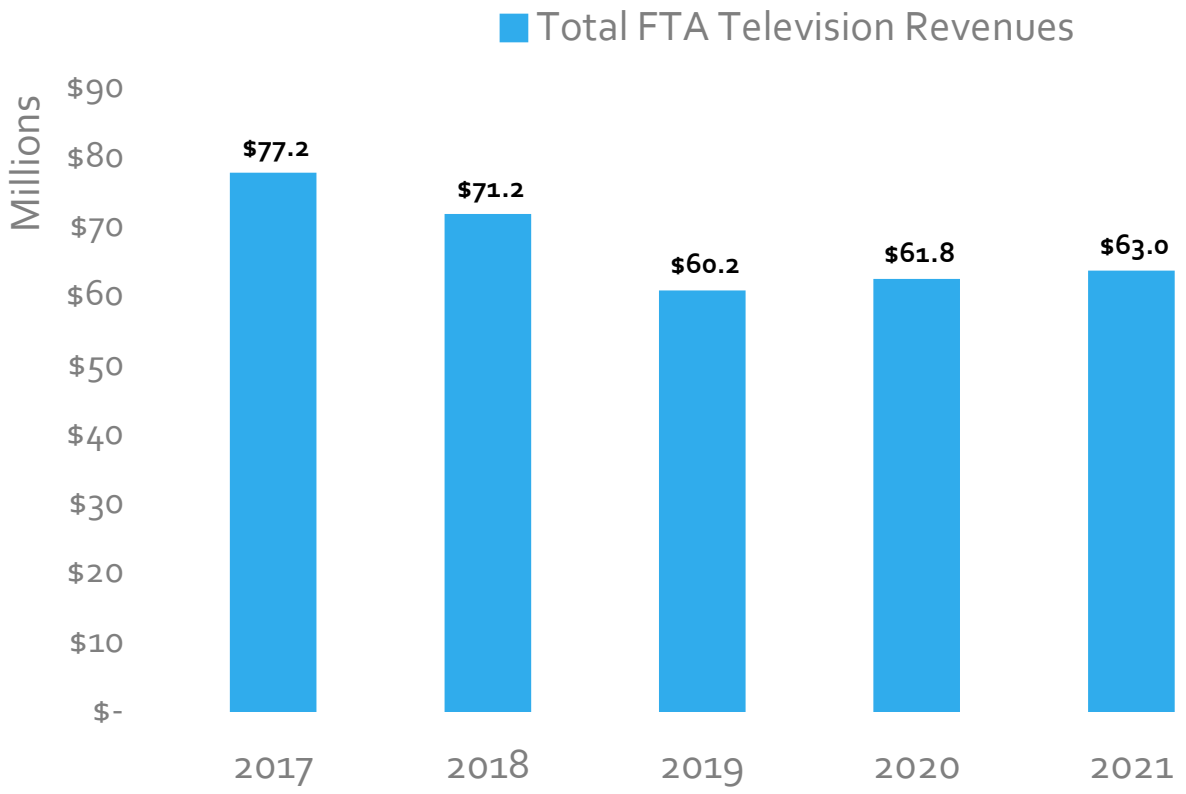
- Minimal additional revenue streams
- Technological stagnation and obsolescence
- Quality stagnation
- Declining earnings and market share
- Slowed network investment and expansion

FTA TV Market adopting DTT

- New Markets
- New revenue streams
- Additional Channel opportunities
- Innovation
- Significantly enhanced service quality
- Opportunity to reduce costs via infrastructure sharing

