March 31, 2015

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, GN Docket No. 12-268, AU Docket No. 14-252, Notice of *Ex Parte* Communication

Dear Ms. Dortch:

On March 30, 2015, Scott Goodwin, Bruce Franca and the undersigned of the National Association of Broadcasters ("NAB") met with Renee Gregory, Legal Advisor to Chairman Tom Wheeler. During the meeting, NAB addressed the following issues:

TV White Spaces Database

NAB discussed its March 19, 2015 Emergency Motion for Suspension of Operations and Petition for Rulemaking seeking to amend the Commission's rules regarding TV white space devices (TVBDs). Currently, absolutely nothing prevents a user from entering false device location information. Indeed, users have every incentive to trick the database in this manner, because it allows them to access more vacant channels. Thus, for example, as shown in the attached presentation, a user operating a white space device in Washington, DC has access to only two vacant channels. If, however, this user decides to change the registered location of the device to Bethany, Missouri, the device gains access to 43 vacant channels. This is simple, can be accomplished in minutes, and allows users to operate on channels that are not vacant simply because the database has no way of knowing where the device is truly located.

NAB seeks two modifications to the existing white spaces rules: (1) a requirement that fixed TVBDs include geolocation capability to automatically determine their location; and (2) a workable enforcement regime that imposes responsibility on database administrators who fail to correct false information in the database. NAB emphasized that the problem is not addressed merely by cleaning up the existing information in the database; rather, it is a systemic issue that requires the Commission to remove the potential for human intervention when it comes to determining the location of fixed

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TVBDs. The solutions NAB proposes are practical, easy to implement, and should be acted upon quickly by the Commission.

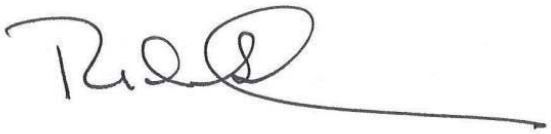
Incentive Auction

NAB discussed the information included in the attached presentation, demonstrating the potential effects of repacking television stations in the wireless portion of the 600 MHz band. According to our analysis, placing even a few stations in the wireless part of the band can create significant impairments that dramatically affect the amount of spectrum available for bidders in the forward auction. Indeed, as this work demonstrates, it is entirely possible that, if the FCC places even a handful of stations in the wireless band, it may consequently be restricting the forward auction to two or three blocks of paired spectrum available in the Northeast corridor, while remaining well under the Commission's expansive proposed 20 percent standard for market variability.

NAB also addressed some recent and unfortunate confusion over the FCC's approach to repacking broadcasters and its impact on the $1.75 billion TV Broadcaster Relocation Fund. To be clear, the FCC's current approach puts minimizing costs to broadcasters in the back seat of the auction process. The FCC is planning on taking into account costs only after the auction is complete. At that point, the likelihood of significantly reducing the number of stations being repacked is incredibly small. Indeed, the FCC has produced no data suggesting that such an approach will lead to any meaningful reduction in the number of stations unnecessarily forced to move frequencies.

We continue to urge the Commission to consider the fact that, by taking an approach that makes broadcaster costs an afterthought, it will be blowing through Congress's $1.75 billion budget and harming broadcasters in the process. Throughout the proceeding, NAB has proposed various ways of minimizing these costs, with minimal impact on the FCC's ability to repurpose spectrum. At the very least, the Commission staff has yet to produce any data suggesting that, by optimizing repacking moves earlier in the auction process, it will be handcuffed from its goal of repurposing spectrum for the wireless industry.

Respectfully Submitted



Rick Kaplan
General Counsel and Executive Vice President,
Legal and Regulatory Affairs
National Association of Broadcasters

cc: Renee Gregory

TV White Space Database Spoofing:

Any TV Channel Can Be Used Anywhere!

March 23, 2015

Robert Weller

Question Investigated

- How difficult is it to fool a TVWS database into authorizing devices to operate on channels already in use by TV stations?

