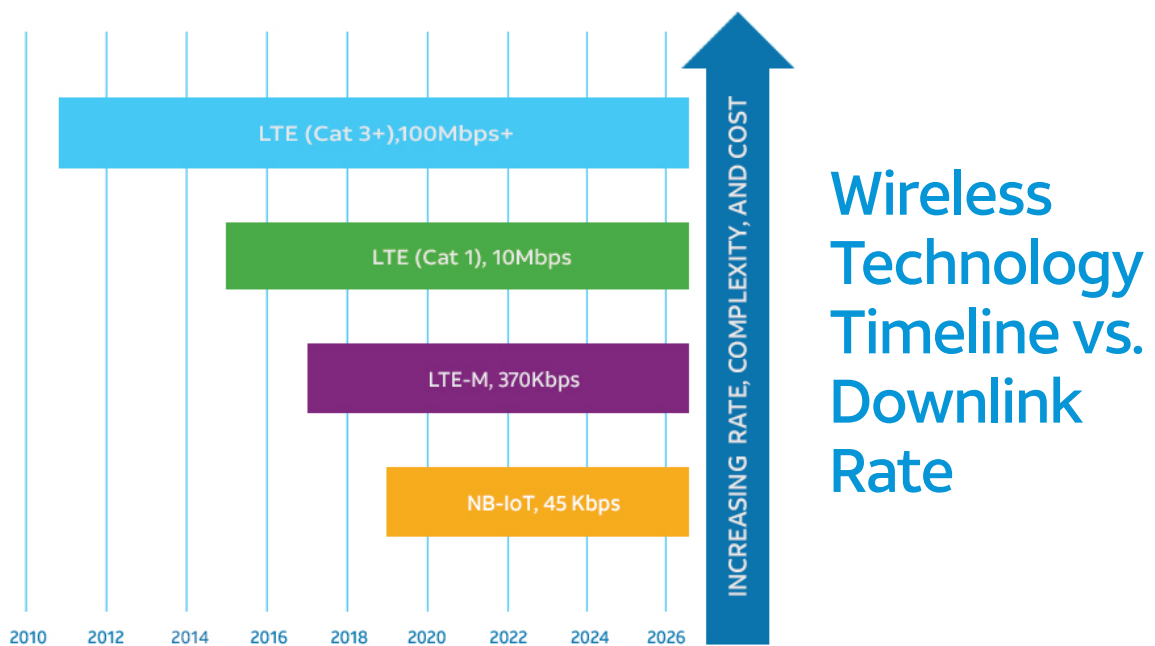




# The Network Technology Roadmap

All networks are not the same, so AT&T offers a multi-network approach to provide you with the dependability and flexibility needed to optimize your IoT solution. Beginning with the LTE-Category 3 in 2011, adding the LTE-Category 1 in 2015, LTE-M in 2017, and now NB-IoT in 2019, AT&T continues to provide the latest in IoT network performance and capability. This network enables developers to use advanced modules that provide the basis for a new generation of devices, while lowering connectivity costs.

You can see on this chart how each evolutionary step allows us to decrease the downlink rate, cost and complexity.



Downlink rates are theoretical maximum throughput.

## Advantages of LTE-M and NB-IoT over traditional connectivity options:

- Longer battery life (expected up to 10 years).
- Better coverage for IoT devices underground and deep inside buildings.
- Reduced module size (as small as 1/6 the size of current modules)
- Reduced module costs (as low as \$7.50 for LTE-M)



## Wireless Technology Comparison for LTE

Each solution brings you the carrier grade, multi-layered, and best-in-class security that you've come to expect from AT&T. This table will help you consider and compare the differentiating features of each LTE network solution so you can make the best choice for your module and device.

Looking toward the future of LTE, the module cost will decrease as the benefits increase.

Features	LTE (Cat 3+)	LTE (Cat 1)	LTE-M (Cat M1)	NB-IoT
<b>Module Cost</b>	\$\$\$	\$\$	\$	\$
<b>Module Availability</b>	Now	Now	Now	2Q - 2019
<b>Network Buildout</b>	Complete, in service	Complete, in service	Complete, in service	2Q - 2019
<b>Theoretical Max Downlink</b>	100 Mbps	10 Mbps	370 Kbps	45 Kbps
<b>Theoretical Max Uplink</b>	50 Mbps	5 Mbps	370 Kbps	45 Kbps
<b>Battery Life</b>	Days	Days	Up to 10 yrs+*	Up to 10 yrs+*
<b>Mobility</b>	Standard	Standard	Standard	Idle Mode Only
<b>Coverage Improvement</b>	None	None	Up to 15dB	Up to 20dB
<b>Voice Support</b>	Yes (VoLTE)	Yes (VoLTE)	Yes (VoLTE)	No
<b>Vertical Market Examples</b>	<ul style="list-style-type: none"> <li>• Smartphone/ Tablets</li> <li>• Automotive Infotainment</li> <li>• Video Surveillance</li> <li>• Routers</li> </ul>	<ul style="list-style-type: none"> <li>• Auto SSD</li> <li>• mHealth</li> <li>• Wearables</li> <li>• mPERS</li> </ul>	<ul style="list-style-type: none"> <li>• Smart Cities (meters)</li> <li>• Alarm Monitoring</li> <li>• Asset monitoring UBI</li> <li>• Sub-Terrain</li> </ul>	<ul style="list-style-type: none"> <li>• Smoke Detectors</li> <li>• Parking Control</li> <li>• Smart Agriculture</li> <li>• Sensors</li> <li>• HVAC</li> <li>• Lighting</li> </ul>
<b>Global</b>	Global Carrier	Global Carrier	Global Carrier support expected	Global Carrier support expected

\* Requires support of Power Saving Mode (PSM) and/or eDRX