Scott Miller: Oh, great question, John. I'm probably a bit of an oddball here because I drive a lot of different vehicles, the newest vehicles, all the time. But I think in general, the quality, the efficiency, the performance, the safety, the convenience, everything keeps getting better and better. And you know, as soon as you get used to something, you expect it, that's sort of the price of entry. So we keep adding more and more to them. So I think in general, the expectations of them is that they become more and more a part of our daily usage and lives, and they need to be very convenient and safe, obviously, even efficient.

John: And so, I don't know if any of you caught the big announcement that Mary Barra and General Motors made today in conjunction with CES. And I'm watching it all. And all of a sudden, Scott pops up and he gives a presentation. So we've got somebody who's got a little bit of media experience under his belt for the day. So thanks for that, Scott. Sanjay, same question. How have your expectations changed and what has driven your change of expectations?

Sanjay Ravi: Yes, so, John, as we think about how I personally look at the experience I have in a vehicle, one area that my requirements or expectation has changed is when you buy a vehicle, you expect it to evolve with you throughout the course of the next two, to three, four years. You know, the experience needs to be updated and a lot of the content in that expectation is that it will evolve and it's not a static at the point of purchase of the vehicle. And so, with the opportunity to update the vehicles today, that that's becoming more and more real.
John: Yeah, that's right. Boy, I remember on cold winter days because I'm from the Detroit area too, boy, your car, you'd crank it, you drank it, and then would a hiccup and sputter down the street until it finally warmed up. That doesn't happen anymore. Brian, what I'd like to get or, Scott, let's go to you again. I'd like to get your input on how OEMs are making the pivot from being hardware producers to high tech producers? And please kick it off with me explaining what the software defined car is? Because I've got my ideas, but I'm not exactly sure they are correct.

So with somebody that's got that in his title, I'd like to hear from you, what the software defined car is and explain how General Motors is making the transition to that?

Scott: That's a great question, and I think it's about the ability to continuously integrate with them. So not just getting the vehicles ready for the point of sale, but even after that, we can continue delivering new software, new features and new capability. We're just improving existing capability and features. And then the customizable aspects of that means that customers will be able to download the apps that are really useful for them and eventually the vehicle becomes an extension of how they use it, integrating with their home or their business. And that's when it becomes the software defined. It's really communicating with them to help them. It's integrated with their environment, and it's evolving and improving continuously. So to me, that's what software defined means the ability to do the continuous integration.

The second thing is the experience, and Scott talked about the convenience factor here. I would love to talk to my vehicle and get certain things done versus looking for the buttons and figuring out, so the more that experience is seamless and I can talk and make changes, that's clearly something that will get my award.

And the last one is probably the most important one is safety, and this is to drive features and aspects there. It's just come a long way already and we have a long way to go, but it's amazing and so, that those would be remain key requirements going forward.

John: That's a great point about safety. You know, all this ADAS, the Advanced Driver Assistance Systems is really increased consumer expectations of what their car can do from them in terms of protecting them. But, Brian, let's get your input on this too.

Brian: I'm going to start with where Scott left off around quality and reliability, dependability. When I go out to my vehicle, I expect it to be there ready for me to go. Twenty years ago, I think it was a lot more common that your vehicle will be down and needs to go in the shop and a lot more repairs. I think we have evolved our expectations that QRD is a baseline requirement. I think the other thing is I expect my car and my phone to operate seamlessly. My phone is an extension of my being. I need my car to be that way as well. So if I get into a car, I want it to connect and I want to know who I am and what my preferences are.
And so, how are we pivoting to that? I think we're doing it very aggressively, first of all, with major initiatives. But over the last -- since 2019, we've been upgrading our vehicles computing capability. We've added comprehensive over-the-air update capability. Cyber security has been massively improved and that's all with our vehicle intelligence platform. And now, and you saw that presentation I did. We've been introducing Ultifi, which is a new Linux based software platform that we're adding on top of the vehicle, and that lets us do this continuous creation by separating the software defined features from the hardware. That means we don't have to do the software that can be agile and adaptive on top of the hardware integration that really takes time and needs to be physically integrated.

