The Public Safety LTE & Mobile Broadband Market: 2016 - 2030 - Opportunities, Challenges, Strategies & Forecasts

Description: Due to the bandwidth limitations of their traditional voice-centric LMR (Land Mobile Radio) networks, public safety agencies are keen to leverage commercial cellular network technology to support their growing broadband application needs. Considering its thriving ecosystem, spectrum flexibility and performance metrics, LTE has emerged as the leading candidate for public safety mobile broadband networks. In addition, with the recent approval of the MCPTT (Mission Critical Push to Talk) voice standard as part of 3GPP Release 13, LTE has also become an attractive substitute for providing LMR-like voice services.

The Qatar Ministry of Interior made headlines when it deployed a private 800 MHz LTE network in 2012. Since then, numerous public safety LTE networks have sprung up across the globe, including the UAE, China, Laos, Turkey and Kenya. Several early adopter LTE deployments are also operational in the United States, as part of the planned FirstNet nationwide public safety broadband network. While most initial public safety LTE investments are limited to small-scale networks, nationwide rollouts in the United States and South Korea are expected to trigger significant large-scale investments throughout the globe.

The European market is largely dominated by MVNO arrangements, such as the UK Home Office's ESN (Emergency Services Network) program that will use EE's commercial LTE network to deliver prioritized mission critical voice and data services for the UK's public safety agencies. As part of the program, EE is enhancing its existing network with additional sites, satellite backhaul and a dedicated mobile core for first responders, among other investments.

Driven by the thriving ecosystem, estimates suggest that annual investments on public safety LTE infrastructure will reach $600 Million by the end of 2016. The market, which includes base stations (eNBs), mobile core and transport networking gear, is further expected to grow at a CAGR of 33% over the next four years. By 2020, these infrastructure investments will be complemented by over 4.4 Million LTE device shipments, including smartphones, rugged handheld terminals and vehicular routers.

The “Public Safety LTE & Mobile Broadband Market: 2016 - 2030 - Opportunities, Challenges, Strategies & Forecasts” report presents an in-depth assessment of the global public safety LTE market, besides touching upon the wider LMR and mobile broadband industries. In addition to covering the business case, challenges, technology, spectrum allocation, industry roadmap, value chain, deployment case studies, vendor products, strategies, standardization initiatives and applications ecosystem for public safety LTE, the report also presents comprehensive forecasts for mobile broadband, LMR and public safety LTE subscriptions from 2016 till 2030. Also covered are public safety LTE service revenues, over both private and commercial networks. In addition, the report presents revenue forecasts for public safety LTE infrastructure, devices, integration services and management solutions.

The report comes with an associated Excel datasheet suite covering quantitative data from all numeric forecasts presented in the report, as well as a list and associated details of over 90 global public safety LTE network commitments (as of Q2'2016).

Key Questions Answered

- How big is the public safety LTE opportunity?
- What trends, challenges and barriers are influencing its growth?
- How is the ecosystem evolving by segment and region?
- What will the market size be in 2020 and at what rate will it grow?
- Which regions and submarkets will see the highest percentage of growth?
- How does standardization impact the adoption of LTE for public safety applications?
- When will MCPTT and proximity services see large scale proliferation?
- What is the status of private LTE rollouts and public safety MVNO offerings across the globe?
- What opportunities exist for commercial mobile operators and MVNOs in the public safety LTE market?
- Is there a market for 400 MHz LTE networks?
- What are the prospects of tactical, vehicle-mounted and airborne LTE eNB platforms?
- How can public safety agencies leverage unused spectrum resources to fund private LTE networks?
What strategies should system integrators and vendors adopt to remain competitive?

Key Findings

- Estimates suggest that annual investments on public safety LTE infrastructure will reach $600 Million by the end of 2016. The market, which includes base stations (eNBs), mobile core and transport networking gear, is further expected to grow at a CAGR of 33% over the next four years.
- By 2020, these infrastructure investments will be complemented by over 4.4 Million LTE device shipments, including smartphones, rugged handheld terminals and vehicular routers.
- Following the Qatar Ministry of Interior’s private 800 MHz LTE network deployment in 2012, multiple private LTE rollouts are underway by security forces throughout the oil rich GCC (Gulf Cooperation Council) region, including the Abu Dhabi and Dubai police forces.
- Driven by nationwide public safety LTE network rollouts in the United States and South Korea, the North America and Asia Pacific regions will account for nearly 70% of all public safety LTE investments over the next four years.
- Almost all major LMR industry players are leveraging partnerships with established LTE infrastructure OEMs such as Ericsson, Nokia, Huawei and Samsung, to offer end-to-end LTE solutions.
- Consolidation efforts are continuing to take place throughout the industry, particularly among the largest LTE infrastructure OEMs and public safety system integrators.

