

# Locating Those Elusive Exclusive-Use Channels

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**President**

**2:00 p.m. ET - April 21, 2016**

# Housekeeping

- Please mute your phones at the start of the webinar: \*6 to mute and \*7 to unmute
- There will be a Q&A session at the end – please submit questions via the chat capability
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# Session Objectives

- Review Basic Rules
- EWA Analyses/Tactics
- Keep it Simple

# Trunking Systems + Exclusive Use Channels

The channel monitoring requirement does not apply to frequencies used within trunked systems where written consent is obtained from affected licensees using either mileage separation or protected contours ...

# Trunked Radio System License Codes

- 150-512 MHz
  - YW - Public Safety
  - YK - B/ILT (Interconnected)
  - YG - B/ILT
- 800/900 MHz
  - YP, YE – Public Safety
  - YB, YU, YO, YI, YJ - B/ILT
  - YM, YX, YL, YS - SMR

# Station Class Codes

- FB2 - Private system repeater (Shared Monitoring)
- FB4 - Community repeater (Shared Monitoring)
- FB6 - Private carrier repeater (Shared Monitoring)
- FB7 - Cooperative repeater (Shared Monitoring)
- FB8 - Private Internal/Carrier repeater (Exclusive Use)
- MO8 - Private Internal/Carrier mobiles (Exclusive Use)

# Critical Technical Data

- Band
- Geographic coordinates
- Effective radiated power
- Antenna pattern
- Height above ground
- Height above average terrain
- Emission designator(s)

# Basic Rules

- 150 - 174 MHz (FCC Rule Section 90.187)
  - Exclusive use channels ... trunked systems only
  - Concurrence from affected incumbents
  - 37 dBu service/19 dBu interfering contour reciprocal co-channel analyses
- 450 - 470 MHz (FCC Rule Section 90.187)
  - Exclusive use channels ... trunked systems only
  - Concurrence from affected incumbents
  - 39 dBu service/21 dBu interfering contour reciprocal co-channel analyses



# Basic Rules

- 470 – 512 MHz (FCC Rule Sections 90.307/313)
  - 40 mile separation from co-channel transmitters
  - Mobile loading (50 PS and 90 B/ILT)
  - Adjacent channel TSB 8.8 analysis ( $\leq 5\%$  degradation)
- 800/900 MHz (FCC Rule Section 90.621)
  - Greater than 113 km separation from co-channel transmitters
  - Reduced power at 88 - 113 km separation from co-channel transmitters

# Successful Techniques

## Have Reasonable Spectrum Expectations

- Minimum number of exclusive channels necessary
- Conduct preliminary channel availability – shared/exclusive channels and number/type of incumbents (No surprises!)
- Monitoring capabilities of proposed trunked system
- Do not over engineer the system – more power than is needed, maximum antenna heights, excessive mobiles
- Be flexible