And then also with that, we're adding the ability to have frictionless data. So, the ability to pass data back and forth with the cloud is really an important aspect to this. And then that requires the high performance connectivity that we're adding. So that's what we're doing to add the vehicle capabilities.

But beyond that too at GM, we're creating these platform strategies and this is so we can continue to offer the vehicle value long after they purchase the vehicle. And we're viewing our vehicles as platforms. It's a way that we can communicate and offer valuable services if the customer wants them or just improve the vehicle to improve our brand quality for the customer.

And the second one is the whole aspect of data and AI, because today you are getting a lot of data inputs from the smart products. But how do you analyze that, get insights? Just the scale of data can actually be overpowering and you need to manage that carefully, so you can get the insights that is important to drive a profitable business.
But the expansion of that to this relationship we’ll have for three, four, five, six, seven years after the purchase, where we can keep adding value to the vehicle, to the customers, for the vehicle, making the vehicles smarter, making the network that the vehicle operates even smarter. That all leads back to this further adoption of our EV platforms. You know, better networks with less congestion, and you can use the autonomous technology for safer roadways and better ADA systems. So I think this era of software defined really says the continuous integration means the team’s improvement of not just the vehicle, but the entire ecosystem.

John: Sanjay, how do you measure it then? How would you evaluate the success of this transition?

Sanjay: You know, I think there are maybe two categories from my standpoint, right? So the first site from an end user perspective. The end user could be a consumer or a business and do they get that efficient product or a service? And that's exciting here, right? You get a vehicle, people continue to buy and own vehicles. But you also get mobility services that might be more efficient and so, that success there would be are we meeting that demand from both the consumer and the business customer.

The second part is as the industry transforms, is this a huge opportunity for the automotive industry to change their profit margins? What we are talking about is getting into new digital driven business models where the profit margins are pretty high. And that was a clear measurement where can we take advantage of the fact that these vehicles and mobility services are going to be a core part of the digital life of someone, and you can bring a lot more value to them. And with that value, drive a more profitable business that is set up to grow and flourish.

Scott: Yeah, it's a great question, John. You know, one of our key mission statement is zero crashes, zero congestion and zero emissions. And that's really at the core in we're making tremendous progress when so many major initiatives to get at that with autonomous and our EV Ultium strategy. And Ultifi is one of those major initiatives which lets us do the continuous integration we just spoke about. And that's really about making – at the core, you need to still make got to have vehicles, but that's expanding, right? Got to have vehicles, has that initial showroom. You know, you need the vehicle that meet your needs and it touches you in a special way.
So those would be the two ways I would look at it in terms of the opportunity ahead. And call what success would be.

John: That's a great point, because presumably this will all have much better margins than the traditional automotive business. But, Brian, let's get your input on this?

Brian: Yeah, I think I'm totally aligned with the rest of the fellows. I mean we're talking about moving from a revenue model where the OEMs recognize revenue and margin at the time of the vehicle sale to one where we have continual revenue over the lifecycle of the customer experience, either through referring revenue through downloading apps or transacting from your vehicle, any number of services that way. I mean the potential, as Sanjay said, to increase profitability is immense because instead of going from a single data point where you make it or break it based on the contemporaneous issues in the market, you smooth out revenue over time. So this is a watershed moment for the industry.

John: Well, I keep saying this is the pot of gold at the end of the rainbow of the automotive industry. So we all agree this is the way it's going to go. But what are some of the pitfalls? What are some of the hurdles that have got to be overcome?

Brian: Well, I think it really starts with resourcing. And Mary talked about today how they're hiring more data scientists than mechanical engineers. I think that's great. I think as an industry, we're going to struggle to meet that demand requirement because those same individual resources are in demand across so many different industries right now. And as much as you and I love the industry, automotive, not all 22-year-olds think automotive is as cool as you and I think it is. So we're not necessarily first up in the pecking order.