Approach

- Purchased two different TVWS devices
- Registered each device to NAB's office location in Washington, DC
  - Only TV Channels 21 and 22 should be available for fixed device use.
- Re-registered each device to rural Bethany, Missouri
  - All TV Channels should be available for fixed device use.
- Verified devices transmitted following registration

Device #1 – Registered in DC

Change Registration details for 8da58837-02eb-4642-8c52-68696fa2cf72

Important - changing the latitude,longitude, antenna height or ratio type will cause the radio to be re-registered and may result in a short loss of service for the end-user.

Provide a display name for the radio

BSC 01454

Latitude

38.907519

Longitude

-77.041308

Antenna Height (m)

6

Notes

Save

Device #1 – Authorized Channel List

Name
BSC 01454
Role
BaseStation
FccId
OPA-RC2-BS
Latitude
38.907519
Longitude
-77.041308
Antenna Height (m)
6
Notes

WSDB Access

Registration state
Registered
Status of last database access
Channels successfully retrieved
Time of last registration attempt
March 23, 2015 at 9:55:00 AM EDT
Channels returned on last database access
509,515
Time of last channel fetch
March 23, 2015 at 11:30:00 AM EDT

Washington, DC
2 channels available →

Device #1 – Registered in MO

Change Registration details for 8da58837-02eb-4642-8c52-68696fa2cf72

Important - changing the latitude,longitude, antenna height or ratio type will cause the radio to be re-registered and may result in a short loss of service for the end-user.

Provide a display name for the radio

BSC 01454

Latitude

40.27

Longitude

-94.03

Antenna Height (m)

6

Notes

Save

Device #1 – Authorized Channel List

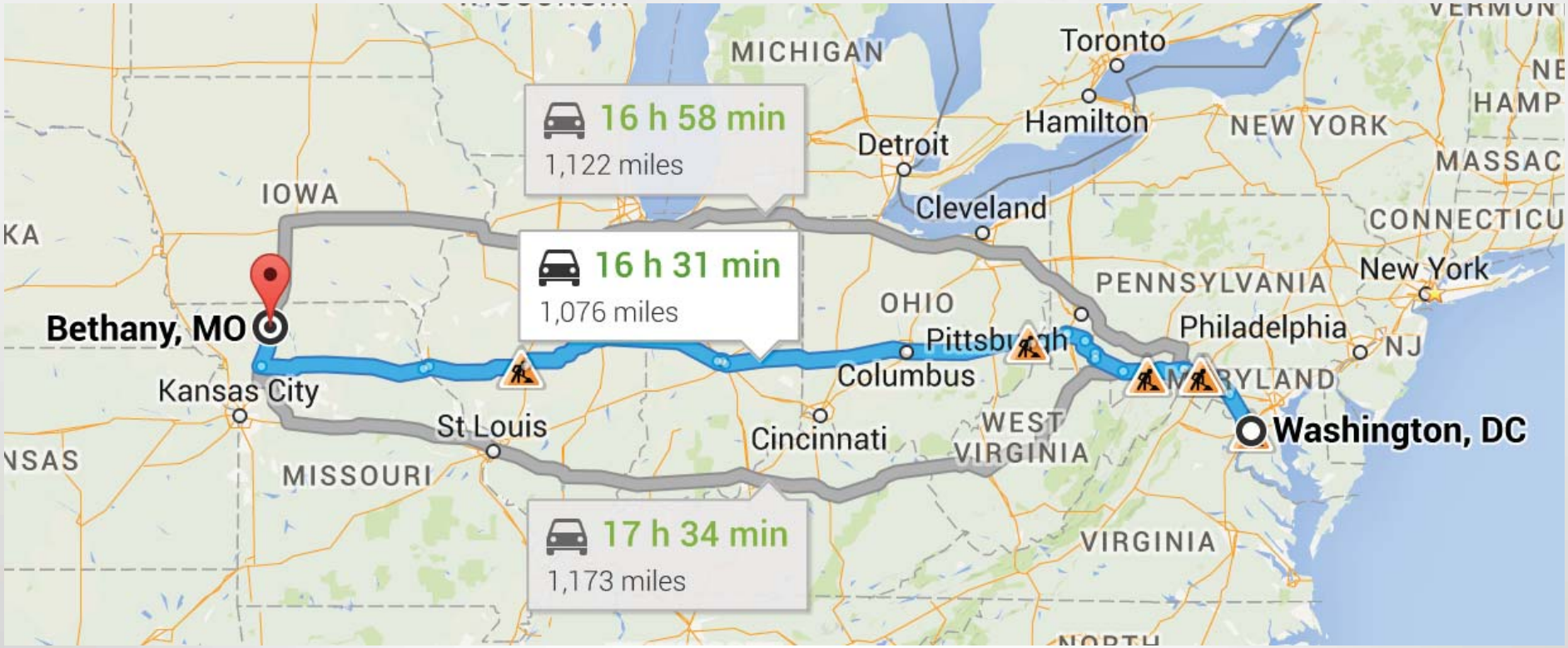
Name
BSC 01454
Role
BaseStation
FccId
OPA-RC2-BS
Latitude
40.27
Longitude
-94.03
Antenna Height (m)
6
Notes

