



Cambium Networks Corporation

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Paul Coster: Good afternoon, everyone. This is the 48th J.P. Morgan TMT Conference, the first virtual version thereof. My name is Paul Coster. I cover alternative energy applied in emerging technologies, including IT hardware, at J.P. Morgan. I'm very happy to introduce Atul Bhatnagar, CEO of Cambium Networks. Atul, good afternoon.

Atul Bhatnagar: Good afternoon, Paul.

Paul: Thanks so much for joining us. Before we start, this is going to be a fireside chat Q&A session. There is an option for the audience to put in questions. You'll find either at the top of your screen or at the bottom, a little Q&A button.

If you click on that and submit a question, I will do my best to incorporate it into the discussion. With which, Atul, thanks again for joining us. You printed your second fiscal quarter results yesterday so everything's fresh in everyone's mind.

Let's assume that there's some folks out there who have not heard about Cambium Networks previously. What is it that you do in the context of the so-called wireless fabric?

Atul: Thanks, Paul. First of all, thank you for inviting us and welcome to everyone on this webcast. Cambium solution is to connect the unconnected people, places and things. We are in the business of bringing connectivities especially to the developing part of the world.

Our main value is to create connectivity that is very affordable yet, very high quality. That's a very key value we honor and also provide as much backwards compatibility so our customers have good investment protection.

We have millions of radios and wireless infrastructure deployed worldwide connecting millions

and millions of people. Our customers [inaudible] service providers worldwide offering wireless connectivity, and also mid-tier enterprises.

As a company, we very much focus on the mid-tier of enterprise and mid-tier service providers. That's our sweet spot. We offer affordability by innovating RF algorithms software management and yet, using merchant silicon who create the hardware.

As a company, we came out of Motorola. There's a strong BNF quality, wireless expertise, very strong scalability of the networks. As a company, we take a lot of pride in that design center and that value we offer as [inaudible] .

We sell through booking a channel, about six, seven thousand channels worldwide. That's [inaudible] able the fulfillment. That's how we scale.

We have tremendous ability in different frequencies. The range, indoor, outdoor. From kilobytes to megabytes to gigabytes now. That is [inaudible] .

Paul: What is the wireless fabric?

Atul: The wireless fabric, we coined that term. Actually we have been using that term for about five years or so. If fabric is a composition of different strengths. We felt that network standards, whether it's a WiFi, whether it's fixed wireless broadband, whether it's microwave, whether it's narrow band, there was too much of technical jargon.

We felt that if fabric should weave those standards and those complexities and demystify connectivity so our end customers can create a purpose built network for a specific job.

Our fabric is very customizable. It comprises those standards and technologies. Very easy to manage because entire fabric can be managed from a single pane of glass, from a manual station in the cloud called Maestro. The fabric invokes that vision of synthesis integration and demystifying the complex networking technologies.

Paul: Right. As you said you're connecting young connected. That's typically developing nations or the rural communities and some suburban. You do that with a points point, point multi-point and, of course, access technology.

Atul: That's correct.

Paul: Can you talk just a little bit about the size of overall market in these subsets and what the growth characteristics of the market?

Atul: Sure. The fabric uses the product as solutions as Paul, you mentioned. Point-to-point products provide the bulk bandwidth transport between buildings, between institutions. They can be as far apart as 100 kilometers and we can build line of sight 150 kilometers in one point.

That's our forte, to handle the interference and tough conditions, all those conditions and yet, transfer the bulk bandwidth. That's point-to-point.

Line-to-market point then transfers the bandwidth once you come within a campus or within a city. Last, maybe 10, 20 kilometers or so. That's the distribution of bandwidth to find multiple [inaudible] .

Then the last four, five hundred meters is our indoor, outdoor WiFi products. The fabric can stretch from those two meters to that 400 kilometers all managed from a single [inaudible] . Those are our key products.

Within those categories, there are multiple frequencies and throughputs and all that depending on the purpose build network, we can choose the right components.

Paul: It is a gigantic market. It's over 20 billion, I think, if you include the enterprise and campus switching products. Some of your market source are quite niche. The point-to-point market for instance where you have a significant share in the smaller market.

Perhaps you can give a sense of some magnitude of point-to-point, point-to-multipoint and the growths around each of those.

Atul: OK. Overall, TAM is about 20, 22 billion. Then we talk about some, the service server market which is more relevant for us. At the point-to-point is about a three, four million dollar market but the one we can service through our unlicensed point-to-point products, different frequencies, microwave.

