



Wireless Innovation: 5G

What it is. Why it Matters. Making it Happen. Role for Policymakers.

John Emra
President
AT&T Connecticut

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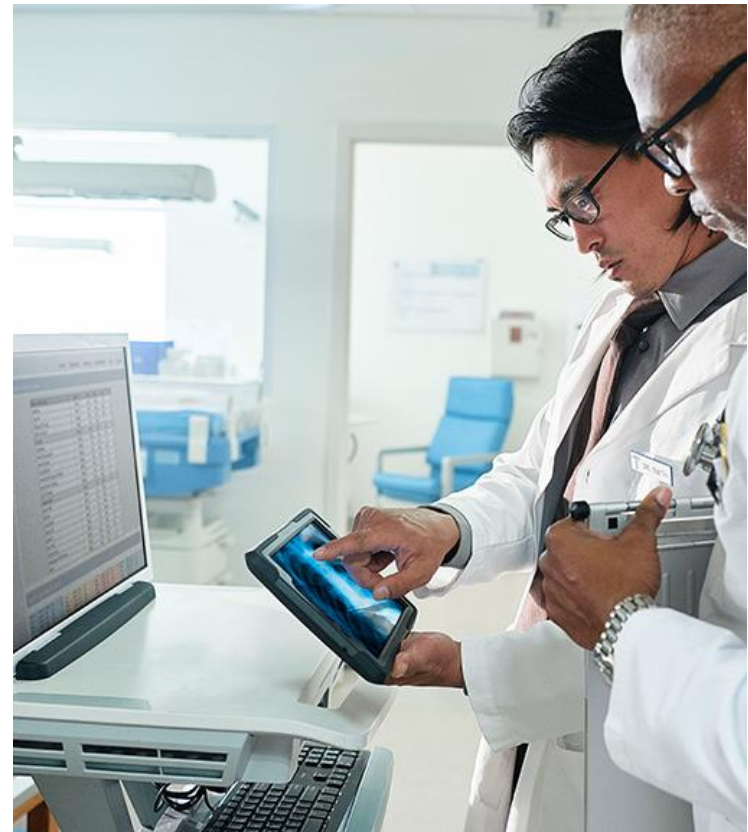
The Next Wave.

We believe mobile 5G will jumpstart the next wave of unforeseen innovation.

Changing the way we live and work

We expect 5G technology to help us connect more devices faster, enable lower latency, increase battery life and handle more data – like surging video growth on mobile networks.

- **Speed** will be an important benefit of strong and reliable 5G networks. We expect standards-based 5G to offer faster connections than today's 4G LTE networks, with an expectation that **latency** likely will someday be imperceptible to humans. This will impact things like time between pressing play and seeing a video actually start to stream.
- However, the true promise of the network is about much, much more. 5G promises to take people places they've never been by unlocking brand new experiences, like **augmented reality** and **virtual presence**.
- Future 5G will enable the technology behind the massive **Internet of Things** movement.



5G Capabilities

In addition to speed, other expected capabilities of the future 5G network will make it special:

- **Massive device connectivity** – We expect it will help handle and manage the “massive IoT explosion.” IDC predicts more than 80 billion devices will be connected to networks globally by 2025 – more than 10 devices for every person in the world today
- **Ultra-reliability** – We expect tomorrow’s 5G network will be one you can depend on which will be especially important for new technologies like automated cars.
- **Ultra-low latency** – Latency is the amount of time that passes between when you tell your technology to do something and when it does it. The industry expects the 5G network to have ultra-low latency.
- **Better capacity** – More connection points in a smaller area – along with using small cells – will improve capacity. That will mean a better customer experience.

5G is expected to be the building block for greater innovation. Wireless networks will empower connected cities – smart power grids and smart homes, driverless cars, telehealth – and open the door for innovators and investors to make the U.S. a leader in the digital age.

Our Mobile 5G Foundation

By investing in our wireless network today we're bringing faster speeds now, and will upgrade to mobile 5G when it's ready.

AT&T is working hard toward a 5G mobile future today. In fact, we're laying the 5G network foundation with 5G Evolution and LTE-LAA.

These technologies serve as the runway to 5G by boosting the existing LTE network and priming it for the future of connectivity.

On December 21, 2018, AT&T became the first and only company in the U.S. to offer a mobile 5G device over a commercial, standards-based mobile 5G network.



Making 5G Possible



Fiber

The success of mobile 5G relies on a quality fiber connection to the wireless towers or small cells, which then translate the fiber connection into an ultra-fast wireless signal for customers.

Towers

By working with more suppliers and tower companies, we're overhauling the cost and layers associated with the traditional wireless tower model. This makes it possible for us to stay ahead of the growth in mobile data usage, giving customers access to faster speeds and a better wireless experience in more locations.

Small Cells

By placing small cells on streetlights, utility poles and other structures we're bringing faster speeds closer to more customers. We are deploying thousands of small cells, which lays the groundwork for future technologies such as 5G.

What are Small Cells?

Small cells are flexible network solutions—like mini-macro cell sites—that can be readily deployed to specific locations, including those where customers are prone to experience connectivity issues, heavily populated areas that need more network capacity or in areas that can't effectively be served by a traditional macro cell.

Small cells are precisely targeted solutions and can cover a radius up to 1500 feet. A small cell provides enhanced voice and data services by helping to bolster network capacity to allow faster downloads and improved call quality within its coverage area.



Where are Small Cells Deployed?

Small cells are low profile, compact, scalable and unobtrusive. Depending on the need, small cells can be placed in buildings or outdoors.

When placed outdoors, small cells can be attached to existing utility poles, light poles or exterior walls of buildings.

And indoors, small cells can be placed above ceiling tiles, attached to drop ceiling mounts or placed in telecom closets.



Connecticut's Rules for Small Cell Deployment

On an existing or replaced utility distribution pole

- PURA Jurisdiction

- Attachment agreement with pole owner and pole owner approval

- Abutter and municipal notification

- PURA application/hearing process

On utility transmission tower, new free standing tower or rooftop tower

- Siting Council Jurisdiction

- Abutter and municipal notification

- Public hearing for towers

On a municipal street lamp, traffic light, or building

- Municipal jurisdiction

- Municipal attachment agreement for street lamps and traffic lights

- Agreement with municipality and whatever local zoning rules are applicable

Possible Needed Action by Policymakers

Eliminate Barriers to Use of State Lands and Rights-of-Way

State agencies believe the law doesn't allow use today

Consider adopting model language to aid deployment on Municipal Property



Thank you

Helpful resources:

AT&T 5G Microsite:

<https://about.att.com/pages/5G>

AT&T 5G Whitepaper:

<https://www.business.att.com/learn/5G.html>