



How to Navigate Emerging LTE Technologies for IoT

As cellular carriers today cater to consumer demand for high-speed LTE connectivity, they are faced with the challenge of finding a network solution that will continue to support the growth of IoT as spectrum re-farming forces the shutdown of legacy 2G and 3G networks. The result: new low-power LTE technologies – Category NB1 (NB-IoT) and Category M1 (Cat-M1 or LTE-M) – that have been specifically designed and deployed for IoT.

NB-IoT vs. Cat-M1

Both NB-IoT and Cat-M1 leverage existing cellular networks, meaning devices on these technologies can easily be installed to current networks by leveraging existing cellular infrastructure. Cat-M1 is a lower power and lower bandwidth variant of LTE and still supports voice communications and full mobility. NB-IoT is the lowest power and lowest bandwidth variant, but does not support voice communication and has a slow cell tower handoff. This means that NB-IoT is not typically a suitable option for mobile applications that may require full mobility support with quick handoffs between cell towers. Common benefits of solutions deployed on LPWA LTE networks include:

- Very low power consumption with some applications boasting a battery life of up to 10 years
- Low cellular module costs leading to lower device unit costs
- Indoor and outdoor coverage in previously unreachable locations
- Scalable technology with ability to support large number of devices over a wide geographic area
- End-to-end secure connectivity and support for authentication appropriate to the IoT application
- Future-proofed technology with no fear of network sunsets in the next 10 years



	LTE Cat 6	LTE Cat 4	LTE Cat 1	LTE Cat-M1	NB-IoT
Bandwidth	40 MHz	20 MHz	20 MHz	1.4 MHz	200 kHz
Battery Life	Days	Days	5 years	5-10 years	10+ years
Throughput	DL: 300 Mbps UL: 50 Mbps	DL: 150 Mbps UL: 50 Mbps	DL: 10 Mbps UL: 5 Mbps	1 Mbps	250 kbps
2-Way Data Tx	Full Duplex	Full Duplex	Full Duplex	Full or Half Duplex	Half Duplex
Security	3GPP (128-256bit)	3GPP (128-256bit)	3GPP (128-256bit)	3GPP (128-256bit)	3GPP (128-256bit)
Scalability	High	High	High	High	High
Mobility Support	Full	Full	Full	Connected & Idle mode	Idle mode
Location Support (LBS)	Yes	Yes	Yes	Needs GPS	Needs GPS
Voice Support	Yes	Yes	Yes	Yes	No
Module Cost	\$50+	\$40	\$20-25	\$10-20	\$5-10
Common Use Case	Virtual Doctor Applications	WAN Primary, WAN Backup for Healthcare Clinics	Diabetes Management Applications	Personal Emergency Response (PERS)	Age-in-Place Applications
Availability	Future 2018	Now	Now	Now	2 nd Half 2018

LPWA LTE Use Cases

Cat-1 is the fastest, most expensive LTE technology that provides an appropriate network solution for some IoT applications (Cat-4 is typically unnecessary for even the most robust IoT solutions). Its high bandwidth, high throughput capabilities make it best suited for applications requiring low latency and high speeds such as:

- Digital Signage
- Video Surveillance
- ATMs
- Kiosks

Cat-M1 fully supports legacy IoT applications due to its ability to support voice communications and full mobility. Key use cases include:

