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T - AT&T Inc at Cowen Technology, Media & Telecom Conference

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PRESENTATION

Colby Alexander Synesael - *Cowen and Company, LLC, Research Division - MD and Senior Research Analyst*

Welcome to day 2 of Cowen's TMT Conference. My name's Colby Synesael. I'm the senior telecom services analyst here at Cowen. For this morning's presentation, we have AT&T, and from AT&T, we have Scott Mair, who is the company's President of Operations. Scott, thanks for being here.

Scott Mair - *AT&T Inc. - President of AT&T Operations*

Thank you. Thank you for having me.

Colby Alexander Synesael - *Cowen and Company, LLC, Research Division - MD and Senior Research Analyst*

So I know you have, I think, an obligatory slide or 2, so I would get to that, and then I'll jump into my questions.

Scott Mair - *AT&T Inc. - President of AT&T Operations*

So safe harbor statement. So some of the statements I'll be making are forward-looking. So as a result, some answers, outcomes may differ materially. If anybody would like more information, they can find that on our website or through our SEC filings. And another one, Colby, is we're still in a quiet period for the SEC options, so I'm not going to speaking about the spectrum today.

QUESTIONS AND ANSWERS

Colby Alexander Synesael - *Cowen and Company, LLC, Research Division - MD and Senior Research Analyst*

Okay. Fair enough. So we don't typically get to have the opportunity to meet with the President of Operations. Can you start by talking about your responsibilities at AT&T and what that actually includes?

Scott Mair - *AT&T Inc. - President of AT&T Operations*

Sure. I mean simply put, responsibilities that I and my team have are basically engineer, build and operate AT&T's wireline and wireless networks. So when you look at the breadth of it, it's across the waterfront of our network and includes 24/7 operations as well as building our wireless networks and wireline networks and fiber and all the elements in between the platforms on top.

Colby Alexander Synesael - *Cowen and Company, LLC, Research Division - MD and Senior Research Analyst*

That's a pretty broad network, both in the wireless and wireline categories. Where are you spending the majority of your time? And what are you focusing on today?



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Scott Mair - AT&T Inc. - President of AT&T Operations

Yes. So really, from a priority's perspective, there's probably about 4 or 5 major ones. So first is FirstNet, build out the FirstNet network. I mean that's really critical to us. We are very honored to have that obligation to serve our first responders out there. So that's number one.

Number two is continuing to improve our wireless network, LTE network, through our 5G Evolution plan, and that's been going really, really well. We're in over 500 markets at this point with that capability, so that's number two.

Number three is continuing to develop and deploy 5G networks. So we have a lot in motion there that I'm sure we'll be spending a lot more time talking about.

And then fiber build, right, we continue to invest in fiber. We have our goal of 14 million homes passed coming up this summer, and so we stay focused on that and make sure we get that across the line.

And then we have ongoing work in virtualization of our network. So those are the -- really the 5 areas where I spend all my time.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

Okay. So let's talk about some of those. So let's start off talking about FirstNet. So the FirstNet build was 53% complete as of March and ahead of your 60% milestone by the end of the third quarter of 2019. Would you expect it to be mostly completed by year-end 2020?

Scott Mair - AT&T Inc. - President of AT&T Operations

So I'm just going to talk a little bit about FirstNet, and then I'll talk about timing and a couple of things here. One is FirstNet is a huge opportunity for us, and quite frankly, it's also a mission. And I say it's a mission because it's like nothing I've ever seen inside of AT&T. I mean when we're serving first responders who are taking care of people at their most critical time and need, it has a higher level of importance. And so all you have to say is related to FirstNet inside of our company and people are engaged, they're focused and the goals we've set out are pretty clear.

So you mentioned the 60% of our square-mile coverage. That's our target. So we have the contractual commitment for next March, but we'll be 6 months ahead of that. So we say we'll complete with that in the third quarter. So that's well on track. We know we're going to hit that, and that's kind of the next milestone for us.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

So it's interesting that the milestone requirement is March of 2020, but to your point, you guys are going to be 6 months ahead of that. So your goal is the third quarter of '19 with the 60%.

Scott Mair - AT&T Inc. - President of AT&T Operations

Correct.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

What's the next goal thereafter that's required for you guys?



