Cirrus Logic

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Blayne Curtis: All right, we'll go ahead and get started. Welcome. I'm Blayne Curtis, the semiconductor analyst here at Barclays. Very happy to have Cirrus Logic, from the company, Jason Rhode, CEO. Jason, welcome.

Jason Rhode: Thanks, Blayne.

Blayne Curtis: You know I thought -- we were just talking outside and, you know, it's interesting how the company has diversified. Not only do you have more customers, you have more products. And I think maybe a good place to start was, where do you see this company out three plus years as you start to ramp some of these other opportunities? And where are the areas where your technology can be applicable?

Jason Rhode: Yeah, it is a great time at Cirrus. We do have a lot more vectors going on than we've had historically. Some of it is us on our own getting critical mass on initiatives, and others are where -- came to the company through the Wolfson acquisition. But the net of it is, you know we've got good opportunities to broaden our business, traditional business out in flagship handsets.

For the first time, in either company's history, we've now got mid-tier, you know devices that are applicable to the mid-tier, which is obviously, you know everybody's concerned about overall handset growth, or especially flagship slowing down a little bit, but the mid-tier is huge and we've never really had products that are applicable in that space at all. So as a longer term prospect to drive in content either smart codecs, a smaller version of smart codecs in a mid-tier amplifiers, which we've never sold in the mid-tier, or really in a meaningful way in the android space. Those are great vectors for us. And then in the longer term, migrating a lot of these technologies that we're developing for handsets out into, you know, the connected home and wearables, the so called Internet of Things, and automotive even. You know voice, as a at least auxiliary interface in all of these systems really makes a lot of sense.

Blayne Curtis: And your main product had been a codec, and now you are -- it's on smart codecs are your leading customers. Maybe explain what that actually is. And then, you know you had a technology day and you shared some of the use cases you can do with this. Maybe you can explain what is smart codecs being used for today, and what are some of the future applications.

Jason Rhode: Sure. And it varies a lot, but the basic concept of a smart codec is simply the combination of a meaningful amount of DSP, you know programmable DSP capability on the same die (ph) as, you know, industry leading analog and mixed signal performance. So it's really been enabled by, you know, the combination of our mixed signal onto a 55-nanometer platform, which really is a great node (ph) for what we do.

So today, you know in the general market, customers use algorithms that we provide. They use algorithms from third parties. They use some of their own secret sauce. They bring them all together with our tools to enable functions that are things like, you know echo cancellation or, you know, voice triggers in kind of the "Okay Google" type functionality. They're really anything -- that speaker protection for example, is another algorithm category that we provide.

So all of that stuff comes together on our chip and gives us a good opportunity to help the customer in terms of system integration role, which from -- and from a long-term perspective, it gives us a lot more insight into the types of problems that they're trying to solve. And that's a great thing for us in the long run as well, so we can start to solve problems that they are anticipating having in the future.

Blayne Curtis: I guess your roadmap, you know a big part of the smart codec roadmap that you see providing more mps (ph), bigger DSPs, and I think you know at one time you said, you know we'll give engineers these mps and they'll fill it up.

Jason Rhode: Yeah.

Blayne Curtis: And they'll want more. And, you know, can you talk about when you're having these conversations with these engineers, how much demand is there to actually run on a DSP? And part of the reasons for having a smart DSP is that it's a lower power solution than doing it on an AP. Can you talk about the tradeoff between doing it on a smart codec versus doing it on AP?

Jason Rhode: Yeah, sure. I mean, you know, good engineers are going to always have more than one way to solve a problem. Certainly any time you have to power up the OS, you know I've heard a good estimate for that is, you know north of 100 milliwatts. You know certainly any sort of function that needs to be always on, that's not even in the universe, you know customers typically want to see you know less than an milliamp from the battery if it's going to be an always on solution, which has really tilted things in the favor of having some programmability on a device like ours.

You know additionally, our solution typically has, you know especially in the flagships, you know multiple relatively simple DSP cores, but quite a few of them. And the way that really benefits the customer is, you know they're doing say the voice weg (ph) and then there might be another department that's having to work on speakerphone functionality, and another department that's working on speaker protection. Having to get all those to run on the same DSP core, which can be done, is actually a lot of work. So having it be able to be partitioned out to run separately on different cores makes the customer's team that does all that system integration job a lot easier.

