



PUBLIC NOTICE

Federal Communications Commission
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**MEDIA BUREAU SEEKS COMMENT ON CATALOG OF ELIGIBLE EXPENSES AND
OTHER ISSUES RELATED TO THE REIMBURSEMENT OF BROADCASTER CHANNEL
REASSIGNMENT COSTS**

GN Docket No. 12-268

Comments Due: October 31, 2013

Reply Comments Due: November 14, 2013

The Spectrum Act¹ establishes a \$1.75 billion TV Broadcaster Relocation Fund (Fund) to be used for reimbursement of eligible relocation costs.² In the *Broadcast Television Incentive Auction NPRM* (NPRM), the Commission sought comment on the types of costs broadcasters and MVPDs are likely to incur and how to determine whether such costs are “reasonable” for purposes of reimbursement under the statute.³ For example, the NPRM sought comment on the types of “hard” costs, such as new equipment and tower rigging, and “soft” costs, such as legal and engineering services, that broadcasters and MVPDs might incur.⁴ In this Public Notice, the Media Bureau seeks to develop further the record on these cost issues as well as solicit additional comment on cost mitigation strategies as set out in the NPRM. The Commission will also hold a public workshop on September 30, 2013 to discuss cost and cost mitigation issues.⁵

¹ Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, §§ 6402, 6403, 125 Stat. 156 (2012) (Spectrum Act).

² *Id.* at § 6403(d)(1); 47 U.S.C. § 309(j)(8)(G)(iii)(I). The Spectrum Act requires that the Commission “reimburse costs reasonably incurred by” broadcast television licensees that are reassigned to new channels as a result of the incentive auction. Spectrum Act § 6403(b)(4)(A)(i). In addition, the Spectrum Act requires the Commission to reimburse MVPDs that reasonably incur costs in order to continue to carry the signals of licensees reassigned to new channels as a result of the reverse auction or repacking process. *Id.* at § 6403(b)(4)(A)(ii).

³ *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Notice of Proposed Rulemaking*, 27 FCC Rcd 12357, 12470 ¶343 (2012) (NPRM).

⁴ NPRM at 12470, ¶343 and 12483, ¶352.

⁵ See FCC Announces Workshop on Issues Surrounding the Reassignment of TV Stations after the Incentive Auction, GN Docket No. 12-286, Public Notice (rel. September 9, 2013).

Specifically, we invite comment on a preliminary Catalog of Eligible Expenses (included as an Attachment), which contains categories and descriptions of expenses that we believe broadcasters and MVPDs are most likely to incur as a result of broadcaster channel reassignments. Although the record in this proceeding contains some comments addressing expense types,⁶ the Commission has engaged a third-party contractor to help further identify the types of costs broadcasters and MVPDs might incur as a result of channel reassignments. With this input and other research, we have developed a preliminary Catalog of Eligible Expenses, which is attached to this Public Notice. Although the Catalog of Eligible Expenses represents an initial summary of common expenses broadcasters and MVPDs may incur, we encourage commenters to identify any additional expense categories that they believe should be eligible for reimbursement.

In addition to seeking comment on the kinds of costs broadcasters and MVPDs will incur, we seek comment on the prices associated with the hard and soft costs included in the Catalog of Eligible Expenses. We are interested both in specific price information, as well as more general information on the costs broadcasters and MVPDs expect to incur. For example, do broadcasters typically pay list price for equipment or are discounts common, particularly for bulk orders or for station group owners? If so, what kinds of discounts generally apply?

Given the Spectrum Act's \$1.75 billion limit on reimbursements, the NPRM also sought comment on potential ways to mitigate costs associated with channel reassignment, such as through bulk purchasing or services agreements by broadcasters and repurposing equipment that is no longer needed by a broadcaster following relocation to a new channel.⁷ We received minimal comments on bulk purchasing and, thus, seek specific comment on the viability of having broadcasters organize bulk purchasing or services arrangements to generate costs savings. Or are the services and equipment necessary to accomplish a channel reassignment too customized to be eligible for discounts or bulk purchasing? We invite commenters to address these and additional ways that could reduce the costs associated with channel reassignment. For example, are there ways to encourage manufacturers and service providers to establish prices with built-in discounts that reflect the volume of business that channel reassignments will generate? For purposes of reimbursement from the Fund, if certain types of costs included in the Catalog of Eligible Expenses (such as for HVAC systems) are already part of a General Services Administration (GSA) Schedule, should the Commission limit reimbursement to the prices offered by the vendors who sell to federal agencies?⁸ We also seek comment on whether to require entities seeking reimbursement from the Fund to obtain competitive bids for equipment and services that exceed a certain dollar threshold. If so, what is the appropriate dollar threshold above which competitive bids should be required? Should the Commission require competitive bids any time a broadcaster requests reimbursement from the Fund for a particular type of equipment or service (such as for the construction of a new tower)? Is such a requirement feasible for all stations, including non-commercial stations that may be owned by entities such as state governments which are already subject to certain purchasing rules?