Contents:

1: Introduction
1.1 Executive Summary
1.2 Topics Covered
1.3 Forecast Segmentation
1.4 Key Questions Answered
1.5 Key Findings
1.6 Methodology
1.7 Target Audience
1.8 Companies & Organizations Mentioned

2: An Overview of the Public Safety Mobile Broadband Market
2.1 Narrowband LMR (Land Mobile Radio) Systems in Public Safety
2.1.1 LMR Market Size
2.1.1.1 Analog LMR
2.1.1.2 DMR
2.1.1.3 dPMR, NXDN & PDT
2.1.1.4 P25
2.1.1.5 TETRA
2.1.1.6 Tetrapol
2.1.1.7 Other LMR Technologies
2.1.2 The Perceived Role of Mobile Broadband in Public Safety Scenarios
2.1.3 The Limitations of LMR Data Capabilities
2.2 Mobile Broadband for Public Safety
2.2.1 Partnerships with Commercial Mobile Operators
2.2.2 Private LTE and WiMAX Deployments
2.3 How Big is the Mobile Broadband Market?
2.3.1 Will the Public Safety Segment Witness the Same Level of Growth as the Consumer Segment?
2.3.2 What are the Growth Drivers?
2.3.3 Will LMR Systems Continue to Support Mission-Critical Voice?
2.4 The Use of Commercial Mobile Broadband Technology for Public Safety
2.5 Why LTE?
2.5.1 Performance Metrics
2.5.2 Coexistence, Interoperability and Spectrum Flexibility
2.5.3 A Thriving Ecosystem
2.5.4 OPEX Reduction
2.6 Public Safety LTE Technology & Architecture
2.6.1 E-UTRAN - The LTE RAN (Radio Access Network)
2.6.2 TDD vs. FDD
2.6.3 UE (User Equipment)
2.6.3.1 Smartphones & Handportable Terminals
2.6.3.2 Vehicle Mount Routers & Terminals
2.6.3.3 Tablets & Notebook PCs
2.6.3.4 USB Dongles & Others

2.6.4 EPC (Evolved Packet Core) - The LTE Mobile Core
2.6.4.1 SGW (Serving Gateway)
2.6.4.2 PGW (Packet Data Network Gateway)
2.6.4.3 MME (Mobility Management Entity)
2.6.4.4 HSS (Home Subscriber Server)
2.6.4.5 PCRF (Policy Charging and Rules Function)
2.6.5 LMR Network Integration and Inter-Working
2.6.6 Support for Roaming in Public Safety LTE
2.6.7 Inter-System Roaming
2.6.8 Intra-System Roaming to Commercial Carriers

2.7 LTE-Advanced & 5G: Implications for Public Safety
2.7.1 The Move Towards LTE-Advanced Networks
2.7.2 Impact on Public Safety LTE Rollouts
2.7.3 5G Requirements: Looking Towards the Future
2.8 Public Safety LTE Deployment Models
2.8.1 Private Public Safety LTE
2.8.2 Shared Commercial Public Safety LTE: Private-Public Partnerships
2.8.3 Public Safety LTE Access over Commercial Networks
2.8.4 Hosted Core Public Safety LTE Networks
2.9 Funding Models for Private Public Safety LTE Network Deployment
2.9.1 BOO (Built, Owned and Operated) by Integrator/Vendor
2.9.2 Owned and Operated by the Government Authority
2.9.3 Local Agency Hosted Core
2.9.4 Multiple Networks
2.10 The Public Safety LTE Business Case
2.10.1 Higher Throughput and Low Latency
2.10.2 Economic Feasibility
2.10.3 Bandwidth Flexibility
2.10.4 Spectral Efficiency
2.10.5 Regional Interoperability
2.10.6 Lack of Competition from Other Standards
2.10.7 Endorsement from the Public Safety Community
2.10.8 Commitments by Infrastructure and Device Vendors
2.10.9 QoS & Priority Provisioning
2.10.10 Support for Group Voice & Multimedia Communication
2.11 Challenges to the Public Safety LTE Ecosystem
2.11.1 Spectrum Allocation
2.11.2 Interworking with LMR Networks & Standardization
2.11.3 Budgetary Issues
2.11.4 Security & Resilience
2.11.5 Support for Mission-Critical Voice and Direct Mode-Operation
2.11.6 Smaller Coverage Footprint than LMR Systems
2.11.7 Device Battery Life in Public Safety Scenarios
2.11.8 User Profiles to Fit Public Safety Requirements

3: Industry Roadmap & Value Chain
3.1 Industry Roadmap
3.1.1 2011 - 2014: Small-Scale Private LTE Rollouts
3.1.2 2015 - 2019: Early Nationwide Rollouts & Maturation of Standards
3.1.3 2020 & Beyond: Large Scale Proliferation with Native Mission-Critical Capabilities
3.2 Value Chain
3.2.1 Enabling Technology Providers
3.2.2 RAN, Mobile Core & Transport Infrastructure OEMs
3.2.3 Device OEMs
3.2.4 System Integrators
3.2.5 Application Developers
3.2.6 Test, Measurement & Performance Specialists
3.2.7 Mobile Operators
3.2.8 MVNOs
3.2.9 Public Safety Agencies

