



Broadband Spectrum: Potential Sources and Challenges

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Utilities' Broadband Spectrum Challenges

- No CII Broadband Allocation
- Congress Wants Spectrum Auctions
- FCC Bias—CII entities should look to
 - Wireless carriers' broadband services
 - Even though not suitable for smart grid apps
 - Spectrum auctions or previously auctioned spectrum
 - Shared/unlicensed spectrum

Utilities' Broadband Spectrum Challenges

- National Broadband Plan
 - Reflected staff's singular focus on commercial broadband for high speed Internet access
 - Not in sync with utility wireless broadband requirements
 - Potential access to P.S. 700 MHz broadband
 - Future CII/utility allocation—TBD

Utilities' Broadband Spectrum Challenges

Goals in National Broadband Plan

Minimum Broadband Capabilities

Universal Service Minimum

- 4 Mbps Download
- 1 Mbps Upload

Goal: By 2020--100 Million Homes to Have

- 100 Mbps Download
- 50 Mbps Upload

NBP does not acknowledge nor discuss utility wireless broadband requirements

No mention of minimum data rates

Utilities' Broadband Spectrum Challenges

Carrier Wireless Broadband Realities

Smart phone apps overwhelm carrier networks

No SLAs

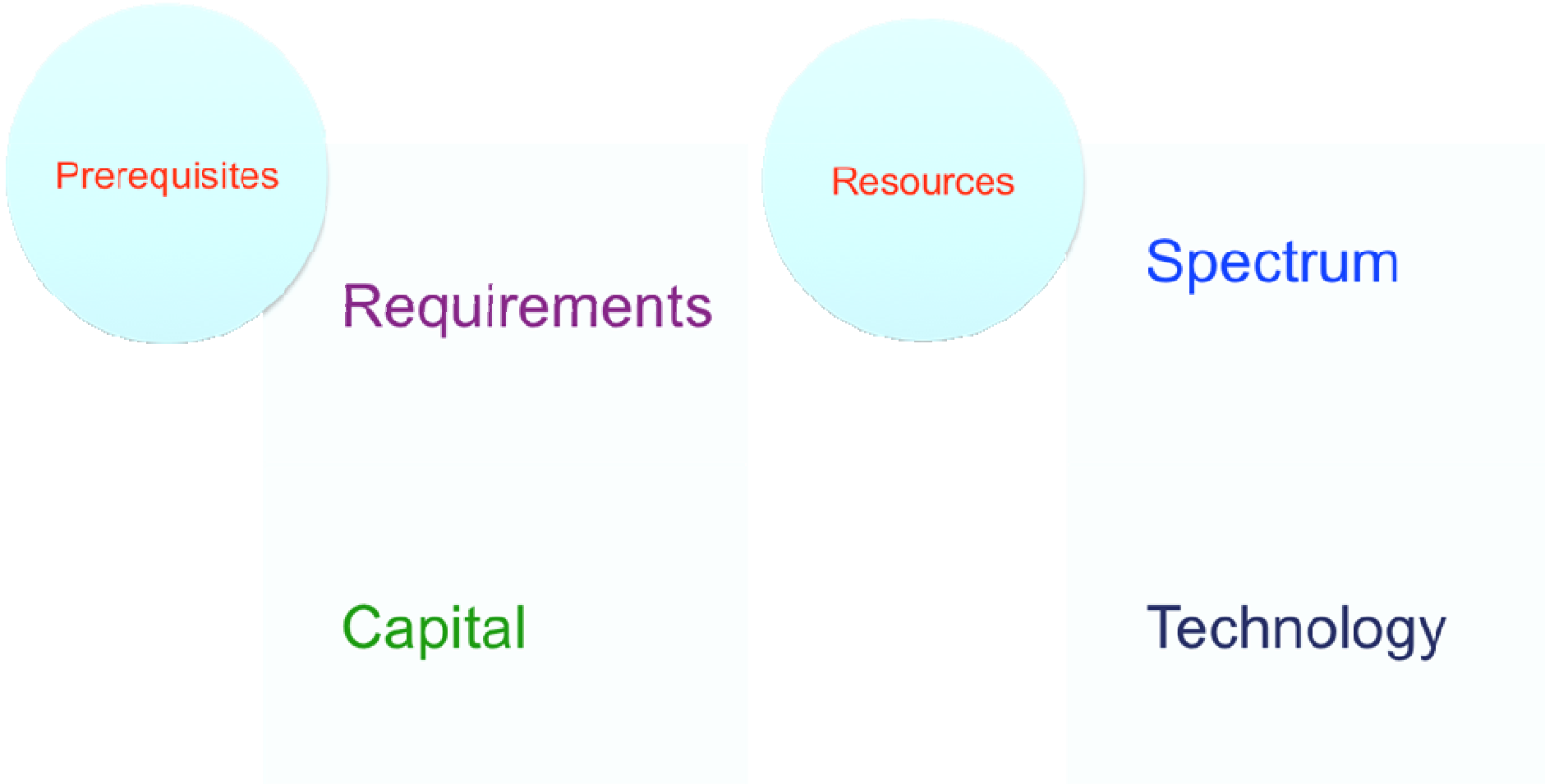
Priority access (if available) ≠ assured access

No customer-specific network options—yet

Mobile-based, HSIA offerings

Utility broadband requirements include substantial fixed apps and not necessarily HSIA