⁶ See, e.g., Harris Comments at 20-21; National Association of Broadcasters Comments at Appendix A (providing a non-exhaustive list of potential expenses); National Cable & Telecommunications Association Comments at 19-20.

⁷ NPRM at 12471, ¶346.

⁸ See, e.g., GSA Schedule List at <http://www.gsaelibrary.gsa.gov/ElibMain/scheduleList.do>. For example, GSA Schedule Number 51V ("Hardware Superstore"), Category 639 001 ("Domestic Appliances") includes a list of vendors and their price lists for HVAC equipment purchased by federal agencies (at <http://www.gsaelibrary.gsa.gov/ElibMain/sinDetails.do?executeQuery=YES&scheduleNumber=51+V&flag=&filter=&specialItemNumber=639+001>) (visited September 11, 2013).

Broadcasters may also realize cost savings, and other benefits, associated with tower co-location or sharing a broadband antenna or other facilities. Should the Commission encourage broadcasters seeking reimbursement from the Fund to pursue tower and antenna sharing arrangements and, if so, how? Broadcasters may also require interim equipment to continue broadcasting during the post-auction transition. We invite comment on ways in which broadcasters can incorporate interim equipment into their permanent facilities, thus saving the expense of potentially purchasing the same equipment twice. Also, are there any circumstances under which the FCC could incentivize cost savings by sharing with broadcasters and MVPDs money saved as a result of cost-saving measures? We invite comment on any additional cost mitigation and transition coordination strategies that could reduce expenses and facilitate broadcasters' moves to new channels.

Interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. When filing comments, please reference **GN Docket No. 12-268**.⁹

Comments may be filed using the Commission's Electronic Comment Filing System (ECFS) or by filing paper copies.¹⁰ Comments filed through the ECFS can be sent as an electronic file via the Internet to <http://www.fcc.gov/cgb/ecfs/>. Generally, only one copy of an electronic submission must be filed. If multiple docket or rulemaking numbers appear in the caption of the proceeding, commenters must transmit one electronic copy of the comments to each docket or rulemaking number referenced in the caption. In completing the transmittal screen, commenters should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking numbers. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to ecfs@fcc.gov, and should include the following words in the body of the message, "get form." A sample form and directions will be sent in reply. Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, commenters must submit two additional copies for each additional docket or rulemaking number.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although we continue to experience delays in receiving U.S. Postal Service mail). Parties are strongly encouraged to file comments electronically using the Commission's ECFS. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission, 445 12th Street, S.W., Washington, D.C. 20554.

- Effective December 28, 2009, all hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building. The filing hours at this location are 8:00 a.m. to 7:00 p.m.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.

⁹ The *NPRM* in this proceeding included an Initial Regulatory Flexibility Analysis (IRFA) pursuant to 5 U.S.C. § 603, exploring the potential impact of the Commission's proposal on small entities. *NPRM*, 27 FCC Rcd at 12523-44. The matters discussed in this notice do not modify in any way the IRFA we previously issued.

¹⁰ See *Electronic Filing of Documents in Rulemaking Proceedings*, GC Docket No. 97-113, *Report and Order*, 13 FCC Rcd 11322 (1998).

- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

Parties shall also serve one copy with the Commission's copy contractor, Best Copy and Printing, Inc. (BCPI), Portals II, 445 12th Street, S.W., Room CY-B402, Washington, D.C. 20554, (202) 488-5300, or via e-mail to fcc@bcpiweb.com.

Documents in GN Docket No. 12-268 will be available for public inspection and copying during business hours at the FCC Reference Information Center, Portals II, 445 12th St. S.W., Room CY-A257, Washington, DC 20554. The documents may also be purchased from BCPI, telephone (202) 488-5300, facsimile (202) 488-5563, TTY (202) 488-5562, e-mail fcc@bcpiweb.com.