4: Review of Major Public Safety LTE Engagements
4.1 FirstNet (First Responder Network Authority)
4.1.1 Funding Prospects & Strategies
4.1.2 Proposed Revenue Model
4.1.3 Seeking Partnerships
4.1.4 Technical Constraints
4.1.5 Moving Towards the Applications Ecosystem
4.1.6 Status of “Early Builder” Ventures
4.1.6.1 LA-RICS (Los Angeles Regional Interoperable Communications System)
4.1.6.2 ADCOM-911 (Adams County Communication Center)
4.1.6.3 State of New Mexico
4.1.6.4 JerseyNet
4.1.6.5 Harris County
4.1.7 Contract Award & Deployment Timeline
4.1.7.1 RFP Summary
4.1.7.2 The Financials
4.1.7.3 Key Bidders
4.1.7.4 Participation of Mobile Operators
4.1.8 Inclusion of 3GPP Release 13 Features
4.1.9 Usage of VNS (Vehicle Network System) Platforms
4.1.10 “Opt-Out” Opportunities
4.2 UK’s ESN (Emergency Services Network)
4.2.1 Leveraging Commercial Networks
4.2.2 Cost Savings
4.2.3 Key Applications
4.2.4 Contract Award & Deployment Timeline
4.2.4.1 Mobile Services
4.2.4.2 User Services
4.2.4.3 Transition Plans
4.3 South Korea’s National Disaster Safety Communications Network
4.3.1 Contract Award & Deployment Timeline
4.3.1.1 Initial Contracts for Pilot Rollouts
4.3.1.2 Nationwide RFP
4.3.1.3 Phased Deployment Plan
4.3.2 Key Applications
4.3.3 Integration with Railway & Maritime Networks
4.4 Other Deployment Case Studies
4.4.1 Abu Dhabi Police
4.4.2 French Army
4.4.3 German Armed Forces (Bundeswehr)
4.4.4 Kenyan Police Service
4.4.5 Lijiang Police
4.4.6 Nedaa
4.4.7 Qatar MOI (Ministry of Interior)
4.4.8 Shanghai Police Department
4.4.9 Telstra LANES (LTE Advanced Network for Emergency Services)
4.4.10 Zhengzhou Metro

5: Public Safety LTE and Mobile Broadband Applications Ecosystem
5.1 Mobile Video
5.2 Mobile Broadband and Seamless Mobile VPN Access
5.3 GIS, AVLs and Mapping
5.4 CAD (Computer Aided Dispatching)
5.5 Remote Database Access
5.6 Telemetry and Remote Diagnostics
5.7 Bulk Multimedia/Data Transfers
5.8 Situational Awareness Applications
5.9 PTT over LTE
5.10 The Present State of the Market: What’s on Offer
5.11 The Numbers: How Big is the Public Safety LTE Applications Ecosystem?

