



## **Lecture 4: Market Tools Part B**

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# **Spectrum Economics and Market Tools**



# Lecture IV: Market Tools Part B

## Spectrum Economics and Market Tools

- I. Introduction
  - 1. Spectrum in the News
  - 2. Nobel Prize Winners
- II. Spectrum Economics
  - 1. History of Auctions
  - 2. Spectrum Valuation Methods
  - 3. Spectrum Valuation Factors
- III. Market Tools Part A
  - 1. Reallocation Challenges
  - 2. Secondary Markets
- IV. Market Tools Part B**
  - 1. Incentive Auctions**
  - 2. Other Tools**
- V. New Developments
  - 1. Satellite Constellations
  - 2. Local Governance
- VI. Conclusion

# IV.1 Incentive Auctions

## **Overview**

1. *Digital Television Transition*
2. *FCC Broadcast TV Spectrum Incentive Auction*
3. *FCC Auction 1001: Reverse Auction – Clearing*
4. *FCC Auction 1002: Forward Auction – New Licenses*



# IV.1 Incentive Auctions

## *Digital Television Transition*



Figure 54. “An Analog TV Showing Noise”  
Noise (video), Wikipedia, [https://en.wikipedia.org/wiki/Noise\\_%28video%29](https://en.wikipedia.org/wiki/Noise_%28video%29).



# IV.I Incentive Auctions

## ***Digital Television Transition***

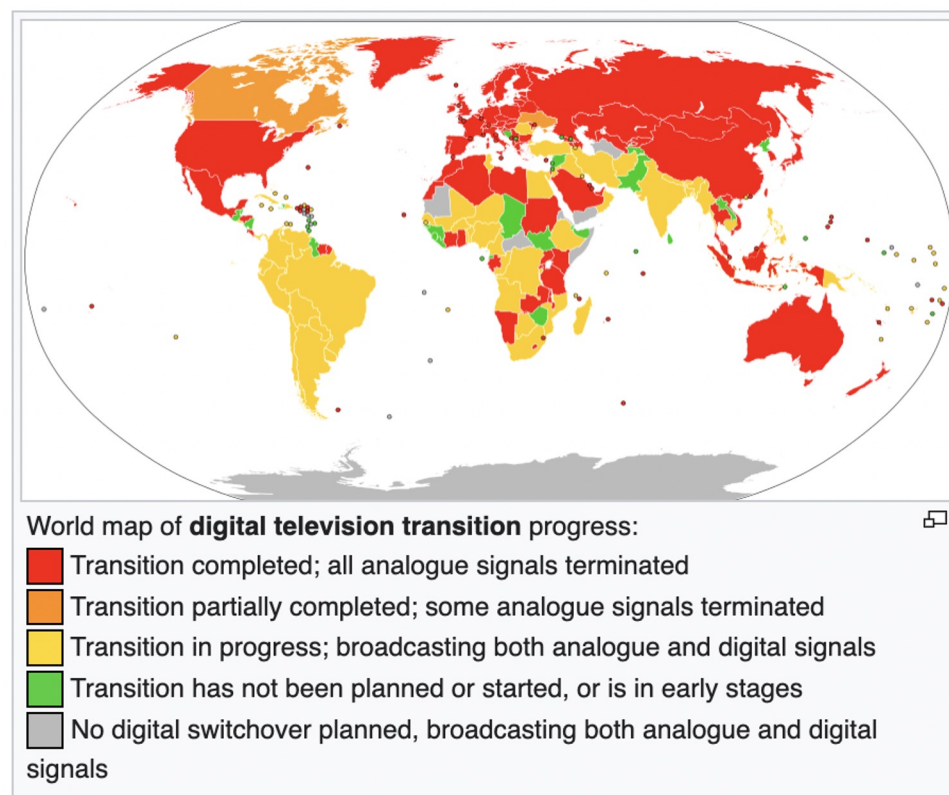


Figure 55. Global Digital Television Transition Status

Digital Television Transition, [https://en.wikipedia.org/wiki/Digital\\_television\\_transition](https://en.wikipedia.org/wiki/Digital_television_transition).

# IV.I Incentive Auctions

## *Digital Television Transition*

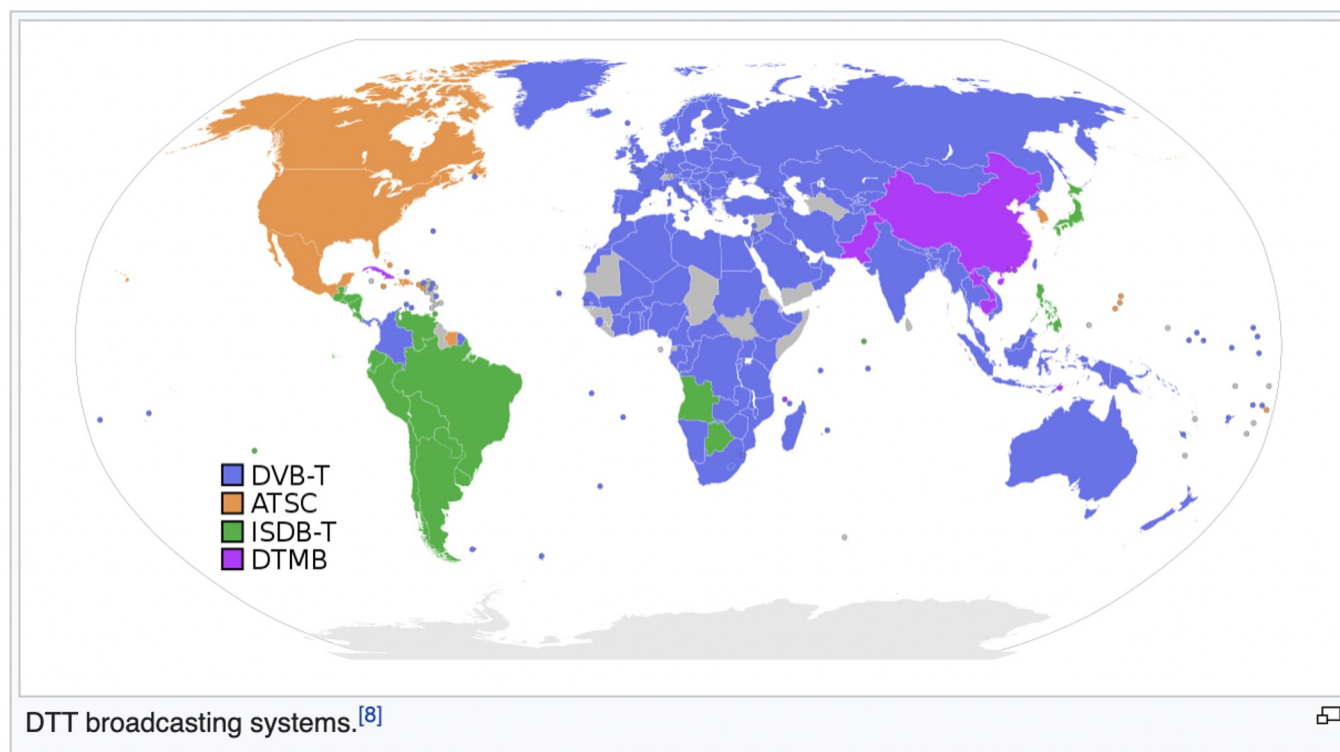


Figure 56. New Digital TV Standards

Broadcast Television Systems, [https://en.wikipedia.org/wiki/Broadcast\\_television\\_systems](https://en.wikipedia.org/wiki/Broadcast_television_systems).

# IV.1 Incentive Auctions

## *Digital Television Transition*



Figure 57. A Digital TV Converter Box  
Source: Jeffrey Beall, Digital Television Adaptor,  
[https://en.wikipedia.org/wiki/Digital\\_television\\_adapter](https://en.wikipedia.org/wiki/Digital_television_adapter).