Essentials for Wireless Deployments



Potential Broadband Spectrum Options

1. Unlicensed spectrum (Part 15)
2. Hybrid/Registration spectrum
3. Access to Public Safety 700 MHz Broadband Allocation
4. Auctioned spectrum
 - Area-wide license
 - Exclusive use of frequencies w/in licensed area
 - Obligation not to interfere w/site-specific systems
 - Varies per frequency band and license area
5. Future CII Broadband Allocation -- TBD

Unlicensed Spectrum Options

Options

900 MHz

2.4 GHz

5.7/5.8 GHz

TV White Spaces

Excellent propagation qualities

Equipment registration could accelerate as database manager is selected

Report and Order expected late September 2010

Pros

No construction reqmts

No license req'd

Equipment available

Cons

Interference protection rules are tech-based

No exclusive areas

Very low output powers

Multiple transmit sites

Hybrid/Registration(3.65-3.70 GHz)

Pros

Site registrations notify others of operations
Nationwide licensing
Equipment available

Cons

No exclusive licenses
Onerous site registration
Technology-based interference measures
Modest output powers
Not all frequencies currently accessible
Not routinely available everywhere in USA

Access to P.S. 700 MHz Broadband

Virtues

Excellent spectrum
Not auctioned
Area-wide licenses
Equipment exists
Potentially receptive partners

Downsides

Utility cannot be licensee or lessee

P.S. broadband is mobile, HSPA-oriented

Policy Issues

20 MHz or 10 MHz?

Utility Access TBD by Congress

Auctioned Broadband Spectrum Options

A. Prime Candidates

900 MHz (NB PCS)

1.4 GHz

B. 2nd Tier Candidates

217-218/219-220 MHz

218-219 MHz

2.3 GHz

C. Dark Horse Candidates

Upper 700 MHz A & B Guardbands

2.5 GHz (Clearwire) Sub-leases

Verizon Wireless and Clearwire
“Special Construction” Networks

Terrestrial Fixed and Mobile
Operations in the Mobile Satellite
Service Bands

Acquiring Auctioned Spectrum

Acquisition Options

- Acquire area-wide auctioned license
- Acquire a portion of an auctioned, area-wide license via disaggregation or partition arrangement
- Enter into a Spectrum Leasing transaction
 - Spectrum manager lease
 - *De facto* transfer lease
 - Sublease under either option

Acquiring Auctioned Spectrum

Common Aspects of Acquisition Options

- Prior Approval by or Notice to FCC
- Involve an asset purchase agreement, lease or sublease
- Agreement, lease or sublease is not submitted to FCC
 - Pricing is not publicly disclosed
 - Prices paid at auction are publicly available at www.fcc.gov
- Interim performance and/or renewal showings (construction, substantial service requirements) must be met
- FCC considering “forced partition” option for some auctioned frequency bands

Acquiring Auctioned Spectrum

Spectrum Valuation Factors

- Spectrum characteristics & bandwidth
- Equipment availability
- Willing sellers/lessors
- \$\$ paid at auction by licensee
 - Permits a MHz/POP calculation
- Spectrum-specific considerations
 1. Propagation characteristics
 2. Multiple uses (mobile/mss/fixed) v. single use
 3. Eligibility limits, prior eligibility waivers or no eligibility limits
 4. Remainder of license term (# of years)

Acquiring Auctioned Spectrum—FCC Rules

- **Acquire entire license**
 - Parties file applications for assignment of license
 - Original license term remains
 - Original licensee conveys all rights in license to assignee
- **Acquire partial interest in a license**
 - Partition and Disaggregation Options
 - Parties file applications for partial assignment of license
 - Upon FCC approval, at least two licenses, sharing common expiration date, are in effect
 - Each licensee solely responsible for construction/substantial service/ renewal showing requirement applicable to its partitioned/ disaggregated license (proposed rule)

Acquiring Auctioned Spectrum—FCC Rules

Enter into a Spectrum Lease

Licensee may lease

- Some or all of spectrum use rights per its license
- For all or some of the licensed spectrum
- In all or a portion of the licensed area of operation
- For any period of time w/in the license term and renewal period

Licensee retains discretion to permit subleasing

Acquiring Auctioned Spectrum—FCC Rules

Spectrum Manager Lease

- Licensee retains control and primary accountability for compliance w/ FCC rules
- Lease/contract must be in place
- Lessee certifies eligibility
- Notice filing w/ FCC
 - Advance notice based on duration of lease (21/10/1 days notice)
- Performance or renewal showing for license remains
- Term & renewal may track license and notice process
 - To be agreed to by parties

De facto Transfer Lease

- Lessee is accountable for compliance w/ FCC rules
- Lease/contract must be in place
- Application submitted for FCC's approval of lease
 - Long term leases placed on public notice for comment
 - Expedited approval process option
- Performance or renewal showing for license remains
- Term & renewal may track FCC approval process for license
 - To be agreed to by parties

Acquiring Auctioned Spectrum—FCC Rules

Spectrum Manager Lease

- Subleasing allowed at licensee's option
- Agreement between licensee and sublessee required
- Licensee must notify FCC of sublease

De facto Transfer Lease

- Subleasing allowed at licensee's option for long-term *de facto* transfer leases
- Sublease must be approved by the FCC
- Sublessee becomes primarily responsible for compliance w/ FCC rules



Thank you !!

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