6: Key Ecosystem Players
6.1 Aaeon Technology
6.2 Accelleran
6.3 AceAxis
6.4 Aculab
6.5 Adax
6.6 ADRF (Advanced RF Technologies)
6.7 Advantech
6.8 Advantech Wireless
6.9 Affarii Technologies
6.10 Affirmed Networks
6.11 Airbus Defence and Space
6.12 Air-Lynx
6.13 Airspan Networks
6.14 Altiostar Networks
6.15 Amdocs
6.16 Anritsu Corporation
6.17 Arcadyan Technology Corporation
6.18 Argela
6.19 Aricent
6.20 ARItel
6.21 Arqiva
6.22 Artemis Networks
6.23 Aselsan
6.24 ASOCS
6.25 ASTRI (Hong Kong Applied Science and Technology Research Institute)
6.26 AT&T
6.27 Athena Wireless Communications
6.28 Athonet
6.29 Avanti Communications Group
6.30 AVI
6.31 Aviat Networks
6.32 Avtec
6.33 Axis Communications
6.34 Axis Teknologies
6.35 Axxcelera Broadband Wireless (Moseley Associates)
6.36 BandRich
6.37 Barrett Communications
6.38 BFDX
6.39 Bittium Corporation
6.40 Black Box Corporation
6.41 Blackned
6.42 Broadcom
6.43 Brocade Communications Systems
6.44 BTI Wireless
6.45 CalAmp Corporation
6.46 Casio Computer Company
6.47 Caterpillar
6.48 Cavium
6.49 CCI (Communication Components Inc.)
6.50 CCI (Competitive Companies, Inc.)
6.51 CCI (Crown Castle International)
6.52 CCTI (Catalyst Communications Technologies, Inc.)
6.53 Ceragon
6.54 Ciena Corporation
6.55 Cisco Systems
6.56 Cobham
6.57 Codan Radio Communications
6.58 Comba Telecom Systems Holdings
6.59 CommAgility
6.60 CommandWear Systems
6.61 CommScope
6.62 Comtech Telecommunications Corporation
6.63 CONET Technologies
6.64 Contela
6.65 Core Network Dynamics
6.66 Coriant
6.67 Corning
6.68 Covia Labs
6.69 Cradlepoint
6.70 Dali Wireless
6.71 DAMM Cellular Systems
6.72 DAP Technologies
6.73 Datang Mobile
6.74 Dell
6.75 DeltaNode (Bird Technologies)
6.76 Dongwon T&I
6.77 DragonWave
6.78 DSC (Digital Special Communication)
6.79 Durabook (Twinhead International Corporation)
6.80 Eastcom
6.81 EchoStar Corporation
6.82 EE
6.83 Elbit Systems
6.84 Ericsson
6.85 ETELM
6.86 Etherstack
6.87 Ethertronics
6.88 EXACOM
6.89 Exalt Communications
6.90 EXFO
6.91 ExteNet Systems
6.92 Federated Wireless
6.93 Foxcom
6.94 Frequentis
6.95 Fujitsu
6.96 Galtronics Corporation
6.97 Gemtek Technology Company
6.98 GENBAND
6.99 General Dynamics Mission Systems
6.100 Genesis Group
6.101 Getac Technology Corporation
6.102 Goodman Networks
6.103 Goodmill Systems
6.104 GrenTech (China GrenTech Corporation)
6.105 GWT (Global Wireless Technologies)
6.106 Harris Corporation
6.107 Hitachi
6.108 Honeywell
6.109 HP (Hewlett-Packard Company)
6.110 HQT Radio
6.111 Huawei
6.112 Hytera Communications Company
6.113 IAI (Israel Aerospace Industries)
6.114 iCOM
6.115 Imtradex
6.116 Inmarsat
6.117 Intel Corporation
6.118 InterDigital
6.119 Intersec
6.120 Intrepid Networks
6.121 ip.access
6.122 JDI (JING DENG INDUSTRIAL)
6.123 JMA Wireless
6.124 JRC (Japan Radio Company)
6.125 Juni Global
6.126 Juniper Networks
6.127 JVCKENWOOD Corporation
6.128 Kapsch CarrierCom
6.129 Kathrein-Werke KG
6.130 KBR
6.131 Keysight Technologies
6.132 Kirisun Communications
6.133 Kisan Telecom
6.134 KMW
6.135 Kodiak Networks
6.136 KT Corporation
6.137 Kudelski Group
6.138 Kyocera Communications
6.139 L-3 Communications Holdings
6.140 Lemko Corporation
6.141 Leonardo-Finmeccanica
6.142 LG Electronics
6.143 LGS Innovations
6.144 Ligado Networks
6.145 LiveViewGPS
6.146 Lockheed Martin Corporation
6.147 Logic Instrument
6.148 Mentura Group
6.149 MER-CellO Wireless Solutions
6.150 Microlab (Wireless Telecom Group)
6.151 Mitel Networks Corporation
6.152 Mitsubishi Electric Corporation
6.153 MobileDemand
6.154 Mobilicom
6.155 MODUCOM (MODULAR COMMUNICATION SYSTEMS)
6.156 Motorola Solutions
6.157 MTI Mobile
6.158 Mutualink
6.159 NEC Corporation
6.160 Netas
6.161 NetMotion Wireless
6.162 New Postcom Equipment Company
6.163 Nexius
6.164 NextNav
6.165 NI (National Instruments) Corporation
6.166 Nokia Networks
6.167 Northrop Grumman Corporation
6.168 nTerop Corporation
6.169 Nutaq
6.170 Oceus Networks
6.171 Octasic
6.172 Panasonic Corporation
6.173 Panda Electronics (Nanjing Panda Electronics Company)
6.174 Panorama Antennas
6.175 Parallel Wireless
6.176 Pepro
6.177 Phonak
6.178 Piciorgros (Funk-Electronic Piciorgros)
6.179 Polaris Networks
6.180 Potevio (China Potevio Company)
6.181 Pryme Radio Products
6.182 Public Wireless
6.183 Puxing Radio
6.184 Qualcomm
6.185 Quanta Computer
6.186 Quell
6.187 Quortus
6.188 RACOM
6.189 Radio IP
6.190 Radisys Corporation
6.191 Raytheon Company
6.192 Reality Mobile (ASTRO Solutions)
6.193 Redline Communications
6.194 RELM Wireless
6.195 RF Window
6.196 RFS (Radio Frequency Systems)
6.197 Rivada Networks
6.198 Rohill
6.199 Rosenberger
6.200 SAIC (Science Applications International Corporation)
6.201 Samji Electronics Company
6.202 Samsung Electronics
6.203 Savox Communications
6.204 Sepura
6.205 SerComm Corporation
6.206 SES
6.207 Sevis Systems
6.208 Siemens Convergence Creators
6.209 Sierra Wireless
6.210 Siklu
6.211 Simoco
6.212 SiRRAN
6.213 SK Telecom
6.214 SK Telesys
6.215 SLA Corporation
6.216 Smith Micro Software
6.217 SOLiD (SOLiD Technologies)
6.218 Sonic Communications
6.219 Sonim Technologies
6.220 Space Data
6.221 Spectra Group
6.222 SpiderCloud Wireless
6.223 Spirent Communications
6.224 Star Solutions
6.225 Stop Noise
6.226 Sumitomo Electric Industries
6.227 Sunnada (Fujian Sunnada Communication Company)
6.228 Symantec
6.229 Tait Communications
6.230 Taqua
6.231 TCL Communication
6.232 Tecom
6.233 Tecore
6.234 TEKTELIC Communications
6.235 Televate
6.236 TELEX (Bosch Security Systems)
6.237 Telrad Networks
6.238 Telum
6.239 TESSCO Technologies
6.240 TETRAtab
6.241 Thales
6.242 Ti (Texas Instruments)
6.243 TITAN Communication Systems
6.244 Toshiba Corporation
6.245 Tropico
6.246 UNIMO Technology
6.247 US Digital Designs
6.248 Utility Associates
6.249 Verizon Communications
6.250 ViaSat
6.251 Viavi Solutions
6.252 Vidyo
6.253 Vision Technologies
6.254 VMware
6.255 West Corporation
6.256 Westell Technologies
6.257 Wildox (Shenzhen Happy Technology Company)
6.258 Winmate
6.259 WNC (Wistron NeWeb Corporation)
6.260 xG Technology
6.261 Xplore Technologies Corporation
6.262 Z-Com (ZDC Wireless)
6.263 Zetron
6.264 Zinwave
6.265 ZTE