Tech companies think about the availability of resources across an ecosystem, and I think that's one of the ways that OEMs and the tier supply base are going to have to start thinking about it as well. So it's about what do I have inside and what do I leverage for my ecosystem partners?

John: Sanjay, what do you see as the big pitfalls for the industry in going this way?

Sanjay: I think the resource and we call it as tech intensity, the opportunity where you could leverage technology and platform technology that is available for your own needs and then you build your own core differentiated tech that will help you drive that innovation that is differentiated. So, yes, resourcing is a core part of this.

Scott mentioned something that's super important in this space and which is cybersecurity and how do you manage all this with security in mind, ticket built and should be core because all we need is one or two really bad things to happen for the industry to take a step backwards. So keeping that top of mind and managing and designing around that security sense is critical.

And so those would be some of the top-of-mind things. The last one, maybe I would add is think about this at a global scale because these platforms were built at a global scale. You have to cater to the consumer needs that would be different in different regions, but you need to operate a global environment. So that would be the third challenge that we need to address.

John: So, Scott, we want to get to you on this. Go ahead.
Scott: No, I just wanted to weigh in a little bit on this because I have a different view than maybe Brian had in that resources are a definite challenge and we’re entering sort of this new realm with the type of software we’re doing in connectivity, in the cloud services. But people and engineers still have a real passion for vehicles and so, what we see is by adding this layer, we’re getting tremendous interest and desire to come do cool things with cool vehicles. Our cars and trucks are some of the coolest things and the potential to add apps and services that use the cameras or use the lights or use the connectivity. You know, to do things with the number of sensors and the data on a vehicle is just wide open. So, you know, by adding this layer to it, it’s really given us a tremendous draw.

And then on top of that, the younger generations coming in. They’re very conscious about the environment. They really, really have that as one of their strong core values. And so, when you talk about a company like GM and the opportunity at scale to impact that, to do good with that, that’s a strong draw that we see. So I’m seeing we’re having a lot of success because of this pivot with the technology and the platforms and the platform that we’re building. We’re drawing in really tremendous talent. We have tremendous talent and we need more. Don’t get me wrong. We need lots more. And Sanjay’s point about expanding and leveraging this and scaling it up, it’s going to be an era that that we need to learn and grow and partner with people like Sanjay and Microsoft on how to do that. And that’s what we’re doing. You know, so that’s how we’re approaching it. But resources is a competitive area, but I think we have a pretty strong position and we’re doing pretty well at it.

Scott: Yeah, I mean it happens more than you can imagine where some of the new people that we brought in, whether they’re 20 years experienced or right out of college. But they’ll tell me that this mission statement, the fact that GM can impact it with scale and the fact that in our strategy on how we’re going about it was what drew them in. And you know, they want to work on meaningful things that are cool to them. You know what’s cooler than vehicles? You could talk to your friends and your family about them. Hopefully, it’s all good stuff. It’s not complaints. But it’s one of those industries where you get to impact something that’s near and dear to everybody.

Sanjay: Yes, so, we already covered a few of the key ones, and I would say it all starts with connectivity. And as we talk about all these advances in technologies today, one thing that’s sobering is less about 40% of the cars in the world are connected. Of course, in the U.S., the number is much higher. So we still have a long way to go to make these vehicles connected because then you start getting the world where you can use all the data to bring the right experiences and the services. So that having very solid connectivity, technology is critical.
And then you have to drive intelligence both at the edge and in the cloud. What I mean by that is you have to make a lot of decisions right inside the vehicle. So Scott and team and their peers are building all kinds of computing power today inside the car that you can do amazing things. So that innovation is key at the edge. And we had this discussion is the edge and automotive edge or the telco edge? And clearly, the automotive edge needs to be evolved and be very rich and then, use the hyperscale of the cloud. So that need to work hand-in-hand.

