Wireless Strategies Inc.

Spectrum is a Finite and Precious National Resource

"Hundreds of promising technologies are dependent on one resource – spectrum. Because there is a finite amount of spectrum and a growing demand for it, effectively managing the available spectrum is a strategic issue for the FCC and the NTIA"

- Source: FCC Web Site

Dramatic Increase in the Demand for More Spectrum for Broadband

Spectrum Requirements

Time

Wireless Strategies Inc.

Without More Backhaul Capacity, Additional Broadband Spectrum Is Useless

- *"Regardless of how the battle for technical supremacy in third- and fourth-generation mobile data pans out, backhaul capacity will fast become a bottleneck unless the network is quickly upgraded."*

- *"Current backhaul capacities are clearly insufficient for the new data-rich services."*

-Daniel Wojtkowiak, RFS Global Product Manager Radio Link Networks. "Microwave Could Ease '4G' Backhaul Strain," *Cellular-News*, posted Sep. 1, 2008; http://www.cellular-news.com/story/33359.php

Need for More Backhaul Capacity (cont'd)

- *"Perhaps the most pressing imperative facing the fixed-line broadband network is not a consumer-facing application. Rather, it is the unglamorous - yet critical - role of backhauling data traffic from the remote cell site…."*

-"The Future of Fixed Broadband" *by John Janowiak, President, International Engineering Consortium, available at http://www.connect-world.com/PDFs/articles/2008/NA_2008/NA_2008_02.pdf*

Problem/Solution

- Problem:
  - The Amount of Spectrum is Finite and All Suitable Spectrum is Assigned
- Solution:
  - Re-allocate Spectrum (Rob Peter to pay Paul)
  - Innovate (Find Wasted Spectrum then Put It to Productive Use)

The Key to Achieving Greater Backhaul Capacity Lies in More Efficient Use of Microwave Links

- The Problem Is that the Main Radio Spectrum for Backhaul, Part 101 Point-to-Point Microwave Spectrum, Is in Short Supply Because It Is Used Very Inefficiently.

- The Following Slides Demonstrate the Problem:

A Theoretically Perfect Point-To-Point Antenna Would Have No Sidelobes

In Reality, All Point-To-Point Antennas Have Sidelobes

Stated Otherwise, All Point-To-Point Antennas Radiate Power in All Directions

Equivalent Isotropically Radiated Power (EIRP)

Rule 101.103 – Coordination of EIRP

(Only the EIRP at zero degrees is used, at all other angles it is unused, it is WASTED)

EIRP

125 Miles

250 Miles

Prior
Coordination
Boundary

Side Lobe Radiation
Concurrently Coordinated

Wireless Strategies Inc.

Wasted Spectrum

- Because These Licenses are Authorized on an Exclusive Use Basis, Around Every Licensed Station There Are Locations Where a New Applicant Could Not Locate a New Station Because It Would Either Cause or Receive Harmful Interference.
- Although Some of These Locations Could Have Been Used by Existing Licensees, They Have Not. The Coordinated Spectrum has been Wasted.

Legacy Microwave Path

Wireless Strategies Inc.

Legacy Microwave Path

Used Coordinated
Radiated Power

Unused (Wasted)
Concurrently Coordinated
Radiated Power

Legacy Microwave Station

Used Coordinated
Radiated Power

Unused (Wasted)
Concurrently Coordinated
Radiated Power

Wireless Strategies Inc.

Wouldn't It Be Wonderful If the Radiated Power in ALL Directions Could Be Put to Productive Use?

Used Coordinated Radiated Power

Unused (Wasted) Concurrently Coordinated Radiated Power

Wireless Strategies Inc.

It Can, Through Innovation

There Are Innovative Techniques that Allow Licensees to Dramatically Increase the Effective Use of this Spectrum by Putting into Productive Use Some of the heretofore Unused Locations by:

