Center for Strategic and International Studies

TRANSCRIPT

Online Event

“AI and AVs: Implications in U.S.-China Competition”

DATE
Wednesday, April 27, 2022 at 3:00 p.m. ET

FEATURING

Gary Peters
U.S. Senator (D-MI); and Chairman, Senate Homeland Security and Governmental Affairs Committee

Admiral Dennis Blair
Former U.S. Director of National Intelligence

John Bozzella
President and CEO, Alliance for Automotive Innovation

CSIS EXPERTS

James Andrew Lewis
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CSIS CENTER FOR STRATEGIC & INTERNATIONAL STUDIES
James Andrew Lewis:

Good afternoon. Welcome to CSIS, and thank you for attending our event on “AI and AVs: Implications for the U.S.-China Competition.” This is a good topic. It’s one that we have done – paid a lot of attention to because it’s of a key interest for, I think, national security, economic competitiveness, and international relations.

We’re lucky today to have some excellent speakers. First will be Senator Gary Peters, chairman of the Senate Homeland Security and Governmental Affairs Committee. He’ll be delivering pre-recorded remarks. He’ll be followed by John Bozzella, president and CEO of the Alliance for Automotive Innovation, auto innovators. John has extensive experience in the automobile industry – the automotive industry. And his full bio will be on the website. And then Admiral Dennis Blair, who most of you know, I assume, know. Currently Knott professor of practice at the University of North Carolina and previously, of course, the director of National Intelligence and the commander in chief of U.S. Pacific Command. They’ll be on a panel moderated by my colleague Bill Reinsch, a man who needs no introduction.

And so, with that, why don’t we go to the recorded remarks of Senator Peters?

Senator Gary Peters (D-MI):

Hello. I’m U.S. Senator Gary Peters. And I’m pleased to join you all for this important discussion about how we can advance autonomous vehicle technologies while ensuring that the United States remains a global leader in mobility, innovation for years to come. As President Biden said while visiting our auto manufacturers in Michigan, the future of the auto industry is electric. But I would also make an addition to that statement and say that the future of the auto industry is electric, but it is also autonomous. The deployment of more autonomous vehicles on our roads will not only save our planet and combat climate change by making cars more energy efficient, it’ll also make our streets safer for both drivers and pedestrians by reducing human error and impaired driving that all too often causes crashes.

For example, recent data shows that during the first nine months of 2021, more than 31,000 people died in car crashes. That’s a jump of 12 percent from 2020. And this is tragic and completely unacceptable. Connected and autonomous vehicle technologies hold great potential to save lives on the road, and it’s all the more reason why we must work to ensure AVs become a reality. In order to do so, we must lead the way in the safe development and deployment of AVs here in the United States. Private industry has already made great strides in developing and testing this technology domestically. But we must ensure that our federal laws and regulations keep pace, especially as we look to the future of manufacturing AVs at scale here in America.
I have long led efforts to pass AV legislation in a bipartisan manner, and I will not stop until we succeed. We cannot let outdated rules, such as requiring a steering wheel, to get in the way of lifesaving technology and innovation. We must also address related challenges, like the chip shortage that threatens our economic competitiveness. And that’s why it’s absolutely imperative that Congress passes a comprehensive competitiveness package to boost federal R&D funding in addition to funding the CHIPS Act, so that we can leverage domestic manufacturing to provide a secure supply of semiconductor technologies that the auto industry needs to grow and to innovate.

Our competitors, particularly in China, are not holding back. They recognize that autonomous technology and the auto industry will be the driving force in the 21st century, not only economic but also from a national security perspective. We cannot fall behind on the global stage.

So thank you for all of your efforts to drive innovation and support technological advancement in the AV field, and I know that I’m committed to ensuring our country remains at the forefront of developing the vehicles of the future and I know you are, too.

Well, thank you very much for that, Senator Peters. That gets us off to, I think, a good start in the conversation, and as Jim introduced them, we’ve got a very knowledgeable group of people here. We thought what we would do is have a discussion rather than formal presentations.