The second area we talked already was software defined vehicles because the entire EE architecture of these vehicles are going to change and there’s a lot of innovation going on. And the effort from GM of the Ultifi platform is that it’s a great example of the speed with which all that innovation is taking on.

From a Microsoft perspective, we are working with many of the players there. We also see open source starting to come together. And this is an area where Brian was touching on earlier, where we do need the ecosystem to work and bring the innovations together.

The third area I would highlight is data and AI capabilities. Again, when I look at some of the most complex computational problems out there, it is assisted drive and autonomous. So it is the coolest computational problem to go and solve today across all industries. So it does require the right data and AI capabilities and talent. And the last one is security. So those will be the four things I would say, John, connectivity, but intelligence of the edge and the cloud, software defined, data and the security aspects.

John: Cool. So, Brian, they’ve got skin in the game. I mean you’re agnostic. Accenture looks at everything. What do you think are the technologies?

Brian: I think Sanjay is spot on. The five that he hit are exactly right or the four. If I was to add one more, it might be around machine learning, helping to improve the autonomous driving algorithms and to help drive an advance CX, making it more intuitive for customers throughout. So if I put that in the list, I think it’s comprehensive. Scott, what’s your view?

Scott: It is headed - you know, a funny story before I go into it. When Sanjay and I talk, we talk about the edge. And when he’s talking about the edge, he’s talking about technology in the vehicles. When I talk about the edge, I’m talking about technology off of the vehicle. So we had sort of a funny aha moment at one point talking about that. But, you know, the technology you all mentioned is core. I’d add to it the software tools or the development tools, the DevOps, the continuous integration, continuous deployment tools are really foundational. And to me, our core capability with our automated driving, with Ultra Cruise and Super Cruise and active safety technology we’re doing, sort of set the stage and we needed to put the computing power in the vehicles, the memory, the sensors, the AI infrastructure to do all that, to the data to train them. It sort of gives you a core competency on how to then evolve this into the software defined in the Ultifi platform.

So, the technology is sort of connected in that way in the expansion of the cloud services and integrating those into the vehicle, is a new realm here. So it’s going to be a lot of fun, but I think we got a pretty good handle on it.

John: Okay, you guys are totally into this. You’re totally committed. You’re all in. What about the consumer? What about the end user? What about a cheapskate like me who doesn’t even want to pay for satellite radio? How do you get consumer adoption with this? And I’m going to throw it up as a jump ball. Who wants to go first?
Brian: I'll start maybe on that one. I think consumers are smart and they want new technology as fast as they can get it at a reasonable price, as you suggested. But they want reliability as part of that equation, and you always see early adopters and there may be more forgiving of failure over the short term. But the followers, they're more critical. And it's for that group that we need to get the reliability levels right in order for the offering to succeed. I think the key point, it's a combination and we see it time and time again in different industries. But if you deliver value and reliability, and that’s the way to accelerate customer adoption.

John: Who's next? Don't be polite, just jump in.

Scott: Well, I was interested to see what Sanjay said, but he talked for me there. You know, it's a great question. We have an interesting experience with Super Cruise, for example, a lot of hesitation, but you get somebody behind the wheel and the experience and they're like, wow. And now our customers are telling us 85% of them say they won't buy another vehicle without it. So there's sometimes you need to give them a little nudge, sometimes you need to make an incentive, but there's always hesitation in new technology. I think the other core part of this is we need to have a portfolio approach. You can't just go all in on every vehicle for affordability reasons alone. So being able to scale this at the right point, having the right view at the showroom and the capabilities. Some customers, that's what they want and they don’t want any updates after they leave. So I think we’ve got to be capable of addressing all of those. Like you say, if we’re going to get to all the followers, which is the market, the volume of the market, we need to have an all in approach and that’s how we’re approaching it.