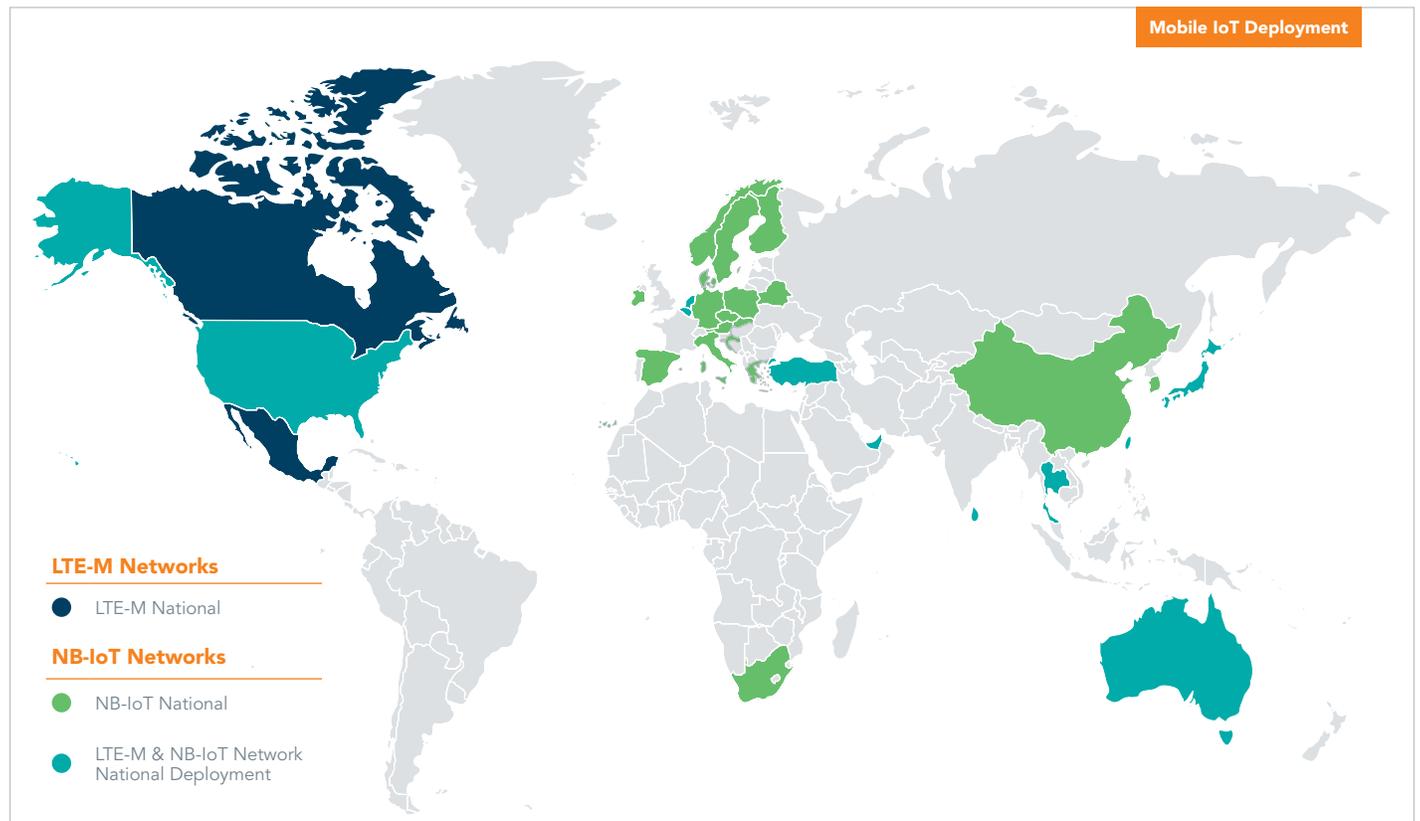
- Fleet Management & Tracking
- Asset Monitoring
- Consumer Wearables

NB-IoT does not support voice communication and has slower cell tower handoff, providing extreme optimizations for low-throughput, delay-tolerant use cases including:

- Smart Grid
- Smart City
- Precision Agriculture

LPWA LTE Network Availability

Predictions from Machina Research estimate that LPWA connections are set to exceed 2G, 3G, and traditional 4G LTE to become the leading technology for IoT by 2022. However, it must be understood that availability is still developing today as only a limited number of operators have commercially launched Cat-M1 or NB-IoT with many still in the planning or piloting phases.



Your Guide to Navigating LTE

Although the availability of LPWA LTE networks is ultimately reliant on the cellular carriers, KORE is committed to offering its customers the most optimal network connectivity solutions possible. As a single source, neutral provider, KORE actively works on our customers' behalf to ensure that new network technologies are available for all representative carrier offerings as soon as they become ready for commercial use.

In addition to providing the foundational, secure, managed LTE LPWA connectivity required to power successful IoT solutions, KORE leverages decades of IoT expertise to offer customers a full suite of professional services that can be applied to accelerate LTE adoption for new IoT deployments and simplify LTE migration for legacy solutions:

- **Deployment Services (Forward Logistics):** streamline LTE implementation processes with capabilities including demand forecasting, order management, staging and kitting, site surveys, installation services and asset management
- **Operational Management:** relieve internal resources of day-to-day operational management tasks with capabilities including help desk support, service assurance, carrier operations management, endpoint monitoring, and network monitoring
- **Sustainment and Support Services (Reverse Logistics):** maintain the health of your IoT deployment by migrating to LTE with capabilities including triage support, claims management, re-staging and kitting, re-installation and activation, and end-of-life disposition

About KORE

KORE is a pioneering leader and trusted advisor that helps deliver transformative business performance from IoT solutions. We help customer organizations of all sizes navigate the complexities of IoT and improve execution, so they can focus on operational and business results. Our IoT expertise and experience, global reach, independence, and deployment agility accelerate and materially improve our customers' return on their IoT investments.

Reach out to KORE today to learn how we can help simplify and accelerate LTE adoption for your organization.