So I have the easy job. I get to ask questions and the other three get to answer them. And then we’ll do that for a while and then we’ll have time, I hope, plenty of time at the end for your questions. So if you have questions put them in the Q&A or put them in the chat and we’ll find a way to get to them once our discussion is over.

So I think what we’re going to focus on is several of the points that Senator Peters began with and, in particular, we’re going to look at the U.S.-China – competitive aspects of this and the implications of that competition, the significance of global leadership in the AV sector or the absence of global leadership in the AV sector, and the security aspects of that in addition, simply, to – you know, it’s nice to be ahead. But there are reasons why you want to be ahead and one of them is national security related.

So we’re going to talk about that. We’re also going to later on talk about – specifically, about some of the military applications of AV technology, which, of course, is an important security element. But we’re also going to get into something that – also something that Senator Peters mentioned as well, which is what the United States needs to do to maintain its position of leadership and there, in particular, we’ve got John Bozzella from the Alliance
for Automotive Innovation there to help us figure out exactly what we need
to do to get this industry moving even faster than it already is and, as the
senator pointed out, there’s already been a lot of innovation already. But we
have a long way to go before we are converted, if you will, to AVs.

So let’s start in with the big – sort of the big picture issue of China
competition and security, and I guess the biggest picture issue is the – how
do autonomous vehicles, both civilian and military, play into the larger
geostrategic competition between the United States and China. Is this
peripheral? Is it central? Is it important? Who wants to comment?

Admiral Dennis Blair: Yeah, I’ll start, Bill, if that’s all right.

Mr. Reinsch: Yeah.

Adm. Blair: If you look back a little bit, China tried hard for many years to break into the
internal combustion engine generation of transportation. One of their
traditional game plan, which is to bring in foreign partners, learn from the
foreign partners, kick them out, build their own companies, protect their
market, and then go back as an exporting behemoth beating these foreign
competitors at their own game, and they never quite did it.

They were not able to develop the real complicated set of skills that you need
for gasoline engines, and so they made a strategic decision here about five
years ago that the world is going to electric vehicles. They are simpler to
operate. All of this entrenched technology and knowledge are not necessary.
So we’re going to – we’re going to jump to EVs as our focus.

If you read this document Made in China 2025, electrical vehicles and
artificial intelligence are listed as two of the 10 areas in which China wants
to seize world intellectual and industrial leadership and it made a lot of
sense for them to go to these EVs to try to dominate it as they were unable to
do in the gas field to solve their – what’s called their Malacca dilemma, which
is that 70 percent of their oil comes out of the Persian Gulf across the Indian
Ocean through the Straits of Malacca, and the U.S. Navy, of course – I mean,
they use that at the sufferance of the U.S. Navy, which could close it any time
if there were a conflict with China.

And they’ve not only poured a lot of resources into the vehicles and the
software in the vehicles themselves, but they’ve also gone around the world
and invested in a lot of the places where the components for electrical
vehicles and autonomous vehicles come from; so cobalt, nickel, manganese,
rare earths. And they have sown up some of these leases in Africa and other
parts of the world. And what they have particularly built are the production
facilities in China for turning these ores into the semifinished materials that then go on in the supply chain.

So, for example, we read about mega-giga factories of batteries being built in Utah for Teslas, and it turns out that those are just assembly plants to put together anodes and cathodes and other materials that are actually processed in China. And so the United States, instead of becoming a complete battery producer, risks becoming an assembler, sort of the position that China had in many other areas.

So this – I think you have to understand the EV challenge in terms of this considered strategic whole-of-government decision that China has been making and pursuing for about 10 years or so.

I think the other thing that’s important in the competition with China is that – is to understand how big the automotive sector is in the U.S. industrial sector. I mean, if the United States loses full-spectrum industrial capacity in the automotive industry – and this means designing the cars, testing them, building them, fixing them, the whole ecosystem – then we are hollowing out the industrial sector that we counted on to become the arsenal of democracy in the Second World War, to become the – it was the industry we turned to when we were short of equipment earlier in COVID, for example.

So it’s – although the United States economy has gone to primarily a services-based economy, this industrial capacity is incredibly important; important to the military sector, as we’ll talk about later. And at the heart of it lies the industry.

