

# The Public Safety LTE & Mobile Broadband Market: 2017 – 2030 – Opportunities, Challenges, Strategies & Forecasts

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## Abstracts

Until recently, LTE has predominantly been considered a supplementary mobile broadband technology in the public safety sector, to provide high-bandwidth data applications that cannot be delivered over existing narrowband LMR (Land Mobile Radio) systems. However, with the standardization of capabilities such as MCPTT (Mission-Critical PTT) by the 3GPP, LTE is increasingly being viewed as an all-inclusive critical communications platform for the delivery of multiple mission-critical services ranging from PTT group communications to real-time video surveillance.

A number of dedicated public safety LTE networks are already operational across the globe, ranging from nationwide systems in the oil-rich GCC (Gulf Cooperation Council) region to citywide networks in Spain, China, Pakistan, Laos and Kenya. Among other notable engagements, several "early builder" networks are operational in the United States – that will subsequently merge with the wider FirstNet nationwide system; early pilot LTE networks for the Sate-Net program are in the process of being commercialized in South Korea; and Canada is beginning to see its first dedicated LTE network deployments, starting with the Halton Regional Police Service.

However, the use of LTE in the public safety sector is not restricted to dedicated networks alone. For example, the United Kingdom Home Office is in the process of deploying an ESN (Emergency Services Network) that will use British mobile operator EE's commercial LTE RAN and a dedicated mobile core to eventually replace the country's existing nationwide TETRA system. The secure MVNO (Mobile Virtual Network Operator) model is already being used in multiple European countries, albeit at a smaller scale – to complement existing TETRA networks with broadband capabilities. In addition, this approach also beginning to gain traction in other parts of the world, such

as Mexico.

Driven by demand for both dedicated and secure MVNO networks, SNS Research estimates that annual investments in public safety LTE infrastructure will surpass \$800 Million by the end of 2017, supporting ongoing deployments in multiple frequency bands across the 400/450 MHz, 700 MHz, 800 MHz, and higher frequency ranges. The market – which includes base stations (eNBs), mobile core and transport network equipment – is further expected to grow at a CAGR of nearly 45% over the next three years. By 2020, these infrastructure investments will be complemented by up to 3.8 Million LTE device shipments, ranging from smartphones and ruggedized handheld terminals to vehicular routers and IoT modules.

The “Public Safety LTE & Mobile Broadband Market: 2017 – 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, market drivers, challenges, enabling technologies, applications, key trends, standardization, spectrum availability/allocation, regulatory landscape, deployment case studies, opportunities, future roadmap, value chain, ecosystem player profiles and strategies for public safety LTE, the report presents comprehensive forecasts for mobile broadband, LMR, and public safety LTE subscriptions from 2017 till 2030. Also covered are unit shipment and revenue forecasts for public safety LTE infrastructure, devices, integration services and management solutions. In addition, the report tracks public safety LTE service revenues, over both private and commercial networks.

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 190 global public safety LTE engagements – as of Q4’2017.

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- 9.14 Adax
- 9.15 ADLINK Technology
- 9.16 ADRF (Advanced RF Technologies)
- 9.17 ADTRAN
- 9.18 ADVA Optical Networking
- 9.19 AdvanceTec Industries
- 9.20 Advantech
- 9.21 Advantech Wireless
- 9.22 Affarii Technologies
- 9.23 Affirmed Networks
- 9.24 Airbus Defence and Space
- 9.25 Air-Lynx
- 9.26 Airspan Networks
- 9.27 Alea
- 9.28 Alepo
- 9.29 Allied Telesis
- 9.30 Allot Communications
- 9.31 Alpha Networks

- 9.32 Alpha Technologies
- 9.33 Altaeros Energies
- 9.34 Altair Semiconductor
- 9.35 AltioStar Networks
- 9.36 Alvarion Technologies
- 9.37 AM Telecom
- 9.38 Amarisoft
- 9.39 Amdocs
- 9.40 American Tower Corporation
- 9.41 Anritsu Corporation
- 9.42 Apple
- 9.43 Arcadyan Technology Corporation
- 9.44 Archos
- 9.45 Argela
- 9.46 ArgoNET
- 9.47 Aricent
- 9.48 ARM Holdings
- 9.49 Armour Communications
- 9.50 Arqiva
- 9.51 Artemis Networks
- 9.52 Artesyn Embedded Technologies
- 9.53 Artiza Networks
- 9.54 ASELAN
- 9.55 ASOCS
- 9.56 Assured Wireless Corporation
- 9.57 ASTRI (Hong Kong Applied Science and Technology Research Institute)
- 9.58 ASUS (ASUSTeK Computer)
- 9.59 AT&T
- 9.60 ATDI
- 9.61 Atel Antennas
- 9.62 Athonet
- 9.63 Atos
- 9.64 AttoCore
- 9.65 Avanti Communications Group
- 9.66 AVI
- 9.67 Aviat Networks
- 9.68 Avigilon Corporation
- 9.69 Avtec
- 9.70 Axis Communications

- 9.71 Axon
- 9.72 Azcom Technology
- 9.73 Azetti Networks
- 9.74 BAE Systems
- 9.75 Baicells Technologies
- 9.76 BandRich
- 9.77 Barrett Communications
- 9.78 BATS (Broadband Antenna Tracking Systems)
- 9.79 BCDVideo
- 9.80 BCE (Bell Canada)
- 9.81 BEC Technologies
- 9.82 Benetel
- 9.83 BeyondTrust Software
- 9.84 BFDX (BelFone)
- 9.85 BHE (Bonn Hungary Electronics)
- 9.86 Bird Technologies
- 9.87 Bittium Corporation
- 9.88 BK Technologies
- 9.89 Black & Veatch
- 9.90 Black Box Corporation
- 9.91 BlackBerry
- 9.92 Blackned
- 9.93 Blueforce Development Corporation
- 9.94 Bosch Security Systems
- 9.95 BridgeWave Communications
- 9.96 Broadcom
- 9.97 Brocade Communications Systems
- 9.98 BTI Wireless
- 9.99 C Spire
- 9.100 CACI International
- 9.101 CalAmp Corporation
- 9.102 Cambium Networks
- 9.103 Capita
- 9.104 Carlson Wireless Technologies
- 9.105 Casa Systems
- 9.106 Casio Computer Company
- 9.107 Catalyst Communications Technologies
- 9.108 Caterpillar
- 9.109 Cavium