To request materials in accessible formats for people with disabilities (Braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

This matter shall be treated as a "permit-but-disclose" proceeding in accordance with the *ex parte* rules.¹¹ Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentations must contain summaries of the substance of the presentations and not merely a listing of the subjects discussed. More than a one- or two-sentence description of the views and arguments presented generally is required.¹² Other requirements pertaining to oral and written presentations are set forth in section 1.1206(b) of the rules.¹³

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¹¹ *NPRM*, 27 FCC Rcd at 12494-95, ¶¶ 416-417; *see also*, 47 C.F.R. § 1.1200 *et seq.*

¹² *See* 47 C.F.R. § 1.1206(b)(2).

¹³ 47 C.F.R. § 1.1206(b).

Attachment: Catalog of Eligible Expenses

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Catalog of Eligible Expenses

I. ABOUT THIS CATALOG

This catalog contains descriptions of the expenses that broadcasters and MVPDs are most likely to incur as a result of broadcaster repacking. While we believe this list is relatively comprehensive, it may not cover every expense for every situation and is not a limitation on expenses that qualify for reimbursement.

Individual broadcasters and MVPDs will incur only some of the expenses listed in this catalog, depending upon the broadcaster's or MVPD's existing equipment and the particular repacking changes that entity must make. Some of the expenses will apply only in limited situations, such as, for example, broadcasters operating on a shared antenna or those that require additional power to support an interim transmitter.

The information in this catalog was developed primarily by Widely, Inc., pursuant to a contract with the FCC, and is based on its interviews with industry stakeholders.

II. BROADCAST COSTS

A. TRANSMITTERS AND IN-BUILDING EXPENSES

I. Retune Existing Transmitter

Depending on its new channel assignment, a broadcaster may be able to retune its existing transmitter to transmit on the new channel rather than replace it. Whether retuning is feasible depends on a number of factors, including the type of transmitter, the range of channels (sub-band) for which it and its component parts are designed, and whether replacement parts and manufacturer support are available. In limited cases, replacement may be the preferred option if the cost of retuning exceeds the cost of a new transmitter. The transmitter output mask filter is channel-specific and will have to be replaced to accommodate any channel change.

UHF – Inductive Output Tube (IOT) Transmitter (price would include banded drivers, RF system, and labor)
Single IOT system (30 kW)
Two IOT system (60 kW)
Three IOT system (90kW)

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Solid State Transmitter (prices based on specific channel move and would include field engineering and parts to retune the RF system, but would not include the cost of a new mask filter, which is a separate line item below)
UHF – minor banding issues (price would pertain to a move of 1-3 channels)
1 kW system
1-2.5 kW system
2.5-5 kW system
5-7.5 kW system
7.5-10 kW system
10-15 kW system
15-20 kW system
UHF – major banding issues (price would pertain to a move of more than approximately 3 channels)
1 kW system
1-2.5 kW system
2.5-5 kW system
5-7.5 kW system
7.5-10 kW system
10-15 kW system
15-20 kW system
VHF – minor banding issues (price would pertain to a move of 1-3 channels)
1 kW system
1-2.5 kW system
2.5-5 kW system
5-7.5 kW system
7.5-10 kW system
VHF – major banding issues (price would pertain to a move of more than approximately 3 channels)
1 kW system
1-2.5 kW system
2.5-5 kW system
5-7.5 kW system
7.5-10 kW system

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New Mask Filter – A new mask filter is required for any channel change
10 kW mask filter
30 kW mask filter
60 kW mask filter
90 kW mask filter
New Exciter – In a few cases, a station may need to purchase a new exciter if the existing exciter cannot be returned.
Single frequency agile exciter
Dual exciter system with change over

2. New Transmitters

If the cost of retuning exceeds the cost of replacement, a new transmitter may be required. The price of a new transmitter would include installation, mask filter, and proof of performance testing.

UHF – IOT Transmitter
Single IOT system (30 kW)
Two IOT system (60 kW)
Three IOT system (90kW)
UHF – Air Cooled Solid State Transmitter
1 kW
2 kW
2.5 kW
4 - 6 kW
10 – 12 kW
15 kW
20 kW
UHF – Liquid Cooled Solid State Transmitter
6.3 kW
7.7 kW
9.25 kW
10.5 kW
12.3 kW

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15 kW
18 kW
20 kW
23.8 kW
29.3 kW
40 kW
50 kW
High VHF – Air Cooled Solid State Transmitter
1 kW
2.4 kW
3.3 kW
5 kW
10 – 12 kW
15 kW
20 kW

3. Other Transmitter Expenses

In only limited situations, these expenses may apply in addition to the expenses in Sections II.A.1 or II.A.2 above.