WSDB Access

Registration state
Registered
Status of last database access
Channels successfully retrieved
Time of last registration attempt
March 23, 2015 at 11:38:00 AM EDT
Channels returned on last database access
473,479,485,491,497,503,509,515,521,527,533,539,545,551,557,563,569,575,581,587,593,599,623,629,635,641,647,653,659,665,671,677,683,689,695
Time of last channel fetch
March 23, 2015 at 11:38:00 AM EDT

Bethany, MO
35 channels available

DC to MO in 8 Minutes!



Device #2 – Registered in MO

Who you are

Contact Name	Robert Weller
Owner Name	National Association of Broadcasters Company Name or Representative
Phone Number	202-429-5397
Email Address	rweller@nab.org
Street Address	1771 N St., NW
City	Washington
State	District of Columbia
Zip Code	20036
Country	US

Where you are

Latitude	40.27 Coordinates in decimal format
Longitude	-94.03 Coordinates in decimal format
Antenna Height	6 Height in meters between 1 and 30

Device Information

FCC ID	OKVMT300
Serial Number	153
Device Type	8

Device #2 – Authorized Channel List

White Space Registration | **Status** | Advanced

Device Status

Radio Status

- Operating Channel: **25**
- Transmitter status: **Enabled**

White Space Status

- Registration Status: **Success**
- Last Registration Request: **Mon, 23 Mar 2015 15:41:24 GMT**

- Channel Request Status: **Success**
- Last Channel Request: **Mon, 23 Mar 2015 15:41:24 GMT**

- Available Channels: **21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,39,40,41,42,43,44,45,46,47,48,49,50,51**

Bethany, MO
28 channels available

Device #2 – Registered in DC

Who you are

Contact Name	Robert Weller
Owner Name	National Association of Broadcasters Company Name or Representative
Phone Number	202-429-5397
Email Address	rweller@nab.org
Street Address	1771 N St., NW
City	Washington
State	District of Columbia
Zip Code	20036
Country	US

Where you are

Latitude	38.907519 Coordinates in decimal format
Longitude	-77.041308 Coordinates in decimal format
Antenna Height	6 Height in meters between 1 and 30