Blayne Curtis: Throughout the years, you know the competition question would always come up and (inaudible) the company. Now there's only Cirrus Logic. Your competition would be the platform solutions, which I would say don't have a smart codec today. Can you talk about the sustainability of your (inaudible), and the Cirrus IT that you've derived to keep that yours?

Jason Rhode: Certainly. Well, I mean think, you know from a performance and a power perspective, we're class leading at what we do. You know, customers that are looking to differentiate on voice and audio in particular, that's a good -- you know, we're a good solution for them. If you're looking to wrap plastic around, you know, the AP provider's reference

design, you know we might not be the right solution for that account, although a lot of those accounts try to figure out ways to innovate around the periphery even by adding, you know, a high performance DDA (ph) converter or a different amplifier, for example. Just in the android space, there's a lot of appetite for differentiation, which is generally not the AP provider's favorite playbook.

Blayne Curtis: I did want to ask you, another application for the smart codec is you do a version of that and you can put it in a headset or an earbud. Can you talk about what that solution is, what the demand for this application is, and how much of that content is yours?

Jason Rhode: Sure. Well the content's all ours. It's probably one of the most exciting things we've ever gotten to work on. We've been working on it for years. We provide acoustic noise cancellation in handsets today. And our technology is so compelling we've really been wanting to migrate that to provide that same functionality but for headsets. So, you know somewhere in the fall timeframe of this year, we got our final silicon on that device. We're out showing it to customers, any customer that will take a meeting. And generally the response, you heard at our investor day, the response is really pretty amazing. It's not a demo that leaves you with any question about this is a valuable function.

So the really differentiating thing about our solution is it's applicable not just to, you know, over the ear kind of headsets that are going to provide some passive isolation, or even that it needs to seal up your ear canal, you know these are -- these enable the noise cancellation function in a headset that is just basically like an earbud that rests in your ear comfortably and provides the noise cancellation all via DSP capability.

So there's a confluence of a couple things that make it even more interesting. You know, obviously we've all been reading the news blogs and whatnot about USB-C migration, and you know once that makes its way into handsets, it's quite a good connector for this type of function. You know the previous USB connector is actually pretty flimsy and impossible to figure out which way to get it in the phone on the first try. So with USB-C, as that makes its way into handsets, customers will be able to enable a headset where they can draw digital audio data as well as power from the handset. So that eliminates the battery. And then in conjunction with our device, it eliminates the need for the materials that seal up the ear, really enables a pretty cost effective headset. And we think that will expand the sound in headsets pretty significantly for noise cancellation.

Blayne Curtis: (Inaudible) you want to say about the content? You know, you had mentioned maybe, you know, upwards of $2.00 for a codec, a smart codec's price, and then there's obviously microphones in there as well. That's for an active noise cancellation solution. I mean I think there's analog solutions that maybe do it with lower power. Can you talk about the tradeoffs to use your solution, which would be more digital and active versus doing something more analog (inaudible).

Jason Rhode: Sure. Well, I mean longer term, the trend any time you compete in mixed signal, the more digital you can be, in the longer term you beat the analog in every scenario that I can think of historically. You know, our solution enables again that -- there's just no way to get the adaptivity with an analog solution and to be able to adapt to an ear that's moving around a little bit or different fitment where you don't have a, you know, rubber grommet type of deal to fix the position of the headphone in your ear. So that's something we can enable, you know currently today that's a bit more power. But, you know, relative to the overall battery in the phone, that's a pretty decent size battery relative to what comes in a headset.

And then kind of an additional benefit that we think will be neat in the phone space, is it's one less thing to charge. So yeah, on the one hand you're going to drain your phone battery a little bit with the headset, but on the other hand you don't have to remember to charge your headphone before you get on an airplane, which is kind of cool.

Blayne Curtis: You said you were showing the solution. What visibility do you have for this product to revenue? And as you look out to next year, if you could bring this to revenue, I assume this is probably your biggest opportunity. What else are you hopeful of in terms of a driver next year?

Jason Rhode: Sure. Well I mean in our space it usually takes a customer a year to develop a product around something that we've got. You know, obviously different customers -- we're shopping this around. It's a general market device. We don't have any restrictions on who we can sell it to. But it does enable a little bit of a new form factor for people, so that usually is a little bit more of a thought provoking process at the customer and they get all sorts of marketing people and up and down the food chain involved to figure out, you know, how are we going to market this, whose going to -- you know what's the channel going to be? Could it potentially be in box (ph)? And so, you know, that probably adds a bit of time in there. But at the same time, you know we've not shown it to -- I can't think of too many customers we've shown it to that haven't had pretty significant interest.

