Border Sharing Plan

A Proposal for State 700 MHz Channel Use in the Northeast

Background

- From the 24 MHz of the 700 MHz Public Safety Band, 2.4 MHz is designated as state use channels. All the states in the Northeast have received a license for all the allocated state spectrum.
- State licenses are granted as geographical area licenses bounded by the state boundaries.
- FCC has given the states the responsibility for their own use of the spectrum.
- Therefore to avoid interference, cooperation on channel use at the borders needs to be addressed by the states

Introduction

- Interior areas of states, beyond the border regions, may use any of the State's geographically assigned channels.
- New York is developing a proposal for state geographically assigned channel use along the borders of all northeastern states.
- New York recommends that an MoU be used to codify the understanding between States.
- The MoU as proposed for this application will cover state use channels at the borders of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, and Vermont.

FCC Channel Plan

- The 2.4 MHz of state license spectrum consists of 192 channel pairs (base/mobile pairings) at 6.25 kHz wide channels.
- The 192 paired channels are a subset of the 960 total 6.25 kHz paired channels that comprise the narrowband segments of the band.
- The state channels begin with channel number 25, and end with channel number 948 (Fixed Station channel numbers).

Proposed Border Channel Plan

- The 192 state paired channels were combined into 48 individual 25 kHz wide aggregated channel sets.
- An aggregated channel plan of 25 kHz was chosen so as not to inhibit the use of future technologies.
- The aggregated channels can easily be reconfigured as 12.5 kHz wide channels for a total of 96 paired channels.

Channel Grouping

- The 48 paired channels are segregated into 12 lots called Groups
  - Each Group contains two channels from TV channel 63 (paired with 68), and two channels from TV channel 64 (paired with 69).
- Each channel in a Group is separated by a min. of 250 kHz.
- The proposal names the Groups: A - L.
- All groups experience the same television interference effects because the interfering television channels are equally represented within each group.

Proposed Channel Grouping

Group	Channel Numbers			
A	25-28	65-68	645-648	685-688
B	29-32	69-72	649-652	689-692
C	33-36	73-76	653-656	693-696
D	185-188	225-228	805-808	845-848
E	189-192	229-232	809-812	849-852
F	193-196	233-236	813-816	853-856
G	105-108	145-148	725-728	765-168
H	109-112	149-152	729-732	769-772
I	113-116	153-156	733-736	773-776
J	265-268	305-308	885-888	925-928
K	269-272	309-312	889-892	929-932
L	273-276	313-316	893-896	933-936

Fixed Station Channel Numbers

Channel Grouping

Group	Channel Numbers			
A	25-28	65-68	645-648	685-688
B	29-32	69-72	649-652	689-692
C	33-36	73-76	653-656	693-696
D	185-188	225-228	805-808	845-848
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This table lists the FCC channels for the Fixed Station side. These are made up from TV channels 63 and 64, and are paired with the Mobile Station channels made up from TV channels 68 and 69.

- Example, Group A.
  - Group A is made up of four 25 kHz plan channels.
  - Each of the 25 kHz plan channels is made of four aggregated 6.25 kHz FCC channels

Plan Super-groups

- Super-groups are combinations of Groups.
- By design grouping in these Super-groups,
  - Minimize the possibility of interference, and
  - Maximize the amount of state use channels that can be utilized at the borders.

    (Note: this plan contemplates a 25 mile border zone within each state's boundary as described later. Along the Canadian border, a similar arrangement is suggested, but international sharing in this band has yet to be negotiated by the U.S. State Department and FCC – 7/28/02.)

Super-groups

- Groups are combined into five Super-groups.
- A Super-group consists of 4 or 6 Groups.
  - –An example of a Super-group would be:

    A, B, C, D, E, F, or

    G, H, I, J, etc.
- Super-groups can be allotted by Counties within a State, or by geographic coordinates.