- 9.110 CCI (Communication Components Inc.)
- 9.111 CCI Systems
- 9.112 CCN (Cirrus Core Networks)
- 9.113 cellXica
- 9.114 CelPlan Technologies
- 9.115 Ceragon Networks
- 9.116 Certes Networks
- 9.117 Challenge Networks
- 9.118 Chemring Technology Solutions
- 9.119 Cielo Networks
- 9.120 Ciena Corporation
- 9.121 Cirpack
- 9.122 Cisco Systems
- 9.123 Cloudstreet
- 9.124 CND (Core Network Dynamics)
- 9.125 Cobham Wireless
- 9.126 Codan Radio Communications
- 9.127 Coherent Logix
- 9.128 Collinear Networks
- 9.129 Comba Telecom
- 9.130 COMLAB
- 9.131 CommAgility
- 9.132 CommandWear Systems
- 9.133 CommScope
- 9.134 Comrod Communication Group
- 9.135 Comtech Telecommunications Corporation
- 9.136 CONET Technologies
- 9.137 Connect Tech
- 9.138 Contela
- 9.139 Coolpad Group
- 9.140 Coriant
- 9.141 Cornet Technology
- 9.142 Corning
- 9.143 Covia Labs
- 9.144 Cradlepoint
- 9.145 Crown Castle International Corporation
- 9.146 CS Corporation
- 9.147 CybertelBridge
- 9.148 CyPhy Works

- 9.149 Dahua Technology (Zhejiang Dahua Technology)
- 9.150 Dali Wireless
- 9.151 DAMM Cellular Systems
- 9.152 Datang Mobile
- 9.153 Dell Technologies
- 9.154 Delta Electronics
- 9.155 Dialogic
- 9.156 DragonWave-X
- 9.157 Druid Software
- 9.158 DT (Deutsche Telekom)
- 9.159 Duons
- 9.160 Eastcom (Eastcom Communications Company)
- 9.161 EchoStar Corporation
- 9.162 Ecom Instruments
- 9.163 EE
- 9.164 EION Wireless
- 9.165 Elbit Systems
- 9.166 ELUON Corporation
- 9.167 ENENSYS Technologies
- 9.168 eolane DOUARNENEZ
- 9.169 Ercom
- 9.170 Ericsson
- 9.171 ETELM
- 9.172 Etherstack
- 9.173 Ethertronics
- 9.174 ETRI (Electronics & Telecommunications Research Institute, South Korea)
- 9.175 EXACOM
- 9.176 Exalt Wireless
- 9.177 Excelerate Technology
- 9.178 EXFO
- 9.179 Expeto Wireless
- 9.180 Expway
- 9.181 ExteNet Systems
- 9.182 Eyecom Telecommunications Group
- 9.183 Fairwaves
- 9.184 FastBack Networks
- 9.185 Federated Wireless
- 9.186 Fenix Group
- 9.187 FiberHome Technologies

- 9.188 FireEye
- 9.189 Flash Private Mobile Networks
- 9.190 FLIR Systems
- 9.191 Forcepoint
- 9.192 Fortinet
- 9.193 Foxcom
- 9.194 Fraunhofer FOKUS (Institute for Open Communication Systems)
- 9.195 Fraunhofer HHI (Heinrich Hertz Institute)
- 9.196 FreeWave Technologies
- 9.197 Frequentis
- 9.198 FRTEk
- 9.199 Fujian Sunnada Network Technology
- 9.200 Fujitsu
- 9.201 Funkwerk
- 9.202 Future Technologies
- 9.203 Galtronics Corporation
- 9.204 GCT Semiconductor
- 9.205 GE (General Electric)
- 9.206 Gemalto
- 9.207 Gemtek Technology
- 9.208 Genaker
- 9.209 GENBAND
- 9.210 General Dynamics Mission Systems
- 9.211 Genesis Group
- 9.212 GenXComm
- 9.213 GeoSafe
- 9.214 Getac Technology Corporation
- 9.215 GIKO GROUP
- 9.216 Gilat Satellite Networks
- 9.217 Globalstar
- 9.218 Goodman Networks
- 9.219 Goodmill Systems
- 9.220 Google
- 9.221 GRENTECH
- 9.222 GroupTalk
- 9.223 GSI (GS Instech)
- 9.224 Guangzhou Iplook Technologies
- 9.225 GWT (Global Wireless Technologies)
- 9.226 Hanwha Techwin



- 9.227 Harris Corporation
- 9.228 Haystax Technology
- 9.229 HCL Technologies
- 9.230 Hexagon
- 9.231 Hikvision (Hangzhou Hikvision Digital Technology)
- 9.232 HISPASAT Group
- 9.233 Hitachi
- 9.234 Hoimyung ICT
- 9.235 Honeywell International
- 9.236 Horsebridge Defence & Security
- 9.237 HPE (Hewlett Packard Enterprise)
- 9.238 HQT (Shenzhen HQT Science and Technology)
- 9.239 HTC Corporation
- 9.240 Huawei
- 9.241 Hughes Network Systems
- 9.242 Hunter Technology
- 9.243 Hytera Communications
- 9.244 IAI (Israel Aerospace Industries)
- 9.245 IBM Corporation
- 9.246 Icom
- 9.247 IDEMIA
- 9.248 IDY Corporation
- 9.249 IMPTT
- 9.250 Indra
- 9.251 Infinova
- 9.252 InfoVista
- 9.253 Inmarsat
- 9.254 InnoWireless
- 9.255 Insta Group
- 9.256 Intel Corporation
- 9.257 Intercede
- 9.258 InterDigital
- 9.259 Intersec
- 9.260 Intracom Telecom
- 9.261 Intrepid Networks
- 9.262 ip.access
- 9.263 IPITEK
- 9.264 Iridium Communications
- 9.265 Irvies Technology

- 9.266 ISCO International
- 9.267 IS-Wireless
- 9.268 Italtel
- 9.269 ITCEN
- 9.270 ITRI (Industrial Technology Research Institute, Taiwan)
- 9.271 ITS Ibelem
- 9.272 JMA Wireless
- 9.273 Johnson Controls
- 9.274 Jolla
- 9.275 JPS Interoperability Solutions
- 9.276 JRC (Japan Radio Company)
- 9.277 Juni Global
- 9.278 Juniper Networks
- 9.279 JVCKENWOOD Corporation
- 9.280 Kapsch CarrierCom
- 9.281 Kathrein-Werke KG
- 9.282 KBR
- 9.283 Keysight Technologies
- 9.284 Kirisun Communications
- 9.285 Kisan Telecom
- 9.286 Klas Telecom
- 9.287 Klein Electronics
- 9.288 Kleos
- 9.289 KMW
- 9.290 Kodiak Networks
- 9.291 Koning & Hartman
- 9.292 Kontron S&T
- 9.293 KPN
- 9.294 KRTnet Corporation
- 9.295 KT Corporation
- 9.296 Kudelski Group
- 9.297 Kumu Networks
- 9.298 Kyocera Corporation
- 9.299 L3 Technologies
- 9.300 LCR Embedded Systems
- 9.301 Leenos Corporation
- 9.302 Lemko Corporation
- 9.303 Lenovo
- 9.304 Leonardo