Combiners for Shared (Panel) Antenna (UHF/VHF)
New combiner, cost per channel (without antenna)
Adding a module to existing combiner (without antenna)
Electrical Service <i>(price would include labor and installation) – A station installing new transmitter equipment may have to increase the power supply to the transmitter or perform other electrical work.</i>
Service entrance 3 phase/800 amp/208 volt
Switchgear – industrial 800 amp
Transformer 3 phase/480v – 150 KVA
Transformer 3 phase/480v – 300 KVA
Transformer 3 phase/480v – 500 KVA
2” Rigid Conduit and Wiring (Cost per foot)
3” Rigid Conduit and Wiring (Cost per foot)
4” Rigid Conduit and Wiring (Cost per foot)

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HVAC Service – Cooling only (price would include labor and installation) – A station installing replacement transmitter equipment may need additional cooling capability.
5 Ton system
10 Ton system
15 Ton system
25 Ton system
50 Ton system
HVAC Service – Heating and Cooling (price would include labor and installation) – A station installing replacement transmitter equipment may need additional air-handling capacity that includes both heating and cooling capability.
10 Ton system
15 Ton system
20 Ton system
30 Ton system
50 Ton system
Transmitter Building Addition – In limited situations, expansion of the transmitter building may be required to accommodate new equipment. Approx. 600-1500 square foot addition (costs vary with location, site access, and construction type)

B. ANTENNAS

Most stations moving to a new channel will require a new antenna. The price of an antenna would not include installation or removing an existing antenna (for those expenses, see Section II.D, Tower Equipment and Rigging). In some cases, new transmission lines will also be required (for those expenses, see Section II.C, Transmission Lines).

UHF – High Power Top Mount (200-1000 kW)
Single station antenna
Single station antenna – with V polarization or C polarization
2 Station broadband panel antenna with combiner
4 Station broadband panel antenna with combiner
UHF – Lower Power Side Mount
Single station –200-500 kW
Single station –200-500 kW with V polarization or C polarization

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Single station antenna – medium power (50-200 kW)
LPTV/Class A single station antenna – basic
Hi-VHF
Single station antenna – top mount
Single station antenna – top mount with V polarization or C polarization
Single station antenna – side mount – non-directional
Single station antenna – side mount – directional
Shared broadband panel antenna – 5 station with V polarization or C polarization
Shared broadband panel antenna – 5 station with V polarization or C polarization, including combiner and transmission line
Hi-VHF, Low Power
LPTV basic slot antenna – side mount
LPTV broadband panel (cost per panel)
Other
Sweep test of existing antenna
Note: For stacked antennas, the cost of the bottom antenna will likely be doubled due to the increased cost of structural components, such as heavier steel and longer structures

C. TRANSMISSION LINES

In some situations, transmission line can be reused in the event of a channel change (e.g., if the move is to a non-prohibited channel or if the transmission line is broadband capable). See Figure 1 below. If new transmission line must be purchased, it is generally priced per foot with the price generally including elbows and hangers, and is based on a length of 1,000 feet.

Flexible Transmission Line
Line Diameter:
7/8" foam dielectric
1 5/8" foam dielectric
2 1/4" foam dielectric
7/8" air dielectric
1 5/8" air dielectric
2 1/4" air dielectric

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3" air dielectric
4" air dielectric
5" air dielectric
Rigid Transmission Line – copper
Line Diameter:
3 1/8"
4 1/16"
6 1/8"
7 3/16"
8 3/16"
Note: Broadband rigid transmission line sections are generally 15% more expensive than other rigid line sections.

D. TOWER EQUIPMENT AND RIGGING

If replacement or addition of antennas is required, it may be necessary to modify the existing tower or construct a new tower. In addition to these expenses, a broadcaster replacing or adding an antenna would incur rigging costs.