So it means that our business where we do a lot of custom devices, that one of the many nice things about that is we usually get pretty crisp visibility about exactly when what needs to be done so that it can ramp. In the general market, you usually get a little bit more nebulous, good but nebulous kind of feedback on the timing.

You know longer term, I would -- well even in fiscal 2017, you know we see good things coming and continuing to happen in amplifiers. You know, that's a big market for us. We've grown it every year since we started in 2012. We continue to see good things happening there. So that's an area we're investing heavily. You might have seen we did a small acquisition this summer of a company that boosted our speaker protection efforts, you know something we had internally but we saw an opportunity to do a small tuck in and really accelerate the progress that we were making now, so it's a good example of that sort of thing.

Blayne Curtis: I do want to ask you about your amplifier product. You know it's a boosted amp. You're maybe first to the market with that solution. Others have boosted amps at this point. You mentioned when we were talking about smart codecs, tying the two together to create some stickiness. There's also some maybe form factor change, either you want stereo sound or thinner form factor, multiple speakers. Can you talk about some of the drivers that would increase amp content, and then your ability to maintain that content?

Jason Rhode: Sure. Yeah, I mean the trends in amplifiers definitely play to our strengths. You know, there are multiple suppliers for amplifiers out there. It's one of the more competitive spaces that we serve. But if you think of -- you know, Cirrus Logic is all about signal processing. The more signal processing that's involved, the more it plays to our strength. And so things that you mentioned, like the form factors getting smaller, you know it seems like the acoustic guys always get the -- get to go last when they're picking out real estate in any sort of a device.

So the smaller the form factor gets, the more constrained the speaker is, the more value we can add with speaker protection and linear relation, things like that. Certainly there has been, you know, a trend towards just trying to get more sound out. And it's probably, for most people, that might be the single most disappointing use case. In most handsets the speaker phone is just flat not loud enough and the echo cancellation functions that it provides you know are really not kind of speakerphone grade. I think everybody would love to, when you get the rental car, set your phone on the passenger seat, put it on speakerphone, and not have to mess around with Bluetooth or any of this stuff, and just be able to carry on a normal conversation.

So in that context, whether somebody was thinking about stereo or just making it louder, sometimes it's easier in a constrained form factor to get more sound out of two small speakers than it is to find space for one big one. So we've seen good progress. You know, customers are interested in that sort of a thing. And being able to do speaker protection in a stereo context again adds more signal processing challenges.

So all of that -- you know, and for us audio isn't a sideline. It's not a small part of our business. It's what we do. It's pretty heavily ingrained in the company. So we're very determined to invest heavily in that space. And, you know, as a -- it's one of the two directions of physical interface in the audio world, the mics and the speakers, we can't integrate that stuff onto an AP. So that's a good place to make sure that we're on really solid ground for the long term.

Blayne Curtis: Yeah, I didn't want to get into the mic side, but it's actually related. You're seeing more mics in a phone potentially as well, and you demonstrated a lot of your use cases or algorithms, you know that speakerphone capability is one where if you put it on the passenger seat, you want the microphone facing you to work, not the other ones.

Jason Rhode: Yeah.

Blayne Curtis: Wind noise and such. Can you maybe talk about some of the applications that -- or algorithms that would make this audio problem more complex?

Jason Rhode: Sure. Yeah, I mean you mentioned a couple of great ones. But in addition to not just having, you know, four or five and having the one that's pointing to you listening, using all of them correctly so that you can cancel out background noise, listen to the person that you're supposed to be listening to, wind noise, rejection, echo cancellations, you know all of that hypo-functionality is definitely right up our alley and something that we see driving really not just the smart codec business but the marriage of the microphone with the smart codecs.

So in the context of four or five microphones per phone, you know we're not all that interested in just being a microphone supplier and duking it out over 30% margins with the industry as it is today. What we think as a smart codec provider co-designing the microphones with the smart codec in a way that makes implementing that overall system, you know, less expensive, more -- less power, higher performance, and just you know well thought out, we see as a good opportunity where we should have a meaningful competitive advantage.