- 9.305 LG Electronics
- 9.306 LG Uplus
- 9.307 LGS Innovations
- 9.308 Ligado Networks
- 9.309 Lime Microsystems
- 9.310 LOCIVA
- 9.311 Lockheed Martin Corporation
- 9.312 Lookout
- 9.313 LS telcom
- 9.314 Luminare Wireless
- 9.315 M87
- 9.316 Macquarie Group
- 9.317 Magister Solutions
- 9.318 Martin UAV
- 9.319 Mavenir Systems
- 9.320 McAfee
- 9.321 MediaTek
- 9.322 Mellanox Technologies
- 9.323 Mentura Group
- 9.324 MER Group
- 9.325 Metaswitch Networks
- 9.326 MIC Nordic
- 9.327 Micro Focus
- 9.328 Microlab
- 9.329 Microsoft Corporation
- 9.330 Microwave Networks
- 9.331 Milestone Systems
- 9.332 MitraStar Technology Corporation
- 9.333 Mitsubishi Electric Corporation
- 9.334 Mobile Tornado
- 9.335 MobileDemand
- 9.336 MobileIron
- 9.337 Mobilicom
- 9.338 ModUcom (Modular Communication Systems)
- 9.339 MoMe
- 9.340 Moseley Associates
- 9.341 Motorola Solutions
- 9.342 Moxtra Public Safety
- 9.343 MP Antenna

- 9.344 MRV Communications
- 9.345 MTI (Microelectronics Technology, Inc.)
- 9.346 Mutualink
- 9.347 N.A.T.
- 9.348 Nash Technologies
- 9.349 NEC Corporation
- 9.350 Nemergent Solutions
- 9.351 Netas
- 9.352 NetMotion
- 9.353 NETSCOUT Systems
- 9.354 New Postcom Equipment
- 9.355 Nextivity
- 9.356 NextNav
- 9.357 NI (National Instruments)
- 9.358 NICE Systems
- 9.359 NIKSUN
- 9.360 Node-H
- 9.361 Nokia Networks
- 9.362 Northrop Grumman Corporation
- 9.363 NuRAN Wireless
- 9.364 NVIS Communications
- 9.365 NXP Semiconductors
- 9.366 Oceus Networks
- 9.367 Octasic
- 9.368 ODN (Orbital Data Network)
- 9.369 Omnitele
- 9.370 Omoco
- 9.371 One2many
- 9.372 Openet
- 9.373 Oracle Communications
- 9.374 Orange
- 9.375 PacStar (Pacific Star Communications)
- 9.376 Palo Alto Networks
- 9.377 Panasonic Corporation
- 9.378 Panda Electronics Group
- 9.379 Panorama Antennas
- 9.380 Parallel Wireless
- 9.381 Parsons Corporation
- 9.382 PCTEL

- 9.383 pdvWireless
- 9.384 Pelco (Schneider Electric)
- 9.385 Pepro
- 9.386 Persistent Telecom
- 9.387 Phluido
- 9.388 Plover Bay Technologies
- 9.389 PMN (Private Mobile Networks)
- 9.390 Polaris Networks
- 9.391 PoLTE Corporation
- 9.392 Potevio
- 9.393 PRISMA Telecom Testing
- 9.394 Pryme Radio Products
- 9.395 Pulse Electronics
- 9.396 Qinetiq
- 9.397 Qualcomm
- 9.398 Quanta Computer
- 9.399 Qucell
- 9.400 Quintel
- 9.401 Quortus
- 9.402 RACOM Corporation
- 9.403 RAD Data Communications
- 9.404 Radio IP Software
- 9.405 Radisys Corporation
- 9.406 RADWIN
- 9.407 Rafael Advanced Defense Systems
- 9.408 Range Networks
- 9.409 Rave Mobile Safety
- 9.410 Raycap
- 9.411 Raytheon Company
- 9.412 Reality Mobile (ASTRO Solutions)
- 9.413 Rebel Alliance
- 9.414 Red Hat
- 9.415 RED Technologies
- 9.416 REDCOM Laboratories
- 9.417 Redline Communications
- 9.418 Redwall Technologies
- 9.419 Rescue
- 9.420 RF Window
- 9.421 RFS (Radio Frequency Systems)

- 9.422 RIVA Networks
- 9.423 Rivada Networks
- 9.424 Rockwell Collins
- 9.425 Rogers Communications
- 9.426 Rohde & Schwarz
- 9.427 Rohill
- 9.428 ROK Mobile
- 9.429 Rosenberger
- 9.430 RugGear
- 9.431 Saab
- 9.432 SafeMobile
- 9.433 SAI Technology
- 9.434 SAIC (Science Applications International Corporation)
- 9.435 Samji Electronics
- 9.436 Samsung Electronics
- 9.437 Sapiient Consulting
- 9.438 Savox Communications
- 9.439 Senstar Corporation
- 9.440 Sepura
- 9.441 Sequans Communications
- 9.442 SerComm Corporation
- 9.443 SES
- 9.444 Sevis Systems
- 9.445 SFR
- 9.446 Shentel (Shenandoah Telecommunications Company)
- 9.447 SIAE Microelettronica
- 9.448 Siemens Convergence Creators
- 9.449 Sierra Wireless
- 9.450 Signal Information & Communication Corporation
- 9.451 Siklu Communication
- 9.452 Silicom
- 9.453 Simoco Wireless Solutions
- 9.454 Singtel
- 9.455 SiRRAN
- 9.456 Sistelbanda
- 9.457 SITRONICS
- 9.458 Siyata Mobile
- 9.459 SK Telecom
- 9.460 SK Telesys



- 9.461 SLA Corporation
- 9.462 SmartSky Networks
- 9.463 Smith Micro Software
- 9.464 Softil
- 9.465 SOLiD
- 9.466 Soliton Systems
- 9.467 Sonim Technologies
- 9.468 Sonus Networks
- 9.469 Sony Corporation
- 9.470 Sooktha
- 9.471 SOTI
- 9.472 Southern Linc
- 9.473 Space Data Corporation
- 9.474 Spectra Group
- 9.475 SpiderCloud Wireless
- 9.476 Spirent Communications
- 9.477 Spreadtrum Communications
- 9.478 Sprint Corporation
- 9.479 SRS (Software Radio Systems)
- 9.480 Star Solutions
- 9.481 STMicroelectronics
- 9.482 Stop Noise
- 9.483 sTraffic
- 9.484 StreamWIDE
- 9.485 Sumitomo Electric Industries
- 9.486 Swisscom
- 9.487 Symantec
- 9.488 Sysoco Group
- 9.489 SyTech (Systems Engineering Technologies) Corporation
- 9.490 TacSat Networks
- 9.491 Tait Communications
- 9.492 Tampa Microwave
- 9.493 TASSTA
- 9.494 Tata Elxsi
- 9.495 TCL Communication
- 9.496 TCOM
- 9.497 Tech Mahindra
- 9.498 Tecom
- 9.499 Tecore Networks