So I think the big picture is China’s all-of-government push and the importance of the automotive sector to American industrial capability. That would sort of be my two big concerns on it.

Mr. Reinsch: Jim or John, do you want to add anything?

John Bozzella: Yeah, if I could. First, I think Admiral Blair did an outstanding job of laying out, you know, sort of what the big challenge here is. The countries that really take the lead in developing cutting-edge, innovative technologies in the auto sector are going to control the supply chains, set the standards, set the running rules, and really own global markets. And that’s the concern.

And I think Admiral Blair has said it right. With regard to EVs, you see U.S. – the U.S. industry already behind China because we’re competing with a national effort that the admiral described.

When you look at AVs, I’d argue from an industry perspective that we still maintain a lead, a technological lead here in the United States, with regard to
AVs. But we’ve reached an inflection point. And we’re moving now from research and development to the development of use cases and the deployment of businesses. And yet we don’t have the running rules to really make that transition. China will very quickly catch up because they won’t run into the types of challenges that we are here with regard to the development, you know, of a broad national policy.

And so, you know, my concern is that the EV story that Admiral Blair so well told is a cautionary tale for us with regard to AVs here in the United States.

Mr. Reinsch: Jim, you want to add anything?

Dr. Lewis: Just a couple quick points. I think John’s point on the flexibility of Chinese regulation is an important one. It’s a significant advantage. And that doesn’t mean they don’t have regulations. It means they just are quicker at making decisions about them.

One thing – and this might also be for John too – is that we’ve seen the Chinese develop – they’ve had this goal since Deng Xiaoping to develop a(n) economy that would catch up to the West. And so now you see a commercial airliner, you see telecom equipment, you see computers, and you see cars. Are they on the same trajectory as Japan or Korea – you know, starting out being low budget and then moving into the market or you know, do they have a brand problem? Where do you think China’s going to go on that?

And I think that’s one of the big issues for China policy is that Chinese may have aspirations but they lack global trust, and there’s only so far that – there’s only so far that subsidies will compensate for that. There’s only so far that we can rely on that for not moving quickly enough, but that’s kind of the thing I was wondering is – are they going to be the next Korea when it comes to cars or are they just going to repeat, as Admiral Blair said, their previous fail to take off?

Mr. Bozzella: Yeah, you know, it’s an interesting question. I – the way I look at it is I think – in some ways I think the Chinese, from an auto industry perspective, have learned some important lessons from how the Japanese industry has developed and exported and how Korea has. And arguably, you know, with regard to the leapfrog over internal combustion engine improvements right to EV technology that the Admiral described, that would indicate a level of learning. They didn’t take the 25-year journey to improve greenhouse gas emissions and criteria pollutant emissions from gasoline engines. They jumped over it. And so – and they had the ability to do that for reasons that I think you, Jim and Bill and certainly the Admiral are probably more equipped to describe than I am.
But that leapfrogging ability could certainly be applied here to AV technology, and that ought to be a concern for us. We do have an opportunity to continue to lead because the benefits of highly automated vehicle technology are so important to us. The safety benefits that we heard the senator refer to, the emissions benefits, the mobility benefits, and the equity benefits of people being able to move more effectively and more efficiently are really important benefits.

And so, we certainly don’t want to be dependent on other economies and other countries for those technologies. We’ve also seen this problem with regard to microprocessors. We do need to control our own destiny when it comes to these technologies.

I’ll add one more point here – and we’ll probably get into this a little further – you know, I think a lot of people think about the automated vehicle technologies and they think about the cutting-edge companies that are in San Francisco and Pittsburgh that are doing great work to develop the AI and the computing power, and the software associated with automated vehicles. But that work supports a broad industrial base all across the United States a whole panoply of auto manufacturers and hardware suppliers that will build the actual vehicles.

And so, to the Admiral’s point about the U.S. industrial base and the U.S. automotive industrial base, we want to maintain a strong, competitive, vibrant automotive industrial base, and AV technology allows us to do that.

