

"LTE Network Build-out - The Service Providers' Infrastructures and the End-Users' Devices"



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IPWireless Company Overview

- San Francisco HQ, UK R&D, 11 year history
- Advanced 3GPP wireless solutions
- End to End Wireless Systems Capabilities



- Deploy large scale and small networks with Mobile Network Operators and Government
 - T-Mobile, New York City, Gillette, SGRITA



- Radio Access Networks, chipsets, UE devices



- Commercial LTE 700 MHz devices, FCC-approved 700 MHz products, Several 700 MHz deployments and contracts

700 MHz Expert

- Announced “4G and Beyond” R&D Initiative with Sony in 2010



LTE 700 MHz Benefits



Spectrum

- 700 – 900 MHz is the “sweet spot”
 - Excellent wide area coverage for rural public safety
 - Good indoor coverage in urban / suburban environments, with relatively low cell count
 - Good economics

LTE Standard

- Adopted worldwide by the major cellular operators
 - > largest and broadest ecosystem
- Highest performance of any wireless standard
 - Especially in single-frequency- networks (700 MHz)
- FDD and TDD modes
- Multiband and multimode

LTE Challenges



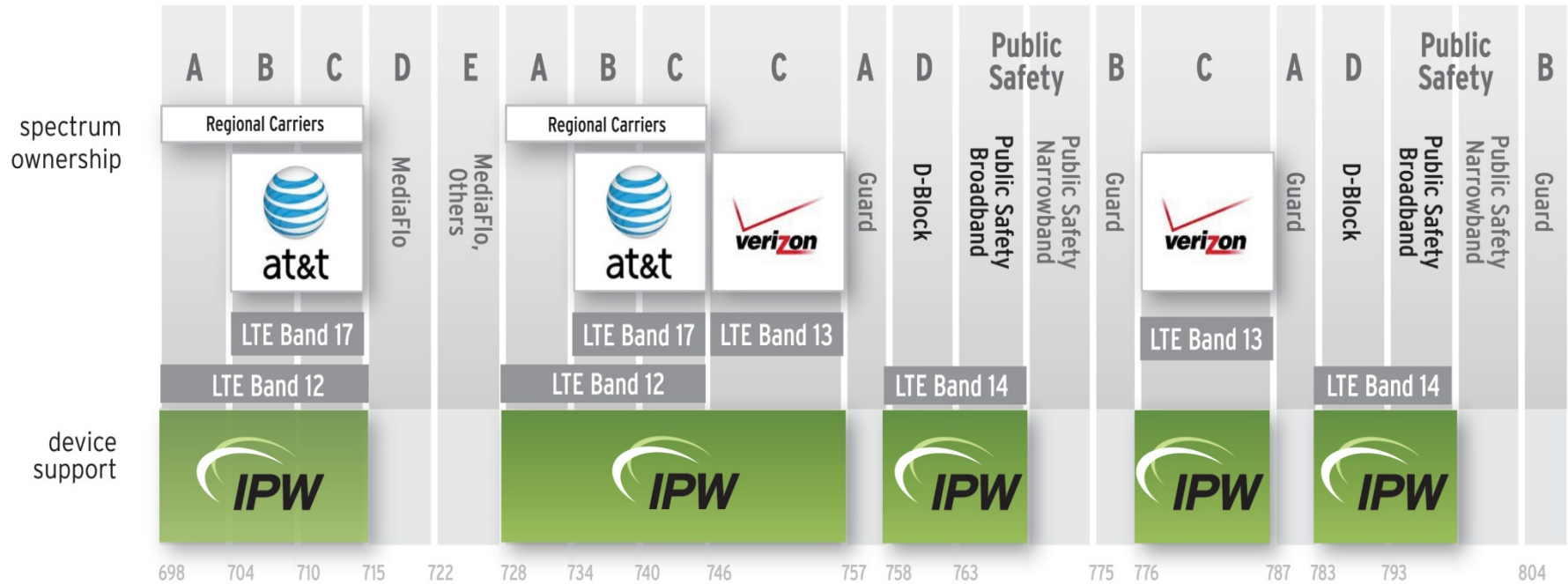
- Commercial product not yet widely available
 - IPWireless is an early leader in LTE user equipment
- Interoperability testing / device certification at least 12 months out
- Most vendors focusing on the requirements of the large operators
- Not yet fully optimized for rural deployments
 - A focus area for IPWireless

700 MHz Challenges

- **There are >24 3GPP band classes for LTE**, plus 3G bands to support
 - 4 band classes in 700 MHz alone
- Mainstream UE vendors **not supporting the full band**
- **Coexistence issues** with MediaFlo and TV Channel 51

IPWireless 700MHz band support

IPWireless Devices Support Regional Carriers, Public Safety, D-Block – as well as roaming into Verizon and AT&T bands



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700 MHz Product Requirements for Rural Operators

- Mobile in towns, fixed UE's to stretch coverage into rural areas
 - *Fixed as well as mobile UE's*
- Full band coverage / multiband
 - *Equipment that covers the lower blocks typically held by rural operators, plus ability to roam (700 MHz and other bands)*
- Dual mode devices
 - *LTE / cdma2000*
- Scalable network infrastructure
 - Minimize initial investment, without limiting ability to scale
 - *Distributed EPC core network*