# IV.I Incentive Auctions

## *Digital Television Transition*



Figure 58. TV Converter Box Coupon Program Voucher  
Digital Television Transition in the United States,

[https://en.wikipedia.org/wiki/Digital\\_television\\_transition\\_in\\_the\\_United\\_States](https://en.wikipedia.org/wiki/Digital_television_transition_in_the_United_States).

# IV.1 Incentive Auctions

## ***FCC Broadcast TV Spectrum Incentive Auction***

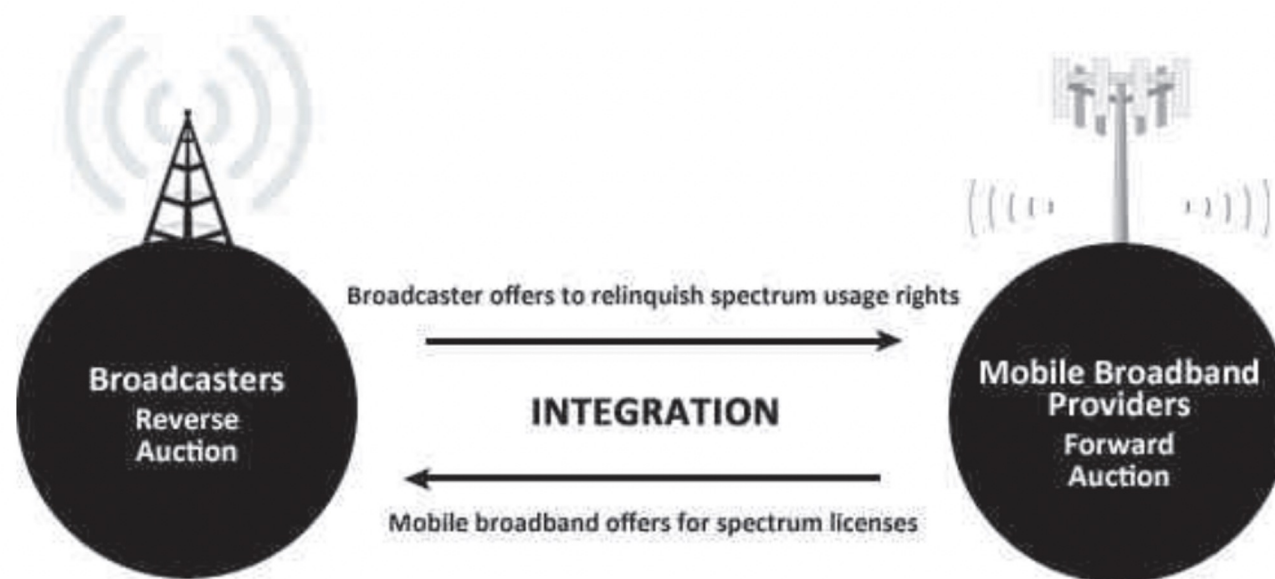


Figure 59. “A Novel Design for a Novel Process”

FCC, The Broadcast Television Spectrum Incentive Auction: A Staff Summary, Jan. 16, 2013, <https://www.fcc.gov/document/broadcast-television-spectrum-incentive-auction-staff-summary>.

# IV.1 Incentive Auctions

## ***FCC Broadcast TV Spectrum Incentive Auction***

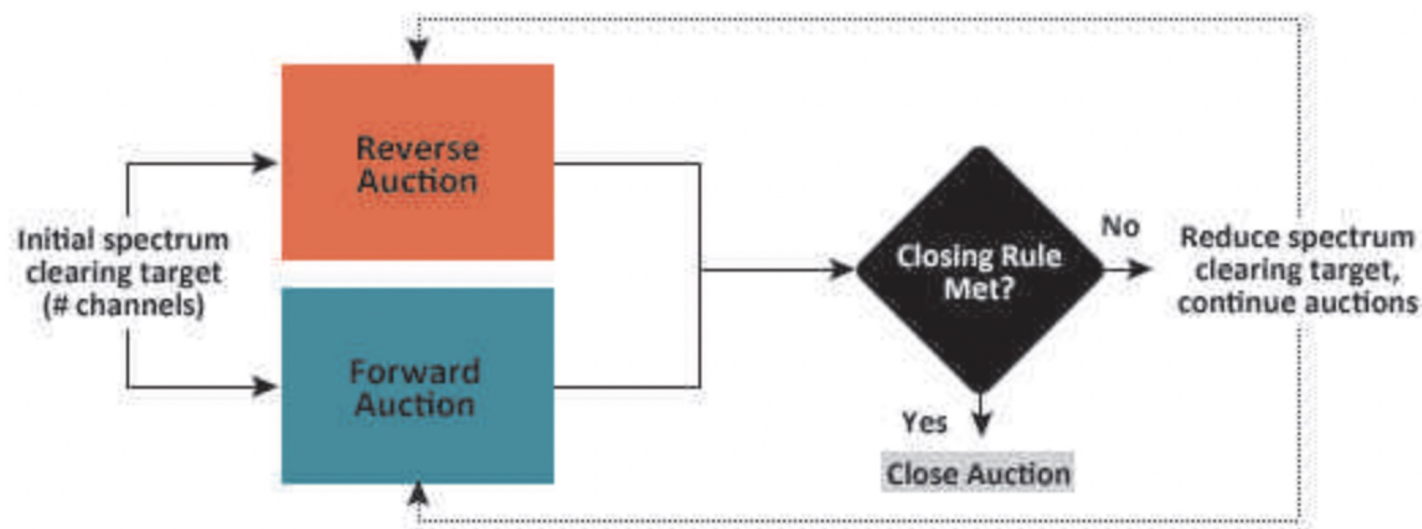


Figure 60. Simplified Version of Decision Chart for Auction Model  
FCC, The Broadcast Television Spectrum Incentive Auction: A Staff Summary, Jan. 16, 2013, <https://www.fcc.gov/document/broadcast-television-spectrum-incentive-auction-staff-summary>.