Blayne Curtis: You know, outside of the digital content we talked about maybe increasing, you know, the analog problem does involve more inputs, more problems that you need to solve. Can you talk about the number of mics in a phone? You've seen some OEMs add them and

then subtract them. What's the demand to actually have these more robust audio features?

Jason Rhode: Well, a lot of it has to do with cancelling noise of some form or another in a use case, so when you're holding a phone up in a loud environment, the people on the far end don't hear all of the noise that's going around you. Those are -- I mean those are kind of some of the types of things that would cause more microphones. Additionally, you know there's a potential that, you know, the best mic that you could have is not necessarily the same one that is the lowest power for use in an always on scenario. So that's another potential as well.

Blayne Curtis: You know, I did want to ask you, I mean you have a small microphone business today.

Jason Rhode: Uh-hm.

Blayne Curtis: Can you talk about ramping that into millions of units, tens of millions, hundred million units?

Jason Rhode: Sure.

Blayne Curtis: The smartphone volumes can be quite large.

Jason Rhode: Yeah. No, and that's an area where, you know, we're a company with a really good reputation. I think probably everybody who has seen it play out with microphone vendors over the years of various things that did not go perfectly in a handset ramp. And actually if I ask our customers what's the number one thing we could do in microphones that would be helpful, the number one thing they say is take the drama out of them. Just make it simple. Make it like a chip, we can design it in and it works.

And so that's kind of step one for us. We're shipping in a flagship handset today, there's been teardowns out there, it's a premium microphone. It was one with great specs. It's really tiny. Enables a lot of good things. We're using that and the other customers we have to really ship enough volume so we can get the microphone manufacturing process to the standards that we have on our chip business, which is hard. I mean MEMS microphones is an incredible confluence of really, really hard problems to solve. From an academic perspective, it's really fun. From a company perspective, it's challenging and stressful.

But so we're in the process of really kind of reaming (ph) all those issues out. It's a good business for us today. But as we get that level of confidence in the business, then longer term we see opportunities to really kind of change the way microphones connect into the system. You know, changing interfaces is always hard, but if it's our mic and our codec, then it seems like we should have an advantage in making the interface a lot more smart.

A lot of the microphones today are analog. Over time there is definitely some motivation to move the front portion of the A-to-D converter into the microphone and turn it into more of a digital mic. But the interface for that today is just awful. It's essentially 1-bit delta-sigma data (ph). It's noisy. It radiates EMI. You've got to -- it causes at least as many problems as it solves. And further, it was never reasonably well thought out for a system that has four or five microphones in a phone. It just gets really cumbersome at that point. And for an AOV kind of application it can be pretty power hungry. So we see opportunities to kind of play with all of that in the context of the microphone and the

smart codec as a system, change the interface, make it lower power, make it easier to not have to have a homerun from every single microphone back to the codec. So a lot of good vectors for us to work on there.

Blayne Curtis: And what is the right timeframe to think about in terms of you being -- having the manufacturing base in place to actually ship these in a bigger volume?

Jason Rhode: Sure. That's one of the longer term growth vectors for the company. So kind of nearer term, thinking about broadening out in flagships, increasing content with existing customers, migrating some of that smart codec, some subset of that smart codec feature set down into the mid-tier, certainly the AMC headset market as well, and then kind of a broadening out into the other markets for our technology. And somewhere in that same timeframe is really more the microphone business.

Blayne Curtis: And then, when you look at a phone that has maybe three mics or four mics, you would have maybe some higher end mics and then some lower end depending on the function they're doing in the phone.

Jason Rhode: Sure.

Blayne Curtis: And, you know, when you move into a smart mic, or a digital mic, which percent of these microphones would actually require the high performance that you would address? Because you're not going to do the most commodity (inaudible).

Jason Rhode: No, but they can be hard in different ways. Like making a really good mic for ALB (ph) is not necessarily easier, it's just different. So we see good -- again, but you're right, they don't all need to be -- in that system, they don't necessarily all need to be amazing. But in the context of a noise cancelling headset, for example, the reference and the error mics that go into the ears, you know you're looking at five or six mics per headset, and those actually do need to be pretty good mics. And they need to be really small. So one of the advantages our solution on mics have is, it's a process that grow -- can grow the MEMs element right straight on top of the ASIC that is providing the amplification or A-to-D conversion.