It's about 1.5 billion, approximately. That market we can absolutely serve at the solutions we have. That is the market's probably flatish and I think our...but I give root, Cambium root. I'm more talking about next few years. Not specifically quarter or so because there could be variations in a

quarter.

I would say long term, we can definitely grow about five percent, seven percent, something like that in the park. Point-to-multipoint is about \$600 million market. We are very key pioneer and a leader in that market because when we came out of Motorola, there was a particle canopy. We created that categorical point to multipoint.

The market is probably growing, I would say, 10 percentage. We are growing long-term model where we grow is probably 10 to 15 percent growth for our point to multipoint.

Then WiFi is about a \$6 billion market and our serviceable market is about 1.5 to 2 billion because we don't go after very high enterprises or very high-end service providers. Our focus is very much met here.

There I would said the serviceable market is probably 1.5 to 2. Market is probably growing six, seven percent. We are growing extremely well, of course from a smaller number based on last quarter. We grew 106 percent year over year. Last year we grew 81 or 82 percent year over year. That gives you a flavor of the markets we served.

Paul: Right, OK. You've put up meetings, growth for several years which is pretty impressive. Last year has been a little bit more challenging. I think it's to do with a number of product cycles and some. Perhaps you can talk people through the last year and maybe set a scene for what comes next.

Atul: Thanks, Paul. There are two major markets we serve. One is the service providers who are providing the broadband connectivity to developing communities. What we find is that every about four years or so, there's a technological shift.

We did see last three quarters that particularly led from Europe, there is a shift towards millimeter wave. Towards 28 gigahertz and possibly 60 gigahertz. We are beginning to start shipments of those products this year.

You will see us transition those customers. We did see a slow down for some of our business there which we plan to pick up as the millimeter wave particularly starts to get traction.

The second area where we did see slow down for us was, there was a very good federal point-to-point solutions we solved in 2018 and part of '19. Some of those were larger projects and the

project life cycle was over. We anticipate as the federal projects come back again we'll start to pick up the newer lifecycle of those products.

Those two key drivers slowed our growth, but our long-term model is still very much intact, which is really grow between, say, 13, 14 percent to 17 percent, somewhere in there, and maintain strong double-digit EBITDA as a company.

The COVID, I feel, is actually opening up quite a few new opportunities for fixed-wireless broadband, and we'll get into that as we converse.

Paul: Let's touch on the negative side of COVID first, which is that, of course, it's impacted so many supply chains and production, and go-to market in many cases. In your case, the first quarter looked pretty good, actually, [laughs] so far, so good. Of course, you've issued somewhat cautious guidance into the second quarter...

Atul: Yes.

Paul: and so like most companies, you've suspended guidance. It's really funny, by the way. At lunch time, Jamie Dimon gave his speech. He recommends to all of his clients that on the issuance side, that they perhaps think of using this COVID as an excuse to never issue guidance ever again, so that...

[laughter]

Atul: Right.

Paul: so a lot of cover there. Anyway, so far, it's not been too bad. What's the current status with respect to COVID?

Atul: We actually have a very diversified supply chain, and a little bit by design, a little bit by legacy, because we came out of Motorola. They had a diversified supply chain.

We have a good partner in Flextronics in Mexico, so a lot of our manufacturing does happen in Guadalajara, Mexico. Then we have some manufacturing presence in eastern seaboard of China, Shanghai, which was not as much impacted as Wuhan area, and a very little manufacturing in central China.

So we had not too minimal impact, at least so far, and our plan is to keep it that way. So far, not concerned much about that as we move into Q2.

Paul: What about the go-to market? Q2 is a little down, right? So what's happening there?

Atul: I think we are being cautious, because we don't know what we don't know. In some cases, COVID...most of us are coming out of it, and it's just starting. Things are slowly reopening, so we felt that it's...there's still the second half of May to go. There's June to go. We wanted to be conservative and be cautious as we entered Q2. That's primarily, I think, the sentiment.

In terms of the macro drivers -- long-term business outlook, long-term business model -- connectivity is lifeline. If one thing COVID has proven, and why I say this will be good for our business long term, our viability long term, our relevance long term, is that COVID has proven broadband, Internet broadband connectivity worldwide is lifelines.

Every government is now prioritizing not just metro -- big areas, big cities, tier one cities, but actually tier two, tier three, tier four cities need to get proper broadband, proper connectivity so you can put sensors, you can put video surveillance, you can put compliance.

I think you will see that drive across the world for many years to come, and...