# IV.I Incentive Auctions

## ***FCC Broadcast TV Spectrum Incentive Auction***

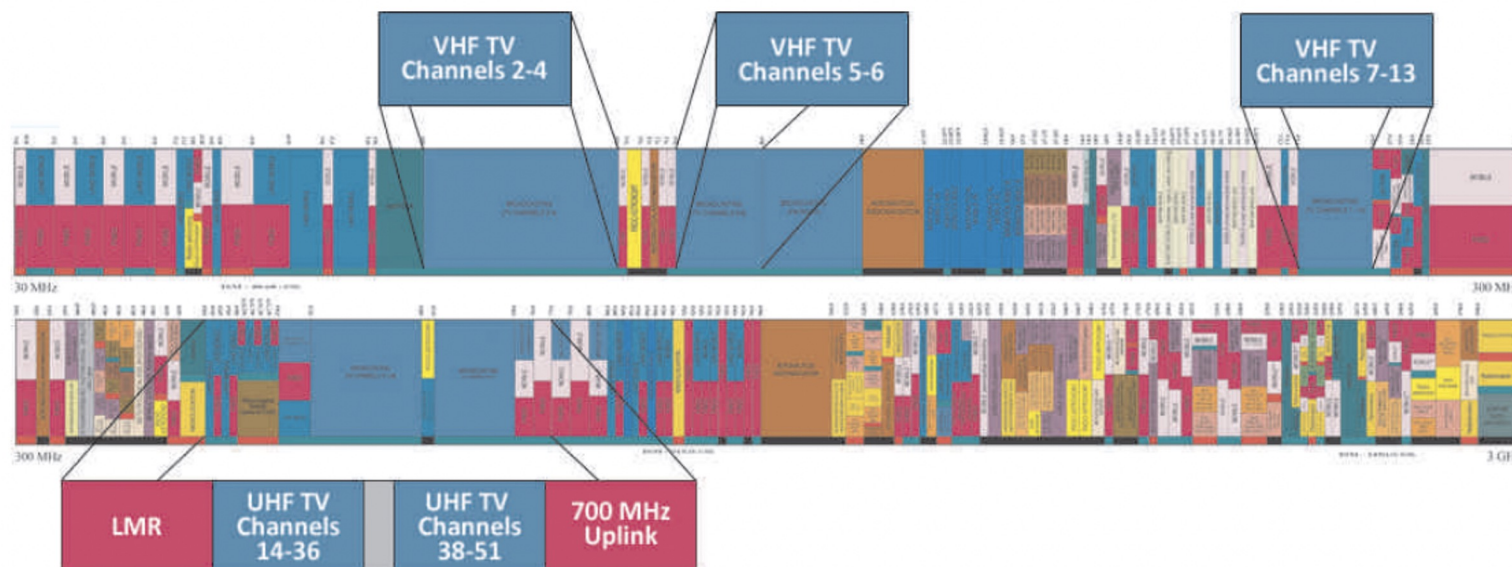


Figure 6I. U.S. Broadcast Television Band with 8,402 TV Stations Prior to Auction  
FCC, The Broadcast Television Spectrum Incentive Auction: A Staff Summary, Jan. 16, 2013, <https://www.fcc.gov/document/broadcast-television-spectrum-incentive-auction-staff-summary>.

# IV.I Incentive Auctions

## ***FCC Broadcast TV Spectrum Incentive Auction***

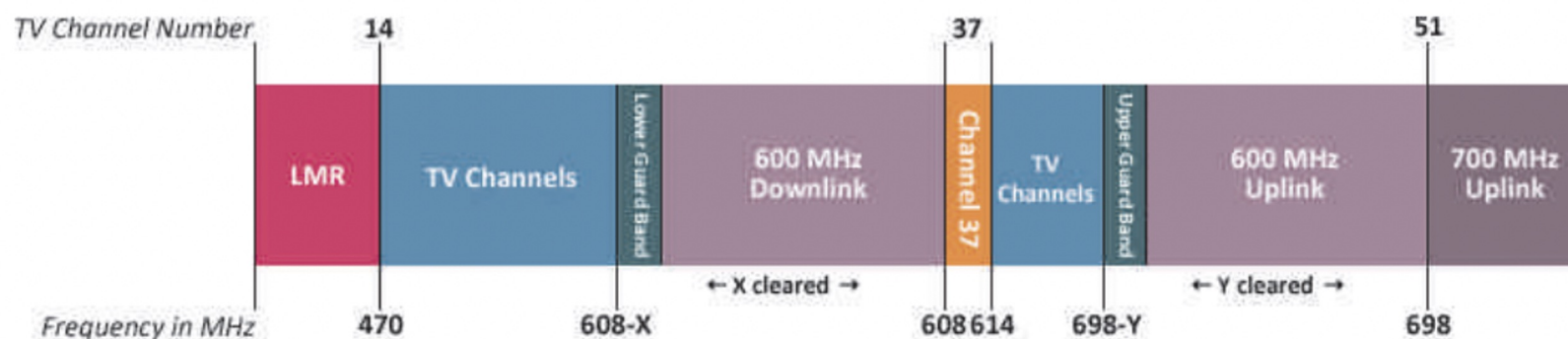


Figure 62. 600 MHz Band Pre Incentive Auction

FCC, The Broadcast Television Spectrum Incentive Auction: A Staff Summary, Jan. 16, 2013, <https://www.fcc.gov/document/broadcast-television-spectrum-incentive-auction-staff-summary>

# IV.I Incentive Auctions

## ***FCC Broadcast TV Spectrum Incentive Auction***

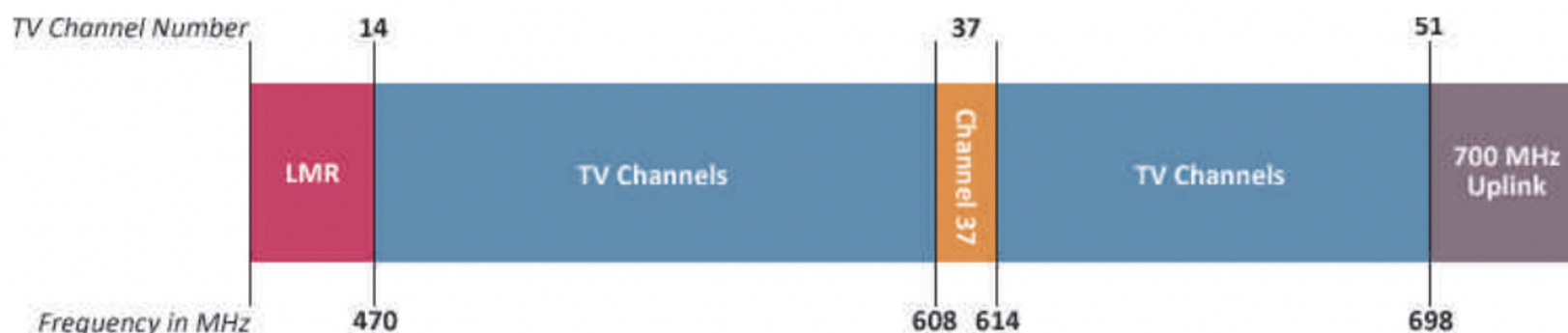


Figure 63. Proposed 600 MHz Band Post Incentive Auction

FCC, The Broadcast Television Spectrum Incentive Auction: A Staff Summary, Jan. 16, 2013, <https://www.fcc.gov/document/broadcast-television-spectrum-incentive-auction-staff-summary>



# IV.I Incentive Auctions

## ***FCC Broadcast TV Spectrum Incentive Auction***

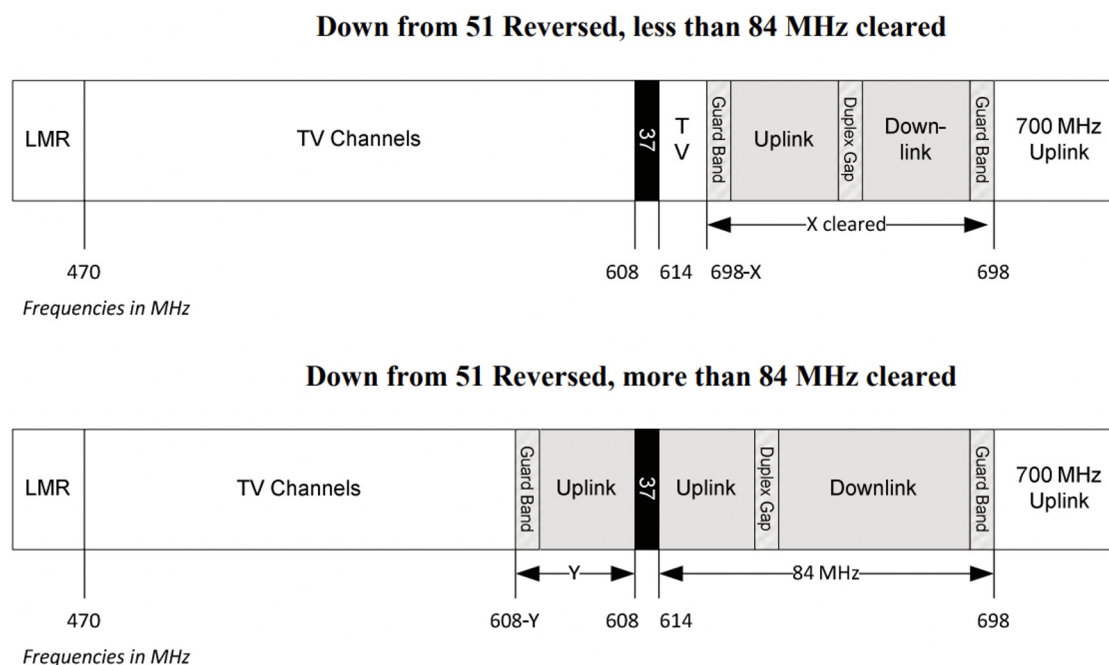


Figure 64. “Down from 51 Reversed” Band Plan Variations

FCC, WTB Seeks to Supplement the Record on the 600 MHz Band Plan, May 17, 2013,

<https://www.fcc.gov/document/wtb-seeks-supplement-record-600-mhz-band-plan>.