# Successful Techniques

## Modify Technical Parameters (Basic)

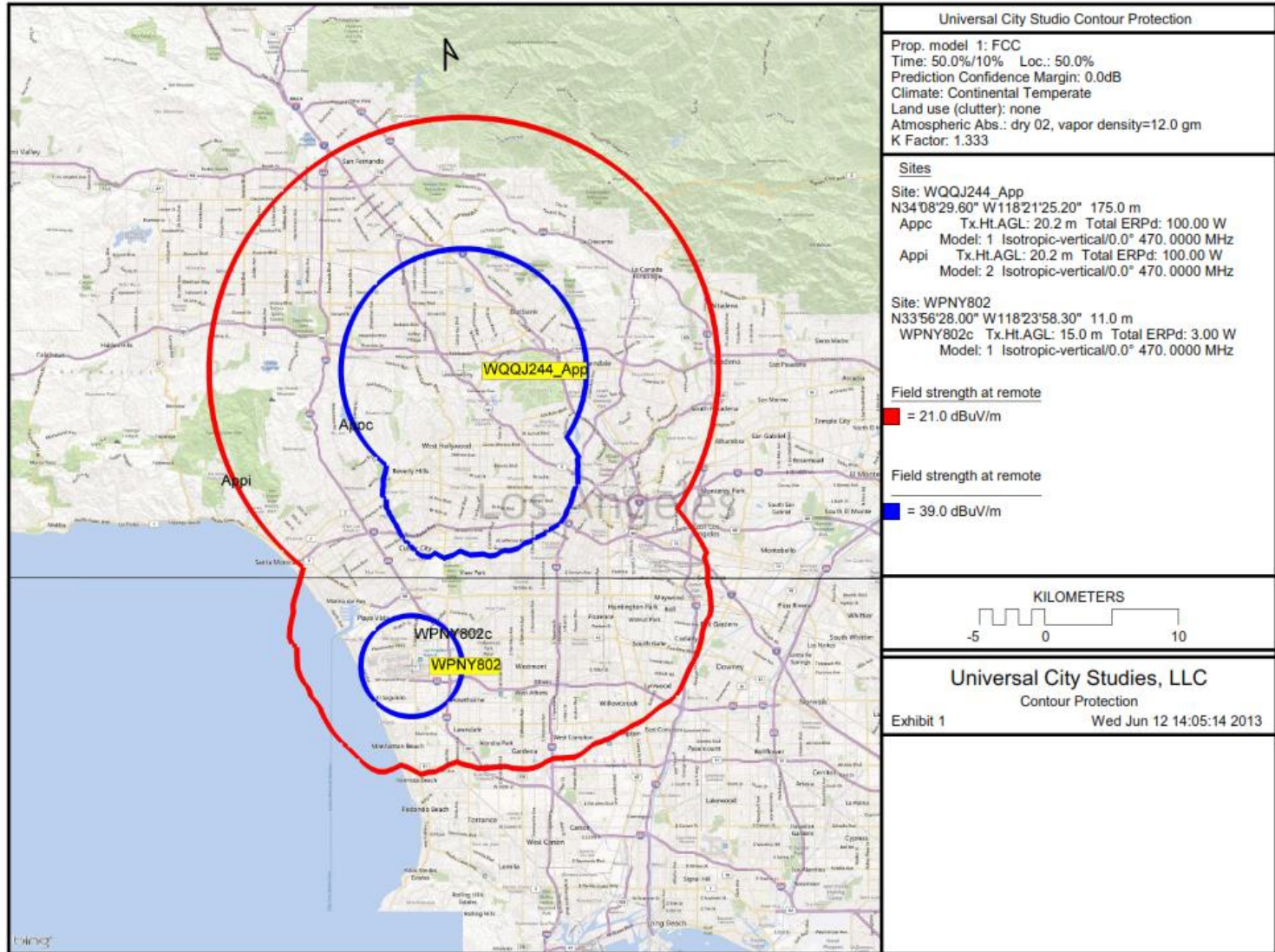
- Identify systems that preclude exclusive use
- Lower power
- Lower antenna height
- Rerun contour analyses