- 9.500 TEKTELIC Communications
- 9.501 Telco Systems
- 9.502 Telefonica Group
- 9.503 Televate
- 9.504 Tellabs
- 9.505 Telo Systems Corporation
- 9.506 Telos Corporation
- 9.507 Telrad Networks
- 9.508 Telstra
- 9.509 Teltronic
- 9.510 Telum
- 9.511 Telus Corporation
- 9.512 TESSCO Technologies
- 9.513 TETRATAB
- 9.514 Thales
- 9.515 TI (Texas Instruments)
- 9.516 Tieto Corporation
- 9.517 TIM (Telecom Italia Mobile)
- 9.518 Titan Securite
- 9.519 TLC Solutions
- 9.520 T-Mobile USA
- 9.521 Toshiba Corporation
- 9.522 Tropico
- 9.523 TRX Systems
- 9.524 Twinhead International Corporation
- 9.525 U.S. Cellular
- 9.526 UANGEL
- 9.527 Ukkoverkot
- 9.528 UNIMO Technology
- 9.529 URSYS
- 9.530 US Digital Designs
- 9.531 Utility Associates
- 9.532 V5 Systems
- 9.533 Vanu
- 9.534 Vencore Labs
- 9.535 Verint Systems
- 9.536 Verizon Communications
- 9.537 ViaSat
- 9.538 Viavi Solutions

- 9.539 Vidyo
- 9.540 Vision Technologies
- 9.541 Visual Labs
- 9.542 VMware
- 9.543 VNC (Virtual Network Communications)
- 9.544 VNL (Vihaan Networks Limited)
- 9.545 Vodafone Group
- 9.546 Voxer
- 9.547 VTT Technical Research Centre of Finland
- 9.548 West Corporation
- 9.549 Westell Technologies
- 9.550 Wildox (Shenzhen Happy Technology)
- 9.551 WINITECH
- 9.552 WinMate
- 9.553 WiPro
- 9.554 Wireless Technologies Finland
- 9.555 Wireless Telecom Group
- 9.556 WNC (Wistron NeWeb Corporation)
- 9.557 WTL (World Telecom Labs)
- 9.558 Wytec International
- 9.559 xG Technology
- 9.560 Xiamen Puxing Electronics Science & Technology
- 9.561 Xilinx
- 9.562 Xplore Technologies Corporation
- 9.563 Z-Com
- 9.564 Zello
- 9.565 Zetel Solutions
- 9.566 Zetron
- 9.567 Zinwave
- 9.568 ZMTel (Shanghai Zhongmi Communication Technology)
- 9.569 ZTE

## **CHAPTER 10: MARKET ANALYSIS AND FORECASTS**

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    - 10.2.1.3 Public Safety Service Revenue over Private LTE Networks
  - 10.2.2 Public Safety LTE over Commercial LTE Networks
    - 10.2.2.1 Public Safety Subscriptions over Commercial LTE Networks
    - 10.2.2.2 Public Safety Device Shipments over Commercial LTE Networks
    - 10.2.2.3 Public Safety Service Revenue over Commercial LTE Networks
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    - 10.2.3.2 Private vs. Commercial Public Safety LTE Device Shipments
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    - 10.2.4.2 Vehicle-Mounted Routers & Terminals
    - 10.2.4.3 Stationary CPEs
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    - 10.3.6.2 Small Cells
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- 10.3.9.2 Microwave
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    - 10.5.2.3 Infrastructure
    - 10.5.2.4 RAN
    - 10.5.2.5 Mobile Core (EPC, Policy & Application Functions)
    - 10.5.2.6 Mobile Backhaul & Transport
    - 10.5.2.7 Management & Integration Solutions
  - 10.5.3 Latin & Central America
    - 10.5.3.1 Subscriptions & Service Revenue
    - 10.5.3.2 Devices
    - 10.5.3.3 Infrastructure
    - 10.5.3.4 RAN
    - 10.5.3.5 Mobile Core (EPC, Policy & Application Functions)
    - 10.5.3.6 Mobile Backhaul & Transport
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    - 10.5.4.3 Infrastructure
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- 10.5.4.6 Mobile Backhaul & Transport
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  - 10.5.5.2 Devices
  - 10.5.5.3 Infrastructure
  - 10.5.5.4 RAN
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- 10.5.6 Western Europe
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  - 10.5.6.2 Devices
  - 10.5.6.3 Infrastructure
  - 10.5.6.4 RAN
  - 10.5.6.5 Mobile Core (EPC, Policy & Application Functions)
  - 10.5.6.6 Mobile Backhaul & Transport
  - 10.5.6.7 Management & Integration Solutions

## **CHAPTER 11: CONCLUSION AND STRATEGIC RECOMMENDATIONS**

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  - 11.4.4.4 Belgium: Pioneering Multi-National MVNO Platforms
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  - 11.4.4.7 Norway: Plans for Hybrid/Commercial LTE Networks
  - 11.4.4.8 Germany: Proceeding with Caution
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  - 11.4.4.10 Italy & the Netherlands: Public Safety LTE Platforms over Commercial Networks
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- 11.4.5 Latin & Central America
  - 11.4.5.1 Shared Military & Public Safety Networks in Brazil
  - 11.4.5.2 Mexico: Wholesale Network for Shared Commercial & Public Safety Use
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    - 11.5.1.2 Band
    - 11.5.1.3 Non-3GPP Bands
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    - 11.5.2.1 Band
    - 11.5.2.2 Band
    - 11.5.2.3 Band
  - 11.5.3 800 MHz
    - 11.5.3.1 Band
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    - 11.5.4.1 1.4 GHz

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  - 11.6.2 Dedicated Spectrum Access for Public Safety Users
    - 11.6.2.1 AT&T & FirstNet
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    - 11.6.3.1 United Kingdom ESN: Priority Services over EE
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  - 11.6.4 BYON (Build Your Own Network) Platforms
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## **LIST OF COMPANIES MENTIONED**

3GPP (Third Generation Partnership Project)  
3M  
450 MHz Alliance  
450connect  
4K Solutions  
6Harmonics  
A10 Networks  
Aaeon  
AAS (Amphenol Antenna Solutions)  
Abu Dhabi Police  
Accedian Networks  
Accelleran  
Accuver  
Ace Technologies Corporation  
AceAxis  
ACMA (Australian Communications and Media Authority)  
Actelis Networks  
Aculab  
Adax  
ADCOM911 (Adams County Communications Center)  
ADLINK Technology  
ADRF (Advanced RF Technologies)  
ADTRAN  
ADVA Optical Networking  
AdvanceTec Industries  
Advantech  
Advantech Wireless  
Aeroflex  
AeroMobile  
Affarii Technologies  
Affirmed Networks  
Agile Networks  
Aicox Solutions  
Airbus Defence and Space  
Airbus Group  
Air-Lynx  
Airspar Networks  
Airvana

Airwave Solutions  
Ajman Police  
Alcatel-Lucent  
Alea  
Alepo  
Alliander  
Allied Telesis  
Allot Communications  
Alpha Networks  
Alpha Technologies  
Alphabet  
Altaeros Energies  
Altair Semiconductor  
ALTAN Redes  
AltioStar Networks  
Alvarion Technologies  
AM Telecom  
Amarisoft  
Amdocs  
America Movil  
American Tower Corporation  
Anatel (Agencia Nacional de Telecomunicacoes)  
Anritsu Corporation  
APCO (Association of Public-Safety Communications Officials) International  
Apple  
APT (Asia-Pacific Telecommunity)  
Aptica  
ARASKOM  
Arcadyan  
ARCEP (Autorite de Regulation des Communications Electroniques)  
Archos  
Argela  
ArgoNET  
ARIB (Association of Radio Industries and Businesses, Japan)  
Aricent  
ARItel  
ARM Holdings  
Armasuisse (Federal Office for Defence Procurement, Switzerland)  
Armour Communications