Adm. Blair: I think one other big-picture question that I’m really not clear in mind on is sort of the hardware versus software part of it. I mean, AV is almost entirely software part of it. I mean, the LIDAR cameras, the radars, and so on are pretty – are pretty standard. It’s just who can be the cleverest in putting it together. And the history of software development is that it’s awfully hard to predict, and if you standardize and freeze too early, you probably are going to make the wrong decision.

I think inherently the American system leaves more flexibility to allow the technologies to play out because they have to attract capital, and you’ve got to make money and you’ve got to compete with the others. The Chinese have a tendency to freeze technology early and try to drive dominance through scale on a frozen technology.

And I don’t quite know how this one is going to play out in the AV part of it. In the EV part of it I think that, as John said, the – it’s pretty well known what an EV is going to look like. There can be some marginal improvements, and China can get ahead. When it comes to AV, all of these questions of slowing rates of improvement in recent months in safety features and weather conditions and reaching the limits of that technology, and all of these argue
that we should keep the – keep the technology open for a while and let ideas compete. And generally, the United States ecosystem is better at that than is the Chinese system. But I haven’t sorted out in my mind – certainly what the senator said, that we’ve got to have an arena so that we can try those different technologies and not drive them off the roads because of, you know, one unfortunate accident, and so on. But I’m not sure that the United States might not continue to keep an advantage of AV because of our flexibility. So I don’t know your thoughts on that, John.

Mr. Bozzella: Yeah. I think it’s a great question, Admiral. And I think that the word “arena” that you use is such an important one, because that’s the concern I have. As we move – as I said, you know, billions of dollars have been invested in this technology. And so now we’re ready for deployments. And so to take that next step to safely and effectively test and deploy on public roads at scale, to do the types of proving out, and to allow that competition to take place, we’re not really equipped to do yet. The Department of Transportation here in the United States has some – to my mind at least, and I think many in the industry – some more work to do to create that environment and to create that arena.

You know, frankly, I – you know – you know, I think needs to be a sense of urgency about this. We do – there are tools in the regulatory toolbox that allow the regulator to get this technology onto the road in a safe manner, determining that the vehicles they’re replacing – in other words, vehicles that are – with humans that are using their hands and feet – are as safe or, frankly, safer than – you know, the vehicles we’re replacing are safer than human-driven vehicles. Let’s use that tool in the toolbox to allow for this deployment onto public roads now at scale. Not a couple thousand here or there, but 100,000 or more, so that we can prove out, Admiral, you know, the technologies that we’re talking about.

And we’re not talking about a beta test here. What we’re talking about is a regulatory process, where the regulator determines on a – using data – that these vehicles are safe. And then we move forward, we collect the data, we learn more, and we – and we continue to develop and go forward. That’s really what we’re talking about here. We don’t have that. And I’m concerned that the China process is seamless. There is no sort of bump in the road. There’s no point at which they’ve got to stop and make that determination. So we’ve got to – we’ve got to do that.

Mr. Reinsch: I want to come back to – I want to come back to China. But I – let me – John, you just said something I wanted to follow up on. How do we – how do we scale up that big and that fast safely?

Mr. Bozzella: Yeah. That’s the question. So, you know, again, and I don’t want to get too in the weeds here, but there is an existing process in the motor vehicle safety
act in the United States, and managed by the National Highway Traffic Safety Administration, to allow companies to apply for an exemption—what’s called an exemption to a typical motor vehicle safety standard that requires hands and feet and eyes and head position and body position. And a company that applies for that exemption has to prove that this vehicle with this technology is as safe, or safer, than the vehicle that’s human controlled.

That process is antiquated. It needs to be modernized and improved to allow for these technologies and these technologists and innovators to apply to allow—to allow for those deployments. That’s one very concrete, specific way we can move more quickly and with a greater sense of urgency to realize the benefits of automated vehicle technology.

Mr. Blair: Like all of these things, isn’t it—it’s just so ironic. I mean, the thing that makes driving dangerous is drinking—(laughs)—underage, not keeping your vehicle in repair. You know, we know all of this. And yet, one—(laughs)—I mean, it sounds heartless. But one software glitch resulting in one crunched front end of a cruise vehicle on a stop sign being turned over stops things cold for weeks. I mean, I think the NHTSA people have to follow the data, you know, and not be driven by one well-publicized—well-publicized incident, which is—which is often what seems to seems to happen. Because we do have a bit of a culture clash here, don’t we, that—you know, what are the slogans that come out of Silicon Valley? Go fast and break things. You know, fake it till you make it. Disrupt. You know, those are not automobile terms that—(laughs)—that people like to hear when they—when they’re buying a car.