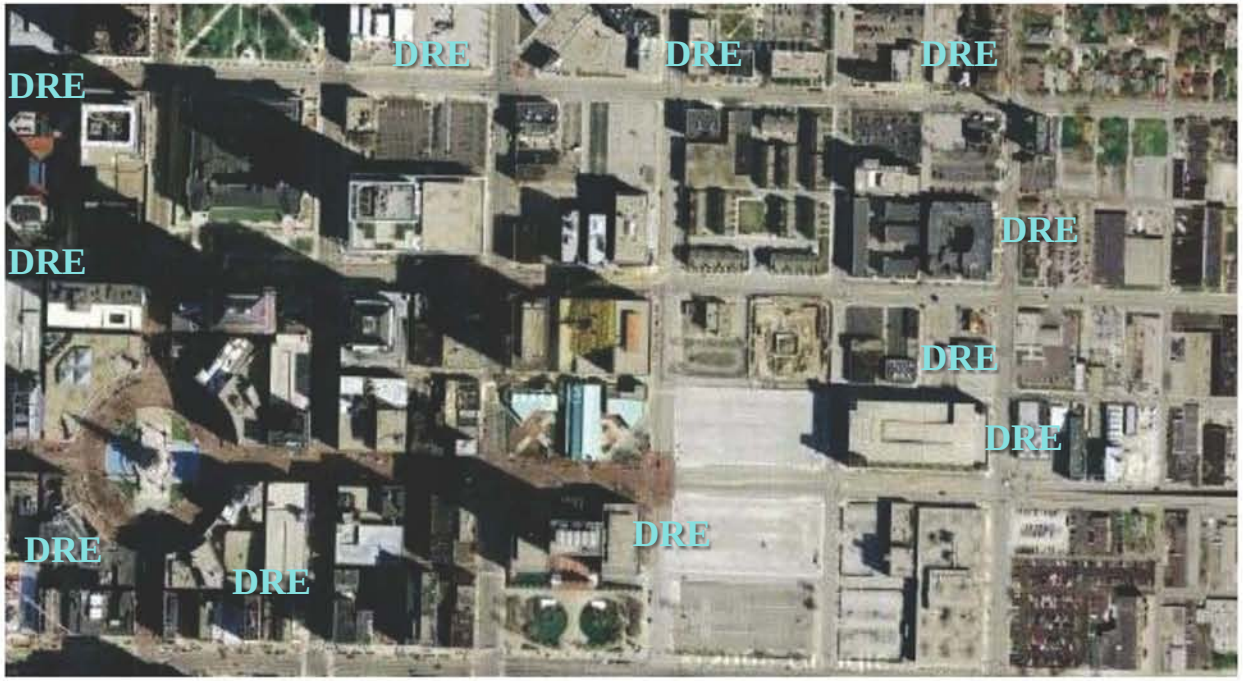
1. Upgrading the Licensed Station's Transceivers to have Multiple Access Capabilities

2. Deploying Distributed Radiating/Receiving Elements (DREs) Around the Licensed Stations

What are DREs?

A licensed antenna's radiating/receiving elements distributed around the station's point of coordination.

Upgraded Microwave Station with DREs



Used Coordinated Radiated Power with DREs

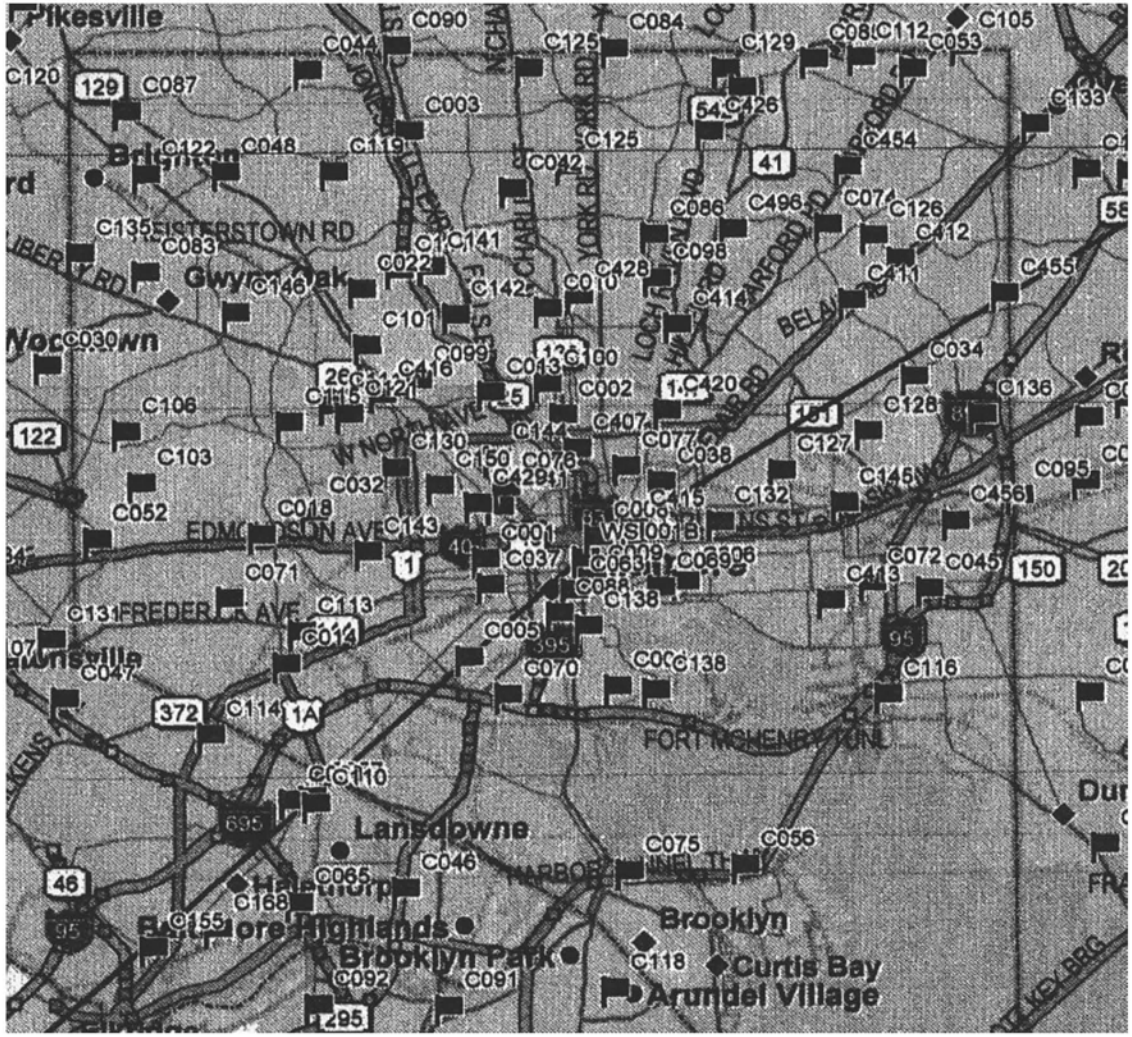
Wireless Strategies Inc.