Arqiva  
Artemis Networks  
Artesyn Embedded Technologies  
Artiza Networks  
ASELSAN  
ASMG (Arab Spectrum Management Group)  
ASOCS  
Assured Wireless Corporation  
ASTRI (Hong Kong Applied Science and Technology Research Institute)  
ASTRID  
ASTRO Solutions  
ASUS (ASUSTeK Computer)  
AT&T  
ATDI  
Atel Antennas  
Athonet  
ATIS (Alliance for Telecommunications Industry Solutions)  
Atlas Telecom  
Atos  
AttoCore  
ATU (African Telecommunications Union)  
Avanti Communications Group  
Avaya  
AVI  
Aviat Networks  
Avigilon Corporation  
Avtec  
Axell Wireless  
Axis Communications  
Axon  
Axxcelera Broadband Wireless  
Azcom Technology  
Azetti Networks  
BAE Systems  
Baicells Technologies  
BandRich  
Barrett Communications  
BASE (Telenet)  
BATS (Broadband Antenna Tracking Systems)



Baylin Technologies  
BayRICS (Bay Area Regional Interoperable Communications Systems Authority)  
BayWEB (Bay Area Wireless Enhanced Broadband System)  
BCDVideo  
BCE (Bell Canada)  
BDBOS (Federal Agency for Public Safety Digital Radio, Germany)  
BEC Technologies  
Benetel  
BeyondTrust Software  
BFDX (BelFone)  
BHE (Bonn Hungary Electronics)  
Bilbao Metro  
Bird Technologies  
Bittium Corporation  
BK Technologies  
Black & Veatch  
Black Box Corporation  
BlackBerry  
BlackBerry AtHoc  
Blackhawk Imaging  
Blackned  
BLiNQ Networks  
Bluebird  
Blueforce Development Corporation  
BMI (Federal Ministry of Interior, Germany)  
BMVg (Federal Ministry of Defense, Germany)  
Boise Police Department  
Bosch Security Systems  
Boston Police Department  
Bravo (Public Telecommunication Company)  
Brazilian Army  
Brazos County Sheriff's Office  
Bridgewater  
BridgeWave Communications  
British Army  
Broadcom  
BroadSoft  
Brocade Communications Systems  
BRTI (Indonesian Telecommunications Regulatory Authority)

BT Group  
BTI Wireless  
Bullitt Mobile  
Bundesnetzagentur (Federal Network Agency, Germany)  
Bundeswehr (Armed Forces, Germany)  
C Spire  
C4i  
CACI International  
CACP (Canadian Association of Chiefs of Police)  
CAFC (Canadian Association of Fire Chiefs)  
CalAmp Corporation  
Calgary Police Service  
Cambium Networks  
Camden County Public Safety  
Canadian Advanced Technology Alliance  
Capita  
Carlson Wireless Technologies  
Casa Systems  
Casio Computer Company  
Catalyst Communications Technologies  
Caterpillar  
Cavium  
CCI (Communication Components Inc.)  
CCI (Competitive Companies, Inc.)  
CCI Systems  
CCN (Cirrus Core Networks)  
CCSA (China Communications Standards Association)  
Cellvine  
cellXica  
CelPlan Technologies  
CEPT (European Conference of Postal and Telecommunications Administrations)  
Ceragon Networks  
Certes Networks  
Challenge Networks  
Chemring Group  
Chemring Technology Solutions  
Chicago Police Department  
Cielo Networks  
Ciena Corporation

Cirpack  
Cisco Systems  
CITC (Communications and Information Technology Commission, Saudi Arabia)  
CITEL (Inter-American Telecommunication Commission)  
CITIG (Canadian Interoperability Technology Interest Group)  
City of Charlotte  
City of Fort Worth  
City of Huntsville  
City of Irving  
City of New Orleans  
City of Oakland  
City of Pembroke Pines  
City of Sendai  
Cloudstreet  
CND (Core Network Dynamics)  
Cobham  
Cobham SATCOM  
Cobham Wireless  
Codan Radio Communications  
Collinear Networks  
Colorado Parks and Wildlife  
Comba Telecom  
COMLAB  
CommAgility  
CommandWear Systems  
CommScope  
Comrod Communication Group  
Comtech EF Data  
Comtech TCS  
Comtech Telecommunications Corporation  
CONET Technologies  
Connect Tech  
Contela  
Coolpad Group  
Coriant  
Cornet Technology  
Corning  
Covia Labs  
CPqD (Center for Research and Development in Telecommunications, Brazil)

Cradlepoint  
CRC (Communications Research Centre Canada)  
Crown Castle International Corporation  
CS Corporation  
CybertelBridge  
Cyfas Systems  
CyPhy Works  
Dahua Technology (Zhejiang Dahua Technology)  
Dali Wireless  
DAMM Cellular Systems  
Datang Mobile  
Datang Telecom  
DDPS (Federal Department of Defence, Civil Protection and Sport, Switzerland)  
DeKalb Police Department  
Dell Technologies  
Delta Electronics  
DEPEN (National Prison Department, Brazil)  
DFW (Dallas/Fort Worth) International Airport  
Dialogic  
DNA  
DND (Department of National Defence, Canada)  
DNK (Norwegian Directorate for Emergency Communication)  
DragonWave-X  
DRDC (Defence Research and Development Canada)  
DRDC CSS (Defence Research and Development Canada's Centre for Security Science)  
Druid Software  
DSB (Directorate for Civil Protection, Norway)  
DSTL (Defence Science and Technology Laboratory, United Kingdom)  
Dubai Police  
Duons  
Eastcom (Eastcom Communications Company)  
EchoStar Corporation  
EchoStar Mobile  
EchoStar Satellite Services  
Ecom Instruments  
EE  
EF Johnson Technologies  
EION Wireless

Elbit Systems  
Elta Systems  
ELUON Corporation  
Embraer  
EMC Corporation  
ENENSYS Technologies  
eolane DOUARNENEZ  
Ercom  
Ericsson  
Ericsson LG  
ETELM  
Etherstack  
Ethertronics  
ETRI (Electronics & Telecommunications Research Institute, South Korea)  
ETSI (European Telecommunications Standards Institute)  
Ewing Police Department  
EXACOM  
Exalt Wireless  
Excelerate Technology  
Exelis  
EXFO  
Expeto Wireless  
Expway  
ExteNet Systems  
Eyecom Telecommunications Group  
FAB (Brazilian Air Force)  
Facebook  
Fairwaves  
Falu Municipality  
Fastback Networks  
Federated Wireless  
Fenix Group  
FFI (Defence Research Establishment, Norway)  
FiberHome Technologies  
Finavia  
FinnHEMS (Helicopter Emergency Medical Services, Finland)  
Finnish Border Guard  
Finnish Defence Forces  
Finnish State Railways