Sanjay: Yeah. Well, one thing I would add to that, Scott, it would be like if consumers, they try certain things and if it doesn't work, a lot of them would not give it a second chance. And so, making sure things work is critical. And one of the areas I want to highlight is how much the technology has evolved in the simple area of speech. I remember getting into a car and trying to use that in the past, and it wouldn't work the second or third time, and then I'd stop it. I would go back using my buttons. But today we are at a place where I think last year the technology has evolved, where the technology around speech recognition is as accurate as humans. So now we have the opportunity to bring these speech and cognitive services inside the vehicle and it will respond in an accurate way. And once it does that, we, as consumers, will demand and will start using it. And so that’s an area where we are and we are in a pivot point where these things are becoming real and it will take off from there.

Scott: That's a great, great point. I mean technology has to be so well integrated and perform well. And even if they’re hesitant, once they start to use it, if it works well, they’ll love it. If it achieves something and its clunky or not working well and you can't improve it, then they’ll put it aside pretty quickly. So that’s a great point, Sanjay.

Brian: That’s the reliability point I was talking about. So it's got to work when you try it.

John: That's right. So, Sanjay, I know Scott's going to want to weigh in on this, but I'm going to start with you. What do you see as the role of open source ecosystems taking that approach?
Sanjay: Sure. So, I think we touched on this earlier. If you just think about the kind of innovation and change that is going on in the industry, it’s profound. There’s so much going on. It’s all happening very fast and we are getting to a place where the people who can tap into the innovation that is happening in the ecosystem and then build their own IP that is differentiated, that’s where I think the balance is going to evolve. You need both. And open source ecosystem starts playing a pretty critical role. In fact, we are doing some work with the Eclipse Foundation right now where we are bringing a number of different players together to see how can you come up with a vendor agnostic open source ecosystem and a community that can contribute? So there are certain things that we can speed from a innovation standpoint and still give the opportunity for each of the members to have their own IP to drive a differentiation. So we see that evolving and expanding, John, pretty aggressively and success for all these digital platforms would be how well you can bring that ecosystem along with you and open source plays a big part there.

John: Brian, your input on that?

Brian: Yeah, I aligned. I mean with the amount of software that we’re talking about going into a vehicle, it would be impossible for any single organization to develop it and to own it end-to-end. So this is where it takes an ecosystem and a partner network to get us to where we need to be. You know, there are areas that you want to maintain absolute control of, a lot of that will be around safety and security, but there are a lot of areas where you can look to your ecosystem partners to accelerate time to market. And I think that’s the key solution.

John: Yeah, Brian, I had said, or, Scott, I had said I wanted to get into Ultifi a little bit more. Isn't this the perfect segue to talk about an open source approach?

Scott: Well, we’re definitely pursuing that for all the reasons that Brian and Sanjay said. It’s a couple of other reasons, right? If you want a sustainable package, open source is a great way to go with that to keep it up-to-date, to keep it current, just that community that does that. It’s tremendous. But also, being able to attract people to be interested in our platform, open source is a great way to go with that as well. So we’re definitely working that and using that to our advantage. And it’s a pretty important part of our plan.

John: Scott, what changed? Because if you go back a decade, a decade and a half or so, traditional automakers did not want Silicon Valley to get part of their operating system. It was like build the wall and keep them out. Now you’ve got a Linux based system and you’re inviting anybody to start coming in and writing apps for your cars.

Scott: Yeah, that’s a great question, and I know the perception says that we want to be close, but cars going from being software enabled to software defined is a pretty profound change. You still need the software enabled part to be a sole rated safety diagnosable with failsafe countermeasures, that part of the vehicle was foundational for our roadway safety. And that needs to be pretty developed in a very robust fashion with clear countermeasures to anything tampering with that. And that’s why with Ultifi what we’re doing is abstracting from that this new layer where you could do software defined features and access that robust secure layer. So we’re expanding, John. It’s not like we never wanted high tech or creative developers to be part of it. It just couldn't be the Wild West either.
We talked about Super Cruise and I think autonomous controls are a great example. I mean I’ll tell you personally, working downtown Dallas and coming home on a Friday night, I can sit in the car in bumper-to-bumper traffic for 60 or 70 minutes. I would pay to have that hour back where I don’t have to concentrate on the red lights in front of me. I think that’s an absolute fantastic application of that. As we move further downstream and more and more of us are starting to drive electric vehicles, I think the battery management and battery optimization is another great example of one of these subscription services. I mean with my phone, I plug it in every night. With an electric vehicle, a lot of people do the same thing. But we could have a process where the vehicle would tell me when I should be doing that or maybe when I should offer power back to the grid and get a full cycle charge after that, some other time. It comes down to value.