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Scott Mair - AT&T Inc. - President of AT&T Operations

Yes. So we'll have an 80% goal, and this is kind of Band 14 coverage across x amount of square miles. So the 60% is a square-mile coverage commitment. That next goal is 3 -- or March of 2021. And again, we'll be in advance of that. We'll complete that in advance of that, more than 6 months.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

And when you complete that goal in the third quarter of '19, the 60%, what is the payment that you'll be getting from FirstNet as a result of that?

Scott Mair - AT&T Inc. - President of AT&T Operations

Yes. As part of the contract, we'll have over \$1 billion of cash that the government will pay us for building out the network. And so that's what we'll see this year.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

And your guidance is \$23 billion gross, \$22 billion net. And is that payment in the third quarter that gets us there?

Scott Mair - AT&T Inc. - President of AT&T Operations

Exactly. That's correct.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

And I mentioned getting complete by year-end '20. I think that there's a perception out there that you would've gone to the easier places first to kind of get to where you need to be, get the payment. That would suggest then that perhaps the second half is going to be the next 40%, if you will. It's going to be more difficult to achieve. What can you tell us about this? And when would you expect to wrap all this up?

Scott Mair - AT&T Inc. - President of AT&T Operations

Sure. So it would be nice to go to the easy places first, but that's not the way the contract is built. And our obligations are really split into we have to hit the square-mile coverage, both in nonrural areas, think metro areas and suburban areas, as well as rural. So I can't meet one versus the other. It's always easier to build in metro areas, but I also need to hit that same 60% target in rural areas. So I need to balance how we're building. And so as we get to the next ones, there's more and more rural that is going to be there. And so that's how the contract is built. So no easy way out. It's build the network and build it as quick as we can for our first responder community.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

And do you think you'll be mostly done by the end of 2020?

Scott Mair - AT&T Inc. - President of AT&T Operations

So I'm not ready to say end of year 2020, right? It's really a 5-year contract. We're in year 2. I have high confidence we're going to finish that build early, but I'm not ready to commit to it's going to be 2020.



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Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

And can you give us a sense how many cell sites are being touched? I mean I think that the number I've heard before that there's roughly 70,000 cell sites in AT&T's network. I'm under the impression you don't have to touch all of them to get Band 14 deployed nationwide in covering all these geographies. Any sense what actually has been done to get you there?

Scott Mair - AT&T Inc. - President of AT&T Operations

Yes. So the way it's built is the majority of sites will have Band 14. But when you look at the first responder that's using our network, they have access to our commercial network as well as Band 14. And even on the commercial network, they get first responder service. So preemption and priority, dedicated core network depending upon the band that they're on, but that capability is going to be there commercially or on Band 14. So conversely, when we deploy Band 14, our commercial customers can use it if first responders are not using it. So it's a pretty good way to provide service. So majority of towers will have Band 14, and we will continue to build out the network with Band 14 as time goes on as well.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

So majority in that are being -- so something north of 35,000 but less than 70,000.

Scott Mair - AT&T Inc. - President of AT&T Operations

Less than 70,000, correct. And so when you think about it, in rural areas, you may not have to provide Band 14 if our commercial network is providing the same level of service.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

That's the plan. And can you provide some metrics to help reflect the benefit of these investments? I know besides the Band 14, you're also deploying the WCS and the AWS spectrum. What's been the benefit of all of this?

Scott Mair - AT&T Inc. - President of AT&T Operations

So I'll just speak to FirstNet as an example. So at the end of the first quarter, we'll go publish their test results. The FirstNet network was the fastest network in the U.S. and 25% faster than any commercial network. So I mean that's a pretty good statement around the capability that we're putting out there for our first responder community.

When you look at what we're doing, we're continuing to enhance our network through our 5G Evolution. So when we're building FirstNet, we're actually touching the tower, and we're doing multiple things. Besides just putting up Band 14, we're putting in new modern technology, radio technology enhancements, the LTE network. So it gives us our 5G Evolution speeds with 256 QAM and 4x4 MIMO and capabilities that -- with carrier aggregation.

Secondly, we're upgrading the radios for 5G capabilities. They're software upgradable. And so when you look at what we're doing, the third thing is spectrum. When we're touching the tower, we're putting up the WCS, the AWS spectrum with Band 14. And with carrier aggregation, I can then stitch that together logically and provide much greater speeds. And so we do 4-way carrier aggregation today. We're going to 5-way and 6-way here in the near future.