Device Information

FCC ID	OKVMT300
Serial Number	153
Device Type	8

Device #2 – Authorized Channel List

Device Status

Radio Status

- Operating Channel: **21**
- Transmitter status: **Enabled**

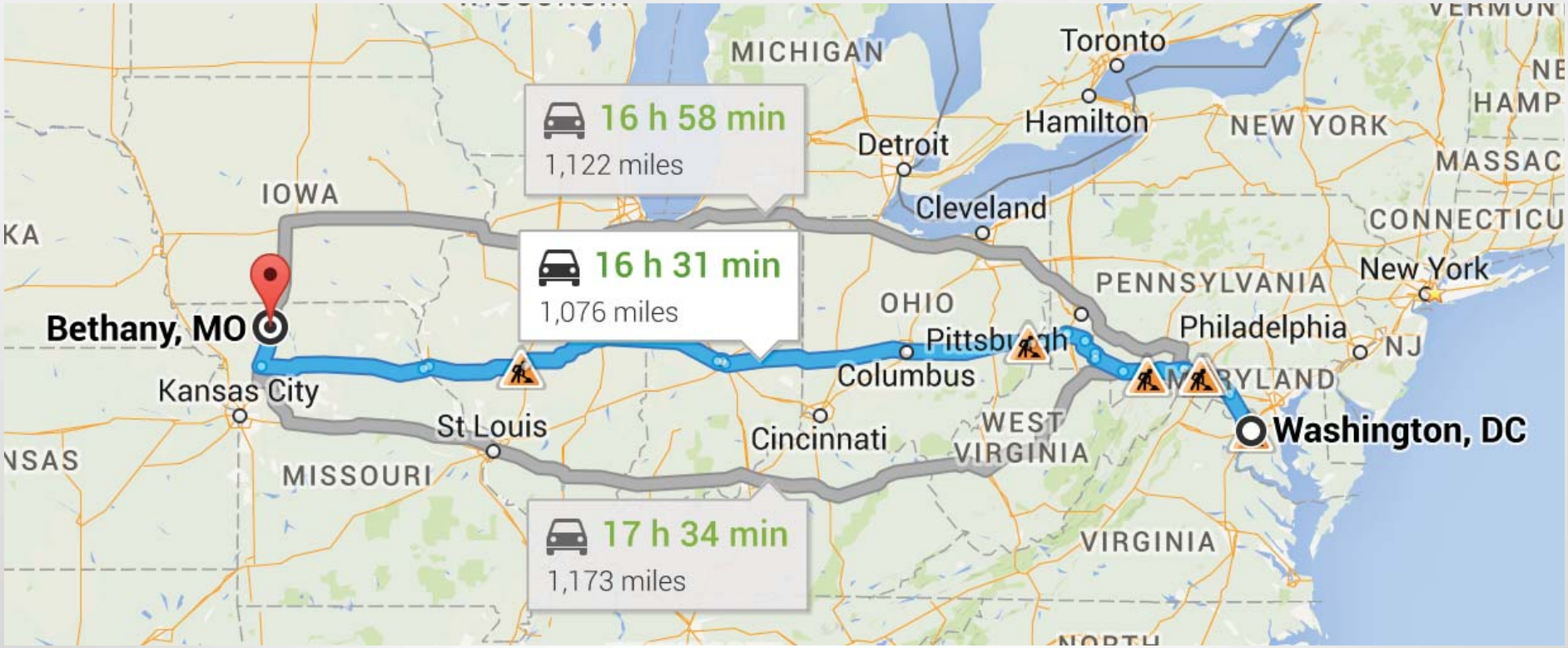
White Space Status

- Registration Status: **Success**
- Last Registration Request: **Mon, 23 Mar 2015 15:47:21 GMT**
- Channel Request Status: **Success**
- Last Channel Request: **Mon, 23 Mar 2015 15:47:23 GMT**
- Available Channels: **21,22,26,31,43,49,51**

Washington, DC
7 channels* available →

*Channel list includes adjacent channels under expired waiver.