# IV.I Incentive Auctions

## FCC Auction 1001: Reverse Auction – Clearing

### FCC Broadcast Television Spectrum Incentive Auction

#### Auction 1001

#### Winning Bids

(Sorted by DMA and Call Sign)

Date of Report: 04/04/2017 03:56 PM ET

Appendix A



Call Sign	Facility ID	DMA	Bidder as of Closing PN	FRN as of Closing PN	Pre-Auction Band	Winning Bid Option	Compensation	Pre-Auction CSA	Post-Auction CSA
WCDC-TV	74419	Albany-Schenectady-Troy, NY	NEXSTAR BROADCASTING, INC.	0009961889	UHF	Go off-air	\$ 34,558,086	No	Yes
WAGT	70699	Augusta, GA	Gray Television Licensee, LLC	0003748241	UHF	Go off-air	\$ 40,763,036	No	No
WUTB	60552	Baltimore, MD	Deerfield Media (Baltimore) Licensee, LLC	0022739833	UHF	Go off-air	\$ 122,912,964	Yes	Yes
WBIN-TV	14682	Boston, MA	WBIN, Inc.	0020871042	UHF	Go off-air	\$ 68,081,337	Yes	Yes
WDPX-TV	6476	Boston, MA	ION Media Boston License, Inc.	0003720208	UHF	Go off-air	\$ 43,467,644	No	Yes
WFXZ-CD	64833	Boston, MA	WFXZ-CD Station, LLC	0021355565	UHF	Go off-air	\$ 63,949,770	No	Yes
WGBH-TV	72099	Boston, MA	WGBH Educational Foundation	0003764560	UHF	Move to Low-VHF	\$ 161,723,929	No	Yes
WLVI	73238	Boston, MA	WHDH-TV	0003613825	UHF	Go off-air	\$ 162,108,481	Yes	Yes
WMFP	41436	Boston, MA	NRJ TV Boston License Co, LLC	0020523098	UHF	Go off-air	\$ 93,647,708	No	Yes
WYCN-CD	9766	Boston, MA	OTA Broadcasting (BOS), LLC	0022430631	UHF	Go off-air	\$ 80,401,978	No	Yes
WYDN	18783	Boston, MA	Educational Public TV Corporation	0008778565	UHF	Go off-air	\$ 134,987,151	No	Yes
WIVB-TV	7780	Buffalo, NY	NEXSTAR BROADCASTING, INC.	0009961889	UHF	Go off-air	\$ 46,015,135	Yes	Yes
WNYB	30303	Buffalo, NY	Faith Broadcasting Network, Inc.	0007202963	UHF	Move to Low-VHF	\$ 31,960,949	No	Yes
WVTT-CD	10869	Buffalo, NY	Woodland Communications, LLC	0024819252	UHF	Move to High-VHF	\$ 9,119,631	No	Yes
WNNE	73344	Burlington, VT-Plattsburgh, NY	Hearst Stations Inc.	0001587583	UHF	Go off-air	\$ 50,464,592	No	Yes
WVTA	69943	Burlington, VT-Plattsburgh, NY	Vermont ETV, Inc.	0005067830	UHF	Go off-air	\$ 56,648,952	Yes	No
WPBO	66190	Charleston-Huntington, WV	THE OHIO STATE UNIVERSITY	0006031983	UHF	Go off-air	\$ 8,822,670	No	No

Figure 66. Excerpt from FCC Auction 1001 Winning Bids

FCC, FCC Announces Results of World's First Broadcast Incentive Auction, Apr. 13, 2017, <https://www.fcc.gov/document/fcc-announces-results-worlds-first-broadcast-incentive-auction-0>; *id.*, Appendix A, <https://docs.fcc.gov/public/attachments/DA-17-314A2.pdf>.

# IV.I Incentive Auctions

## ***FCC Auction 1001: Reverse Auction – Clearing***



### **The Incentive Auction “By the Numbers”**

#### Reverse Auction

<b>\$10.05 billion</b>	Revenues to winning broadcast stations
<b>84 MHz</b>	Cleared by the reverse auction process
<b>175</b>	Winning stations
<b>\$304 million</b>	Largest individual station payout
<b>\$194 million</b>	Largest non-commercial station payout
<b>30</b>	Band changing winners (moved to low- or high-VHF)
<b>36</b>	Winning stations receiving more than \$100 million
<b>11</b>	Non-commercial stations winning more than \$100 million

Figure 67. Reverse Auction - Results “By the Numbers”

FCC Announces Results of World’s First Broadcast Incentive Auction,

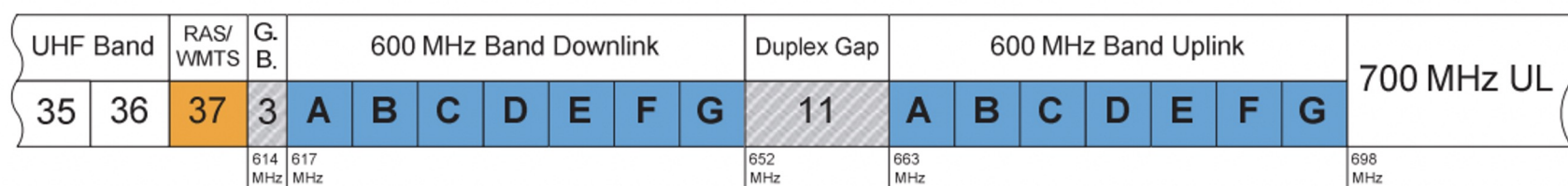
<https://www.fcc.gov/document/fcc-announces-results-worlds-first-broadcast-incentive-auction-0>; *id.*, Fact Sheet, <https://docs.fcc.gov/public/attachments/DOC-344398A1.pdf>.



# IV.I Incentive Auctions

## ***FCC Auction 1002: Forward Auction – New Licenses***

**Figure 1: 600 MHz Band Plan<sup>22</sup>**



**Figure 68. 600 MHz Band Plan**

In the Matter of Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Report and Order, 29 FCC Rcd 6567,  
<https://www.fcc.gov/document/fcc-adopts-rules-first-ever-incentive-auction>,  
<https://docs.fcc.gov/public/attachments/FCC-14-50A1.pdf>.

# IV.I Incentive Auctions

## ***FCC Auction 1002: Forward Auction – New Licenses***

Table 1: 600 MHz Band License Summary

Block	Downlink Frequencies (in MHz)	Uplink Frequencies (in MHz)	Total Bandwidth	Geographic Area Type	No. of Licenses
A	617-622	663-668	10 MHz	PEA	416
B	622-627	668-673	10 MHz	PEA	416
C	627-632	673-678	10 MHz	PEA	416
D	632-637	678-683	10 MHz	PEA	416
E	637-642	683-688	10 MHz	PEA	416
F	642-647	688-693	10 MHz	PEA	416
G	647-652	693-698	10 MHz	PEA	416

Figure 69. 600 MHz Band License Summary

In the Matter of Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Report and Order, 29 FCC Rcd 6567, <https://www.fcc.gov/document/fcc-adopts-rules-first-ever-incentive-auction>, <https://docs.fcc.gov/public/attachments/FCC-14-50A1.pdf>.