[crosstalk]

Atul: strongly that what COVID has done for us, some of the standards and some of the decisions regarding frequencies and standards have been sped up by two years. It would have been debated for a long time. I think COVID has put a sense of urgency, building proper wireless infrastructure worldwide, so we think long term, it bodes well for us.

Paul: I imagine that COVID-19 testing, at least, is going to drive demand for connectivity in rural environments, where the healthcare and telemedicine capabilities are so limited.

Atul: Exactly. Another point I want to make is it's not just Google environment. Actually, any country, you travel out of a main city -- tier two, tier three, tier four cities -- it's amazing to see how much connectivity needs there are.

Secondly, even where there is connectivity, now that everybody's using video...a little known fact that what fixed wireless broadband is, fixed wireless broadband offers symmetric performance,

upload and download. You can program percentage of performance you want on each channel or each of that streams.

For video, now that there's e-learning going on and students are uploading videos, the upstream performance is as important, and some of the differentiation is not showing, I think, for our architectures and our products.

Overall, I think in general the e-learning, more sensors, compliance, more video surveillance means more point-to-point backhaul bandwidth necessary, more point-to-multipoint bandwidth distribution, and more WiFi performance in the last 500 meters. All three need to be upgraded. You can't just have a great WiFi performance and then the pipeline is constricted.

Paul: One thing that I guess might be a little confusing for investors is that you've suspended guidance for the second half of the year, but you also have a pretty strong product lineup coming to market. Even in this second quarter, you'll have your new WiFi 6 products commercially available, right?

Atul: Yes.

Paul: Then in the latter part of the year, you're going to have Millimeter Wave products that are also potentially disruptive in your end markets. Can you talk to us about the product cycles?

Atul: Yes. As I said, Paul, I think it's better to be conservative right now. You want all the uncertainties because of COVID situation.

Also, I think many service providers may not have full capacity to deliver and deploy. Even if they have upgrade orders, even if they have the need, my sense is that full employee base, fully functional, will probably take few months [inaudible] , because this has been a unprecedented disruption. That is another reason why we are being careful.

If I fast-forward six quarters -- and that's kind of how we think -- the architecture for the future is gigabit. The architecture for the future will be next generation. That will not slow down.

In a few quarters here and there, things may slow down because of lack of delivery, [coughs] it will be of some of the service providers to deploy. That's the main...

[crosstalk]

Paul: Yeah, sure. You have some exposure to hospitality, education. Are these...in other words, end markets where dense populations of people in specific locations could be affected by COVID-19.

Now, on the other hand, you also have this excellence in the market and outside applications, so there's some offsets there. Can you talk through that a bit?

Atul: Yeah. I think, Paul, you were cutting off a little bit. In terms of the markets, I would say education market is definitely little impacted because we don't know whether they will upgrade the architectures so they will wait. Hospitality is impacted a lot more.

Both are important markets as far as by enterprise. We do see a little bit of that slow-down in the enterprise. On the other hand, the outdoor markets, outdoor event, outdoor WiFi might speed up. The smart city ideas might speed up because of more sensors, more video surveillance.

I think it's a question mark right now, which will grow in Q1, Q3. Long term, I think it will all even out. With short term, we definitely want to be conservative.

Paul: You're not competing in the tier one space and you're not really going off to big enterprise business. You're really looking at tier two, tier three wireless Internet service providers and...

[crosstalk]

Atul: Exactly. As a rule, we do more deer hunting than elephant hunting.

Paul: [laughs]

Atul: [inaudible] because over the years, what we have found is that it's easier to go after mid-tier because mid-tier is being progressive. They're using unlicensed bands in many situations. They are economical. They really value economics.

They want easy management. They are less personnel. That plays very well to our strengths. Whereas if we go after tier one, just the sale cycle is very long. You have to integrate your systems into their management system which is a very long-drawn process.

As a rule, we've find that our resilience is higher in focusing on mid-tier and the recovery from

COVID, we believe what mid-tier enterprises and mid-tier service providers to lead the way.

Paul: Why is that?

Atul: The reason I believe that is if you look at the big cities, if you look at, Paul, even to your own broadband needs, if you live in a big city, you have a smartphone, at least it will be OK in terms of performance and application.

If you live in a very free tier to tier three or four cities, that's where the upgrades and better performance, and more broadband is necessary. Tier two, tier three serves that region. I think you see more demand in terms of greener pastures, new connections coming out of the developing communities of the world.

Paul: Even here in the United States, the federal government has already reserved some funds for rural connectivity and there's more coming. Potentially even more if it's included in infrastructure.