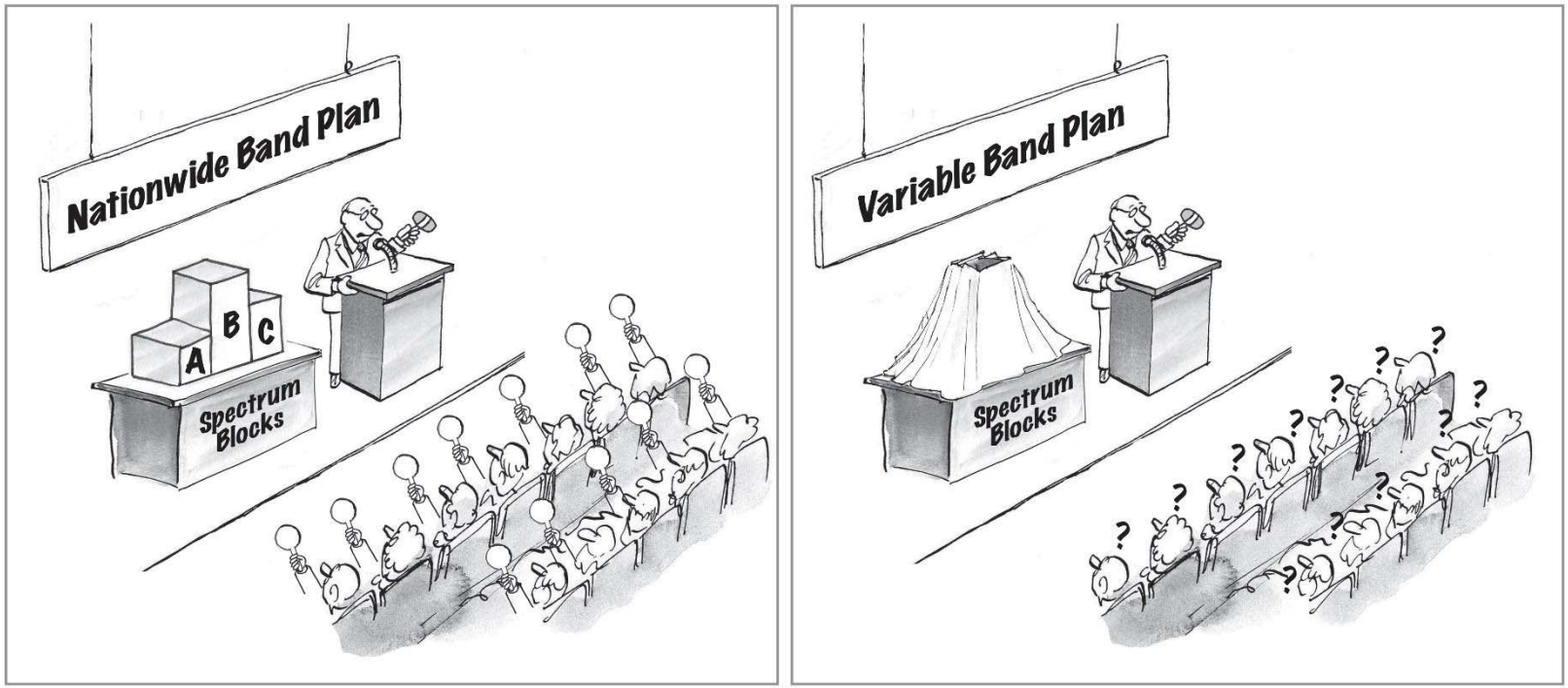
MO to DC in 6 Minutes!



Summary

- The TVWS devices tested provide a browser interface, which makes changing registration data a simple task for anyone
- By entering false geographic coordinates, the devices can be made to transmit on almost any TV channel without regard to interference
- The databases permit drastic location changes, authorizing new channels in less than 10 minutes

Market Variability



A nationwide plan creates more certainty and predictability for bidders.

Questions Investigated

- Does the proposed “not more than 20% of weighted pops impairment” standard limit spectrum and market variability?
- What would a plan that meets the 20% standard look like? Does this standard yield a “near Nationwide Plan”?