Super-group #	Groups
1	A, B, C, D,E, F
2	G, H, I, J, K, L
3	G, H, I, J
4	E, F, K, L
5	A, B,C, D

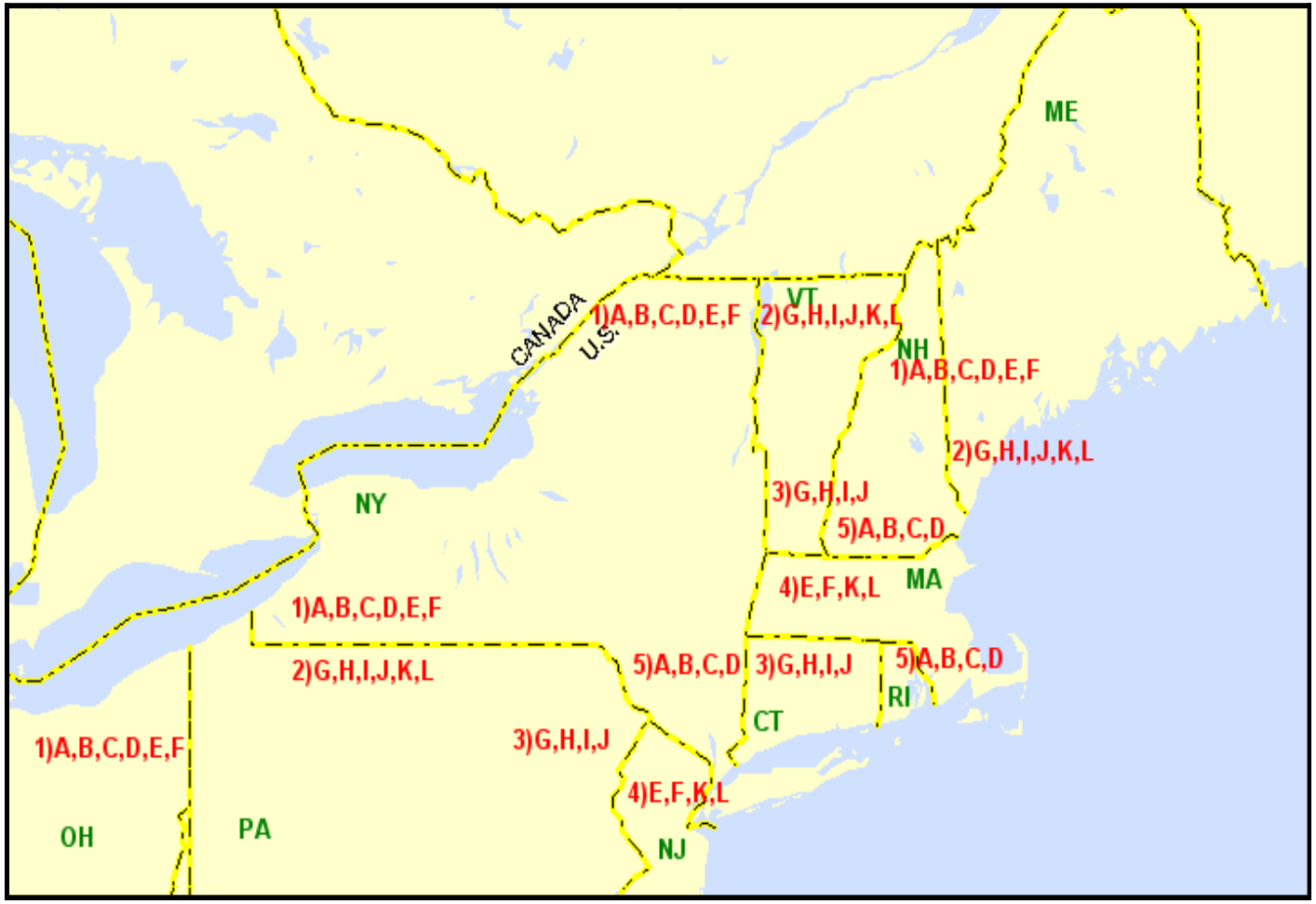
This Table lists Super-group assignments as proposed for this Northeast application.

Super-group Assignments

State	Super-group #
Ohio	1
Pennsylvania	2 and 3
New York	1 and 5
New Jersey	4
Connecticut	3
Rhode Island	5
Massachusetts	4
Maine	2
New Hampshire	1 and 5
Vermont	2 and 3

- Along most of the shared common border between NY and PA Super-group 1 is allotted to NY, and Super-group 2 is allotted to PA.
- Near the border of NY, PA, and NJ, Super-group 3 is allotted to PA, Super-group 4 is allotted to NJ, and Super-group 5 is allotted to NY.
- In the region of the NY, MA, and VT border, Super-group 1 is allotted to NY, Super-group 4 is allotted to MA, and Super-group 3 is allotted to VT.