# IV.I Incentive Auctions

## ***FCC Auction 1002: Forward Auction – New Licenses***

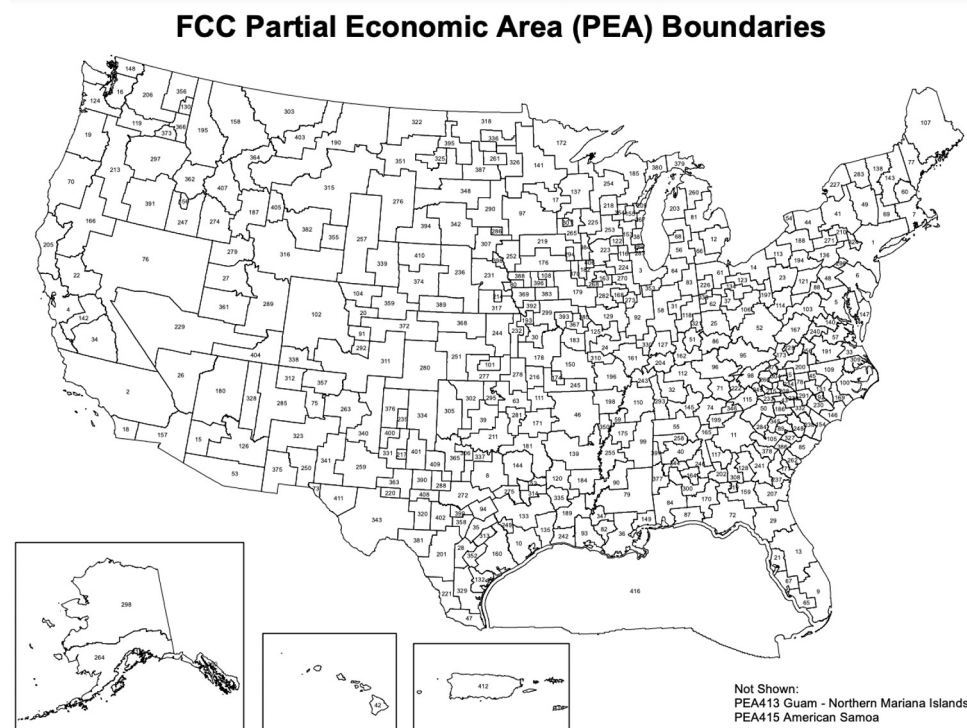


Figure 70. Forward Auction Partial Economic Area (PEA) Boundaries  
FCC, WTB Provides Details about Partial Economic Areas, <https://www.fcc.gov/document/wtb-provides-details-about-partial-economic-areas>; *Id.*, Attachment, <https://docs.fcc.gov/public/attachments/DA-14-759A4.pdf>.

# IV.I Incentive Auctions

## FCC Auction 1002: Forward Auction – New Licenses

**FCC** Public Reporting System

**Incentive Auction: Forward Auction Results**

Search   Download CSV (146864 rows)

Your request exceeds the limit of 9000 records. Please add filters (e.g. a specific round number) to reduce the number of records to download

To customize your report, you can click on [x] to hide columns in the table below.

Auction ID	Stage	Round	Market Number	Market Name	Category	Bidder	FRN	Processed Demand
Showing first 1000 of 146864 rows								
1002	1	1	PEA001	New York, NY	C1	AT&T Spectrum Holdings LLC	0025241142	10
1002	1	1	PEA001	New York, NY	C1	Bluewater Wireless II, L.P.	0025247107	2
1002	1	1	PEA001	New York, NY	C1	CC Wireless Investment, LLC	0025232257	10
1002	1	1	PEA001	New York, NY	C1	Channel 51 License Co LLC	0025259565	3
1002	1	1	PEA001	New York, NY	C1	ParkerB.com Wireless L.L.C.	0025268459	4
1002	1	1	PEA001	New York, NY	C1	T-Mobile License LLC	0001565449	2
1002	1	1	PEA001	New York, NY	C1	UNITED STATES CELLULAR CORPORATION	0004372322	2
1002	1	1	PEA002	Los Angeles, CA	C1	AT&T Spectrum Holdings LLC	0025241142	5
1002	1	1	PEA002	Los Angeles, CA	C1	Bluewater Wireless II, L.P.	0025247107	1
1002	1	1	PEA002	Los Angeles, CA	C1	CC Wireless Investment, LLC	0025232257	5

Figure 71. FCC Auction 1002 Results  
FCC Public Reporting System,

<https://auctiondata.fcc.gov/public/projects/1000/reports/forward-results>.

# IV.I Incentive Auctions

## ***FCC Auction 1002: Forward Auction – New Licenses***

**FCC Incentive Auction - Forward Auction  
Auction 1002  
Bidder Summary**

Appendix B



**Date of Report: 04/06/2017 08:50 AM ET**

Bidder	FRN	Bidding Credit Type	Number of Licenses Won	Number of PEAs	Gross Adjusted Payment	Net Adjusted Payment
Agri-Valley Communications, Inc.	0003778362	rural - 15%	5	3	\$ 5,285,000	\$ 4,492,250
AT&T Spectrum Holdings LLC	0025241142		23	18	\$ 910,202,302	\$ 910,202,302
Bluegrass Consortium	0025234709	rural - 15%	4	4	\$ 3,928,000	\$ 3,338,800
Bluewater Wireless II, L.P.	0025247107	small - 25%	66	64	\$ 718,323,225	\$ 568,323,225
CC Wireless Investment, LLC	0025232257		73	72	\$ 1,724,877,376	\$ 1,724,877,376
Cellco Partnership d/b/a Verizon Wireless	0003290673		0	0	\$ 0	\$ 0
Cellular South Licenses, LLC	0020434767		11	6	\$ 19,453,000	\$ 19,453,000
Channel 51 License Co LLC	0025259565	small - 25%	8	5	\$ 1,008,704,549	\$ 858,704,549

Figure 72. Excerpt from FCC Incentive Auction Results – Auction 1002  
FCC, Forward Auction Auction 1002 Bidder Summary,  
<https://docs.fcc.gov/public/attachments/DA-17-314A3.pdf>.



# IV.I Incentive Auctions

## ***FCC Auction 1002: Forward Auction – New Licenses***

### Forward Auction

**\$19.8 billion**

Gross revenues (2<sup>nd</sup> largest in FCC auction history)

**\$19.3 billion**

Revenues net of requested bidding credits

**\$7.3 billion**

Auction proceeds for federal deficit reduction

**70 MHz**

Largest amount of licensed low-band spectrum ever made available at auction

**14 MHz**

Spectrum available for wireless mics and unlicensed use

**2,776**

License blocks sold (out of total of 2,912 offered)

**\$1.31**

Average price/MHz-pop *sold* in Top 40 PEAs

**\$.93**

Average price/MHz-pop *sold* nationwide

**50**

Winning bidders

**23**

Winning bidders seeking rural bidding credits

**15**

Winning bidders seeking small business bidding credits

**Figure 73. Forward Auction - Results “By the Numbers”**

FCC, FCC Announces Results of World’s First Broadcast Incentive Auction, <https://www.fcc.gov/document/fcc-announces-results-worlds-first-broadcast-incentive-auction-0>; *id.*, Fact Sheet, <https://docs.fcc.gov/public/attachments/DOC-344398A1.pdf>.