# Successful Techniques

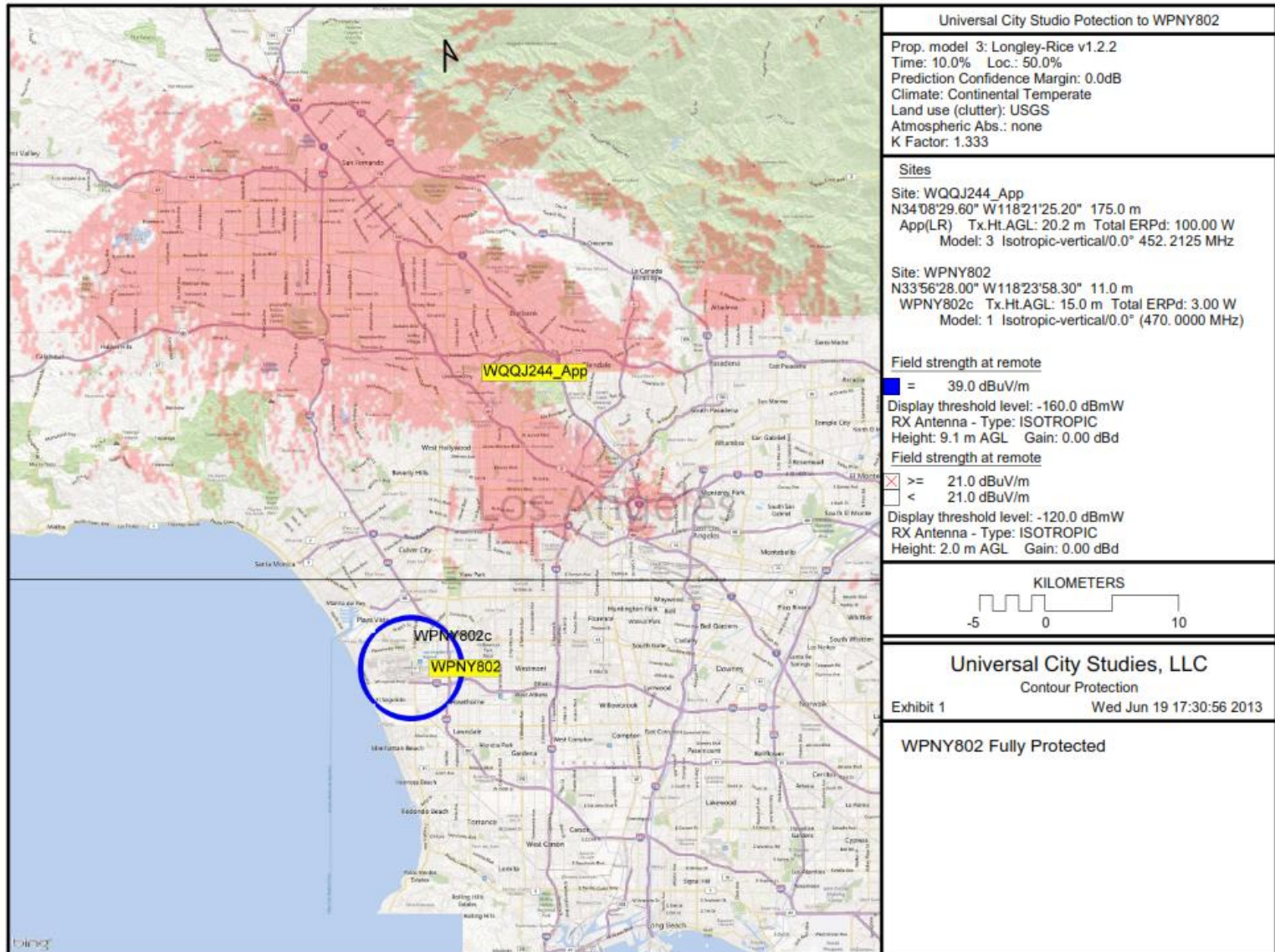
## Modify Technical Parameters (Advanced)

- Identify alternative sites
- Use Longley Rice propagation model (in lieu of R6602) for contour analyses (Western regions)
- Review level of contour overlap, amend antenna pattern, rerun analyses