We put together packages that create value for the customers. A subscription model will take off. We’re already used to it. We’re trained as customers. We buy Netflix. We buy satellite radio and the like. These are just evolutions of that.

John: Brian, subscription services, big buzzword in the industry right now. As you talked about earlier in the old days, you’d lease a car to a customer, they disappear for three years, maybe they’d come back for some service. If they bought the car, you never saw them for eight years. Subscription services offers a lot for the auto industry. How do you think that’s going to change the way that the industry sells cars and services them?

Brian: Great question, John, and I think we had a similar kind of conversation back in October at another industry event. And I think at that time, we talked about different examples where OEMs are charging $100 a month, $150 a month. And if you just look at the pure math around that over 36, 48, 60 months, I mean that can add up somewhere, $8,000, $9,000 in incremental revenue on a vehicle. And that’s absolutely massive in our industry. The question and I think maybe the pinch point on this is in order to convince customers to invest in those services, we have to add value. And there’s been some examples out there in the marketplace where maybe we didn’t hit that value equation and we’ve seen tests launch and fail. I do think there are some examples out there that will catch on big time.

We put together packages that create value for the customers. A subscription model will take off. We’re already used to it. We’re trained as customers. We buy Netflix. We buy satellite radio and the like. These are just evolutions of that.

John: Sanjay, I want to hear what you have got to say about this because I mean subscription services potentially change the business model for the industry, doesn’t it?

Sanjay: It does, and I would maybe just add, Brian touched on a number of great use cases, and I would add that there is also an element here about data sharing because the consumer paying through subscription services, that is one modernization model and that will evolve. We are getting to a place where there is a lot of very interesting data that is coming in terms of traffic, in terms of the quality of the road and there are multiple business players that could use this data to drive value.
And so, data sharing is going to be critical. And, frankly, the industry right now is in the early stages where what I see is everybody is catching on to their data because there is no good way to protect the data and manage IP, etc., today. The technology's evolving to support that. But soon we will get into a place where folks will be comfortable sharing data and get value for that data. So, this is another add on, John, that I see in addition to the subscription services that the industry can tap into and it will evolve over time.

John: Yeah, I'm so glad you brought that up. And, Scott, I'd love to hear what you guys are thinking about in terms of being able to monetize data?

Scott: Well, there's so many different things we can do with it. You know, you just think about automated driving and why should we have to wait for the customers to complain about something? We know when they took over, we can collect the data when that happened. Look at the event and make an improvement before they even gotten home. So I think from using data to improve the vehicle, it's kind of foundational. Using a network of vehicles on the roads to create a traffic service or poor weather service or that type of stuff to add convenience is a way to do it and a use for it. But I like what Brian said, there's a there's a hurdle there. If someone's going to purchase a subscription, there has to be a real value to them and it's worth the subscription price that they're paying. And if we meet that formula, then I think that's the idea of this platform strategy really gets at that. Because even if the first purchaser didn't purchase something, maybe the second or third one wants to add it or maybe it's a new service that wasn't even available when the original vehicle was purchased. So it just extends the opportunity to have that interaction to offer those services. And, hopefully, if they're great services, we are a for profit business and we'll make more money.

John: Yeah. Brian, data, boy, everybody's talking about data in the auto industry today, not just the automakers, even the suppliers are. But let's get your input on what you see the industry being able to do with data?