And I think—so I think the—you know, the Waymos of this world and the—and the AVs that are growing out of Silicon Valley need to get a little bit more the safety conscious that the GMs and the Fords have had to live with for many years when they will—well, you know, I just had my—I just had my Bolt completely battery-packed replaced because of two fires in two garages among 400,000 vehicles. So it’s a— you know, we’ve just got to let the facts drive us in this thing and not be sort of pushed around either by fear of China or by fear of one accident. We’ve got to get back to following the data.

Dr. Lewis: One of the things that came up in the prep for this that I thought was interesting is the legal limit of 2,500 cars a year if they don’t have a steering wheel or pedals, because I don’t know about others but I always—you know, you see the video of the driverless car and it’s got a steering wheel. Like, well, how come? And it turns out it’s a—it’s a legal requirement. So we—2,500 is not a lot in the car market, and that’s one that probably deserves a second look.

Mr. Reinsch: I guess the question that I’d like to pursue on that is it seems to me that, I mean, I’ve been thinking about this, that the—if we were entirely an AV
country where all vehicles were autonomous, I think the safety claims, the environmental claims, all of it, the claims that have been made for this, would be – would be validated. On the other hand, if you have only 2,500 vehicles out there being tested, you know, who cares? The problem is the transition. How do you get from A to B? What happens when you have a population where, you know, half the vehicles being driven are autonomous and half of them are people making mistakes? And how do we deal with that situation? Because we have to get there. We can’t – we can’t go from zero to a hundred overnight, so this is going to – scaling up is going to take time, it seems to me.

Mr. Bozzella: Yeah, I’d agree with that. And I think part of the scaling up – and this builds on Jim’s question about the 2,500. Those were the – that’s the limit under the exemption authority I was discussing earlier for any exemption to any federal motor vehicle safety standard, whether it’s the one requiring a steering wheel or, you know, whatever it happens to be.

And so part of scaling up is – and this will connect to something Admiral Blair just said – you need data, right? The agency needs data to be able to make smart decisions about how to continue to develop this broader policy environment. And so, you know, increasing that number from 2,500 to something much higher allows for that transition to take place, allows for the agency to do the analysis to determine that those deployments are safe or safer and to collect data to continue to inform the public through the agency, as well as the industry about key developments. And so that’s really a key aspect of the transition.

Another key aspect of the transition is continuing to educate consumers. A big piece of this is going to be customer acceptance and customer awareness of the benefits of the technology. If we limit deployments to tiny little pilot programs here and there, customers – the general public will never really learn about the benefits, and that will slow us down also. And so I think we do need broader deployments for a public acceptance and a public education aspect.

And then the last point I’d make is, remember, of course we’re going to have a mixed fleet of vehicles. We’ll see highly automated vehicles in the near future that are – you know, first- and last-mile package delivery – moving people in cities as we’re already seeing. And then you – but you will also see vehicles with advanced safety features that still require a driver to be present and engaged in the driving process. Keep in mind some of that hardware – cameras, sensors, LiDAR – that is associated with driver assist systems are also the building blocks for highly automated vehicles. And so, you know, and safer conventional vehicles will help us manage a mixed fleet.
Adm. Blair: I think the other thing that we don’t really fully grasp yet is how revolutionary autonomous vehicles will be. I mean, Senator – we all know about safety. Most accidents are caused by humans and if you can minimize that those 31,000 deaths will come down.

We know that an autonomous vehicle would be a tremendous advantage to older people to – you know, the ones who don’t want to drive anymore but need to get around. They’ll be a tremendous advantage, and we did a study on this at SAFE, the Securing America’s Future nonprofit I’m part of on the way this will allow low-wage workers who now rely on inadequate public transportation to get to their jobs. You know, taking three buses across town, getting up at 4:00 in the morning in order to get to a job at 6:00 – if they can order up an autonomous vehicle that’ll come pick them up and take them there, I mean, just what a – how much better that will be, how it will add to the incomes of people who are just struggling to get by because they can get to the jobs more easily.