Approach

- Assumed 126 MHz initial spectrum clearing target
- Looked at markets where variability is likely to occur
- Also looked at US/Canada border region
- Used FCC ISIX approach to determine wireless impairments
- Did **not** permit TV in duplex gap

ANALYSIS STILL A WORK IN PROGRESS

ISIX *Uplink* Impairment Calculations and Impacts by Channel Block

Northeast Corridor Scenario

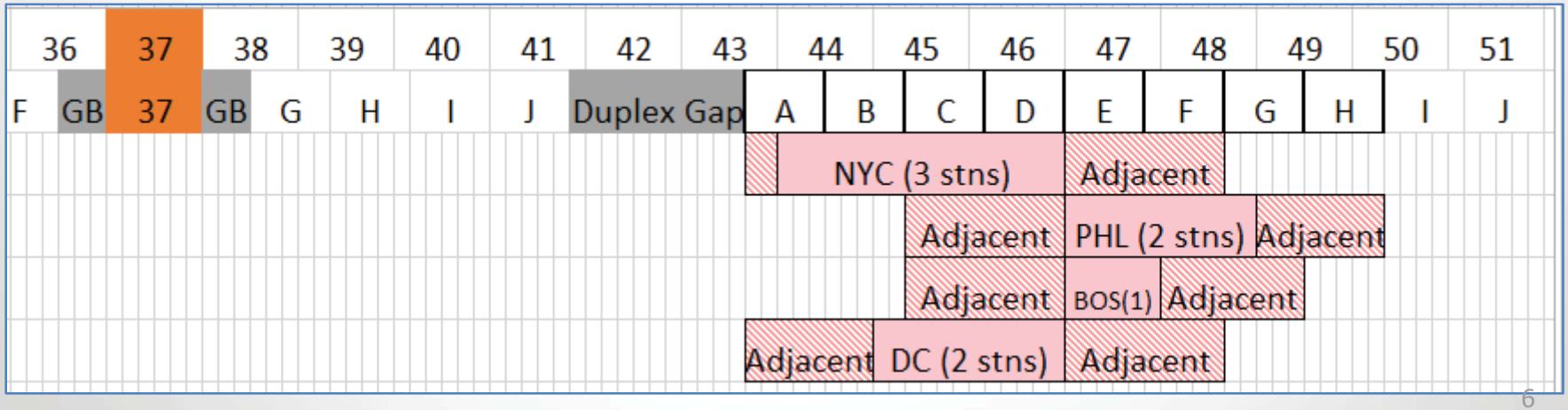
Market	Total UHF Stations	Stations in 600 MHz *
New York	24	3
Philadelphia	23	2
Boston	20	1
Washington (Baltimore)	20 (7)	2

* Stations can be placed in 600 MHz as part of initial clearing target or by dropping out of the auction