So again, that, touching the tower with FirstNet, is an entrée, really an entrée into enhancing our LTE network, and we're seeing the results of it, right? I mean if you look at last fall, the GWS Best Network Award, end of the first quarter, now the fastest network. And it's really a result of a



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multiyear plan we've had that with FirstNet, with the planning and spectrum that we've been doing, spectrum acquisition. We're putting that investment to work, and it's demonstrated through all that third-party testing that we see out there.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

Yes. The 4x4 MIMO, are you deploying that on all bands? Or is that more for like the mid-band, like WCS, AWS spectrum?

Scott Mair - AT&T Inc. - President of AT&T Operations

More mid-band.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

Got it. And can you remind us how big of a market opportunity FirstNet represents? I mean we've heard figures in terms of looking at just the FirstNet responders themselves, potentially expanding that group and maybe even including their families. How could we get a sense of the TAM that, that opportunity represents for you guys?

Scott Mair - AT&T Inc. - President of AT&T Operations

So I'll start with at least where we're at right now, and then I'll talk about the total market, total addressable market. So right now, we have 600,000 customers on FirstNet, and we have 7,500 agencies that have already signed up. And we're gaining momentum, right? That's growing very, very quickly. And so the community out there, the first responder community is gaining momentum and buying in.

When you look at the addressable market, so kind of classified in the 2 tiers, right? You have a Tier 1, so a direct first responder. So that market is about 3 million. We have a second tier of first responders that are power companies and other people that provide mission-critical services in support of fire, police, FEMA and those things. And that total market is about 10 million.

So when you consider both Tier 1 and Tier 2 -- the other thing that we're finding with FirstNet, which is very fascinating, is when we signed up for first responder more often than not, most of the time, we're getting an additional line associated with that. So someone in their family will want to also have the same carrier as that first responder. And so that's not even part of the 10 million that I just mentioned. So it's a fairly sizable market, one that we were underrepresented in until we started building FirstNet. And so that's a lot of net adds, if you will. So right now, when you look at the base that we have, where most -- where almost surprisingly 50% are new customers to AT&T.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

Right. So 3 million of the Tier 1, 7 million of tier 2, which gets you to that aggregated 10 million, and that's ignoring the potential for family, which may come with the double lines, maybe we can be at 20 million rough numbers here?

Scott Mair - AT&T Inc. - President of AT&T Operations

Correct.



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Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

Okay. Moving on and talking about 5G Evolution, which you touched on briefly. So AT&T launched its 5GE network last year, which from our understanding leverages a lot of the incremental technological advancements associated with LTEA including carrier agg, massive MIMO, or at least MIMO, and 256 QAM. Is that correct? And what type of network improvement have you seen in the areas you've rolled out 5GE?

Scott Mair - AT&T Inc. - President of AT&T Operations

So as I mentioned, 5GE is the way that we kind of characterize. And again, it's LTE-Advanced capabilities that come with upgrading a tower and building our spectrum. When you look at the carrier aggregation, that really gives us the ability to stitch together the multiple different frequencies that we have. So it doesn't need to be contiguous. We can put those together logically and then get the same bandwidth channel. And at the end of the day, it's speed. So that's why I want to mention the fastest network. That is a direct result of our strategy to deploy the extra bands that we have available that we have not yet put to work.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

That carrier agg, I'm just curious, does that in theory devalue the argument that contiguous spectrum is of more value? Because if you think about it -- millimeter wave is an example. So part of the value of millimeter wave is you get these huge channels, right, measured in hundreds of megahertz. And the argument is that by combining them, you get these bigger channels, you can get better throughput. But if you can do that technologically with carrier agg, is that really needed?

Scott Mair - AT&T Inc. - President of AT&T Operations

So when you look at contiguous spectrum, you basically have the full channel with -- as that block as design, right? So 10 megahertz, 20 megahertz. So with carrier aggregation, there is a small efficiency cost to it. It's not really significant, but there is a little bit of a difference. Plus, with carrier aggregation, if you have the spectrum with wide bandwidth, you can put it up and start using it.