7: Public Safety LTE Spectrum Allocation Strategies
7.1 North America
7.2 Latin & Central America
7.3 Europe
7.4 Middle East & Africa
7.5 Asia Pacific
7.6 The Prospects of Spectrum Harmonization
7.6.1 Lobbying From Industry Bodies
7.6.2 400 MHz
7.6.3 700 MHz
7.6.4 Higher Frequencies

8: Market Analysis and Forecasts
8.1 The Global Public Safety Mobile Broadband Market
8.1.1 Public Safety Data Subscriptions over Commercial Cellular Networks
8.1.2 Data Subscriptions over LMR Networks
8.1.3 Public Safety Data Subscriptions over Private Mobile Broadband
8.1.3.1 The Unreliability of Commercial Cellular Mobile Broadband Networks
8.1.3.2 Private Public Safety LTE and WiMAX Subscriptions Compared
8.2 The Global Public Safety LTE Devices Market
8.2.1 Private Public Safety LTE Networks
8.2.1.1 Public Safety LTE Subscriptions over Private Networks
8.2.1.2 Public Safety LTE Device Shipments over Private Networks
8.2.1.3 Public Safety LTE Service Revenue over Private Networks
8.2.2 Public Safety LTE over Commercial LTE Networks
8.2.2.1 Public Safety LTE Subscriptions over Commercial Networks
8.2.2.2 Public Safety LTE Device Shipments over Commercial Networks
8.2.2.3 Public Safety LTE Service Revenue over Commercial Networks
8.2.3 Private vs. Commercial Public Safety LTE Compared
8.2.3.1 Private vs. Commercial Public Safety LTE Subscriptions
8.2.3.2 Private vs. Commercial Public Safety LTE Device Shipments
8.2.3.3 Private vs. Commercial Public Safety LTE Service Revenue
8.2.4 Public Safety LTE Device Segmentation by Form Factor
8.2.4.1 Smartphones & Handportable Terminals
8.2.4.2 Vehicle Mount Routers & Terminals
8.2.4.3 Tablets & Notebook PCs
8.2.4.4 USB Dongles & Others
8.3 The Global Public Safety LTE Infrastructure Market
8.3.1 Segmentation by Submarket
8.3.2 RAN
8.3.3 EPC & Policy
8.3.4 Mobile Backhaul & Transport
8.3.5 RAN Segmentation by Mobility
8.3.5.1 Fixed Base Stations
8.3.5.2 Transportable Base Stations
8.3.6 RAN Segmentation by Cell Size
8.3.6.1 Macrocells
8.3.6.2 Small Cells
8.3.7 Transportable RAN Segmentation by Form Factor
8.3.7.1 NIB (Network-in-a-Box)
8.3.7.2 VNS (Vehicle Network System)
8.3.7.3 SOW (System-on-Wheels)
8.3.7.4 Airborne Platforms
8.3.8 Public Safety & Commercial LTE Base Station Shipments Compared
8.4 The Global Public Safety LTE Management & Integration Solutions Market
8.4.1 Segmentation by Submarket
8.4.2 Network Integration & Testing
8.4.3 Device Management & User Services
8.4.4 Managed Services, Operations & Maintenance
8.4.5 Cybersecurity
8.5 Regional Market Assessment
8.5.1 Asia Pacific
8.5.1.1 Subscriptions & Service Revenue
8.5.1.2 Devices
8.5.1.3 Infrastructure
8.5.1.4 Base Stations
8.5.1.5 EPC & Policy
8.5.1.6 Mobile Backhaul & Transport
8.5.1.7 Management & Integration Solutions
8.5.2 North America
8.5.2.1 Subscriptions & Service Revenue
8.5.2.2 Devices
8.5.2.3 Infrastructure
8.5.2.4 Base Stations
8.5.2.5 EPC & Policy
8.5.2.6 Mobile Backhaul & Transport
8.5.2.7 Management & Integration Solutions
8.5.3 Latin & Central America
8.5.3.1 Subscriptions & Service Revenue
8.5.3.2 Devices
8.5.3.3 Infrastructure
8.5.3.4 Base Stations
8.5.3.5 EPC & Policy
8.5.3.6 Mobile Backhaul & Transport
8.5.3.7 Management & Integration Solutions
8.5.4 Middle East & Africa
8.5.4.1 Subscriptions & Service Revenue
8.5.4.2 Devices
8.5.4.3 Infrastructure
8.5.4.4 Base Stations
8.5.4.5 EPC & Policy
8.5.4.6 Mobile Backhaul & Transport
8.5.4.7 Management & Integration Solutions
8.5.5 Eastern Europe
8.5.5.1 Subscriptions & Service Revenue
8.5.5.2 Devices
8.5.5.3 Infrastructure
8.5.5.4 Base Stations
8.5.5.5 EPC & Policy
8.5.5.6 Mobile Backhaul & Transport
8.5.5.7 Management & Integration Solutions
8.5.6 Western Europe
8.5.6.1 Subscriptions & Service Revenue
8.5.6.2 Devices
8.5.6.3 Infrastructure
8.5.6.4 Base Stations
8.5.6.5 EPC & Policy
8.5.6.6 Mobile Backhaul & Transport
8.5.6.7 Management & Integration Solutions