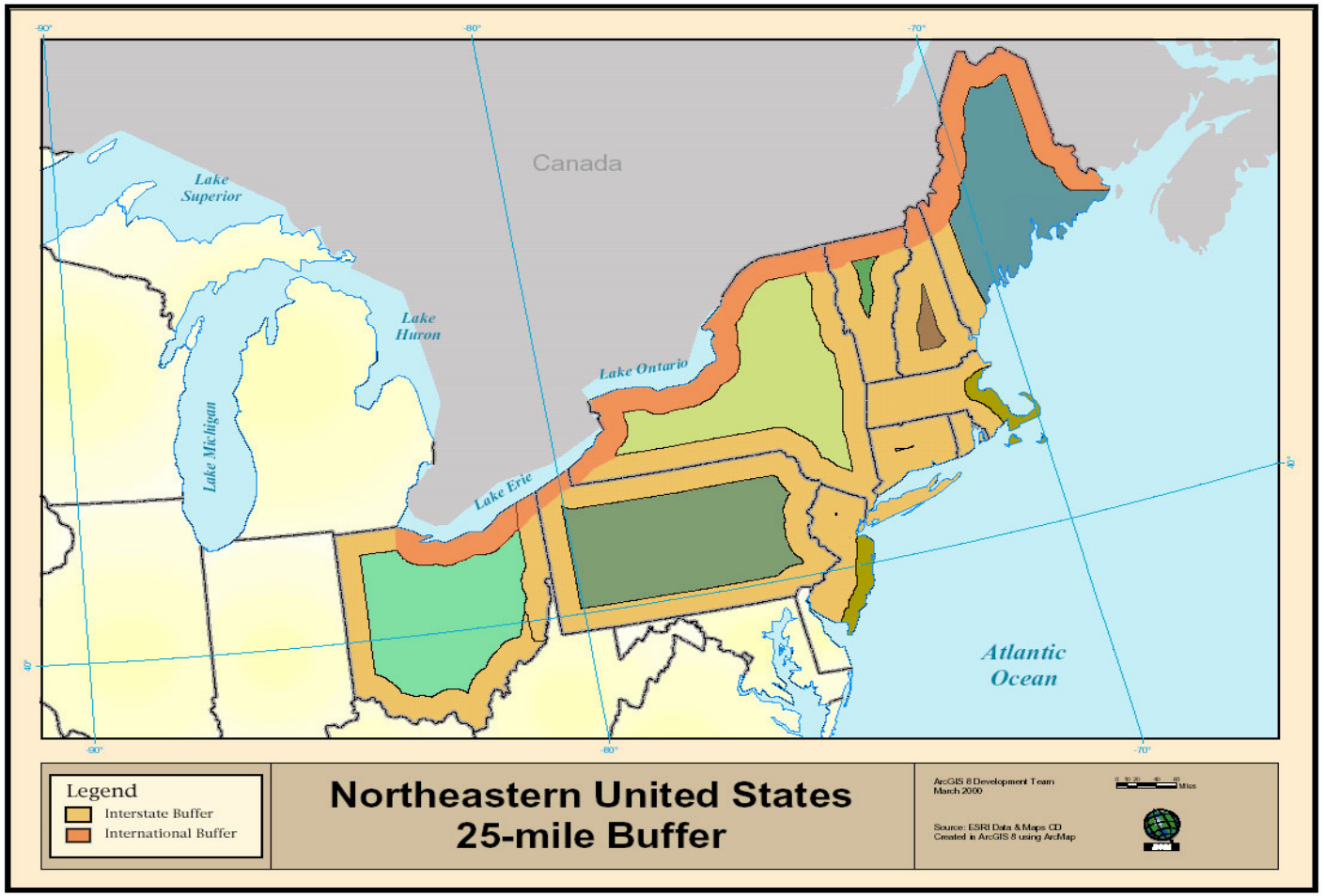
Super-group Assignments



Frequency Reuse

- Super-groups allotted to a state can be used within a 25-mile buffer zone along the border regions.
  - The 25-mile buffer zone was deemed reasonable based upon simulations employing directional antennas, and radio horizon calculations.
    - Tx height of 150 feet and a Rx height of 6 feet.
- Sites within the buffer zone can have their 40 dBμV/m contour (service contour) extend a distance of 5 miles beyond their border.