Existing Towers – <i>Towers without sufficient documentation of the tower specifications may need to be mapped prior to completion of a tower load study</i>
Tower mapping for an undocumented/poorly documented tower and preparation of documentation necessary for tower load study
Structural engineering tower load study for documented tower
Structural engineering tower load study for a documented tower with candelabra
Minor tower reinforcement/modifications (see Fig. 2 for sample minor modifications)
Major tower reinforcement/modifications (see Fig. 2 for sample major modifications)
Serious tower reinforcement/modifications (see Fig. 2 for sample serious modifications)
New Towers – <i>Cost includes constructing a new tower, priced per foot</i>
New tower between 1000' and 1500' without elevator, normal soil conditions
New tower between 1500' and 2000' without elevator, normal soil conditions

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Tower Rigging – Cost includes fees paid to expert tower crews for equipment removal and installation, such as removing the existing antenna and installing the replacement antenna, and if necessary (and for additional cost), removing the existing transmission line and installing the replacement transmission line.
Tall Tower (greater than 500')
Short Tower (less than 500')
Complex Tower (includes, for example, those with candelabras and/or stacked antennas)

E. INTERIM FACILITIES

To avoid prolonged periods off the air while repacking changes are made, stations may need to use interim facilities. Some stations currently have a licensed auxiliary facility or own backup equipment that may be used for this purpose post-auction while others may need to purchase or rent equipment or facilities.

Transmitter
A station may need a new transmitter for interim use on either its pre- or post-auction channel to permit continued operation during construction of the post-auction facility. New transmitters are listed in Section I.A.2, Transmitters and In-Building Expenses.
Antenna
Interim antenna rent and installation – Cost will depend upon antenna size and height and/or complexity of tower
Tower Equipment and Rigging – Cost will be similar to those described in Section II.D, Tower Equipment and Rigging, above
Interior RF Systems – A station that needs an additional transmitter for interim use may need an additional interior RF system
UHF inside RF system including switching
VHF inside RF system including switching

F. SPECIAL CASES

1. Channel 14

Television broadcasters operating on Channel 14 are required to guard against interference with mobile use on frequencies 467-470 MHz. See 47 C.F.R. § 73.687(d).

RF Consulting Engineer (to determine correct mask filter to avoid interference)
Channel 14 Mask Filter
Additional field engineering time, 10-30 days (to test for interference after mask filter is installed)

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2. Distributed Transmission Services (DTS)

Television stations operating DTS systems will incur engineering costs related to each DTS site (instead of, and not in addition to, the RF engineering category in Section II.H, Professional Services, below).

RF Consulting Engineer (priced per DTS site)
Critical Facility: "Critical" refers to operations that have signal overlap between adjacent DTS sites which are not terrain-shielded; such facilities will require exact power levels, signal synchronization, and antenna directional and elevation patterns to minimize interference between sites.
Terrain-shielded Facility: "Terrain-shielded" refers to operations that serve regions that are terrain blocked from each other, resulting in less interference as compared to critical facilities.

3. AM Pattern Disturbance

Stations constructing or making significant modifications to an antenna tower in the immediate vicinity of an AM radio station are required to analyze whether such construction or modification will result in disturbance to the AM station's radiation pattern. If it will, the television station must notify the AM station of the disturbance and take measures to correct it. See 47 C.F.R. § 1.30000 et seq.

Impact study (to assess the potential impact of tower construction or modification on AM radio stations)
Remedy (price would include installing detuning apparatus or adjusting existing detuning apparatus necessary to restore proper operation of the directional or non-directional AM antenna and include before and after field measurements)

G. MISCELLANEOUS EXPENSES

1. DTV Medical Facility Notification

DTV broadcasters are required to notify nearby medical facilities of DTV channel changes pursuant to a condition in their construction permit.

Markets 1-64
Markets 65-150
Markets 151-199
Markets 200+

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2. Other

Obtain building permits from local zoning authorities (<i>cost of preparation, submission, and prosecution of necessary forms or applications</i>)
Obtain local permits other than for zoning (<i>cost of preparation, submission, and prosecution of necessary forms or applications</i>)
Coordinate with Bureau of Land Management and National Forest Service (<i>This may be necessary for towers located on land managed by these agencies and would include the cost of preparation and submission of relevant forms</i>)
Disposal cost for legacy equipment, if applicable
Develop and air announcement of upcoming channel change
Notify MVPDs of channel change

H. PROFESSIONAL SERVICES

Stations without sufficient internal resources, either at the station itself or at an affiliated station or company, may have to obtain professional services from an outside source to complete the station's channel relocation.