9: Standardization & Regulatory Initiatives
9.1 NPSTC (National Public Safety Telecommunications Council)
9.2 NIST (National Institute of Standards and Technology)
9.3 NTIA (National Telecommunications and Information Administration)
9.4 PSCR (Public Safety Communications Research)
9.5 APCO International (Association of Public-Safety Communications Officials)
9.6 3GPP (Third Generation Partnership Project)
9.7 TCCA (TETRA and Critical Communications Association)
9.8 ETSI (European Telecommunications Standards Institute)
9.9 UIC (International Union of Railways)
9.10 ATIS (Alliance for Telecommunications Industry Solutions)
9.11 TIA (Telecommunications Industry Association)
9.12 OMA (Open Mobile Alliance)
9.13 Features for Public Safety LTE Standardization
  9.13.1 OMA's PCPS (Push-to-Communicate for Public Safety)
  9.13.2 Building upon PCPS: 3GPP's MCPTT (Mission Critical PTT)
  9.13.3 GCSE (Group Communication Service Enablers)
  9.13.4 GROUPE (Group Based Enhancements)
  9.13.5 D2D Communication & ProSe (Proximity Services)
  9.13.6 eProSe (Enhancements to Proximity-based Services)
  9.13.7 Resilience & IOPS (Isolated E-UTRAN Operation for Public Safety)
  9.13.8 Mission Critical Video & Data
  9.13.9 Higher Power User Terminals