[crosstalk]

Paul: moving forward to. Well, what is lined up at the moment domestically and perhaps you can also add anything you know of internationally that you think might be essentially catalyst?

Atul: Yeah. In United States there is Connect America Fund Phase 2, CAF II. They give subsidies and funds to service providers to provide connectivity to communities. We are participating that to them.

Then there is a big fund which is being groomed. It might take a year, year and a half called RDOF, Rural Digital Opportunity Fund, which will be an 10 to 20 billion dollars. There [inaudible] infrastructure.

CAF II is probably one or two years and then after that, RDOF will take over. That is United States. Similar initiatives are being conceived or implemented in many, many countries.

As I said, broadband is lifeline. If a country doesn't have broadband, they will not be able to compete. I think they're needed before but with the e-learning and telehealth, and smart cities, they are just making that a foundation of investment.

Paul: Let's get to some new technologies shortly. Before we do that, can we just talk a little bit about more mundane things? What are you doing to prepare for this period of uncertainty in terms of offsets in the balance sheet, making sure that working capital expenses are under control of sections?

Atul: First of all, we were going to the technology transition a little bit of federal defense slow down for our revenue. We were already banking expenses in Q4 last year and Q1 this year.

Actually, in a [inaudible] that was good because it prepared us better for COVID. We didn't know about COVID at that time. One of the principles we have in our company is really focus on growth and profitability not just wants.

That's how we run it. We are very committed in our long-term model to upgrade EBITDA 18 percent, 17 percent range, and growth between 13 to 17 percent. [inaudible] deliver that. We feel very good that we will deliver that as markets come back, as recovery happens.

Meanwhile, when COVID happened, we felt that we're keeping support that we should remain cash flow positive even in a worst case. That cannot draw us who're making further decisions because it is important to have a plan for the worst case. That's why we did it.

That's why we're confident. As markets come back, we'll still be efficient. We'll still be sometimes very, very careful about adding expenses but know we can deliver the numbers in the long-term market.

Meanwhile, even while we were cutting expenses and being more efficient, we kept our R&D investments on critical gigabit programs, WiFi 6, CBRs delivery, all of those programs very much full speed.

As markets come back, I believe that should position us very well. While doing expense control, we made sure we prioritized our investments in the right areas. The next few quarters will show that.

Paul: You made the point that you're of Motorola heritage. You're a new company from a public company perspective, but you've got some mature company DNA to you, meaning that you're already global. You've already got a very, very big distribution channel capability, a lot of customers who are repeat business and so on. This is all excellent.

Can you talk to us also about the technology and the intellectual property of the company? What is it you think distinguishes you?

Atul: Excellent question. The first key thing which distinguishes us is the ability in the company to optimize RF algorithms based on commercial chips. A lot of our intellectual property really is that software which runs in the cloud and on the products. Number one.

Second is that we offer world-class spectral efficiency. Spectral efficiency means how many bits can you pump in that frequency per second. We have world-class products. I won't go into the depth of technology, but our Medusa product, which is massive MU-MIMO technology, offers world-class spectral efficiency. That percolates down into all of our key products.

Third, we can manage all the complex technologies from a single pane of glass of Maestro, so cloud management. Our customers love that. Whether it's WiFi, whether it's switching, whether it's fixed wireless broadband, microwave, they see that they can manage the complexity from a single pane of glass.

The last thing I would say is our formula is always offer affordability yet enterprise mission-critical quality. That's why mid-tier service providers and mid-tier enterprises value the overall value we offer. That's something we are able to maintain through a lot of innovation. You saw example of CBRS.

CBRS is a very innovative way of spectrum access services. I gave an example on the earnings call. The way cloud did compute horsepower control through the cloud software 10 years back and you saw what happened to the data centers, similarly frequency access control is now moving to the cloud through CBRS.

What FCC has done there with partners -- Cambium was a very early adopter and solution offerer in that arena -- bodes very well. Many countries in the world will copy that.

Spectrum is a very precious resource. We are very proud of what we have done with CBRS. All of Cambium 450 product lines can be over-the-air upgraded to use CBRS. That's the kind of innovation we are doing.

Paul: How does that generate revenues though if all that you're doing is repurposing existing equipment to hop onto a new bit of spectrum? Does that actually benefit you?

Atul: Yeah, it does because you do bring new access points for three gigahertz, even if you upgrade a subscriber module. Then there's a software. There's a SaaS service from Maestro which basically gives them that frequency control. We charge for that.