# IV.2 Other Tools

## **Overview**

1. CBRS and SAS/PAL Regime
2. Experimental Licenses

## IV.2 Other Tools

### ***CBRS and SAS/PAL Regime***

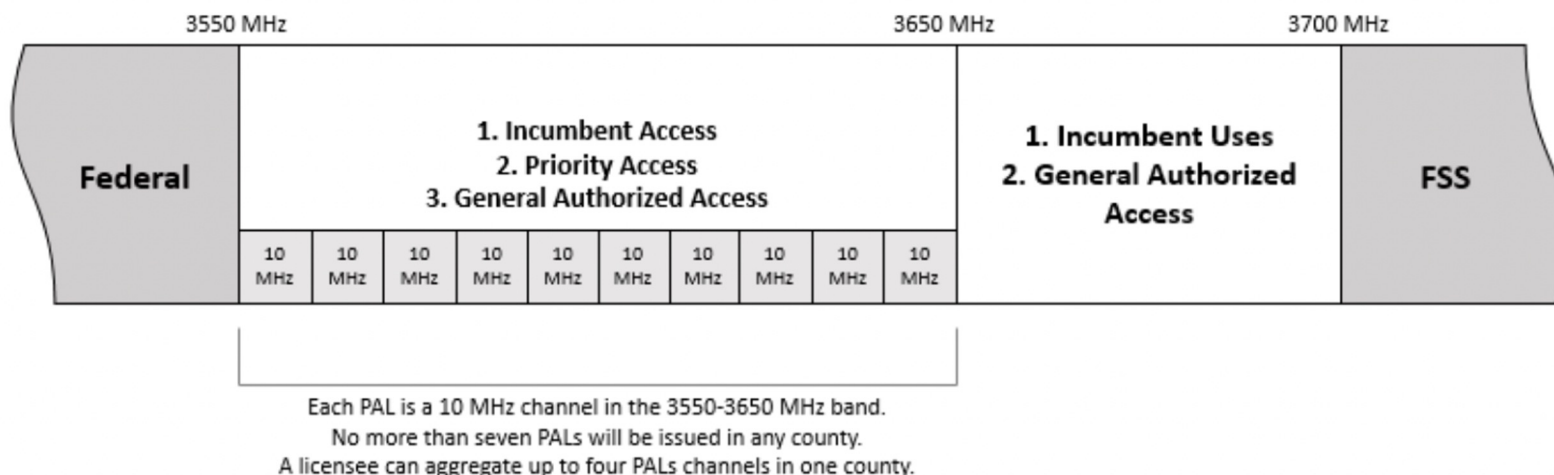


Figure 74. Band Plan for 3.5 GHz Band

FCC, 3.5 GHz Band Overview, <https://www.fcc.gov/wireless/bureau-divisions/mobility-division/35-ghz-band/35-ghz-band-overview>.

## IV.2 Other Tools

### CBRS and SAS/PAL Regime

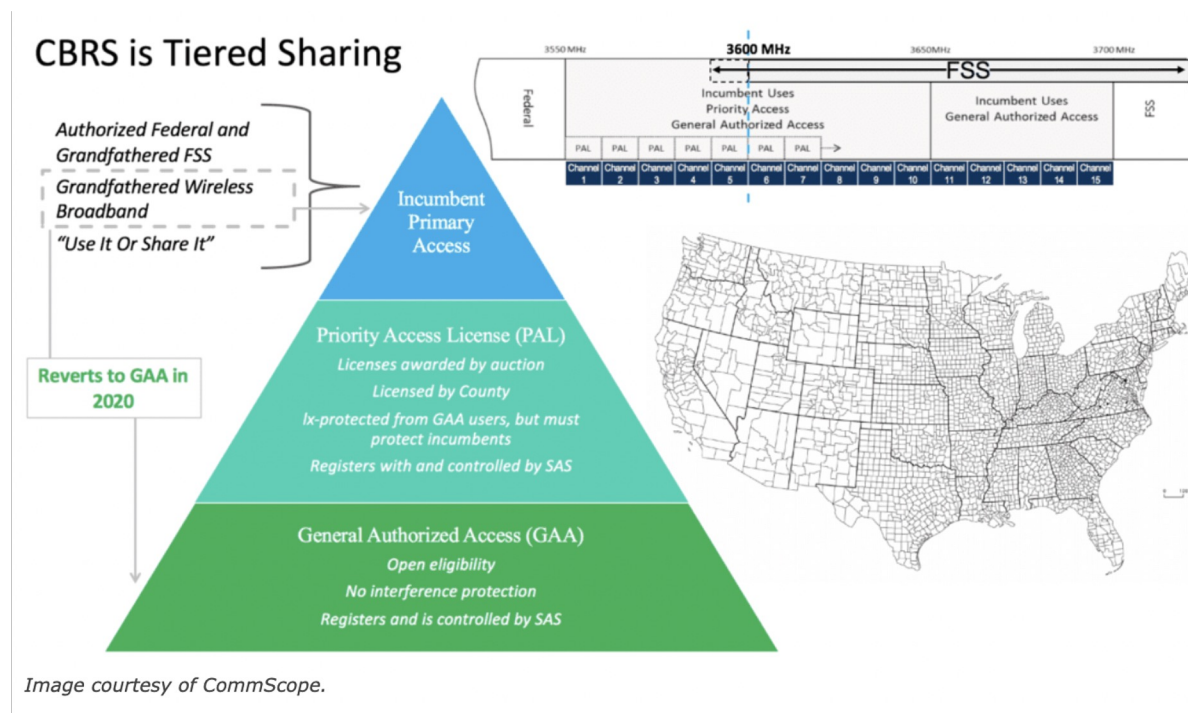
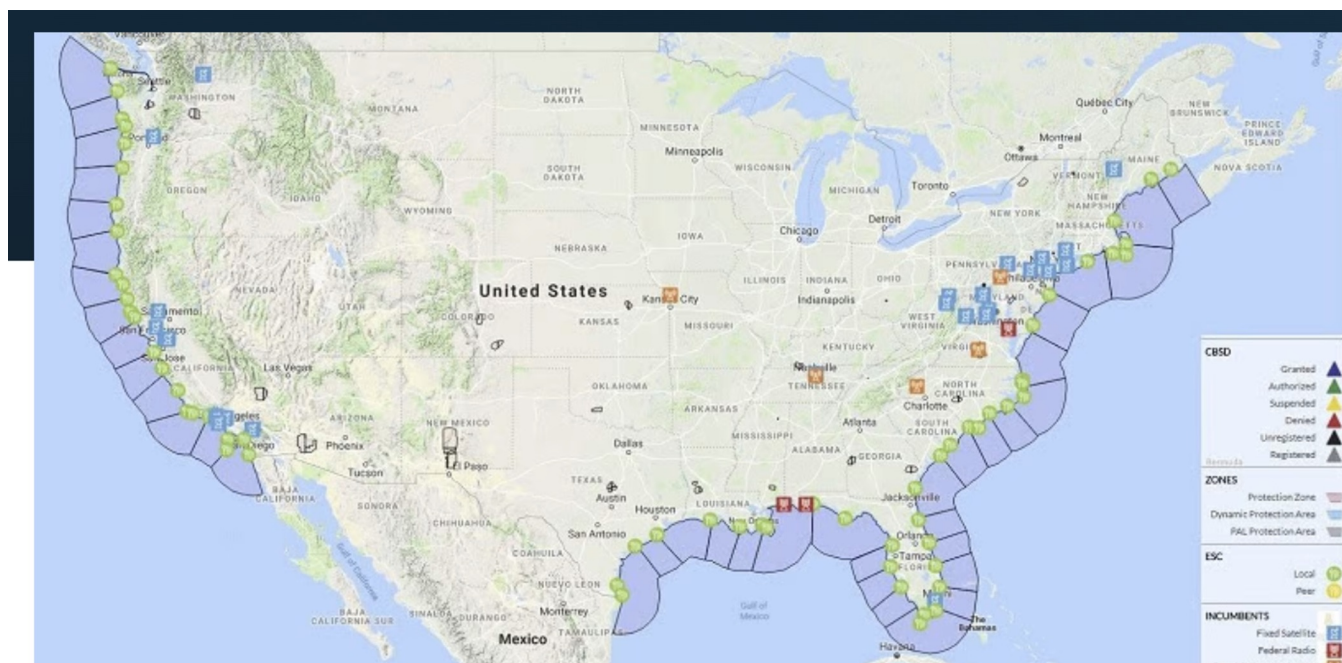


Figure 75. Citizens Broadband Radio Service (CBRS)

Sean Kinney, "Where Are We Today with CBRS and What's Next?" RCR Wireless, Dec. 16, 2019, <https://www.rcrwireless.com/20191216/policy/cbrs-whats-next>, citing image source, CommScope.