10: Conclusion and Strategic Recommendations
10.1 Consolidation and Alliances
10.1.1 Recent Acquisitions
10.1.2 Alliances: Are there More to Come?
10.2 Improving Economics: Monetizing Unused Capacity
10.3 PTT Standardization: The Key to a Successful Ecosystem
10.3.1 Adoption of OMA's PoC Standards
10.3.2 3GPP MCPTT: Timelines for Standardization & Commercial Availability
10.3.3 Will China's B-TrunC Standard Witness International Adoption?
10.4 Status of Private LTE Network Rollouts
10.4.1 Early Rollouts in the Middle East
10.4.2 Increasing Traction in Asia Pacific
10.4.3 North America: FirstNet Leading the Way
10.4.4 Small-Scale Tactical Deployments in Europe
10.4.5 Opportunities in Other Regions
10.5 Spectrum: Will 700 MHz Gear Dominate the Market Worldwide?
10.5.1 Prospects of 400 MHz LTE
10.5.2 TD-LTE and Opportunities for Higher Bands in Public Safety
10.6 The Public Safety LTE MVNO Opportunity
10.6.1 ASTRID
10.6.2 Airwave
10.6.3 VIRVE
10.7 Revenue Prospects for Commercial Mobile Operators
10.7.1 The Opportunity for LTE Service Revenue
10.7.2 Dedicated Spectrum for Emergency Services: Telstra LANES
10.7.3 Priority Service Offerings: Verizon and AT&T
10.7.4 Emerging Business Models: Telefónica’s “LTE in Box”
10.7.5 PTT and Dispatch Solutions over LTE
10.8 TCO Analysis: Private LTE vs. Public-Private Partnerships
10.9 Military & Tactical Deployments Gaining Traction
10.10 What Cell Types will Public Safety LTE Networks Encompass?
10.10.1 Macrocells
10.10.2 Small Cells
10.10.3 Macrocell Relay Nodes: Does the Opportunity Exist?
10.10.4 VNS (Vehicle Network System) Units
10.10.5 Tactical SOW Units
10.10.6 Tactical NIB Units
10.10.7 Airborne Platforms
10.11 Public Safety LTE Mobile Core Investments
10.12 Mobile Backhaul & Transport Network Investments
10.13 Strategic Recommendations
10.13.1 Recommendations for LMR Vendors/Public Safety Integrators
10.13.2 Recommendations for LTE Infrastructure Vendors
10.13.3 Recommendations for Public Safety Agencies
10.13.4 Recommendations for Commercial Mobile Operators

11: Expert Opinion - Interview Transcripts
11.1 Ericsson
11.2 Airbus Defence and Space
11.3 Sepura
11.4 Aricent
11.5 Parallel Wireless

List of Figures

Figure 1: Global LMR Subscriptions by Technology: 2016 - 2030 (Millions)
Figure 2: Global Analog LMR Subscriptions: 2016 - 2030 (Millions)
Figure 3: Global DMR Subscriptions: 2016 - 2030 (Millions)
Figure 4: Global dPMR, NXDN & PDT Subscriptions: 2016 - 2030 (Millions)
Figure 5: Global P25 Subscriptions: 2016 - 2030 (Millions)
Figure 6: Global TETRA Subscriptions: 2016 - 2030 (Millions)
Figure 7: Global Tetrapol Subscriptions: 2016 - 2030 (Millions)
Figure 8: Global Other LMR Technology Subscriptions: 2016 - 2030 (Millions)
Figure 9: Global Mobile Broadband Subscriptions by Technology: 2016 - 2030 (Millions)
Figure 10: Purpose of Using Mobile Broadband for Public Safety Applications (Survey Results)
Figure 11: LTE Speed Compared to 3G & Wi-Fi Networks (Mbps)
Figure 12: Global LTE Subscriptions: 2016 - 2030 (Millions)
Figure 13: Public Safety LTE Network Architecture
Figure 14: Global VoLTE (Voice over LTE) Subscriptions: 2016 - 2030 (Millions)
Figure 15: 5G Requirements
Figure 16: Public Safety LTE Industry Roadmap
Figure 17: Public Safety LTE Value Chain
Figure 18: Key Elements of the FirstNet LTE Network
Figure 19: FirstNet RFP Statement of Objectives
Figure 20: UK ESN Timeline
Figure 21: South Korea's Public Safety LTE Network Timeline
Figure 22: Telstra LANES Concept
Figure 23: Global Mobile Video Surveillance Revenue: 2016 - 2030 ($ Million)
Figure 24: PTT over LTE Application
Figure 25: Global Public Safety LTE & Mobile Broadband Applications Revenue by Category: 2016 - 2030 ($ Million)
Figure 26: Global Public Safety Mobile Broadband Subscriptions over Public Networks by Technology: 2016 - 2030 (Millions)
Figure 27: Global LMR Data Subscriptions by Technology: 2016 - 2030 (Thousands)
Figure 28: Global Public Safety Mobile Broadband Subscriptions over Private Networks by Technology: 2016 - 2030 (Thousands)
Figure 29: Global Public Safety LTE Subscriptions over Private Networks: 2016 - 2030 (Millions)
Figure 30: Global Public Safety LTE Device Shipments over Private LTE Networks: 2016 - 2030 (Thousands of Units)
Figure 31: Global Public Safety LTE Device Unit Shipment Revenue over Private LTE Networks: 2016 - 2030 ($ Million)
Figure 32: Global Public Safety LTE Service Revenue over Private Networks: 2016 - 2030 ($ Million)
Figure 33: Global Public Safety LTE Subscriptions over Commercial LTE Networks: 2016 - 2030 (Millions)
Figure 34: Global Public Safety LTE Device Shipments over Commercial Networks: 2016 - 2030 (Thousands of Units)
Figure 35: Global Public Safety LTE Device Unit Shipment Revenue over Commercial Networks: 2016 - 2030 ($ Million)
Figure 36: Global Public Safety LTE Service Revenue over Commercial Networks: 2016 - 2030 ($ Million)
Figure 37: Private vs. Commercial Public Safety LTE Subscriptions: 2016 - 2030 (Millions)
Figure 38: Private vs. Commercial Public Safety LTE Device Shipments: 2016 - 2030 (Thousands of Units)
Figure 39: Private vs. Commercial Public Safety LTE Device Shipment Revenue: 2016 - 2030 ($ Million)
Figure 40: Private vs. Commercial Public Safety LTE Service Revenue: 2016 - 2030 ($ Million)
Figure 41: Global Public Safety LTE Device Shipments by Form Factor: 2016 - 2030 (Thousands of Units)
Figure 42: Global Public Safety LTE Device Unit Shipment Revenue by Form Factor: 2016 - 2030 ($ Million)
Figure 43: Global Public Safety LTE Smartphone & Handportable Terminal Shipments: 2016 - 2030 (Thousands of Units)
Figure 142: Western Europe Public Safety LTE EPC & Policy Revenue: 2016 - 2030 ($ Million)
Figure 143: Western Europe Public Safety LTE Mobile Backhaul & Transport Network Revenue: 2016 - 2030 ($ Million)
Figure 144: Western Europe Public Safety LTE Management & Integration Solutions Revenue: 2016 - 2030 ($ Million)
Figure 145: LTE ProSe (Proximity Service) Examples
Figure 146: TCO Comparison for Private LTE vs. Public-Private Partnership
Figure 147: Global Public Safety LTE Base Station (eNB) Installed Base by Cell Size: 2016 - 2030 (Thousands of Units)
Figure 148: Global Public Safety LTE Macrocell Installed Base: 2016 - 2030 (Thousands of Units)
Figure 149: Global Public Safety LTE Small Cell Installed Base: 2016 - 2030 (Thousands of Units)
Figure 150: Global Public Safety LTE VNS eNB Installed Base: 2016 - 2030
Figure 151: Global Public Safety LTE SOW eNB Installed Base: 2016 - 2030
Figure 152: Global Public Safety LTE NIB eNB Installed Base: 2016 - 2030
Figure 153: Global Public Safety LTE Airborne eNB Platform Installed Base: 2016 - 2030