FTA TV Market Trends

Opportunity for market innovation



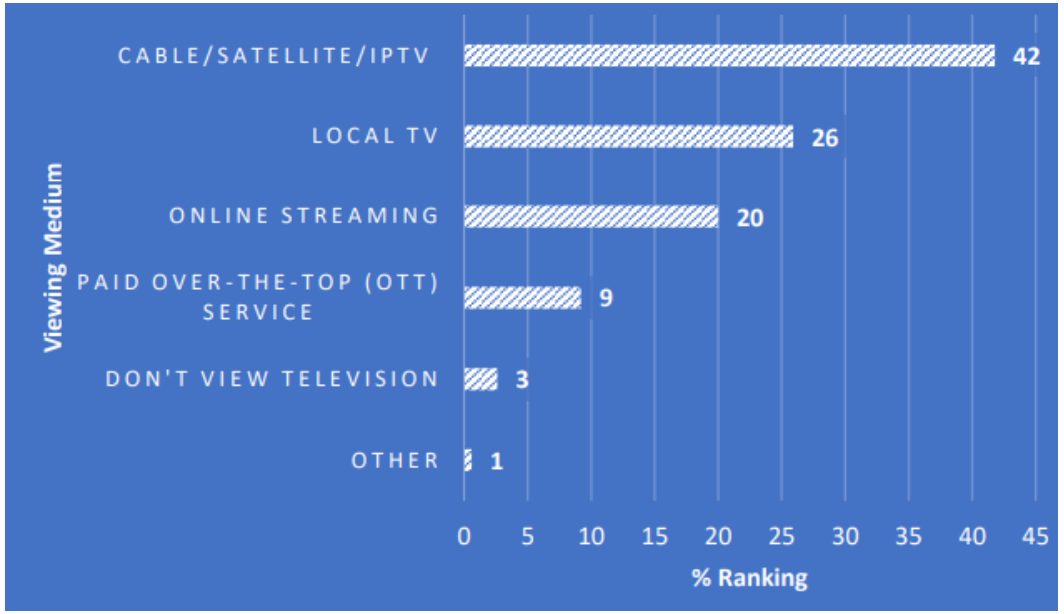
- Gradually declining revenues
- Increased market concentration over last 10 years
- Product convergence

FTA TV Demand

FTA still presents a significant market opportunity

National Digital Inclusion Survey 2021

Rankings of television viewing preferences



Indicator	Source	Result
Households with a TV device	2021 (DIS)	93.6%
Households without Subscription TV	2021 (AMR)	**41.3%**
Households that consume FTA (including OTT)	2021 (DIS)	37.2%
Households that prefer FTA TV	2021 (DIS)	26%

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ATSC 3.0 Overview by ATSC

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DTT Signal Distributor Models

All options available for FTA broadcasters based on their strategy

Single Existing Concessionaire	Greenfield Single Entity	Single Industry Consortium	Multiple DTT Transmitters	Hybrid
• Low capex investment required • Regulatory intervention requirement	• Capex investment higher than existing entity • Less regulatory intervention	• Lowest capex investment • Less regulatory intervention • Lowest infrastructure duplication	• Highest Capex option • Greatest infrastructure duplication • Least regulatory intervention	• Median capex implication • Little regulatory intervention as options are available

Eligible bidders for Signal Distributor can include new or existing independent entities, FTA TV broadcasters and subscription TV broadcasters

Jamaica DTT Implementation

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- As of Sep 2022
- 2 FTA TV Broadcasters piloted ATSC 3.0 transmitters
- ATSC 3.0 Receiver distribution still in progress
- Proposed a Single SD approach
- Currently a Multiple Transmitter approach
  - Possibly evolve to a Hybrid model of 1 SD with 2 broadcasters, and 1 standalone DTT broadcaster

TVJ Lights Up Jamaica's Second ATSC 3.0 Transmitter

By Tom Butts published about 7 hours ago

The switch on of the second transmitter happened in western Jamaica from TVJ's Flower Hill tower in Montego Bay, St. James

Phoenix Collaborative Model Market

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Compete on content, collaborate on network infrastructure costs