But when you – when we get into the – and I’m sure we’re going to talk about it later – the 5G-enabled vehicle-to-vehicle, vehicle-to-person, person-to-infrastructure jobs, there are just going to be massive changes in the way that the – in the way, I think, that the gasoline vehicle built suburbia because it allowed people to live a drive away from their job instead of a walk away or a bus or trolley ride away from their job.

And I think, you know, John, I just haven’t seen that sort of visionary what this all means for autonomous vehicles come to it. It still seems more like a safety issue or a convenience issue rather than a transforming issue, and I – we want to stay ahead while that happens because I think that will really ignite it – ignite the vision once it is grasped.

Dr. Lewis: One of the interesting things to look at is generational, right? And so when you talk to a lot of people in their 20s or below 30, many of them don’t own a car and don’t want to own a car and they’ll take advantage of these services. Now, maybe that will change when they get older and have kids and move out there.

But, you know, I think we’re seeing a shift in how people consume transportation. This is part of it. You know, another part is that we’re seeing the same technologies in other – autonomous technologies in other vehicles. And so if you follow the drone market, the big change for me – if you ever had a drone, one of the early stage drones, what you immediately did was crash it, right, and now the drones that are coming on the market are AI guided to avoid that kind of crash. So there’s going to be interplay between the two technologies. There’ll be changes in demand. One of the questions for us is will the automotive sector be a leader in this or will there be things that keep them kind of behind some of the other autonomous areas.
Mr. Reinsch: Well, let me – yeah, let me come back to – pick up on that and go back to something that Admiral Blair said because he talked about jobs and mentioned jobs and one of the issues that’s come up here this – if you think about truck drivers, this may put a lot of people out of work. Is this net – are AVs going to be net job creating or are they going to be job losing, and, if the latter, what do we do about that? John?

Mr. Bozzella: Yeah. Well, first of all, let’s start with what we know about jobs as a result of automated vehicles today. We’re creating new jobs as we speak as a result of U.S. investments by technology leaders in highly automated vehicle technology. We’re seeing pilot programs across the country. We’re seeing communities of companies, competitors, startups, in places like Pittsburgh and San Francisco and other places across the country where there are thousands of jobs being created – yes, engineers and software developers but also, you know, test drivers and engineers designed to fit these new technologies into the physical constraints of a vehicle. And so we’re seeing right now job growth in the sector.

We’re also seeing the opportunity, as Admiral Blair mentioned, for these technologies, as they deploy, to allow and support access to mobility for people who need to get to work. So I do think that as we see AV as a mover of people come into the marketplace, that’s going to support employment for people who can’t get to work.

Beyond that, I also think, you know, you see there are places in the economy where we have a shortage of jobs right now, for example, in moving goods. And highly automated vehicles could help solve those job shortages.

With regard to how this develops in the future, we do need to continue to work on what that looks like. We need to continue to be invested heavily in K-to-12 education to make sure that we have students that are going to come into the economy with the skills required for cutting-edge technologies like the automotive innovation – industry, rather – as well as the economy more broadly. So those are really the – that’s the way I look at it.

Net-net, where does it come out? I mean, that’s a question that we’ll continue to look at over the next 15, 20, 25 years. But right now we’re off to a great start with regard to job creation from the sector.

Mr. Reinsch: The political problem that comes up – and I get this all the time when I’m working on trade issues, because it comes up there as well – is that the people who are losing the old jobs are not the same people that are getting the new ones. And so you end up with – you’re creating a lot of new opportunities, but they’re for people with different skill sets. And you’ve got the people that have the old skill sets, and many of whom are not in a
position economically or not of a mindset to acquire the new skill sets. And that creates a political problem. But I’m not sure there’s a solution to that.