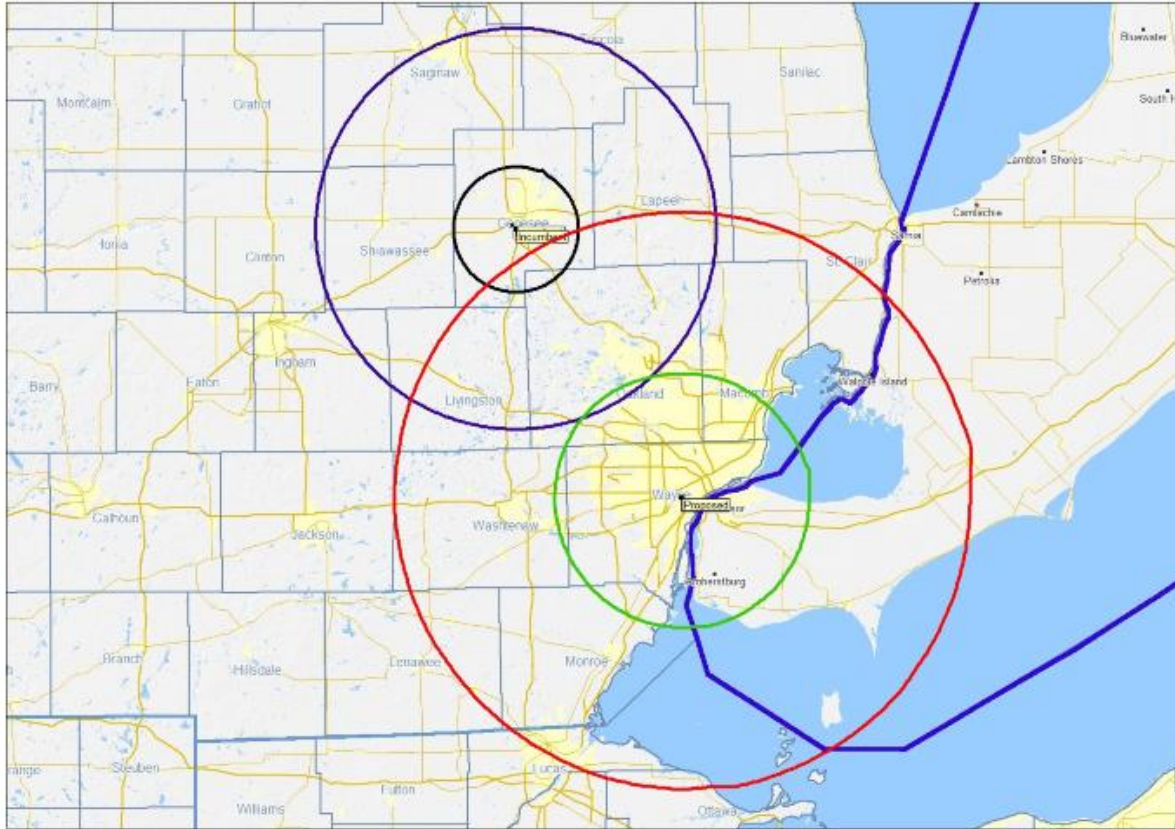
# R6602 Fails Evaluation



# Longley Rice Passes Evaluation

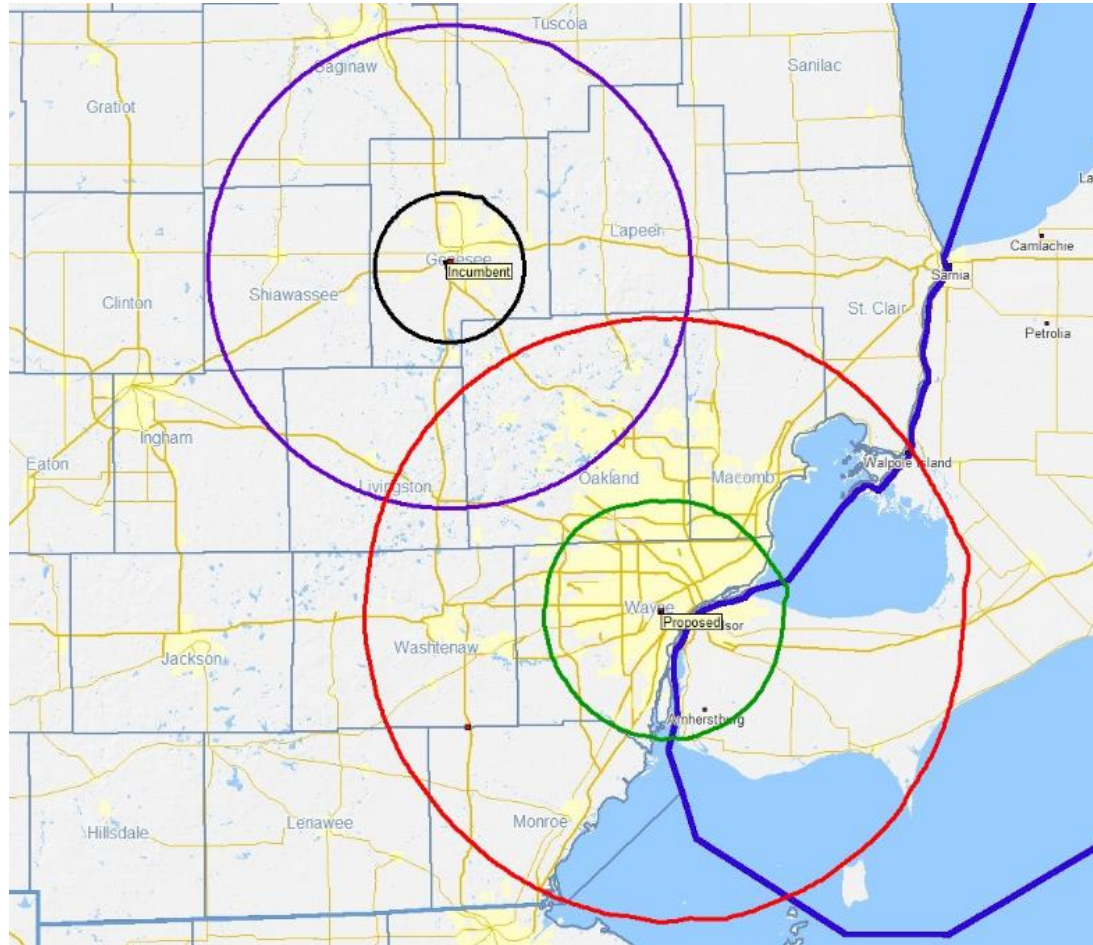


# Shared Channel Usage



Call sign	Latitude	Longitude	Freq (MHz)	Antenna Height (m)	ERP (W)	Emission
Incumbent	42°58'25.1" N	83°43'10" W	450-470	18	500	11K2F3E
Proposed	42°18'26.1" N	83°9'40.7" W	450-470	60	800	11K2F3E