It's a software SaaS service. It's not massive amount of money, but our journey for software-as-a-service has started with these kind of things. Over time, it will start building.

Paul: Why are service providers starting to look at millimeter wave, 28 gigahertz and 60? What's in it for you?

Atul: The service providers basically are always looking for more bandwidth. The 20 gigahertz and 60 gigahertz, it gives much wider channels. You can offer to an enterprise or a home hundreds of megabits per second, even gigabits per second type of throughput.

For the first time, these wireless service providers can take on a fiber situation and offer gigabits of connectivity. These are also bands which are not as crowded, as much noise-prone as three gigahertz or six gigahertz are.

The catch is though that since these are high frequencies, the distance covered is less. Distance you cover in three gigahertz and five gigahertz is far more. For shorter distances, like a kilometer or a kilometer and a half, with a meshing architecture, you can start to offer point-to-point, point-to-multipoint in urban setting.

In the urban settings, also Cambium will be able to offer products, say, in 2021, as our 60 gigahertz starts to take shape. Then 28 gigahertz will give you more distance, maybe four to five kilometers, but not as much as the three and five gigahertz, yet lot more throughput.

The single biggest thing service providers are looking for is a much bigger pipe. If you're doing lot of multimedia, lot of AR/VR type of stuff from home, these technologies will give you that throughput. That's the attractiveness.

Paul: Got it. You've also been transitioning your technology to LTE and now looking at 5G as well. Are these catalysts for you? The skeptics might say, "Well, you know, the mobile network guys with 5G are going to start to penetrate your market and compete with you in the rural environment." Can you talk us through that dynamic?

Atul: Sure. Very good question. There are two important points I'll make. One thing COVID has

done, COVID has proven the value of fixed wireless broadband versus mobile.

Remember, 5G can do gigabits or hundreds of megabits at 80 miles an hour. What COVID is saying is office is wherever you are. If that is true, without mobility, fixed wireless broadband is a very good alternative. That's one point.

Secondly, the large equipment manufacturers who focus on tier one cities and tier one service providers, their scalability is far higher than what we offer. That's not where we focus. The design cycle for those kind of systems is also probably four to six years for that kind of switching, routing, security, scaling. We don't do that.

We are very focused on mid-tier for a reason. We can use commercial chips, have a two-year design cycle, serve extremely well, with affordability and reliability and quality, the customer base which is sweet spot for us. We aren't concerned about that.

If anything, down the line, some of those larger manufacturers will come to us and say, "How did you design this with this price, performance, and reliability?" Ultimately, there'll be cooperation, but so far we see significant opportunity for the mid-tier customer. That's our sweet spot.

That's what we do with our software innovation, off-the-shelf chips, and yet enough innovation that these are mission-critical enterprise-class products.

Paul: WiFi 6. Why do you think that there will be an upgrade cycle? What catalyzes that upgrade cycle?

Atul: In the WiFi arena, Paul, every five years or so, the standards evolve. What WiFi standards do, they become more deterministic, fundamentally. WiFi is a non-deterministic technology. WiFi standards are always getting best practices from the cellular world, fundamentally. The standards add more security. They add more scalability, more performance.

The WiFi world moves, by definition, every four to five years to that new standard. It is always backwards-compatible. That's the beauty of WiFi. Customers always look for that scalability, that performance.

We believe that WiFi 6 will bring three to four times more performance to customers. Again, last 400 meters or so type of a distance. It is also offering multiple radios, more reliability, and low latency.

That's another thing, WiFi 6, is that it's much lower latency. Your multimedia applications, AR/VR type of stuff will work much better. It's just bigger, better, more scalable, low latency, enabling next-generation multimedia applications. Since the chip manufacturers will manufacture in large volume, you also benefit from that scale.

Paul: Last question. In a nutshell, because we've only got a minute left, emerging markets and some of the defense business or civil government business you're seeing now, are there any things to look forward to this year or early next in any specific markets?

Atul: As I said, infrastructure projects across the world will get priority. Government fundings will come to that. That should help us. Defense side of things, as governments are beginning to function again, we will see a better buildout of funnels on those projects.

In general, my key message is broadband connectivity is lifeline. Since people are working from wherever they are, fixed wireless broadband becomes a mainstream, legitimate application and fairly relevant for many years to come.

Paul: Atul, thank you so much for finding the time to talk to us today. We appreciate it.

Atul: Thanks, Paul. Thank you. Thank you for inviting.

Paul: Bye-bye.

Atul: Thank you for your time. Thank you. Bye-bye.

Paul: Bye-bye.



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