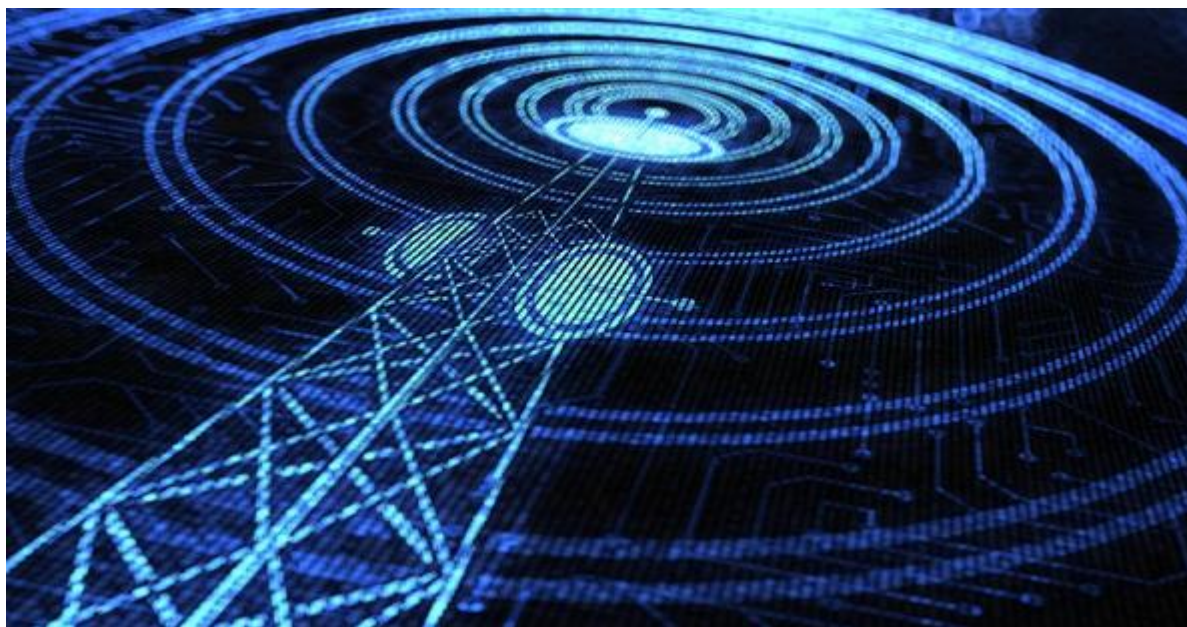


Wireless Spectrum Research and Development (WSRD)  
*Promoting Economic Efficiency in Spectrum Use*

## ***Fallow Spectrum And The Economy***

*Determining Economic Losses Caused by  
the Fallow and Poorly Built-Out Licensed Spectrum*



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# Barlow Keener

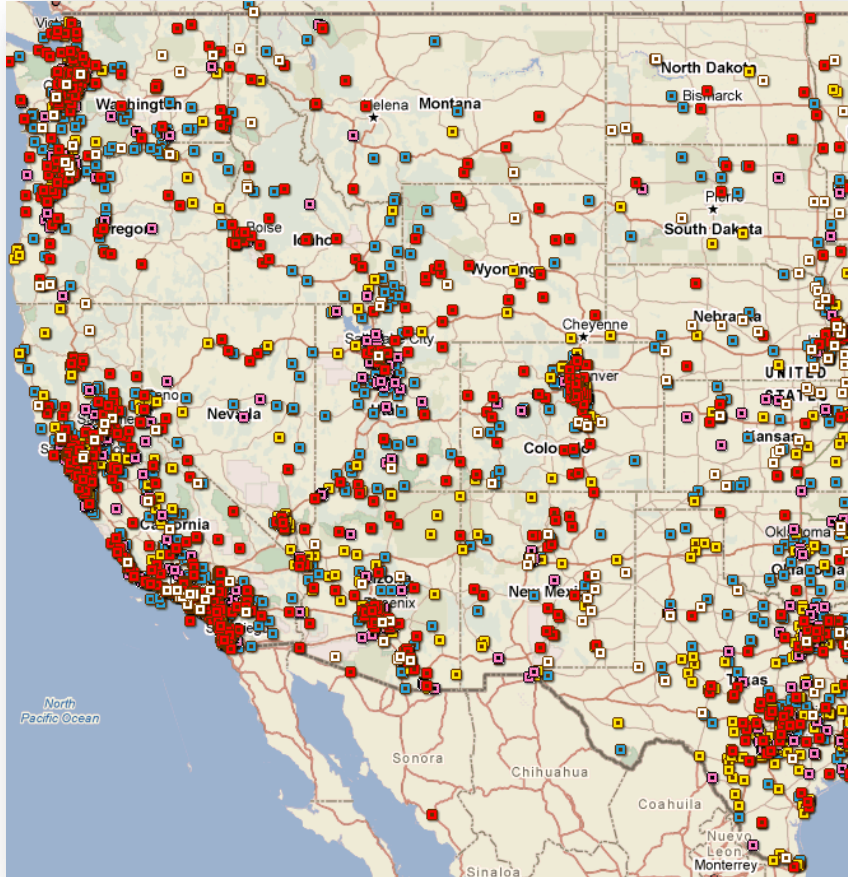
Keener Law Group



- White Spaces regulation and transactions
- Muni-Wi-Fi and fiber optic construction legal issues
- Practicing telecommunications law for 20 years
- Represent fiber optic service providers
- Distributed Antenna System (DAS) projects
- Former in-house counsel for RBOC and CLEC
- B.A., University of the South
- M.A., North Carolina Central University
- J.D., Emory University School of Law