FireEye  
Flash Private Mobile Networks  
FLIR Systems  
Forcepoint  
Fortinet  
Foxcom  
Fraunhofer FOKUS (Institute for Open Communication Systems)  
Fraunhofer HHI (Heinrich Hertz Institute)  
FreeWave Technologies  
French Armed Forces  
Frequentis  
FRTek  
Fujian Sunnada Network Technology  
Fujitsu  
Funkwerk  
Future Technologies  
Galtronics  
GCT Semiconductor  
GE (General Electric)  
Gemalto  
Gemtek Technology  
Genaker  
GENBAND  
General Dynamics Corporation  
General Dynamics Mission Systems  
Genesis Group  
GenXComm  
GeoSafe  
Getac Technology Corporation  
GIKO GROUP  
Gilat Satellite Networks  
Global Invacom Group  
Globalstar  
Goodman Networks  
Goodmill Systems  
Google  
Grant County Sheriff's Office  
GRENTECH  
Groupe ADP (Aéroport de Paris)

GroupTalk  
GSI (GS Instech)  
Guangzhou Iplook Technologies  
GWT (Global Wireless Technologies)  
Halton Regional Police Service  
Hanwha Techwin  
Harris Corporation  
Harris County  
Harris County Fire Marshal's Office  
Harris County Sheriff's Office  
Haystax Technology  
HCL Technologies  
HFRS (Hampshire Fire & Rescue Service)  
Hikvision (Hangzhou Hikvision Digital Technology)  
HISPASAT Group  
Hitachi  
Hoimyoung Corporation  
Hoimyoung ICT  
Home Office, United Kingdom  
Honeywell International  
Hong Kong Police Force  
Horsebridge Defence & Security  
Houston Police Department  
HPE (Hewlett Packard Enterprise)  
HQT (Shenzhen HQT Science and Technology)  
HTC Corporation  
Huawei  
Hub One  
Hughes Network Systems  
Hunter Technology  
Hytera Communications  
IAI (Israel Aerospace Industries)  
iBwave Solutions  
ICCRA (International Critical Control Rooms Alliance)  
Icom  
ICT (Islamabad Capital Territory)  
IDEMIA  
IDF (Israel Defense Forces)  
IDY Corporation



IFT (Federal Institute of Telecommunications, Mexico)  
IMDA (Info-communications Media Development Authority of Singapore)  
IMPTT  
Indian Army  
Indiana DHS (Department of Homeland Security)  
Indianapolis Fire Department  
Indianapolis Metropolitan Police Department  
Indra  
Infinova  
InfoVista  
INL (Idaho National Laboratory)  
Inmarsat  
InnerWireless  
InnoWireless  
Insta Group  
Intel Corporation  
Intercede  
InterDigital  
Intersec  
Intracom Telecom  
Intrepid Networks  
ip.access  
IPITEK  
Iridium Communications  
IRIS (Red Nacional de Radiocomunicacion de Mision Critica Tetrapol)  
Irvees Technology  
ISCO International  
ISED (Innovation, Science and Economic Development Canada)  
IS-Wireless  
Italtel  
ITCEN  
ITELAZPI  
ITRI (Industrial Technology Research Institute, Taiwan)  
ITS Ibelem  
ITU (International Telecommunication Union)  
JMA Wireless  
Johnson Controls  
Jolla  
Jordanian Armed Forces

JPS Interoperability Solutions  
JRC (Japan Radio Company)  
Juni Global  
Juniper Networks  
JVCKENWOOD Corporation  
Kantonspolizei Zurich (Cantonal Police of Zurich)  
Kapsch CarrierCom  
Kathrein-Werke KG  
KBR  
KCC (Korea Communications Commission)  
Kenyan Police Service  
Keysight Technologies  
Kirisun Communications  
Kisan Telecom  
Klas Telecom  
Klein Electronics  
Kleos  
KMW  
Kodiak Networks  
Koning & Hartman  
Kontron S&T  
KPN  
KPN Critical Communications  
KRNA (Korea Rail Network Authority)  
KRTnet Corporation  
KT Corporation  
Kudelski Group  
Kudelski Security  
Kumu Networks  
Kyocera Corporation  
L-3 Communication Systems-West  
L-3 Technologies  
Laos Police  
LA-RICS (Los Angeles Regional Interoperable Communications System)  
Las Vegas Metropolitan Police Department  
LCR Embedded Systems  
Leenos Corporation  
Lemko Corporation  
Lenovo

Leonardo  
LG CNS  
LG Electronics  
LG Group  
LG Uplus  
LGS Innovations  
Ligado Networks  
Lijiang Police  
Lime Microsystems  
LOCIVA  
Lockheed Martin Corporation  
Logic Instrument  
London's Air Ambulance  
LS telcom  
Luminate Wireless  
M87  
Macquarie Group  
MadCo 911 (Madison County Alabama's 911 Dispatch Center)  
Magister Solutions  
Martin UAV  
Mavenir Systems  
MBIE (Ministry of Business, Innovation and Employment, New Zealand)  
McAfee  
MCMC (Malaysian Communications and Multimedia Commission)  
MCTIC (Ministry of Science, Technology and Innovation and Communications, Brazil)  
McWane  
MediaTek  
MegaFon  
Mellanox Technologies  
Mentura Group  
MER Group  
Metaswitch Networks  
MetroPCS  
MHA (Ministry of Home Affairs, Singapore)  
Miami-Dade County  
Miami-Dade Police Department  
MIC (Ministry of Internal Affairs and Communications, Japan)  
MIC Nordic  
Micro Focus

Microlab  
Microsoft Corporation  
Microwave Networks  
MIIT (Ministry of Industry and Information Technology, China)  
Milestone Systems  
MIMOon  
Minas Gerais State Military Police  
Ministry of Defence, Sweden  
Ministry of Industry and Information Technology, China  
Ministry of Interior & Coordination of National Government, Kenya  
Ministry of Interior, Angola  
Ministry of Interior, France  
Ministry of Justice, Sweden  
MitraStar Technology Corporation  
Mitsubishi Electric Corporation  
Mobile Tornado  
MobileDemand  
MobileIron  
Mobilicom  
MoD (Ministry of Defence, United Kingdom)  
ModUcom (Modular Communication Systems)  
MOI Qatar (Ministry of Interior, Qatar)  
MoMe  
Monmouth County Sheriff's Office  
Moscow Police  
Moseley Associates  
Motorola Mobility  
Motorola Solutions  
Moxtra Public Safety  
MP Antenna  
MPS (Ministry of Public Security, China)  
MPSS (Ministry of Public Safety and Security, South Korea)  
MRC (Mobile Radio Center)  
MRV Communications  
MSB (Civil Contingencies Agency, Sweden)  
MTI (Microelectronics Technology, Inc.)  
Mutualink  
N.A.T.  
Nash Technologies