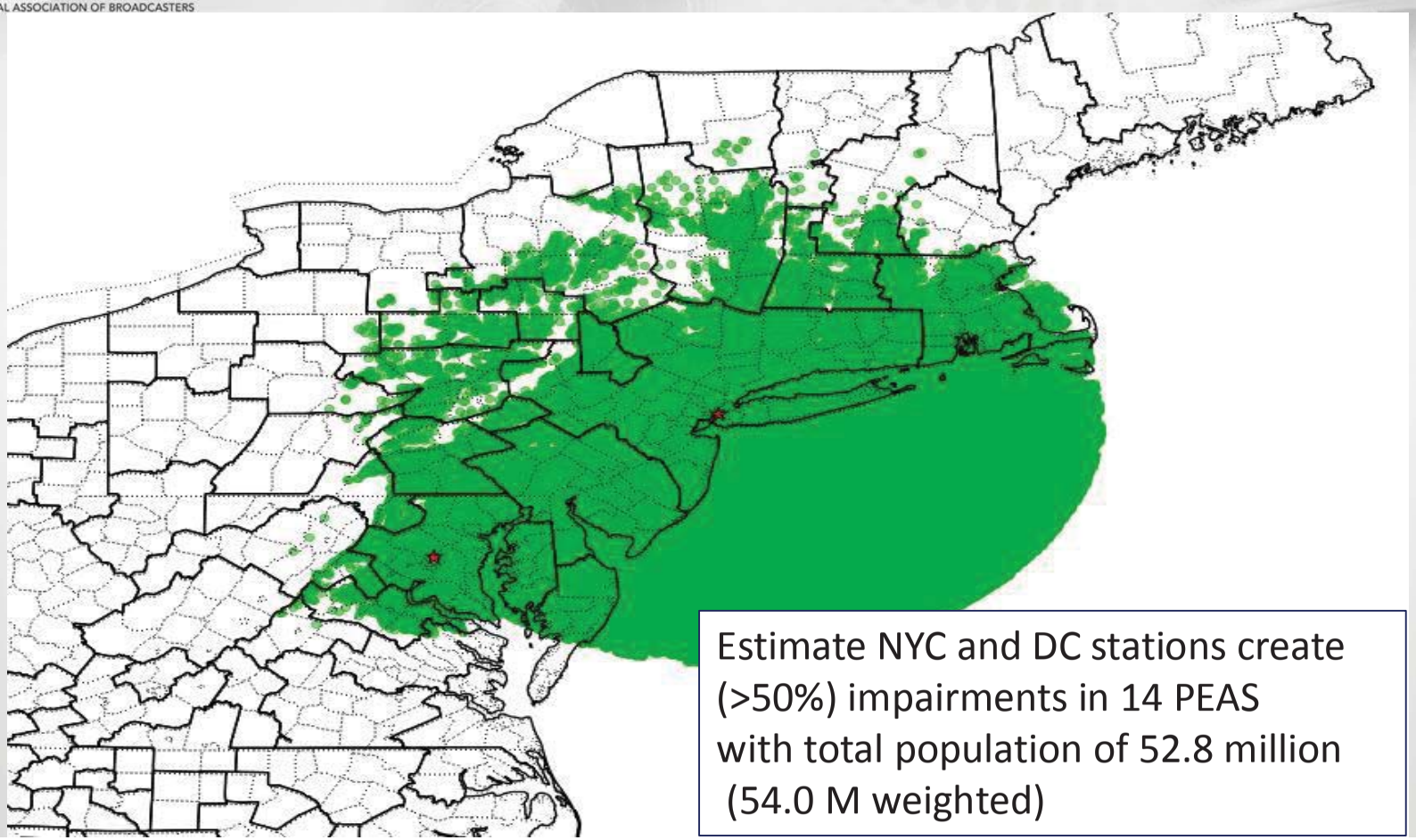
Assumed Impairments (NE Corridor)

(Uplink - 126 MHz Recovery Target)

- Repack to minimize the number of TV channels needed and wireless blocks impaired to accommodate TV stations in impairment scenario
  - 3 NYC Stations (Channels 44, 45, 46)
  - 2 PHL Stations (Channels 47, 48 – cannot be co-channel with NYC stations)
  - 2 DC Stations (Channels 45, 46 – cannot be co-channel with PHL stations)
  - 1 BOS Station (Channel 47 – cannot be co-channel with NYC stations)



A Block (Uplink) Impairments



Estimate NYC and DC stations create (>50%) impairments in 14 PEAS with total population of 52.8 million (54.0 M weighted)

Total Uplink Impairments
(NE Corridor, 126 MHz recovery target)

Block	PEAs with >50% Impairment	Weighted Pops (M) Impaired	Percentage of Weighted US Population
A	14	54.0 M	23.2%
B	29	59.8	25.7%
C	35	62.4	26.8%
D	26	60.0	25.8%
E	24	59.9	25.8%
F	27	60.4	26.0%
G	22	59.2	25.5%
H	1	8.2	3.5%
I, J	0	0	0
Total		423.9 Million	18.2% (9.1 % w/ 50% Uplink discount)