## IV.2 Other Tools

### ***CBRS and SAS/PAL Regime***



The CommScope SAS, in coordination with the environmental sensing capability, identifies wireless signals of incumbent users to avoid interference from CBRS operations. (CommScope/Business Wire)

Figure 76. CommScope Interoperability Testing of Incumbent Military Radar on CBRS Bands  
Monica Alleven, "Ericsson, CommScope Complete CBRS Interoperability Tests," Fierce Wireless, Apr. 12, 2018,  
<https://www.fiercewireless.com/wireless/ericsson-commscope-complete-cbrs-interoperability-tests>.



## IV.2 Other Tools

### ***CBRS and SAS/PAL Regime***

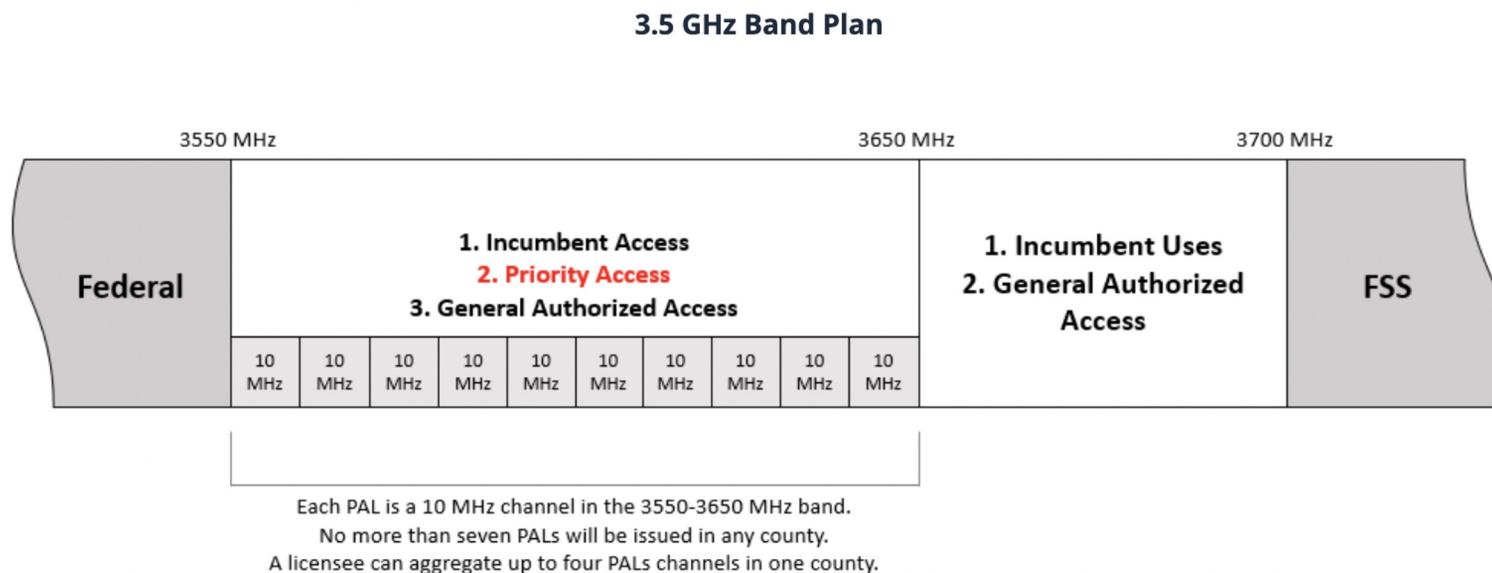


Figure 77. 3.5 GHz Band Plan in FCC Auction 105 for Tier 2 Priority Access Licenses (PALs)  
FCC, Auction 15: 3.5 GHz Band, <https://www.fcc.gov/auction/105>.

## IV.2 Other Tools

### *Experimental Licenses*

The screenshot shows the FCC's Office of Engineering and Technology (OET) Experimental Licensing System (ELS) website. The header includes the FCC logo and navigation links: Search, RSS, Updates, E-Filing, Initiatives, Consumers, and Find People. The OET logo is also present. The main heading is "Office of Engineering and Technology". Below this, there's a breadcrumb trail: FCC > FCC E-filing > ELS. The page title is "OET Experimental Licensing System".

**Filing Options**

- [Form 405 - License Renewal](#)
- [Form 442 - New License/Modification of License](#)
- [Form 702 - Assignment of License](#)
- [Form 703 - Transfer of Control](#)
- [Special Temporary Authority](#)
- [Add Attachments](#)
- [Reply to Correspondence](#)
- [Amend/Complete Application](#)
- [Return to 159 Form](#)
- [File an Informal Objection](#)

**Reports**

- [Application Status](#)
- [Call Sign Search](#)
- [Generic Search](#)
- [Point Radius Search](#)

**Welcome and thank you for visiting the OET Experimental Licensing Branch Electronic Filing Home Page. The pages to the left are designed to provide the public a means to electronically file and report on the various Experimental Licensing Applications.**

**Notes of Interest:**

Please update your browser bookmarks for the Experimental Licensing System (ELS) to our new location: <https://apps.fcc.gov/els> at your earliest convenience.

Fee applications should be paid using the Form 159 at the time of filing to avoid fee system problems. Applicants should use the Return to 159 form link if needed. Applications not paid within 10 days of filing may need to be dismissed and refiled if there are any fee payment complications.

[Add this RSS feed to your reader to receive notifications of ELS license and Special Temporary Authority grants.](#)

There are several free online services that will convert Microsoft Word and Excel documents to Adobe PDF. Some examples include, but are not limited to:

- [Doc 2 PDF](#)
- [Primo Online](#)

You may also purchase license software to convert documents to PDF by visiting [Adobe](#).

**Innovation Zones:**

Information for the FCC Innovation Zones can be found at the following page <https://apps2.fcc.gov/ELSExperiments/pages/innovation-zone-experiments.htm>

**STA FILERS:** [Please review these guidelines](#) before completing an Application for Special Temporary Authority.

Figure 78. FCC's OET Experimental Licensing System

FCC, OET Experimental Licensing System, <https://apps.fcc.gov/oetcf/els/index.cfm>.

## IV.2 Other Tools

### *Experimental Licenses*

FCC Federal Communications Commission

Search | RSS | Updates | E-Filing | Initiatives | Consumers | Find People

OET

Office of Engineering and Technology

OET Home Page

FCC > FCC E-filing > ELS > FCC FORM 442

**Dashboard For Experimental Radio Station Authorization (Form 442)**

Please select one of the below links to start the process:

**Filing Options**

- Form 405 - License Renewal
- Form 442 - New License/Modification of License
- Form 702 - Assignment of License
- Form 703 - Transfer of Control
- Special Temporary Authority
- Add Attachments
- Reply to Correspondence
- Amend/Complete Application
- Return to 159 Form
- File an Informal Objection

**Experimental License Types:**

- Conventional Experimental License
- Program Experimental License
- Medical Testing License
- Compliance Testing License

Figure 79. FCC's Form 442 for Experimental Station Authorization  
FCC, Dashboard for Experimental Radio Station Authorization (Form 442),  
<https://apps.fcc.gov/oetcf/els/forms/442Dashboard.cfm>.

## IV.2 Other Tools

### ***Experimental Licenses***

<sup>162</sup> Those 13 experiments are being conducted by the following licensees under the listed call signs.