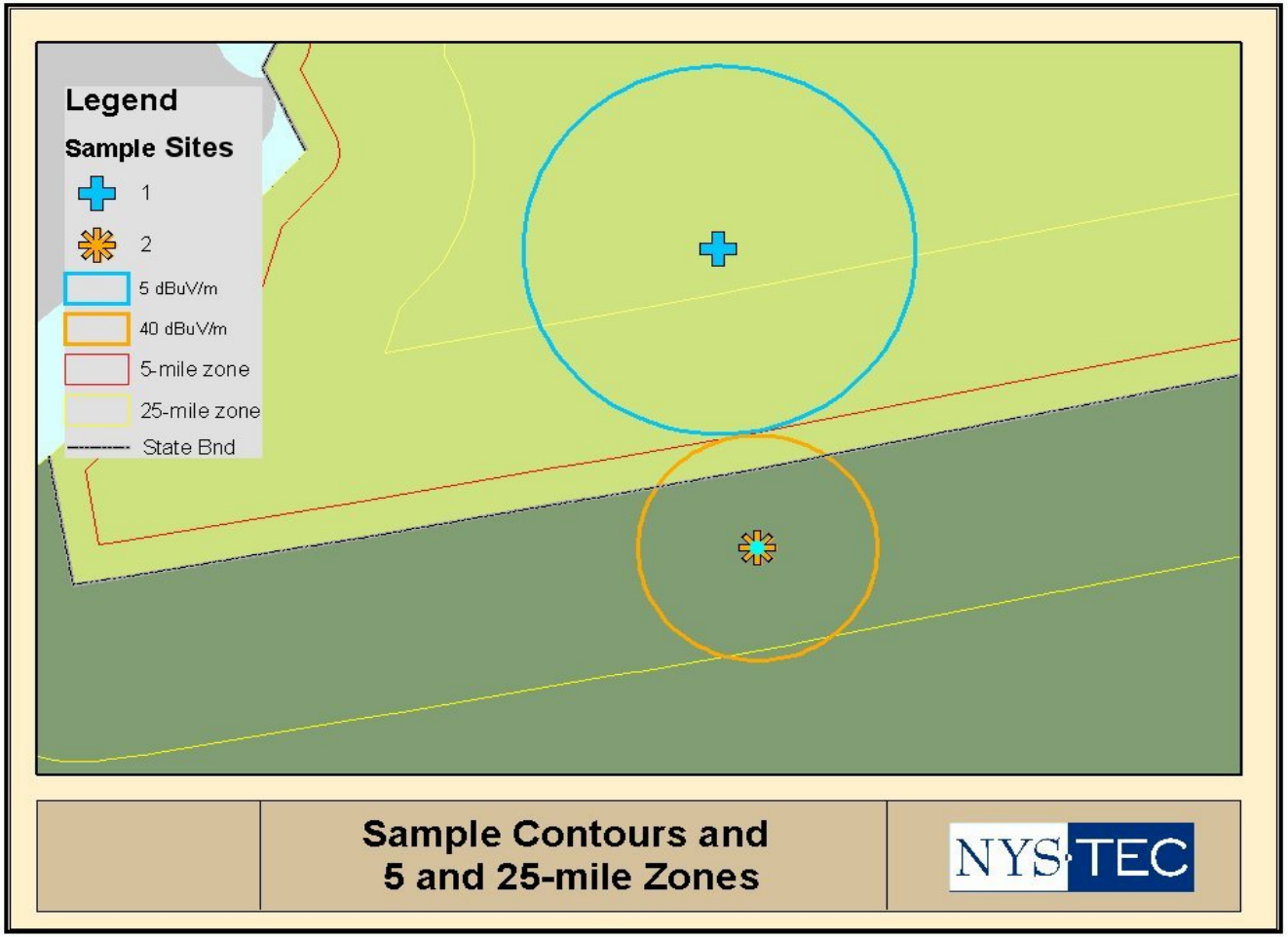
25 - Mile Buffer Zone



NYSTEC

STATEWIDE WIRELESS NETWORK

Example: Sample Sites



Frequency Reuse

- To avoid interference between Channel Groups outside the 25-mile buffer zone to the same Groups within the 25-mile buffer zone in bordering states, the site outside the 25-mile buffer zones' 5-dBμV/m contour (interference contour) shall not come closer than 5 miles to another state's border.
- Geographic site placement may be essential to achieving the desired contours.
- This Border Sharing Plan requires that States will use substantial antenna pattern and ERP constraints to ensure that interference contours are in accordance with their MoU.

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