With carrier aggregation, you have to have the device capability and the software capability to put it to work. So it depends upon the timing. If I have the spectrum and put it to use, there is some benefit to that wide band. Otherwise, I have to make sure that my time lines match up with the software releases and device releases to take advantage of the carrier aggregation. So there's some difference in it, but when you have those things lined up, it's pretty similar.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

Yes. So in a perfect world, you'd prefer to get these big spots of spectrum. It's more efficient. It's easier to deploy. It's quicker to deploy. But technologically speaking, carrier agg really does replicate what that would have done.

Scott Mair - AT&T Inc. - President of AT&T Operations

Yes. It changes -- it minimizes the difference once you have a carrier aggregation capability.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

And then let's talk about your 5G build. So you're in 19 cities today with 5G+, and I think it's important to explain what that is, with plans to be nationwide with sub-6 gigahertz 5G by mid-2020. Well, I guess first off, what have you done to build out the 5G+ network?



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Scott Mair - AT&T Inc. - President of AT&T Operations

Yes. So let me describe, there's kind of what I would call 2 different deployment processes for 5G. One is millimeter wave. So it's building with millimeter wave, a very different build model from the traditional macro tower. And the second way is basically putting 5G on our macro tower.

So I'll kind of take 5G+ first. So 5G+, we're in 19 cities. It's basically a millimeter wave small cell strategy. And a small cell is different because it's generally not mounted on a tower. Generally, it's light poles, telephone poles, sides of buildings. And in order to do that, you're working with different people. So there's a new ecosystem that is being built for small cells.

And what's really different is, with the small cell, I now have to work very closely with cities for permitting and approvals of city for that infrastructure on city streetlights or telephone poles. And typically, when I was putting something on a macro tower, I wouldn't largely have to interface with the city. So I have to work with cities. And there's a -- it's a slow process overall, and it's picking up speed, right? We're immature in this. So it's going to get a lot better. It's a learning curve, a lot of education going on and we're seeing that, right, the momentum.

I really like the momentum I'm seeing right now from our build in terms of the C-RAN or small cell capabilities. So that millimeter wave, basically, 200-, 300-plus meters radius. So there's a lot more of those small cells that you need to put in place to provide that capability. When it's there, it's 1 gigabit plus speeds. We recently just, through a software upgrade, tested over 2 gigabit speeds using millimeter wave 5G. And so it's a really lightning-fast capability.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

Going back to 4G as a comparison. The way I've always envisioned it is when a carrier like AT&T is building out a city like New York, you would go and upgrade a certain number of cell sites that kind of give you that coverage across New York whether it was rooftops in this example or macro towers, and then a press release would come out and say, "Hey, we've covered New York. New York is now 4G-ready." It seems with 5G+, it's different. It is a millimeter wave solution, and it's utilizing small cells. Their ability to have coverage across a given market like New York is not what's intended really with 5G+. Am I correct in my description? And do you think consumers understand that? Because we've seen in some of the press of recent that with some of your competitors that there has been some scrutiny around the coverage of what they're calling 5G. I'm just curious what your thoughts on all these are.

Scott Mair - AT&T Inc. - President of AT&T Operations

So it is a different deployment as I mentioned. So small cells, we've largely been using a capacity trigger as a way to say where we're going to go put small cells. And so we're putting them in, in different locations.

Now there's probably 2 things that we'll see over time. Yes, there will be smaller geographic areas that are more contiguous coverage, but they're not likely to be across a whole metro city, right? When you consider the number of cells that are -- that, that would take, there'll be areas where more contiguous; other places, it will be more unique to a smaller area, buildings or area -- apartment buildings and such where small cells will be built.

So different deployment because it's not really a coverage layer, if you will, like you would -- like you described New York. You'd put up cell sites, and you'd cover all of New York City and call it good and move on, right? Small cells are going to be more in smaller areas, I think, initially. But over time, it will grow a bit.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

And talk about your sub-6 gigahertz 5G launch. So that has not yet occurred, and that's expected to be nationwide in mid-2020. I guess what's involved with that? What physical equipment is being put in place to support that? And what's your definition of nationwide by mid-2020?