DREs Will Cause No Harm

DREs are secondary to the licensed path

(They must not cause and must accept harmful interference)

Baltimore



Since July 2008 WSI has been operating two 6GHz Licensed Paths with Multiple Access Capability Serving Only Two Locations. With permission to Deploy DREs an Additional 98 4G Base Stations could have each been served Conserving 5.8GHz of Spectrum compared to Legacy Paths and to have done so at a Cost 80% Less than the Legacy Approach.

Wireless Strategies Inc.

Benefits from the Deployment of DREs Around Licensed Microwave Stations

Dramatically Increases the Effective Use of Spectrum

- ✓ Dramatically Lowers the Cost of Backhaul and Access
- ✓ Conserves Large Amounts of Spectrum - A Finite National Resource
- ✓ Makes it Economical to Provision Broadband Services to Unserved and Underserved Communities
- ✓ Promotes Investment in Innovation
- ✓ Improves the Quality and Lowers Healthcare Costs Through the Use of Telemedicine Due to Lower Cost Broadband
- ✓ Creates Wireless Industry Jobs in Research, Development, Manufacturing, Construction and Installation

Wireless Strategies Inc.

NOTICE OF INQUIRY

GN Docket No. 09-51

Fostering Innovation and Investment in the Wireless Communications Market

GN Docket No. 09-157

A National Broadband Plan For Our Future

Comments

GN Docket No. 09-51

"As the Commission recognizes, there is no more effective way to kill a potential innovative concept than to consign it to regulatory limbo [years of delay]".

-Enterprise Wireless Alliance , filing September 30, 2009, Item D

"Reaching the market early is critical to an innovating entrepreneur. It trumps competitors, pays back investors, gives a leg up in the standards process, and might even brand a new product category. Regulatory delay [years] threatens all of these benefits. To the individuals involved, the wait for Commission action is enormously frustrating – and all the more so when the product not only offers obvious benefits to the public, but presents no realistic threat of Interference".

- Mitchell Lazarus, filing September 30, 2009, Item B last paragraph.

WTB Docket 07-121

- February 23, 2007 WSI filed a request for a declaratory ruling.
- June 19, 2007 WTB issued a Public Notice asking for Comments.
- Out of frustration, on August 21, 2009 WSI asked for an Immediate Ruling to allow DREs to be deployed around licensed stations on the following conditions:

Conditions to DRE Deployment

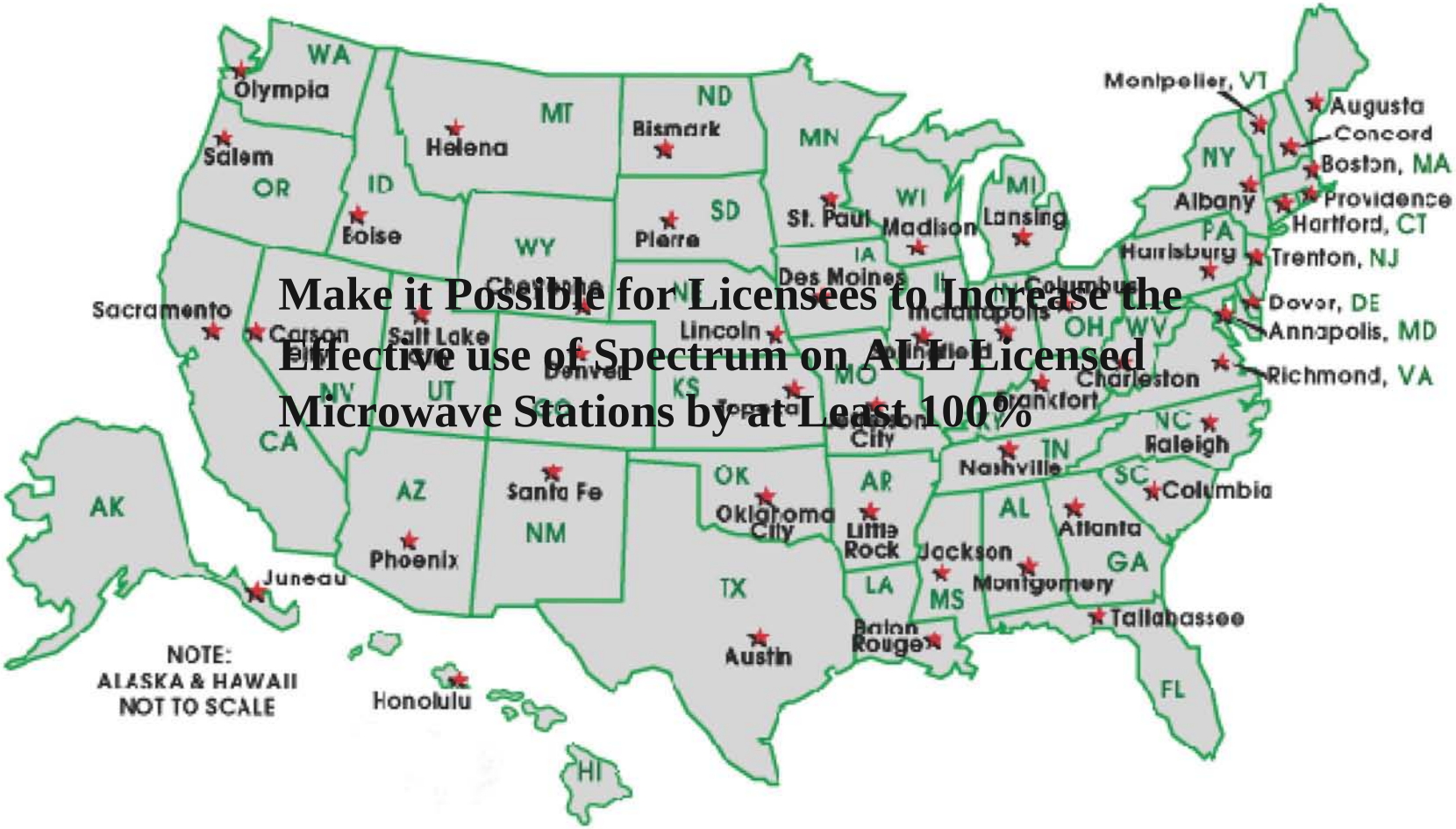
1. DREs are secondary to the licensed path (They must not cause and must accept harmful interference).

2. As required by Rule 101.103 and consistent with existing procedure, before deployment of one or more DREs the licensee must coordinate the proposed DREs by studying the prospect for harmful interference, issuing a prior coordination notice (PCN) to frequency coordinators and allowing the coordinators thirty days to evaluate the potential for harmful interference.

3. Following existing coordination practice, a new applicant attempting to frequency coordinate a new path who predicts that interference from a DRE would be greater than the interference from the DRE's licensed or prior applicant's proposed licensed station(s), can require the licensee or prior applicant to reduce the predicted interference to levels no higher than would be predicted from the DREs associated licensed station(s).

4. The addition of DREs around a licensed station is considered a major change to the license

An Immediate Ruling that DREs can be deployed around licensed microwave stations would:



Make it Possible for Licensees to Increase the Effective use of Spectrum on ALL Licensed Microwave Stations by at Least 100%

Wireless Strategies Inc.

Facilitating Broadband Deployment

The Commissioners are requested to help Bring the Benefits of the Deployment of DREs Around Licensed Microwave Stations to the Nation ASAP.