Blayne Curtis: And from a competitive landscape in microphones, I think you had -- one of the suppliers made an acquisition of an audioesque (ph) company, let's say.

Jason Rhode: Yeah.

Blayne Curtis: (Inaudible). Can you just talk about the competitive landscape and will there be anybody who will be able to match what you would bring to the market?

Jason Rhode: Well I mean, you know, we'll see. You never want to minimize the competition. You know, certainly the microphone space is full of, you know I would say kind of commodity microphone suppliers. You know certainly the company you mentioned has got aspirations to kind of move in the direction that we -- where we are, and we're kind of moving in their direction. So, you know, it's good to have competition and we'll see who gets there first, or better.

Blayne Curtis: And when you do take that longer term view of 2017, it seems like you know maybe mics could be in that category with maybe some revenue in 2017. Mid-range comes into focus as well in terms of your smart codecs?

Jason Rhode: Sure.

Blayne Curtis: How do you move these solutions downstream? Because as you get in the mid-range, then price becomes more important, platform technologies should be there. Maybe one customer has their own solution and maybe there's an opportunity, but how pervasive can the smart mic be in the mid-range across other customers?

Jason Rhode: Well I mean we'll see. It's a ways out there, but I do think, you know, that's an area where android is going to be -- it's the always on thing, the "Okay Google" type functionality is going to be conspicuous in its absence, even in the mid-tier, you know, because if you identify it, you know (inaudible) thinking oh, I've gone off and bought a mid-tier handset, it's got android on it. So they're going to want that "Okay Google" type functionality. It's really helpful with all of the hands free laws that are getting more and more strict and pervasive.

So we see -- as long as we have targeted the solution for the system, well kind of like the mid-tier smart codecs that we shop around today, as long as we've targeted it appropriately for the system they're intended to go in, we don't see necessarily the margins need to be lower to serve that space. We do see good opportunity to differentiate though with that kind of functionality. It's not -- you know, certainly not the 2.50 to 3.50 that a smart codec in a flagship would get, and they're probably not going to pay for the same sort of premium on the microphone side either, but we do see opportunity there if we can get that -- the smarts migrated into the microphone.

Blayne Curtis: And this always on voice is not, you know, not the only function you can do with these, but obviously it was kind of the lead one, although I would say the initial marketing has started to show it as a function, but it wasn't an initial deployment or marketing campaign. What is the awareness of always on voice? And when you talk to the OEMs, where is it on their list of priorities?

Jason Rhode: It's interesting because it seems like in general it's pretty high on people's list of problems they want to solve. But you're right, it isn't necessarily marketed as heavily as you might imagine given the focus that they put on it with us and the amount of power that they really are turning the screws on us to lower. You know, there's -- the bulk of the android guys that make a flagship are really, really keen on having that solution be good. And, you know, some of them I think are actually pretty elegant.

Blayne Curtis: And in the android world, you know you have a lead customer. They came through Wolfson acquisition. They have a new deployment in Q1. Can you talk about your content story in an OEM like that in the android world?

Jason Rhode: Well, I mean a flagship smart codec is kind of not too different than the range we've been thinking of. You know, I mean relative to that particular customer, I'd say the last couple years have been a little bit anomalous, you know in different extremes. You know, certainly not -- when we drew the Wolfson acquisition up on paper, we never imagined that this year was going to be quite as amazing as it was from the content perspective there. So we would expect things to be a little bit more long-term business as usual. It's a great account for us. We've got relationships you know up and down the food chain. I definitely feel like we're more of an audio partner than I would have expected.

Blayne Curtis: And then when you wrap the moving pieces of your major customers up and you look

into Q1 in terms of your visibility, and I hate the term normal seasonality that never seems to be normal year-over-year, what are your thoughts as you go into next year?

Jason Rhode: Well, going into next calendar year, you know it's difficult to call at this time of year. I mean it's -- you know you certainly have a big holiday thing, and it's kind of about this time of year that our customers start to figure out well is it a great holiday or not. And so there's definitely cases where we see -- cases historically where we see pretty big swings in our industry. And then it's often something we don't get a ton of visibility in until the very end of the quarter. You know, it's interesting. I know that -- I mean the financial community of course gets pretty wrapped up in the details of a particular quarter, but there can definitely be scenarios, have been tons of times, where we've got, you know, tens of millions of dollars of business stacked up on one day either side of the quarter and you don't know until the quarter's over which quarter it's going to land in. And then too the vector I've seen in some of your notes on (inaudible) what's happening out there inventory wise.