pearl

COXMEDIA GROUP · GRAHAM MEDIA GROUP · gray

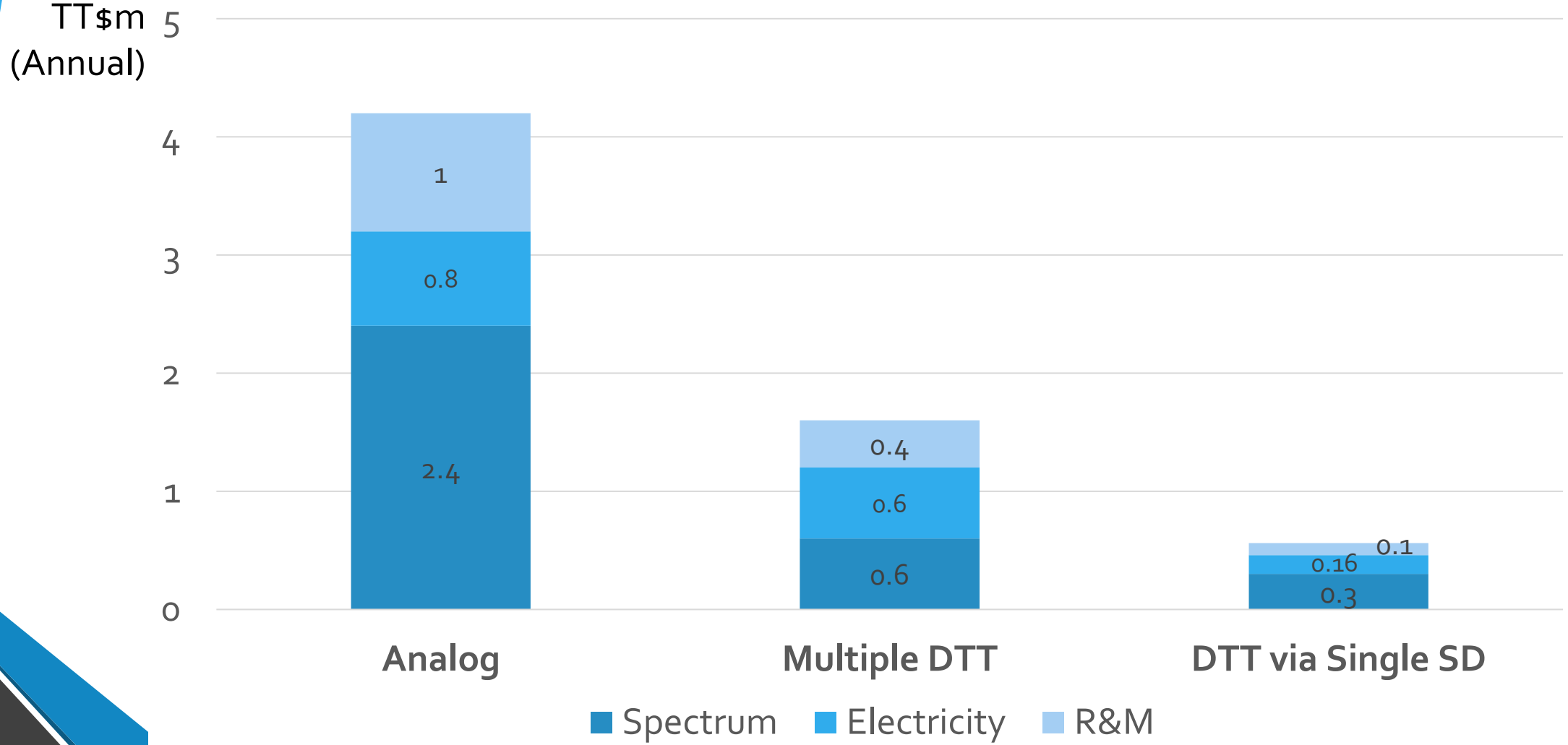
HEARST television · meredith · Nexstar MEDIA GROUP, INC.

SCRIPPS · SINCLAIR BROADCAST GROUP · TEGNA

- Phoenix, AZ serves as model market for ATSC 3.0 collaborative deployment in November 2017
- 1.8m households and over one in five FTA viewers
- Led by Pearl TV and comprises 11 stations including ABC, FOX, CBS, CW, NBC & PBS
- Collaborated with Sony to develop EPG in 2018
- Second SFN Transmitter site launched in 2020
- Host Station Manual developed for use
- Collaborations in Detroit including Scripps & NBC, and Florida including ABC, NBC, CBS & FOX

Industry Opex Benefits of DTT

Driven by the adoption of a Single Frequency Network using DTT



Single Signal Distributor Model

Single Frequency Network (SFN) comprising 5 sites

Capital Investment – TT$9.687 Million Annual Operational Expenditure – TT$1.079m	
Annual Rent for 4 Players **TT$622.5k**	Annual Rent for 5 Players **TT$498k**

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Cost Comparison of Alternatives