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Scott Mair - AT&T Inc. - President of AT&T Operations

So when you think about 5G, so 5G standards-based, this is -- think about our traditional macro cell tower network, right? How do we provide 5G in that -- on that infrastructure? So as I mentioned, as we're -- on building out FirstNet and putting our spectrum to work, the radios we've been hanging are basically software upgradable. So that will help get a lot of coverage more in a traditional sense that we were talking about.

So what do I need to do? I need to touch the radio. I need to deploy a software, and obviously, devices need to be available. So the device ecosystem is such that it's starting to pick up a little bit this year. We said that we'll have our -- we have 2 devices that'll come out this year for 5G, one in the first half and another one by the end of the year. Other operators have similar plans or different plans for different types of devices. So we'll start to see that mature. And that's why as we've said, this time next year, we'll have nationwide coverage of 5G on a macro tower backed up by our 5G Evolution LTE-Advanced capability on those same towers. And that we define nationwide as basically greater than 200 million pops, so just to be clear on that. That's how we describe it.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

And as part of this build, you're also going to be -- you already have done admittedly, investing in C-RAN architecture as well. I think that that's a big important aspect of what a 5G network is going to look like. Can you talk about what you've been doing with C-RAN?

Scott Mair - AT&T Inc. - President of AT&T Operations

So C-RAN is our small cell. So C-RAN is the architecture that's called the centralized radio access network. So -- but the node at the end of the small cell. So we use the terms interchangeably, but to describe what C-RAN is and why there's an advantage here, it's an -- so if you think about a cell tower, you've got a radio at the top and you've got like a baseband unit. You've got the brains of the tower at the bottom. Take that vertical architecture and turn it on its side. So now I'm putting a baseband unit or the brains of my small cell deployment in a central location, think about a technical office, a data center, and I'm extending fiber out from that central location to all these small cells out in the city.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

[Illustrative of] the front hall.

Scott Mair - AT&T Inc. - President of AT&T Operations

The front hall, that's the fiber portion. And so what's really nice about it is if I have 500 small cells attached to that centralized unit, when I do a software upgrade, I'm upgrading 500 small cells all at the same time. It's very efficient from an upgradability standpoint. And the small cells will continue to build out in the cities based upon that centralized hub-ing architecture.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

Any sense how many small cells you guys have built so far? And then how many C-RAN aggregation points you've built? Or maybe how many cell sites, small cells can be supported by a C-RAN aggregation? Any color on this to get a sense where you're at?

Scott Mair - AT&T Inc. - President of AT&T Operations

So I don't disclose specific numbers. But I will say that our build right now is gaining a lot of momentum, all right? We've -- we can do 2x, 3x year-over-year, as I mentioned, getting the relationships with the cities, getting the processes put in place and then building out. I mean it's catching on momentum-wise, and it's immature. That's normal for a process. And so the hubs, depending upon the city, the ratio will vary. Sometimes, they



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have 1 hub, and I'm in a smaller city. Other times, I might have a number of hubs in all of the major metro cities. So they'll all hub back to the same place.

Colby Alexander Synesael - *Cowen and Company, LLC, Research Division - MD and Senior Research Analyst*

Do you have a strong view in terms of wanting to build the fiber and the small cells yourself versus using third parties? Or are you open to go with whatever is the best economic alternative -- or solution?

Scott Mair - *AT&T Inc. - President of AT&T Operations*

Yes. It's usually the best economic solution. And we really use 3 models. One is where we have our enfranchise footprint or fiber outside of our footprint, we'll look to build that ourselves. And many times, we do. The other side of that scale is basically a turnkey operation, right, just basically have someone build it all for us.

And so we use both of those models, and we actually use a third one, which is in between. It's a hybrid model. I may partner with someone to bring fiber to a pole for a node. And then if I have people in that area, my construction team, we'll build the node ourselves.

So we use all 3. And it really is economics-driven for us. In footprint, we're going to build more out of footprint. We'll use the other 2 models more.

Colby Alexander Synesael - *Cowen and Company, LLC, Research Division - MD and Senior Research Analyst*

Yes. We talked a lot about 5G, and we actually read a report recently on what we define as true 5G, which, to simplify, basically means everything but the phone-oriented experience or opportunity. When you think of the revenue opportunity for AT&T, and I'm taking you a little out of our own area of focus, what do you think is ultimately going to be the bigger revenue opportunity for the company?