Ordering:  
Order Online - http://www.researchandmarkets.com/reports/3727181/

Order by Fax - using the form below

Order by Post - print the order form below and send to

Research and Markets,
Guinness Centre,
Taylors Lane,
Dublin 8,
Ireland.
Fax Order Form
To place an order via fax simply print this form, fill in the information below and fax the completed form to 646-607-1907 (from USA) or +353-1-481-1716 (from Rest of World). If you have any questions please visit http://www.researchandmarkets.com/contact/

Order Information
Please verify that the product information is correct and select the format(s) you require.

Product Name: The Public Safety LTE & Mobile Broadband Market: 2016 - 2030 - Opportunities, Challenges, Strategies & Forecasts
Web Address: http://www.researchandmarkets.com/reports/3727181/
Office Code: SCBRF5TQ

Product Formats
Please select the product formats and quantity you require:

<table>
<thead>
<tr>
<th>Format</th>
<th>Single User</th>
<th>Enterprisewide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic (PDF)</td>
<td>USD 2500</td>
<td>USD 3500</td>
</tr>
</tbody>
</table>

Contact Information
Please enter all the information below in BLOCK CAPITALS

Title: Mr Mrs Dr Miss Ms Prof
First Name: ________________________ Last Name: ________________________
Email Address: * ________________________
Job Title: ________________________
Organisation: ________________________
Address: ________________________
City: ________________________
Postal / Zip Code: ________________________
Country: ________________________
Phone Number: ________________________
Fax Number: ________________________

* Please refrain from using free email accounts when ordering (e.g. Yahoo, Hotmail, AOL)
Payment Information

Please indicate the payment method you would like to use by selecting the appropriate box.

☐ Pay by credit card:  You will receive an email with a link to a secure webpage to enter your credit card details.

☐ Pay by check:  Please post the check, accompanied by this form, to:
Research and Markets,
Guinness Center,
Taylors Lane,
Dublin 8,
Ireland.

☐ Pay by wire transfer:  Please transfer funds to:
Account number  833 130 83
Sort code  98-53-30
Swift code  ULSBIE2D
IBAN number  IE78ULSB98533083313083
Bank Address  Ulster Bank,
27-35 Main Street,
Blackrock,
Co. Dublin,
Ireland.

If you have a Marketing Code please enter it below:

Marketing Code: ____________________________

Please note that by ordering from Research and Markets you are agreeing to our Terms and Conditions at http://www.researchandmarkets.com/info/terms.asp

Please fax this form to:
(646) 607-1907 or (646) 964-6609 - From USA
+353-1-481-1716 or +353-1-653-1571 - From Rest of World