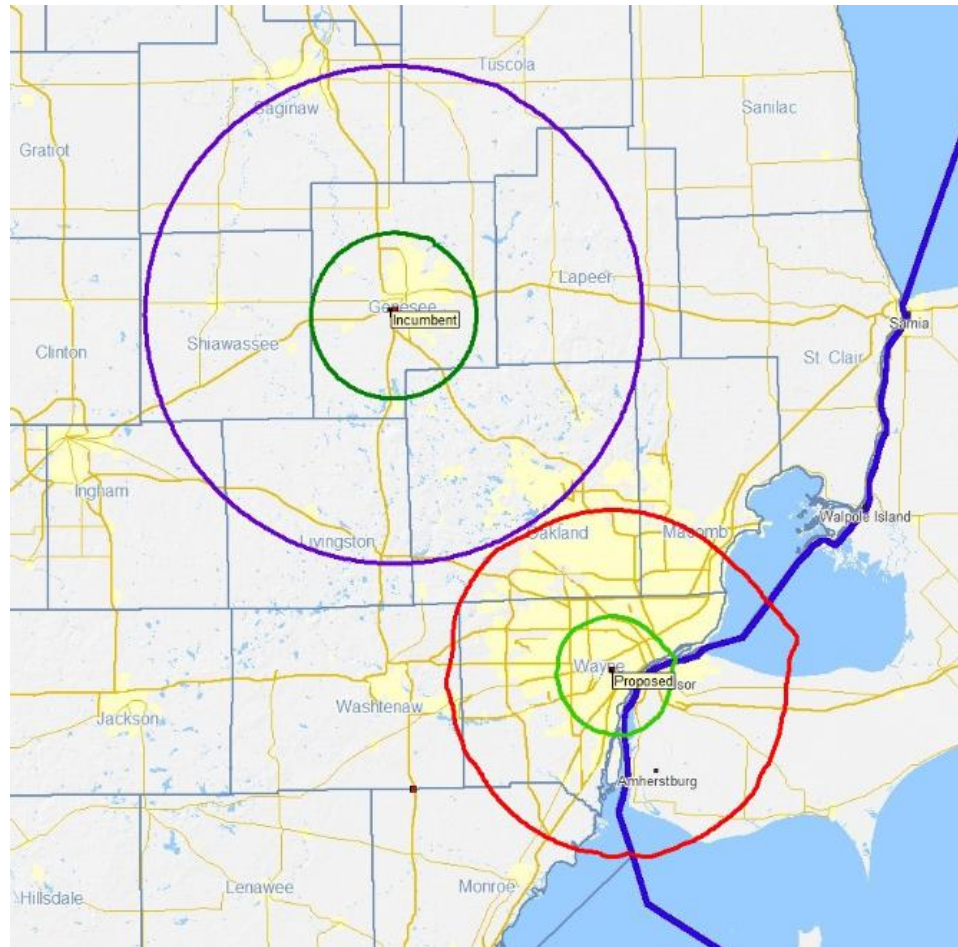
# Exclusive Use Systems



Callsign	Latitude	Longitude	Freq (MHz)	Antenna Height (m)	ERP (W)	Emission
Incumbent	42° 58' 25.1" N	83° 43' 10" W	450-470	18	500	11K2F3E
Proposed	42° 18' 26.1" N	83° 9' 40.7" W	450-470	50	800	11K2F3E



# Exclusive Use Systems



Callsign	Latitude	Longitude	Freq (MHz)	Antenna Height (m)	ERP (W)	Emission
Incumbent	42°58'25.1" N	83°43'10" W	450-470	18	500	11K2F3E
Proposed	42°18'26.1" N	83°9'40.7" W	450-470	25	100	11K2F3E

# Successful Techniques

## Use of “Friendlies”

- Seek written concurrence with technical showing
- Run contour analyses with “Friendlies” not considered affected incumbents – concurrence(s) still required
- Relocate affected “Friendlies” to alternative channels

# Successful Techniques

## Analyze Alternative Spectrum Resources

- “Shared” spectrum pool – adjacent to primary radio service allocations (See Public Notice DA 02-1319)
- Petroleum, Power, Automobile Emergency, Railroad pools
- Low power pools
- Airport primary channels
  - 30 mile separation
  - Campus applications

# Successful Techniques

## Access/Acquire Spectrum Resources

- 450/460 MHz guard band channels
  - 4k - 451/456.00625, 451/456.009375, 451/456.0125, 462/467.5375 and 462/467.7375 MHz
  - 7k – 451/456.009375 MHz
  - Waiver required
  - Rule changes pending
- Acquire/lease Part 22 geographic licenses
  - Partition geography as necessary
  - Asking prices vary widely

# Successful Techniques

## Special Considerations – 6.25 kHz Only Channels

- 4K emission designators only
- 450 MHz co-channel contour analyses based on 39 dBu service/21 dBu interfering evaluations
- 450 adjacent channel analyses
  - If adjacent channel user is employing an 11K emission, a derated 51 dBu interfering contour is used
  - If adjacent channel user is employing a 7K emission, a derated 59 dBu interfering contour is used
  - If adjacent channel user is employing 4K emission, no further analysis is required

# Successful Techniques

## 4K Emission Designators at 150-174 MHz

- Co-channel contour analyses based on 37 dBu service/19 dBu interfering evaluations
- 150-174 adjacent channel analyses
  - If adjacent channel user is employing an 11K emission, a derated 82 dBu interfering contour is used
  - If adjacent channel user is employing a 7K emission, a derated 73 dBu interfering contour is used
  - If adjacent channel user is employing 4K emission, no further analysis is required

# Successful Techniques

## Intercategory Sharing

- Public Safety accessing B/ILT allocations
  - Reasonably high hurdle
  - Documentation required
  - Waiver/Public Notice process
- B/ILT accessing Public Safety allocations
  - Not possible below 470 MHz
  - Possible above 470 MHz

# Using Cevo Pro

- Provides Shared and Exclusive use results
  - Part 90 channel validation
  - Provides co-channel cumulative overlap analyses
  - “0” percent overlap = Exclusive use channel
- List of incumbents provided per channel
- User selects channels, manages evaluation



# Thank You - Questions?

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# Upcoming EWA Webinars – Dates TBD

Why Do I Need to Understand Emission Designators?

6.25 kHz Only Channel Opportunities

Cevo – Spectrum Choices at Your Fingertips

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