Let me – we’re getting some –

Adm. Blair: Bill, could I just raise one point on that? I mean, John glanced at – but I think that the job creation will be in new companies that use autonomous vehicles for their purposes. It’ll just be a work-a-day piece of technology that says, oh, I can use this to do X, Y, Z. And those companies will hire people with all sorts of skills. It’ll be sales, marketing, delivery, everything. It won’t be necessarily, you know, troubleshooting an open-source computer program on a new type of vehicle. It’ll be a new company, new slice of industry, that has been made possible because AVs exist.

And so I tend to be on the optimistic side that this will create a whole wide range of jobs, not all of which will require a Carnegie-Mellon computer-science degree.

Dr. Lewis: And as Bill knows, every wave of automation has been greeted with these fears, going back to the late 18th century, and every time they proved wrong. So it’s bumpy, and there’s things we can do in education and in social-support networks to smooth the path. But, you know, overall – Keynes wrote an article in 1930 about how automation was not going to kill employment. And I don’t think it’ll be any different this time.

Mr. Reinsch: Well, this is why I said it was a political problem more than a substantive problem. You’re right about the answers.

But let me – we’re getting some really good questions from the audience, and I want to cover a couple of things before we turn to them. Let me go back to Admiral Blair for a minute and ask you to say a few words about the military aspects of this. So far most of the discussion – most of the public conversation has been about the commercial market, civilian marketplace. What economic and innovation value do military applications of the AVs present? And are there military spillovers into the civilian economy of AVs?

Adm. Blair: I mean, I think it’s worth remembering that the whole AV thing started with a DARPA grant challenge in which – (laughs) – in which a friend of mine put out a – I think it was a $100,000 prize to the team that could have an autonomous vehicle go – oh, I think the original one was about 20 miles of desert, and nobody made it the first time and so on.

So, you know, people in the armed forces will take advantage of machines that can go into very difficult places that you have to take extraordinary measures to protect a pilot or an operator or a driver. So there will be no lack of uses for autonomous land vehicles, just as drones have been – have
exploded in their uses in the armed forces, so that infantry squads take them out of their back pockets and toss them up in the air to look over the next hill. And I think autonomous vehicles will be – will be no different. You’ll send them where you – where you can, to save your people for doing other things.

So I just think that we will take – we will take, in the armed forces, full advantage of whatever kinds of – kinds of ground mobility without a driver come out of this. And everything from logistics, just getting the food and the food trucks to the right place, up through sending out a scout car down a road that might have IEDs on it. And before you blow real soldiers and Marines up, you’d like to – you’d like to neutralize it. Up through putting weapons on some of these – on some of these autonomous vehicles so that you can send them out to actually conduct armor attacks into terrain that you normally have to send out armed tanks and Bradley fighting vehicles and so on.

So I think the armed forces will take tremendous use of them. And of course, I’m not sure of the spillovers, but the – but the Navy and the Air Force are also thinking in terms of unmanned vehicles because the extra equipment we put into either an airplane or a ship so that people can be on it adds to weight, adds to complexity, adds to cost. And the more that we can have AV types of thinking into air and maritime vehicles, as well as ground vehicles, the more effective we can be.

Mr. Reinsch: Has the Russian invasion of Ukraine changed our thinking about this, or accelerated the urgency of moving on this?

Adm. Blair: I’m not sure – I’m not sure I’ve seen any specific Ukraine-based weapons that have suddenly shown their – shown their worth. But just in general making people realize that there are bad guys out there who are going to attack, that withdrawing from the Middle East doesn’t mean the end of war fighting as we know it, is going to, I think, keep a fire under people to, in the armed forces and more acceptance within the public to keep our armed forces on the cutting edge and being effective.

Mr. Reinsch: Let me go back to China for a minute, and then we’ll turn to the audience, because we are getting a number of good questions. Something that we were talking about back in the beginning, and something that – a point that Admiral Blair made reminded me – some of these questions, particularly about China, are not new questions. We’ve been wrestling with these for a very long time. I recall when I was in the later days of my government service in the year 2000 I attended a conference sponsored by one of those agencies that Admiral Blair has been affiliated with in the past that we don’t usually mention the name of. And the topic was: What will the Chinese
economy look like in 20 years? So this was 2000. And so now 22 years later, you know, we can see who was right.