# Fallow Spectrum

## Measurable Losses in Dollars



- Fallow = Spectrum Licensed but not used**
- Infrastructure not built, or lightly built
  - Hoarding = Preventing Competitive Use

### Economic Losses Result from Fallow Spectrum

- Losses Difficult to Analyze
- Typically, but not always, in Rural Areas

### For Carriers:

- Churn,
- Roaming Charges

### For Public:

- Worker Efficiencies – Time Lost
- Public Safety – lack of communication
- Lack of ability to access data
- Lower real estate values

# The Problem:



## Measuring Economic Loss Resulting From Fallow Spectrum

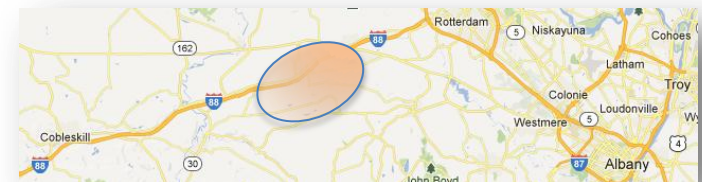
**Fallow Spectrum is not well identified on a GIS mapped level  
What Carrier owns what spectrum and where?  
Where is infrastructure built out, or lightly built?**

**Similar to identifying the lack of broadband in rural areas**

**Fallow Spectrum impedes productivity for anyone driving in rural areas even on major highways.**

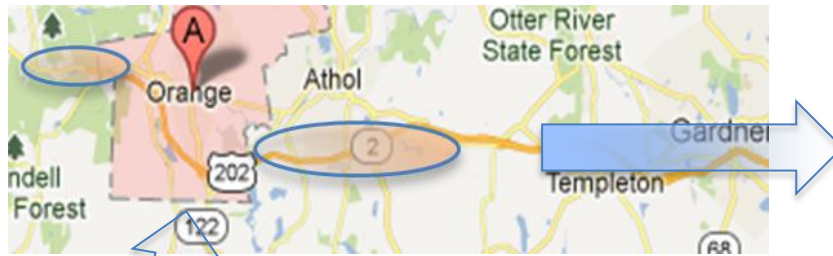
**Economic loss caused by fallow spectrum is real, but not measured**

**Requires measurement from the “ground up”**





# Study



Develop a study using **micro-geo spectrum data** and population data

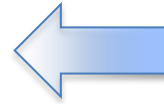
Micro-geo spectrum data is available and can be used for a more accurate measurement geographies and **roads without mobile service**

**The numbers of mobile users traveling** with lost productivity can be measured

The loss of productivity on a micro-basis is measurable



# How



**Fallow Spectrum  
Lost Productivity**

**Use micro-mapping, big-data methods** to determine precise fallow spectrum areas in U.S. lacking mobile coverage.

**Number of competing carriers by micro-geography** and estimated subscribers by carrier

**Mapping data will be over-layered** in these geographic areas with population data, income data, home data, and road traffic data.

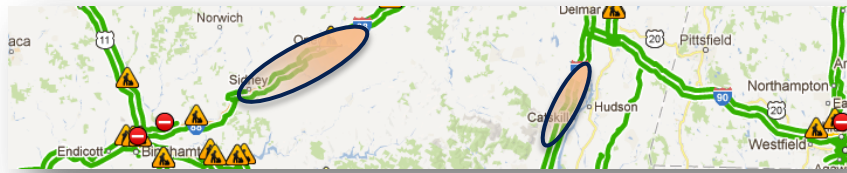
Productivity estimates for the loss of productivity by the population occupying these areas and **traveling through areas – like Amtrak**

**Hours of time lost** while out of email and phone communication on road ways.

**The result would be the national economic loss** caused by fallow licensed spectrum.



# Challenges



**Traffic Patterns**

Obtaining **accurate micro-geo spectrum information for fallow and poorly used spectrum**

**Matching the fallow spectrum with the licensees - subscriber numbers**

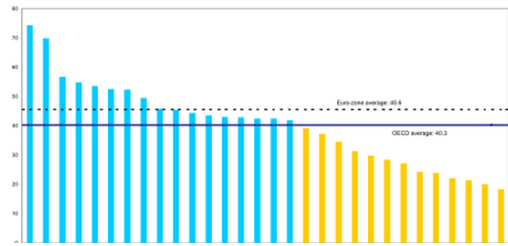
**Finding data regarding** the number of vehicles on the roads

**Extrapolating potential lost productivity where users can access broadband at** their homes but not mobile service

**“No bars”** Determining the losses caused when public safety, NEMA, other emergency and mobile governmental workers are out of communication

**“I’m about to lose you.”** Determining the lost productivity in areas that are semi-fallow – meaning not well-built out with infrastructure

# Benefits



**Determining accurate economic losses** caused by fallow spectrum would:

**Give regulators information needed to design** appropriate licensing strategies

- Enforcement of “use it or share it” requirements
- Crafting regulations for fallow spectrum sharing or Priority Use.
- Public economic losses can be balanced against auction revenues
- Eliminate hoarding motivation for spectrum
- Increasing competition and choice

**Give carriers information regarding:**

- Lost revenue caused by churn of customers traveling regularly through fallow areas
- Customer dissatisfaction
- Alternative for 3<sup>rd</sup> party roaming agreements using fallow spectrum

**Create safer rural roads**

- Ensuring public safety and driver communication in rural areas



# Thank you

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