

Broadcaster Relocation Fund Workshop Expanded Presentation

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Likely Scenarios for Station Channel Changes

- Channel change within the technical limits of the existing transmitter and antenna
 - Transmitter employs currently supported technology
 - Estimated that <5% of stations in this category
- Channel change beyond the technical limits of the existing supported transmitter and antenna
 - Transmitter employs currently supported technology
 - Estimated about 40% stations in this category
- Channel change beyond the technical limits of the existing un-supported transmitter and antenna
 - Transmitter is no longer supported due to technology obsolescence
 - Estimated about 55% stations in this category

Station Issues During Channel Change

- How to remain “On Air” during a channel change?
 - Typical effort to change channel on transmitter in most cases will require multiple days of down time
 - Either a temporary transmitter or a new replacement transmitter will be required – most probably a new transmitter will be required
 - In limited instances there may be two transmitters
 - Tower structures must be able to support the addition of temporary antennas and feed lines during the transition
 - Revised EIA specs show that many towers will be overloaded
 - Is building space and power available for a second transmitter during transition?

Station Issues During Channel Change

- Addressing local zoning law and regulations related to facilities modification and antenna/tower changes.
 - Issues are both timing and cost
- Engineering considerations related to building modifications, site surveys, tower loading evaluation, etc.
 - Issues are both timing and cost
- How to reimburse if a station has 2 transmitters...1 main and 1 alternate or multiple sites?

Industry Issues During Channel Change

- Limited number of qualified tower crews to change out antennas and feed lines
 - See next slide for more details
- Limited number of technical crews to retune existing or install new transmitters
- Manufacturing capacity for replacement antennas, channel filters, RF line systems and transmitters
- How to deal with and compensate stations when a common antenna facility is involved
- How to deal with and compensate stations located at a common antenna site that do not change channel but are impacted by adding a first adjacent channel station to the common site

Industry Issues During Channel Change

- There is a total of 14 tower crews in the US that have the skills, training, equipment and insurability to remove and replace heavy television transmitting antennas on tall towers
- The typical broadcast TV antenna replacement job including a temporary antenna will take from 3 to 6 weeks to complete
 - Average 5 weeks including travel
 - Working 52 weeks per year for 3 years, the 14 crews could do a maximum of 434 stations

Issues Presented by the Laws of Physics

- Moving to lower frequency channel assignments will mean larger antennas for equal gain or lower gain for equal sized antennas
 - Tower loading limitations may impact the size of antenna or drive additional cost to reinforce the tower structure
 - Lower gain antennas will require higher transmitter power to provide equal coverage
 - Ties back into industry issues (i.e., limited number of tower crews)

What We Do Not Know

- How many stations will move and to what frequencies?
- What will be the impact of the move for each individual station based on their unique equipment and needs?
- Over what period of time will the channel change process occur?
 - Start date
 - End date
 - Transition period
- Will the channel change process take place across a region, by DMA or by auction market?

Where Reimbursement May Be Needed

- Engineering study
- Transmitter(s)
- Transmitter installation
- Channel filter
- Antenna
- Tower rigging
- Permits
- Building modifications
- Electrical service modifications
- Leasing temporary antenna and transmission line
- Tower loading study
- Proof of performance testing
- Coverage verification
- Transmission line
- Channel combiners at common sites
- Constructing a new tower if needed
- Legal services for filing
- Clean up and removal of old equipment

Channel Change – Least Impact (<5%)

- Retune transmitter to new channel
- Replace Output Mask Filter
- Conduct Proof of Performance testing
- Begin operation on new channel

Channel Change – Moderate Impact (15%-25%)

- Install temporary antenna and transmission line
- Retune existing transmitter to new channel
- Replace Output Mask Filter
- Conduct Proof of Performance testing
- Cut over to new channel
- Remove original antenna
- Install new antenna
- Cut over to new antenna
- Remove temporary antenna and transmission line

Channel Change – Likely Impact (45%-55%)

- Install temporary antenna and transmission line
- Modify building and electrical for additional transmitter
- Install new transmitter
- Install new channel mask filter
- Remove original antenna
- Install new antenna
- Conduct system proof tests
- Cut over to new channel
- Remove temporary antenna and transmission line
- Remove original transmitter or convert to new channel as back up transmitter

Channel Change – Almost Worst Case Impact (20%-25%)

- Install temporary antenna and transmission line
- Modify building and electrical for additional transmitter
- Install new transmitter
- Install new channel mask filter
- Remove original antenna
- Remove original transmission line
- Install new transmission line
- Install new antenna
- Conduct system proof tests
- Cut over to new channel
- Remove temporary antenna and transmission line
- Remove original transmitter or convert to new channel as back up transmitter

Channel Change – Worst Case Impact (10%-15%)

- Acquire new site for tower and transmitter
- Make site improvements
- Build new building for transmitter
- Erect new tower structure
- Install new transmission line
- Install new antenna
- Install new transmitter
- Conduct system proof tests
- Cut over to new channel
- Remove old antenna and transmission line
- Remove old transmitter and associated equipment
- Restore old site

Cost Factors for High TPO UHF Stations

Existing Transmitter	3-Tube IOT
Upgrade in-band*	\$300,214
Upgrade out-of-band*	\$429,548
New Transmitter	\$1,633,214
Antenna	\$168,000
RF Line (1200')	\$392,160
Antenna change out	\$140,000
RF Line Installation	\$225,000

Note:
These examples show
“Hard” equipment costs
only
Not included are permits,
legal fees, engineering
studies, disposal of old
equipment, building
modifications, tower
modifications, etc.

Total with New Transmitter: \$2,558,374

* If possible

Cost Factors for Medium TPO UHF Stations

Existing Transmitter	2-Tube IOT
Upgrade in-band*	\$249,976
Upgrade out-of-band*	\$339,310
New Transmitter	\$1,158,976
Antenna	\$168,000
RF Line (1200')	\$222,811
Antenna change out	\$140,000
RF Line Installation	\$195,000

Note:
 These examples show
 “Hard” equipment costs
 only
 Not included are permits,
 legal fees, engineering
 studies, disposal of old
 equipment, building
 modifications, tower
 modifications, etc.

Total with New Transmitter: \$1,884,787

* If possible

Cost Factors for Lower TPO UHF Stations

Existing Transmitter	1-Tube IOT
Upgrade in-band*	\$101,429
Upgrade out-of-band*	\$226,333
New Transmitter	\$619,429
Antenna	\$72,000
RF Line (1200')	\$144,046
Antenna change out	\$140,000
RF Line Installation	\$150,000

Note:
 These examples show
 “Hard” equipment costs
 only
 Not included are permits,
 legal fees, engineering
 studies, disposal of old
 equipment, building
 modifications, tower
 modifications, etc.

Total with New Transmitter: \$1,125,475

* If possible

Questions?