NATO (North Atlantic Treaty Organization)  
Naval Postgraduate School  
NBTC (National Broadcasting and Telecommunications Commission, Thailand)  
NCRIC (Northern California Regional Information Center)  
NDOT (Nevada Department of Transportation)  
NEC Corporation  
Nedaa  
Nemergent Solutions  
Neptune Mobile  
Net4Mobility  
Netas  
NetMotion  
NETSCOUT Systems  
New Hampshire Department of Safety  
New Jersey Office of Homeland Security and Preparedness  
New Jersey ROIC (Regional Operations Intelligence Center)  
New Jersey State Police  
New Mexico DoIT (Department of Information Technology)  
New Postcom Equipment  
New Zealand Police  
NewCore Wireless  
NextG Networks  
Nextivity  
NextNav  
NI (National Instruments)  
NICE Systems  
Nigeria Police Force  
NIKSUN  
Nkom (Norwegian Communications Authority)  
Node-H  
Nokia  
Nokia Networks  
Norsat International  
Northglenn Police Department  
Northrop Grumman Corporation  
NTT DoCoMo  
NuRAN Wireless  
Nutaq Innovation  
NVIS Communications

NXP Semiconductors  
O3b Networks  
Oakland Fire Department  
Oceus Networks  
Octasic  
ODN (Orbital Data Network)  
OFCOM (Federal Office of Communications, Switzerland)  
Ohio State University  
OMA (Open Mobile Alliance)  
Oman Royal Office  
Omnitele  
Omoco  
One2many  
Ontario Ministry of Transportation  
Ooredoo  
Openet  
OpenSignal  
Optiway  
Optus  
Oracle Communications  
Orange  
Orange Belgium (Mobistar)  
Ottawa Fire Services  
PacStar (Pacific Star Communications)  
Palo Alto Networks  
Panasonic Avionics Corporation  
Panasonic Corporation  
Panda Electronics Group  
Panorama Antennas  
Parallel Wireless  
PCC (Paramedic Chiefs of Canada)  
PCTEL  
pdvWireless  
Pelco  
Pennsylvania State Police  
Pepperl+Fuchs  
Pepro  
Persistent Telecom  
Philadelphia Police Department

Phluido  
Pikewerks Corporation  
Plover Bay Technologies  
PMN (Private Mobile Networks)  
Polaris Networks  
Police Federation of Australia  
Police of the Netherlands  
Polizia di Stato (State Police, Italy)  
PoLTE Corporation  
Portalify  
Potevio  
PowerTrunk  
PRISMA Telecom Testing  
Productivity Commission, Australia  
PROMTEL (Office for the Promotion of Investments in Telecommunications, Mexico)  
Proximus  
Pryme Radio Products  
PSCA (Punjab Safe Cities Authority)  
PSCE (Public Safety Communications Europe)  
PSP (Potomac Spectrum Partners)  
PTS (Post and Telecom Authority, Sweden)  
Public Safety Canada  
Publicis  
Pulse Electronics  
Qatar Armed Forces  
Qinetiq  
Qingdao Police  
Qiqihar Municipal Public Security Bureau  
Qiqihar Police  
Qualcomm  
Quanta Computer  
Qucell  
Quintel  
Quortus  
RACOM Corporation  
RAD Data Communications  
Radio IP Software  
Radisys Corporation  
RADWIN



RAF (Royal Air Force)  
Rafael Advanced Defense Systems  
Range Networks  
Rave Mobile Safety  
Raycap  
Raytheon Company  
RCC (Regional Commonwealth in the Field of Communications)  
RCMP (Royal Canadian Mounted Police)  
Reality Mobile  
Rebel Alliance  
Red Hat  
RED Technologies  
REDCOM Laboratories  
Redline Communications  
Redwall Technologies  
RESCAN (Canary Islands Network for Emergency and Security)  
Rescue  
RF Window  
RFS (Radio Frequency Systems)  
RIKS (State Infocommunication Foundation)  
Rio de Janeiro Fire Department  
RIVA Networks  
Rivada Networks  
Rockwell Collins  
Rogers Communications  
Rohde & Schwarz  
Rohill  
ROK Mobile  
ROKAF (Republic of Korea Air Force)  
Roper Industries  
Rosenberger  
Royal Thai Police  
R-TRON  
RugGear  
Saab  
Safaricom  
SafeMobile  
Safe-Net Forum  
SAI Technology

SAIC (Science Applications International Corporation)  
Samji Electronics  
Samsung Electronics  
Samsung Group  
Samsung SDS  
San Diego Fire-Rescue Department  
San Diego Police Department  
SANG (Saudi Arabian National Guard)  
Sao Paulo State Military Police  
Sapient Consulting  
Sapura Secured Technologies  
Saudi MOI (Ministry of Interior)  
Savis  
Savox Communications  
Schneider Electric  
SCT (Mexican Ministry of Communications and Transport, Mexico)  
Senstar Corporation  
Sepura  
Sequans Communications  
SerComm Corporation  
SES  
SETAR  
Sevis Systems  
SFR  
Shanghai Police Department  
Shentel (Shenandoah Telecommunications Company)  
Sheriff's Department of Suffolk County  
SIAE Microelettronica  
Siemens  
Siemens Convergence Creators  
Sierra Wireless  
Signal Entertainment Group  
Signal Information & Communication Corporation  
Siklu Communication  
Silicom  
Simoco Wireless Solutions  
Singapore Police Force  
Singtel  
SiRRAN Communications

Sistelbanda  
SITRONICS  
Siyata Mobile  
SK Telecom  
SK Telesys  
SLA Corporation  
SLC (Secure Land Communications)  
SmartSky Networks  
Smith Micro Software  
SoftBank Group  
Softil  
SOLiD  
Soliton Systems  
Sonim Technologies  
Sonus Networks  
Sony Corporation  
Sony Mobile Communications  
Sooktha  
SOTI  
Southern Company  
Southern Linc  
Space Data Corporation  
Spanish Army  
Spectra Group  
SpiderCloud Wireless  
Spillman Technologies  
Spirent Communications  
Spreadtrum Communications  
Sprint Corporation  
SRS (Software Radio Systems)  
Stadtpolizei Zurich (Zurich City Police)  
Star Solutions  
State of Colorado  
State of Louisiana  
State of Minnesota  
State of Mississippi  
State of New Jersey  
State of New Mexico  
State of Ohio

State of Oklahoma  
State of Texas  
State Security Networks Group  
STC (Saudi Telecom Company)  
STMicroelectronics  
Stop Noise  
sTraffic  
StreamWIDE  
SUBTEL (Subsecretaria de Telecomunicaciones de Chile)  
Sumitomo Electric Industries  
Surrey Police  
Swedish Police Authority  
Swiss Army  
Swisscom  
Swisscom Broadcast  
Symantec Corporation  
Sysoco Group  
SyTech (Systems Engineering Technologies) Corporation  
TacSat Networks  
Tait Communications  
Tampa Microwave  
Taqua  
TASSTA  
Tata Elxsi  
TCCA (TETRA and Critical Communications Association)  
TCL Communication  
TCOM  
Tech Mahindra  
Tecnicas Competitivas  
Tecore Networks  
TEKTELIC Communications  
Telcel  
Telco Systems  
Telefonica Group  
Televate  
Tellabs  
Telo Systems Corporation  
Telos Corporation  
Telrad Networks