Clear cost benefits from Collaborative Single Frequency Network using DTT

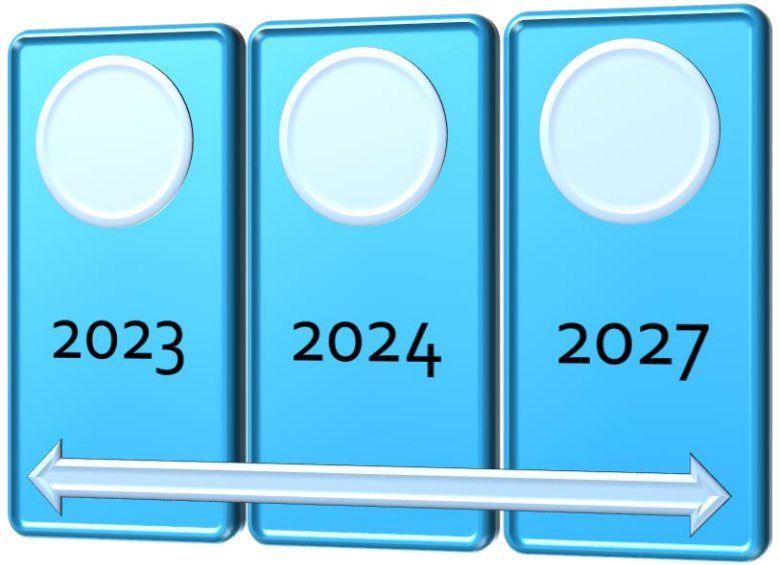
DTT Model Cost per broadcaster	Capex (TT$)	Annual Opex (TT$)	Annual Rental (TT$)	Payback Period (years)
Status quo (analog)	0.1m	**> 1,000k**	N/A	N/A
Single SD with 4 FTA players	2.42m	**270k**	**622.5k**	4
Multiple Transmitter Approach	6.07m	450k	N/A	12+

Opex includes Spectrum licences, Electricity, Repairs & Maintenance, Insurance

Prospective Timeframe

A 3 to 4-year DSO plan may focus on key events for higher viewing interest and DSO monetization

- 2026 World Cup
- 2025 General Elections
- 2024 Olympics (South Korean experience)
- 2025 SEA preparations (Educational Datacasting)



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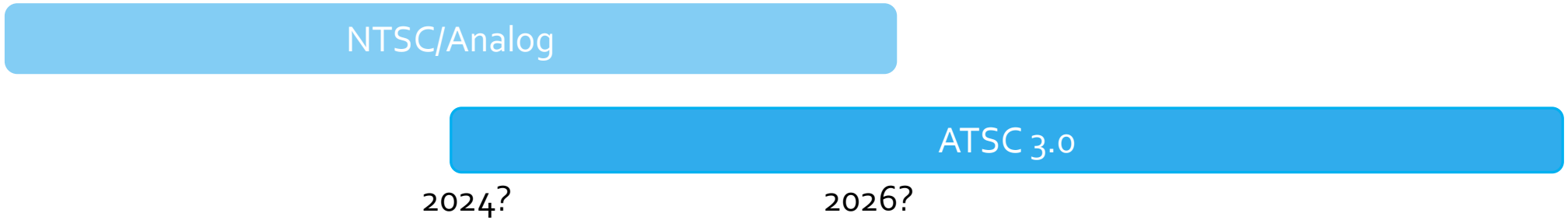
DTT Transition path



Proliferation of ATSC 3.0 device ***ecosystem*** to occur from 2023 to 2026 to enable Analog Switch-off

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Next Steps

- Establish an industry Working Group by October 2022 to develop its implementation plan within six (6) months, and drive implementation until Digital Switch Over
- Align on strategy for adoption and proliferation of receivers and agreement on signal distributor model by December 2022
- Collaborate to ensure opportunities and efficiencies available are leveraged
- **Focused development** of a public communications and awareness strategy