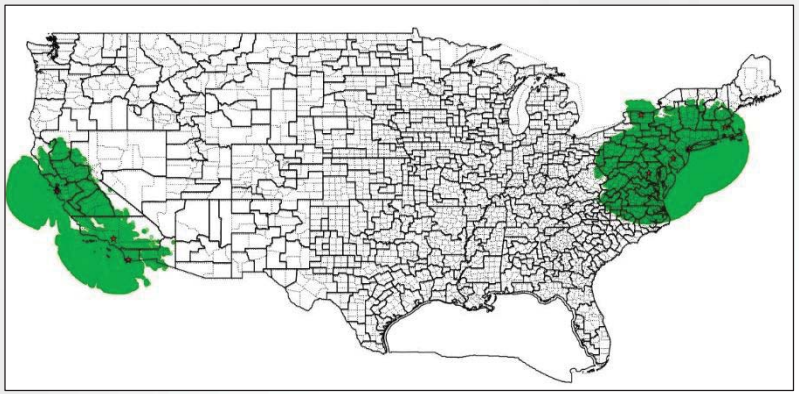
Channel Pair Availability

- Total of 9.1% of "weighted" population impaired
  - Well below 20% impairment threshold for reduction in recovery target
- Only 2-3 of 10 "paired" wireless channels are available in all major northeast corridor markets

TV in Uplink Band	PEA	Block A	Block B	Block C	Block D	Block E	Block F	Block G	Block H	Block I	Block J
	NYC	X	X	X	X	X	X	X	√	√	√
	PHL	X	X	X	X	X	X	X	X	√	√
	WAS	X	X	X	X	X	X	X	√	√	√
	BOS	X	X	X	X	X	X	X	√	√	√

Uplink Scenario Summary

FCC "Near Nationwide" Plan (Block C shown)



- Total "weighted pops" impairment is 14.4%
  - Northeast corridor (9.1%)
  - Southern California (3.7%)
  - US/Canada Border (0.6%)
  - San Francisco (1.0%)
- Additional 5.6% impairments possible and still meet proposed FCC 20% limit (TBD)
  - No uplink channels available in Miami equates to 1.2% impairment

Market	Total Unimpaired Wireless Channel Pairs Available
New York	3
Philadelphia	2
BOS	3
DC	3
LA	3
SD	2
Buffalo	5
Rochester	7
Erie	8
SF	6

Comparison of Channel Availability

TV in Uplink Band

PEA	Block A	Block B	Block C	Block D	Block E	Block F	Block G	Block H	Block I	Block J
NYC	X	X	X	X	X	X	X	√	√	√
PHL	X	X	X	X	X	X	X	X	√	√
WAS	X	X	X	X	X	X	X	√	√	√
BOS	X	X	X	X	X	X	X	√	√	√

Unimpaired Plan

PEA	Block A	Block B	Block C	Block D	Block E	Block F	Block G	Block H	Block I	Block J
NYC	√	√	√	√	√	√	√	X	X	X
PHL	√	√	√	√	√	√	√	X	X	X
WAS	√	√	√	√	√	√	√	X	X	X
BOS	√	√	√	√	√	√	√	X	X	X

Bottom Line

- FCC should maximize amount of **unimpaired** spectrum cleared
  - Truly near-nationwide clearing target
  - Eliminate Dynamic Reserve Pricing
- Such an approach would
  - Maximize forward auction proceeds
  - Maximize broadcaster prices and participation
  - Maximize useable paired wireless channels
  - Minimize future inter-service interference issues
- For example, an **unimpaired** plan (vs. impaired 120 MHz uplink scenario studied) actually provides **more** channels in 6 of the top 10 markets:
  - 4 additional paired channel blocks in NYC, Washington, Boston, Los Angeles and San Francisco
  - 5 additional paired channel blocks in Philadelphia and San Diego
  - Generates **more** revenue, **higher** prices and **maximizes** usable paired spectrum