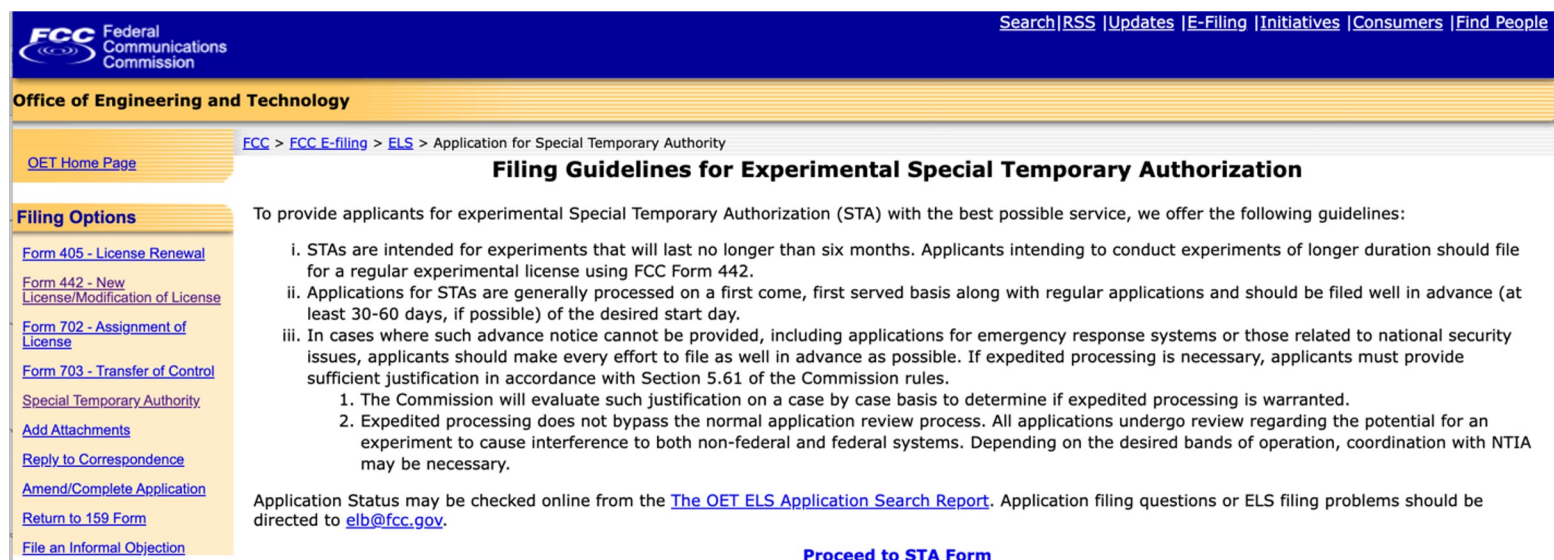
(1) Brown University (WI2XVS) – Propagation measurements, including passive bands at approximately 100, 200, 300, and 400 GHz. (2) Lockheed Martin Corporation (WG2XJE) – Radar cross-section measurements in various bands, including 95-100 GHz. (3) Northrop Grumman Systems Corporation (WJ2XEM) – Testing of frequency hopping systems in two bands, including the 92-96 GHz band. (4) NYU Tandon School of Engineering (WI2XSY) – Propagation testing, including 5G, in various bands, including 140-160 GHz. (5) Raytheon IDS (KI2XGC) – Development of antenna test ranges in various bands, including 92-100 GHz. (6) Raytheon Missile Systems (WB2XGB) – Testing, development, and demonstration of radars in three bands, including 92-100 and 102-105 GHz. (7) Raytheon Missile Systems (WI2XWW) – Testing of carbon-loaded Teflon equipment for US Army in the 92-96 GHz band. (8) Raytheon Missile Systems (WG2XHU) – Testing of RF deterrent system in the 94-96 GHz band. (9) Raytheon Missile Systems (WM9XAM) – Testing antenna patterns in the 90-102 GHz frequency range. (10) S2 Corporation (WH2XUK) – Development of a broadband spatial/spectrum receiver in support of developing a broadband staring receiver in various bands, including 26.5-100 GHz. (11) Sierra Nevada Corporation (WE2XCP) – Testing helicopter autonomous landing system in the 92.5-95.5 GHz band. (12) The Boeing Company (KB2XEU) – Testing of company's antennas in various bands, including 148.5-151.5 and 185-190 GHz. (13) University of Buffalo (WM9XGE) – Propagation measurements in the 1 THz region. Database query of January 30, 2018.

### **Figure 80. The 13 Experimental Radio Licenses above 95 GHz as of 2018**

In the Matter of Spectrum Horizons, ET Docket No. 18-21, RM-11795, Notice of Proposed Rulemaking and Order, Feb. 28, 2018, [https://docs.fcc.gov/public/attachments/FCC-18-17A1\\_Rcd.pdf](https://docs.fcc.gov/public/attachments/FCC-18-17A1_Rcd.pdf), at ¶ 67 n.162.

## IV.2 Other Tools

### *Experimental Licenses*



The screenshot displays the FCC's Office of Engineering and Technology (OET) website. At the top, the FCC logo and navigation links (Search, RSS, Updates, E-Filing, Initiatives, Consumers, Find People) are visible. Below the header, the OET Home Page is shown, with a breadcrumb trail: FCC > FCC E-filing > ELS > Application for Special Temporary Authority. The main heading is "Filing Guidelines for Experimental Special Temporary Authorization". To the left, a "Filing Options" sidebar lists links for Form 405 (License Renewal), Form 442 (New License/Modification of License), Form 702 (Assignment of License), Form 703 (Transfer of Control), Special Temporary Authority, Add Attachments, Reply to Correspondence, Amend/Complete Application, Return to 159 Form, and File an Informal Objection. The main content area provides guidelines for applicants, stating that STAs are intended for experiments lasting no longer than six months and should be filed well in advance (at least 30-60 days). It also mentions that applications are processed on a first-come, first-served basis. A link to "Proceed to STA Form" is provided at the bottom of the guidelines section.

**Filing Guidelines for Experimental Special Temporary Authorization**

To provide applicants for experimental Special Temporary Authorization (STA) with the best possible service, we offer the following guidelines:

- STAs are intended for experiments that will last no longer than six months. Applicants intending to conduct experiments of longer duration should file for a regular experimental license using FCC Form 442.
- Applications for STAs are generally processed on a first come, first served basis along with regular applications and should be filed well in advance (at least 30-60 days, if possible) of the desired start day.
- In cases where such advance notice cannot be provided, including applications for emergency response systems or those related to national security issues, applicants should make every effort to file as well in advance as possible. If expedited processing is necessary, applicants must provide sufficient justification in accordance with Section 5.61 of the Commission rules.
  - The Commission will evaluate such justification on a case by case basis to determine if expedited processing is warranted.
  - Expedited processing does not bypass the normal application review process. All applications undergo review regarding the potential for an experiment to cause interference to both non-federal and federal systems. Depending on the desired bands of operation, coordination with NTIA may be necessary.

Application Status may be checked online from the [The OET ELS Application Search Report](#). Application filing questions or ELS filing problems should be directed to [elb@fcc.gov](mailto:elb@fcc.gov).

[Proceed to STA Form](#)

Figure 8I. Filing Guidelines for Experimental Special Temporary Authorization  
FCC, Filing Guidelines for Experimental Special Temporary Authorization,  
<https://apps.fcc.gov/oetcf/els/forms/STANotificationPage.cfm>.



# Lecture IV: Market Tools Part B

## Spectrum Economics and Market Tools

- I. Introduction
  - 1. Spectrum in the News
  - 2. Nobel Prize Winners
- II. Spectrum Economics
  - 1. History of Auctions
  - 2. Spectrum Valuation Methods
  - 3. Spectrum Valuation Factors
- III. Market Tools Part A
  - 1. Reallocation Challenges
  - 2. Secondary Markets
- IV. Market Tools Part B**
  - 1. Incentive Auctions**
  - 2. Other Tools**
- V. New Developments
  - 1. Satellite Constellations
  - 2. Local Governance
- VI. Conclusion



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