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Thank You

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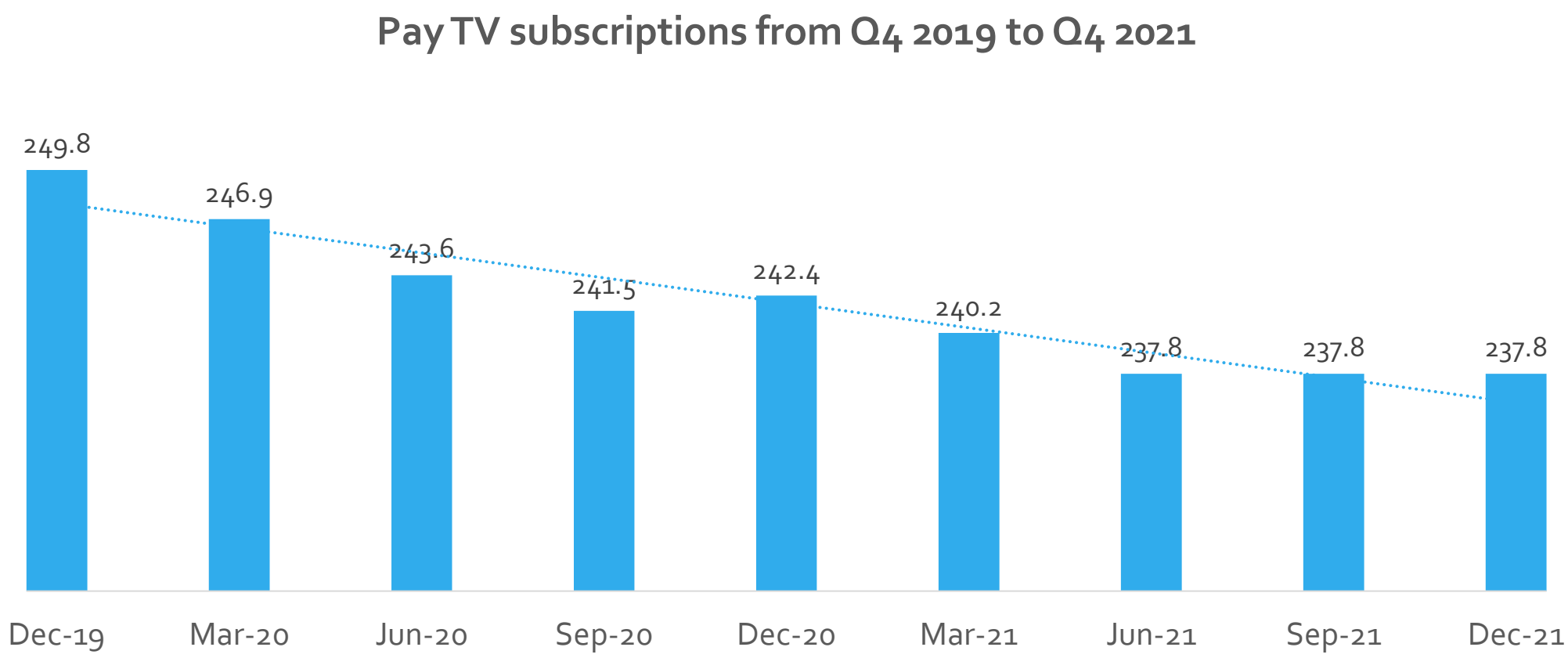
Trends in Pay TV penetration 2019 - 2021