Blayne Curtis: Right. And I did want to ask you, we're asking everybody, as you look into next year, and even beyond, what are the most disruptive technology trends that you see impacting Cirrus Logic or the overall semi industry?

Jason Rhode: Well there's a (inaudible) 2017, you know we're really excited about our growth opportunities. Some of them are driven by some disruptive technology. You know we see a continuing move to more interesting uses of amplifiers like we talked about. One of the technology trends I think as USB-C becomes prevalent in headsets, that enables people to do really interesting things. Having a proper digital interface with a reasonable connector on the end is going to let a lot of people innovate in the connected to the handset space. And we think our AMC fits into that extremely well.

Blayne Curtis: Great. I did want to leave any time for questions if there are any. There's one back (inaudible).

Unidentified Participant: (Inaudible - off mic) that you could produce for your your new handset, or your new earphone?

Jason Rhode: No. I mean our -- the AMC device is built in 55-nanometer, so you know one of the great things about transitioning from 180 to 55 is our spend with our foundry partners went up, and our percentage of their capacity went way down, which is a really good trend. We were an uncomfortably large percentage of the 180 capacity. So that was a big challenge. So it really moves -- it makes the supply chain a lot easier for us, so we don't see any constraints along those lines (ph).

Blayne Curtis: Did want to ask you about the (inaudible) technology. Wolfson had a 65-nanometer power (inaudible), you've ramped 55 now. As you look into next year, will it still be that split? And then maybe your thoughts on future node transitions.

Jason Rhode: Sure. Well I mean they had started in 65 before 55 was available. Fifty-five is really just an optical shrink, so subsequent to that everything they've worked on has been 55 as well. So 55 will be the workhorse node for the company for a number of years. That said, we're already starting to look at 28 because we can see some particularly interesting things, especially the voice biometric kind of stuff that's a lot more mps and memory intensive than what we've done historically. That's a really good reason that we need to be investigating 28-nanometer.

Blayne Curtis: I do want to ask you, you brought up the voice biometric, and it does get into other applications outside of a smartphone. It could be home automation (ph), it could be your TV, your car.

Jason Rhode: Uh-hm.

Blayne Curtis: Can you talk about -- I mean that's obviously a longer term view and not going to be as big as (inaudible) smartphone, but could you talk about some of these other applications (inaudible)?

Jason Rhode: Sure. Well we see it actually as yet another example of something we want to perfect for a smartphone first simply because the unit volume is so high. You know we don't see it replacing a thumbprint by any stretch because your thumb is kind of pretty conveniently located to your phone a lot when you're using it. But as a second factor authentication, we see that as good, or fraud protection. So what our technology does, it doesn't -- unlike a lot of what's out there today, we're not trying to figure out what you're saying, we're just trying to figure out who you are. Which is frankly a little bit creepy, but it is pretty helpful in a lot of context. So you can have it as a second factor authentication in a phone.

But outside of the handset, your thumb isn't going to be -- you know you're not going to put a thumbprint sensor on all the connected devices around your house. And either for security reasons as well as just context awareness, in a multi-user system, it's really helpful to know who's speaking. So this is technology that the company we bought the mobile effort (ph) from is shipping today in call centers. And what we wanted to do with it is take that and render it down into a very embedded small, you know, point solution that people could put in anything. So my phone's always on, always listening, always recording, and now it knows who we are. Yes, that's perfect, right.

Blayne Curtis: (Inaudible) you said you bought that company. You know, kind of do you have everything you need in terms of that biometric, bio verification side? And is it your technology or do you see customers adding some as well?

Jason Rhode: Well we always -- we love that when customers take, you know, some element of what we do and intertwine it with their own stuff. That makes it as sticky as it gets. I think we're in a position to largely control our destiny there, but it's an area where this is a pretty blue sky investment for us. It's further out than most of the kinds of things that we do and it is more of a kind of game changer. So if we could do a little tuck in here or there that accelerated our path on that, I mean I guess this kind of was in the first place, but if we could supplement that, that would be great.

Blayne Curtis: All right. We're out of time. Thank you, Jason.

Jason Rhode: Thanks so much.