A Proposal for an FCC Spectrum Exchange

Evan Kwerel
Office of Strategic Planning and Policy Analysis
Federal Communications Commission

John Williams
Spectrum Guru, Ret.

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Disclaimer

• The opinions expressed in this talk are those of the authors and do not necessarily represent the views of the FCC or any other members of its staff.
Only about 7% (185 MHz) of Spectrum in 300-3000 MHz Range Is Fully Available to Market Today

- Cellular 2%
- PCS 3%
- SMR 1%

Legend:
- Cellular 50 MHz
- PCS 120 MHz
- SMR 15 MHz
- Other 2545 MHz
Another 15% (413 MHz) for Flexible Use in the Pipeline

- From TV Channels 52-69 (78 MHz) 3%
- From MDS/ITFS (190 MHz) 6%
- From Gov't, MSS and others (145 MHz) 5%
But…

• Heavily encumbered
• Fragmented in geographic and frequency domains
• Needs massive restructuring
TV and DTV Stations that Encumber Channel 67 in EAG-1
Percent of MHz-Pops Encumbered on TV Channels 60-69 in Northeast EAG

![Bar Chart]

**Percent of Pops Encumbered in EAG1 (Northeast) on Paired Channels 60-69 (buffered).**

Total Pops in Area = 41,569,094

<table>
<thead>
<tr>
<th>Channel Pair</th>
<th>Encumbered Percentage</th>
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<tbody>
<tr>
<td>60/65</td>
<td>65.53</td>
</tr>
<tr>
<td>61/66</td>
<td>77.30</td>
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<tr>
<td>62/67</td>
<td>85.03</td>
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<tr>
<td>63/68</td>
<td>82.39</td>
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<tr>
<td>64/69</td>
<td>74.88</td>
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Three or More TV Stations Encumber All Blocks in the 700 MHz Band in NYC

Channel 59-69 TV Incumbents Within 100 Miles of New York City
How to End the Spectrum Drought

• Property rights and markets
  – Define flexible, exclusive and exhaustive spectrum rights
  – Use markets to move spectrum to its highest value use

• FCC spectrum exchange during transition
  – Simultaneous market mechanism to restructure fragmented spectrum
  – Wholly voluntary for incumbents
  – Incentives for incumbents to participate
  – Reduces transaction costs
  – Increases liquidity
Proposal for Rapid Transition

- **Flexibility**: reallocate restricted spectrum to flexible, exclusive use
- **FCC spectrum exchange**: conduct series of large-scale, two-sided simultaneous auctions of spectrum *voluntarily* offered by incumbents together with any unassigned spectrum
Proposal (continued)

• Incentives to participate
  – Immediately grant participants flexibility
  – Allow participants to keep the proceeds from the sale of their spectrum
  – Participating incumbents share in increased value from flexibility and value created by a rapid and efficient restructuring of the spectrum
Proposal (continued)

- Incumbents not harmed
  - **Non-participants:** allowed to continue current operations and would receive full flexibility in 5 years.
  - **Participants:** not required to sell to get immediate flexibility. Can buy back their licenses.

- Expect incumbents to participate
  - Participation costs are low, nothing else to lose
  - No flexibility withheld
  - Participation serves efficiency by making explicit the opportunity cost of keeping spectrum.
Initial Implementation

• 413 MHz in the 300 to 3000 MHz range
• Reduce current spectrum shortages for high demand uses
Removing Barriers to Flexible Use Isn’t Enough

• Unassigned spectrum needs to be available for flexible use

• Need to reconfigure existing spectrum into tradable property rights
  – Redefine interference limits in terms of outputs
  – Some licenses dissolve into flexible overlay licenses
Removing Barriers to Flexible Use Isn’t Enough (cont’d)

• Need to address coordination problem
  – Put all highly interdependent spectrum up for sale at the same time
  – Mechanism to combine spectrum into efficient packages

• Incentive problems may prevent efficiency-enhancing trades
  – Interests of spectrum managers vs. interests of firm as a whole
  – Incumbents with incentives to strategically hold out
Who Runs the Exchange?

• Why not a purely private spectrum exchange?
  – Who sells FCC held spectrum?

• The FCC is in the best position to solve the coordination problem
  – FCC holds unencumbered spectrum
  – Little cost to adding licensed spectrum
  – FCC has established credibility in conducting transparent auctions for spectrum rights
Who Runs the Exchange?

• The FCC is in the best position to solve incentive problems of ensuring participation and mitigating hold-out problems
  – FCC regulatory authority over spectrum gives it more carrots (e.g., conditional flexibility) and sticks than private parties
  – Solving the coordination problem helps solve the participation problem
Remaining Issues

• Design of exchange mechanism
  – Incumbents can bid on (and buy back) own licenses in band-restructuring auction
  – Exchange with rising bids and falling ask prices
  – Role of FCC as seller of spectrum

• Defining flexible spectrum rights to promote liquidity in the spectrum exchange
Remaining Issues

• Application of exchange to specific exclusively allocated bands
• Promoting efficient use of spectrum not exclusively assigned to private parties
  – Public safety spectrum
  – Public broadcasting spectrum
  – Federal government spectrum
  – Non-exclusive (e.g., private land mobile)
  – Unlicensed spectrum (part 15)
TV and DTV Stations that Encumber Channel 67