ATSC 3.0 Network

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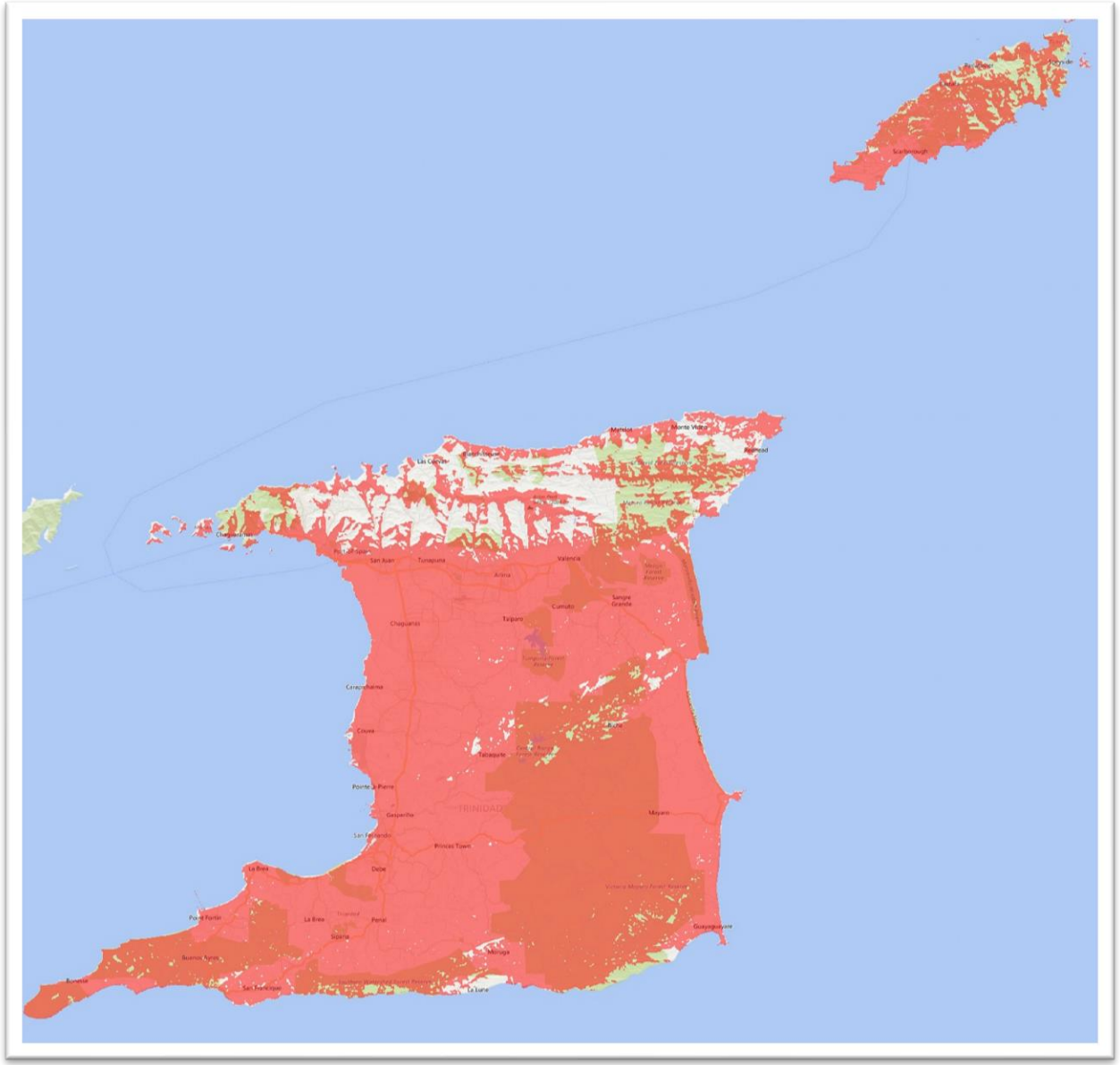
- **Number of Sites:** 5 (1 TRI, 4 TOB)
- **% Coverage (Populated Area):** 94 TRI, 90 TOB
- **Min Received Field Strength:** 41 dBµV/m
- **Phy. Layer Config.:** 1 PLP, BCH, 6/15 LDPC (64800) and 64 QAM
- **SNR:** 7.82 dB
- **Data rate:** 12.54 Mbps (accommodates 2 HD and 2 SD channels on 6 MHz)



ATSC 3.0 Network Costing

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Cost Items		$TTD
Total Equipment	$	7,810,139.63
Total Installation	$	1,288,485.41
Total Infrastructure	$	460,293.75
Fees & Taxes	$	128,020.34
Total	**$**	**9,686,939.13**

- Equipment cost include transmission, headend and backhaul equipment
  - Tx and head-end: COMARK 2 kW and 250 W air-cooled digital transmitters, high-power and low power combiner systems, transmission lines and antennas. TITAN Live ATSC 3.0 encoder and Enensys ATSC 3.0 headend stack. Backhaul: U6 GHz STLTP links, with three relay sites
- Infrastructure cost includes all costs related to work to prepare the transmitter sites
- Fees and Taxes only include brokerage fees for the equipment and components to be imported