Scott Mair - *AT&T Inc. - President of AT&T Operations*

So I think our company is very committed to -- we believe the best opportunity right now is in the enterprise business space. The use cases that we're focused on are being -- are in development. So if you think about hospitals, we've talked about Rush Hospital. You look at smart factories, and we're partnering with Samsung and Austin on that. You look at venues, so sporting venues, right, a very different experience in sporting venues for 5G. So we're partnering with the Cowboys in AT&T Stadium and others. So you look at smart cities and the opportunity there.

So I think it's the use cases that are really going to be driving the revenue. And those use cases will use a couple of other aspects related to 5G, which is a different core network, backed in the data centers that gives us an innovation platform and also, basically, partnering with others to develop software applications. That's where I think the revenue opportunity is.

Colby Alexander Synesael - *Cowen and Company, LLC, Research Division - MD and Senior Research Analyst*

We've spoken pretty strongly about the value of network slicing, and the concern has always been for carriers with 5G is that we need to ensure that you guys make money. If you don't make money, the waterfall, no one is going to make money. And the concern is that with 4G, when you look overall, the majority of the value creation occurred at the app layer beyond where you guys were able to participate. But it seems like there's something technologically different with 5G that gives you a better likelihood of actually participating, and that kind of simplified that down to network slicing. Just curious to your views.



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Scott Mair - AT&T Inc. - President of AT&T Operations

Yes. Network slicing, so network slicing is basically the 5G core that will be coming into production in the next couple of years across the operators has a fundamental capability to architect services on top of that core. And those in the LTE world, it has been very difficult to architect services other than broadband-based applications. With the new core, we'll be able to architect services specific to IoT or maybe video applications or certain use cases that face off to needs of enterprise customers. And that gives us an innovation platform that was not necessarily there in the LTE environment.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

Yes. We've referred to it as a permission in network, where if a specific application says it needs 10 gigahertz versus another one might need 20 gigahertz, and one needs it in millimeter and one needs it in mid-band, if you have one that says that we need more latency, one that doesn't need it, one that needs an SLA, one that doesn't need it, all these different attributes could be virtualized effectively through network slicing, and it requires whomever is building that application on a 5G network to basically talk with and work with AT&T to ensure that the network is tuned accordingly for their applications, which means that unlike 4G, which was a very homogeneous flat network, they really do have to work with you which is where that revenue opportunity comes in.

Scott Mair - AT&T Inc. - President of AT&T Operations

Correct. And then the other thing that -- when you talk about the architecture, the edge nodes are another element of that architecture. So that gives us an innovation platform to put applications closer to the customer with low latency but still stay connected to the core for basic control functions.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

My last question, fixed wireless. So Verizon moving forward with their millimeter wave solution. T-Mobile moving forward to the extent that their deal gets approved. Where does AT&T sit on fixed wireless and its opportunity long term?

Scott Mair - AT&T Inc. - President of AT&T Operations

So we've said for a while now, we're mobility first and we will use fixed wireless in certain situations. It's a technology that clearly works. We've been doing it for LTE as part of our CAF II commitment and have deployed and used fixed wireless today. And so there's going to be places where we're going to want to use it. But if we build the node for mobility, that node can actually do mobility service as well as fixed service. And we -- broadband replacement is one of the things that has been talked about and fixed wireless provides -- we see it today -- it provides an option to do. We see it today. People are starting to use their mobile service as a broadband replacement. And so I think normal -- natural evolution is fixed and/or mobile. It's going to be a combination of either.

Colby Alexander Synesael - Cowen and Company, LLC, Research Division - MD and Senior Research Analyst

Do you envision at some future point, we won't talk time line, AT&T having what I'll refer to as a material millimeter wave fixed wireless solution in the market?

Scott Mair - AT&T Inc. - President of AT&T Operations

So I think over time, fixed -- because millimeter wave will be built out over time. And whether it's providing mobile services or fixed, I think you're going to see a lot of it over time.



MAY 30, 2019 / 12:30PM, T - AT&T Inc at Cowen Technology, Media & Telecom Conference

Colby Alexander Synesael - *Cowen and Company, LLC, Research Division - MD and Senior Research Analyst*

Great. Well, with that, we're out of time. Thank you very much for being here.

Scott Mair - *AT&T Inc. - President of AT&T Operations*

Thank you. Thank you for having me.

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