Brian: Yeah, I think it is a great topic because we've seen a sea tide of change in data starting from the whole issue around who owns the data coming off the vehicle. And I think the younger generations have helped us all think about data in a different way. By sharing data, I am allowing the OEM, I'm allowing my service providers to enhance my experience with the vehicle. And that is maybe how I want to be communicated, which medium in the vehicle, when I want to be communicated and the kinds of things that I find value in. I think that is, to me, is the point that changed. Previously, we were all worried about who's watching? What do they know about my driving capabilities? The insurance companies, I think, led us in the market showing us that if we're a good driver and you share with me and prove that you're a good driver, I'll benefit financially. But I think it's a thing that we just talked about value again, value and personalized my offer.

John: Now we're getting down to the end here. Let's look out a little bit into the future five, seven years, before the end of the decade. And I want the three of you to tell me what your mobility experience is going to be like? And, Sanjay, let's start with you.

Sanjay: Okay, so I'm actually going to start with things that we expect in the future that is happening already. In fact, I've got an opportunity to sit through Scott with all the Super Cruise capabilities and a little bit of a taste of the Ultra Cruise. And it's amazing the convenience these assisted drive capabilities are going to bring and it is a lot of them is available already and it's going to be available a lot broader going forward.
I'm so envious of seeing videos of people sitting in the cruise vehicles in the Bay Area and going around without a safety driver. So as soon as I can get down to Bay Area, that's something I would love to be in and experience. And finally, about five years back at CES as we were talking about this and I talked about this notion of vehicles becoming living room on wheels, our office on wheels because if it can take care of driving around, you can have a great entertainment experience or you can have a good productivity experience and that cruise vehicle that is going around, you can do both. And that's available today. And, of course, over the next five to seven years, it'll be broadly available.

So those are things where, John, I see the future happening already and super excited. And I want to say there are three things, and Scott touched on this earlier. We are getting to a place where it's going to be safer, more productive and sustainable. These vehicles are five to seven years from now, will be a lot more safer because it's in automated features. It'll be productive because, as Brian mentioned, when he is sitting at 60 to 90 minutes in the car looking at red lights, he could actually be sending emails because he doesn't have to be actively engaged. So it'll be a productive experience. And then finally, it's all about sustainability because we are getting to more and more of the EV fleets that will make us such a big impact to the carbon footprint. So those are the three things I see as we go into the future.

John: Okay, Scott, let's get your vision of the future?

Scott: Well, you heard Mary today in the keynote address talk about personal autonomous vehicles by the mid-decade-ish time frame. That's in your time window here. If you think about that, just imagine that, right? It's a game changer in what the cruise team has achieved is nothing short of amazing. And how do we expand that technology to more different fleets is coming. So, we're at an inflection point where the auto industry and the focus on zero, zero, zero, it's real. And I think congestion and safety and convenience are all part of it. And our personal autonomous vehicle or any autonomous vehicle, if you think about it is it's just if you think about the engineering and the achievement of that that's what blows me away.

John: Totally agree. I can't wait for my own personal autonomous vehicle. That's awesome. Okay, Brian, your viewpoints and you wrap it up for us?

Brian: Thank you. I'm going to bridge off of what was said already, and I think in seven years, the vehicle may no longer be at the center. The transportation need will be. I'll decide on my transportation solution based on my transportation need. It may be a business or personal or vacation, a short trip versus a long trip, special needs, cargo or moving elderly people around and, of course, budget. I can see a scenario seven years beyond where I'm maybe a member of a transportation company like I am today, a frequent flier program, where I use a singular company for my vast, different transportation needs, and that could be an OEM or it can be another company. So that's where I think that we could possibly be ending.

John: Real good. Well, it's a future that's right around the corner, that's what's so exciting about this. We're not talking way deep into the century. We're talking just a few years from before this decade is out. And with that, we're going to wrap it up. Sanjay Ravi with Microsoft, Scott Miller with General Motors, Brian Irwin with Accenture. Want to thank the three of you and I want to thank all of you in the audience for having watched all this and stayed with us through it. Thank you.