Telstra  
Teltronic  
Telum  
Telus Corporation  
TESSCO  
TETRATAB  
Texas A&M University  
Texas National Guard  
Thales  
TI (Texas Instruments)  
TIA (Telecommunications Industry Association)  
Tieto Corporation  
TIM (Telecom Italia Mobile)  
Titan Securite  
TLC Solutions  
T-Mobile USA  
Tokyo Metropolitan Police Department  
Toshiba Corporation  
TOURTech  
TPL Systemes  
TRAI (Telecom Regulatory Authority of India)  
Tropico  
TRX Systems  
TSDSI (Telecommunications Standards Development Society, India)  
TTA (Telecommunications Technology Association of Korea)  
TTC (Telecommunication Technology Committee, Japan)  
Turk Telekom  
Turkish National Police Force  
Twinhead International Corporation  
Twisted Pair Solutions  
TxDPS (Texas Department of Public Safety)  
U.S. Air Force  
U.S. Army  
U.S. CBP (Customs and Border Protection)  
U.S. Cellular  
U.S. Coast Guard  
U.S. Department of Commerce  
U.S. DHS (Department of Homeland Security)  
U.S. DIA (Defense Intelligence Agency)

U.S. DoD (Department of Defense)  
U.S. FBI (Federal Bureau of Investigation)  
U.S. FCC (Federal Communications Commission)  
U.S. FEMA (Federal Emergency Management Agency)  
U.S. FirstNet (First Responder Network Authority)  
U.S. Marine Corps  
U.S. Navy  
U.S. NIST (National Institute of Standards and Technology)  
U.S. NPSTC (National Public Safety Telecommunications Council)  
U.S. NTIA (National Telecommunications and Information Administration)  
UANGEL  
UCLA (University of California, Los Angeles)  
Ukkoverkot  
UNIMO Technology  
University of Ottawa  
UPMC (University Pierre and Marie CURIE)  
Uppsala Ambulance Services  
UPV/EHU (University of the Basque Country)  
URSYS  
US Digital Designs  
USSOCOM (U.S. Special Operations Command)  
Utility Associates  
Vanu  
Vencore Labs  
Verint Systems  
Verizon Communications  
ViaSat  
Viavi Solutions  
Victoria Police  
Vidyo  
Vientiane Municipal Government  
Village of Schaumburg  
VIRVE  
Vision Technologies  
Visual Labs  
Vmware  
VNC (Virtual Network Communications)  
VNL (Vihaan Networks Limited)  
Vodafone Group

Vodafone Hutchison Australia  
Vodafone Netherlands  
Vodafone New Zealand  
Voxer  
West Corporation  
Westell Technologies  
Western Australia Police  
Wildox (Shenzhen Happy Technology)  
WINITECH  
WinMate  
Wireless Technologies Finland  
Wireless Telecom Group  
Wireless Telecom Group Company  
WNC (Wistron NeWeb Corporation)  
WTL (World Telecom Labs)  
Wytec International  
xG Technology  
Xiamen Puxing Electronics Science & Technology  
Xilinx  
Xplore Technologies Corporation  
Zain Saudi Arabia  
Z-Com  
Zello  
Zetel Solutions  
Zetron  
Zhengzhou Metro  
Zhengzhou Municipal Public Security Bureau  
Zhengzhou Police  
Zinwave  
ZMTel (Shanghai Zhongmi Communication Technology)  
ZTE

## About

For more than 60 years first responders have relied on narrowband Land Mobile Radio (LMR) systems for mission critical voice communications. While many of these dedicated LMR systems generally support basic data applications such as short data messaging, first responders are often compelled to rely on commercial (cellular) mobile broadband networks to support data intensive applications such as bulk multimedia transfers in emergency situations.

However, commercial networks do not meet the availability and resilience requirements for public safety operations, where a single glitch in communications can result in a loss of human lives. Thus public safety agencies worldwide are echoing demands for the deployment of cost effective mobile broadband networks dedicated for public safety usage.

While a number of public safety agencies deployed a combination of private WIMAX and proprietary technology based mobile broadband networks between 2009 and 2011 to support data intensive applications such as video surveillance, it soon became apparent that a solution that is interoperable nationwide and across borders will be necessary enable cooperation among different public safety entities, and to achieve economies of scale.

Considering its thriving ecosystem, spectrum flexibility and performance metrics, public safety organizations worldwide recognize LTE as the de-facto standard for mobile broadband.

With spectrum already allocated, public safety agencies in the Middle East, Asia Pacific and the U.S have already begun to operate private LTE networks. Driven by public safety demands, LTE products can now also operate in spectrum bands previously unthinkable, such as the 400 MHz band, which is widely available to public safety agencies worldwide. Moreover, demands for tactical and rapidly deployable broadband solutions have also led vendors to develop private LTE base station products in a variety of innovative form factors such as Cell in a Box (CIAB) or airborne cells.

SNS Research estimates the global spending on private LTE infrastructure including base stations (eNodeBs), mobile core (EPC) and backhaul will account for \$2 Billion annually by the end of 2020. By the same time, the installed base of private public safety LTE base stations (eNode Bs) will reach nearly 155,000 globally, following a



CAGR of nearly 60% between 2014 and 2020, and will serve nearly 4 Million private public safety LTE subscribers worldwide.

However it is important to note that the transition to LTE is one of the will be one of the most complex technical changes the public safety communications industry will ever witness and will present challenges in its own right, particularly in the context of global standardization. Furthermore spectrum, regulatory and budgetary issues in certain regions such as Europe will delay large scale private deployments.

Nonetheless, service prioritization partnerships with commercial LTE network carriers will create an ecosystem for operating public safety devices over commercial LTE networks during this transition period. We estimate that public safety LTE device shipments over commercial networks will account for nearly \$7 Billion in annual revenue by the end of 2020.

This report presents an in-depth assessment of the global public safety LTE market, besides considering the wider LMR and mobile broadband industries. In addition to covering the business case, challenges, spectrum allocation strategies, industry roadmap, deployment case studies, vendor products, strategies, standardization activities and application ecosystem for public safety LTE, the report also presents comprehensive forecasts for mobile broadband, LMR and public safety LTE subscriptions from 2011 till 2020. Also covered are public safety LTE service revenues as well as device and infrastructure (eNodeB base stations, EPC mobile core, backhaul) shipment and associated revenue forecasts.

The report comes with an associated XLS datasheet covering quantitative data from all figures presented within the report, as well as a list and associated details of 46 global private public safety LTE network deployments (as of Q1'2014).

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