Consulting Radio Frequency Engineer Fees
Perform engineering study for new channel assignment and antenna development
Prepare engineering section of Form 301 FCC Construction Permit Application
Prepare engineering section of Form 302 FCC License to Cover Application
Prepare request for Special Temporary Authorization
Attorney Fees
Prepare and File Form 301
Prepare and File Form 302
Prepare and File request for Special Temporary Authorization
Other Transition-Related Personnel Costs
Project management of the transition, if needed
Field Engineering Fees
Comprehensive coverage verification via field study, if needed
Change in Structure Height Services: Modification to Antenna Structure Registration (ASR)
Provide NEPA Section 106 environmental review, if needed
ASR modification (towers ≥ 450 feet with red lighting)
ASR modification (other towers)

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FAA consultant, including cost of preparing FAA Form 7460 (Notice of Proposed Construction), if needed for height increase

III. MVPD COSTS

MVPDs that receive signals over-the-air may be required to make changes to their receive facilities in order to continue to receive a television station that is changing channel. This table lists the kinds of changes an MVPD might have to make to continue to deliver a repacked broadcaster's signal to its customers once the broadcaster has delivered its signal to the MVPD.

Equipment Costs
<i>New receive antenna – (Will be necessary when existing antenna is channel-specific or uses directivity to minimize interference from other stations. Some UHF and VHF broadband receive antennas should be able to continue receiving stations that are not changing bands.)</i>
<i>New receiver or other RF processing equipment (such as pre-amplifiers)</i>
<i>Coaxial cable (for MVPDs that install new receive antennas and/or receivers)</i>
<i>Structural or capacity augments for towers (to meet new tower loading requirements as a result of installation of replacement equipment)</i>
<i>Tower rigging (price would include removal of existing antenna and transmission line, if necessary, and installation of replacement equipment)</i>
Professional Services
<i>Structural study of tower capacity (to determine if additional support is necessary for any replacement equipment)</i>
<i>Engineering study (to estimate receive strength of new channel assignments, capabilities of current equipment, and determine whether and what replacement equipment may be necessary)</i>

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IV. FIGURES

Figure 1: Rigid coaxial line section lengths and the channels not supported.

Transmission line connects the transmitter or combiner output to the antenna, running from the equipment building up the tower to the antenna. While lines typically come in lengths of about 20 feet, the exact section length is determined by the station's assigned channel. After repacking, the transmission line may have to be replaced depending on whether the new channel is allowable for the existing line section length. This is principally an issue for lines that have been in use to feed a single-station antenna. Transmission line is usually "broadbanded" for use with shared antennas by making minor, non-repeating changes to the section lengths, designed for the channels involved. Following is a chart of transmission line section lengths and the channels that are prohibited for each length.

Prohibited Channels per Line Length

20' Sections	4, 10, 16, 17, 20, 21, 25, 26, 29, 30 33, 34, 37, 38, 41, 42, 45, 46, 49, 50 53, 54, 57, 58, 61, 62, 65, 66, 69
19 ³ / ₄ ' Sections	10, 11, 14, 17, 18, 22, 23, 26, 27, 30 31, 34, 35, 38, 39, 42, 43, 46, 47, 50 51, 55, 56, 59, 60, 63, 64, 67, 68
19 ¹ / ₂ ' Sections	5, 7, 14, 15, 18, 19, 23, 24, 27, 28, 31 32, 35, 36, 39, 40, 44, 45, 48, 49, 52, 53, 56, 57, 60, 61, 65, 66, 69

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Figure 2: Tower Modifications

This chart provides representative samples of minor, major, and serious tower modifications.

Tower Modifications		
Minor	Major	Serious
Guy wire retensioning	Guy wire replacement 2 to 3 levels	Guy wire replacement > 4 levels
Tension Diagonal replacement < 12 bays	Tension Diagonal replacement > 15 bays	Addition of guy levels
Horizontal (struts) reinforcing < 12 levels	Horizontal (struts) reinforcing > 15 bays	New Anchors for new guy levels
Leg reinforcing (addition of redundants) < 12 levels	Horizontal (struts) replacement > 15 bays	Replacement of tower sections
Minor foundation reinforcing at anchors	Leg reinforcing (addition of redundants) > 15 bays	Tension Diagonal replacement > 15 bays
	Leg reinforcing (requiring welding)	Horizontal (struts) reinforcing > 15 bays
	Tension/Compression Diagonal replacement	Horizontal (struts) replacement > 15 bays
	Tension/Compression Diagonal -requiring welding	Leg reinforcing (addition of redundants) > 15 bays
	Minor foundation reinforcing at base and anchors	Leg reinforcing (requiring welding)
		Tension/Compression Diagonal replacement
		Tension/Compression Diagonal -requiring welding
		Foundation reinforcing at base and anchors