The debate at the time very quickly devolved into kind of a binary option. Were they going to be the world’s most efficient producer of other people’s stuff, or were they going to be able to turn the corner and become an innovator and designer and creator of their own stuff, and produce that? At the time, which was 22 years ago, the majority felt the former and not the latter. And I was in the minority. So I continue to ask that question. Is AV an example where they’ve turned a corner and are going to be an innovation and design leader in this sector? And have we – or is this up to us, and whether we compete with them effectively? Or have we already lost out?

Adm. Blair: Well, I think, as always, Xi Jinping is doing us all a favor by attacking the very best Chinese companies that are showing innovation. And the Chinese companies that are world class have been the AMPs and Baidus and the IT companies who are working on certainly the AI part of this, so that they’re slowing down in the areas that they were most competitive.

I think that the sort of decoupling of the – of the Chinese economy from the rest of the world is something you need to watch in this space, Bill. It’s the – because artificial vehicles involve so much data, and data is so controversial, and the trend these days seems to be – certainly within China and in many other countries, don’t let it out of your country, don’t let other people have access to it, that we may – it may be that separate AI industries and AV technologies grow up in China and in the – and in the rest of the world.

So I think it’s still too uncertain to say, especially with the final factor of the really inter-investment and cooperation among AV companies that we’ve seen. I mean, Pony.ai (sic; Pony.ai) testing in Silicon Valley, American investors going into these companies, Chinese investors going into American AV/EV companies. It’s a brave man who predicts which one of those two will be – (laughs) – will be dominant.

Mr. Reinsch: All right. Let’s – we’ve got some good audience questions, like I said. Let’s go to those. And some of them we’ve addressed kind of so far, so we might be able to go through these fairly quickly. But some of them are interesting, some of them are provocative. The first one is – relates to what we were just talking about. China has shown tremendous ability to scale and upskill its manufacturing, particularly in areas like solar panel arrays, that have leapfrogged U.S. manufacturing. What paths can the U.S. government take to ensure the AV industry has an ability to scale to prevent this from happening to them?

John.
Mr. Bozzella: Yeah, let me see if I can take a first shot at this. It’s a great question. I think the first thing we’ve got to do is we’ve got to make sure that we can transition from R&D to testing and deployment at scale. We are stuck now. And so, as I said earlier, we do need to resolve this, get over this bridge, and allow companies to be able to test and deploy, develop data, have that data inform continual reinvestments and redevelopment. That’s really where we are. But that’s first and foremost in my mind. We’ve got to do that first.

The second thing we have to do is we have to make sure that we are invested in our own development and fabrication of semiconductors. You know, these vehicles will require enormous amounts of computing power onboard. And so to be reliant on an a broad supply chain, not to mention a semiconductor supply chain that’s controlled by others, including China, is a big problem for us.

So those are the two things. Let’s get this done. Congress is debating funding the CHIPS Act, in other words, investments in wafer fabrication here in the United States. Let’s get this done. And then let’s create this pathway to testing and deployment at scale so that we can keep our lead – our current lead on AVs over China.

Mr. Reinsch: OK. Here’s a – here’s a provocative one. If you all want to duck it, I won’t blame you. Why is the U.S. auto industry so far behind China in EVs, with the exception of Tesla? What really has been inhibiting GM, Ford, and others? Vision? Talent? Continued focus on combustion products? Cash? Anybody want to take that on?

Mr. Bozzella: (Laughs.) Yeah. So let me see if I can try. It may not be a complete answer because, you know, I know you’ve got a lot of other questions. I do think Admiral Blair laid out, I think, a key element of this. There was a recognition in China that they could not take the same pathway to reducing criteria pollutant emissions from internal combustion engines that we did here in the United States. It’s one of the great public health success stories, that we virtually eliminated criteria pollutant emissions from gasoline powered engines. So that was a long journey for us.

What the Chinese realized, in my view at least, is that if they took that same time and that same journey, that they would continue to exacerbate an already challenging, significantly problematic pollution situation in China. And so for pollution purposes, they saw EVs as a critical pillar. And so government focus, government investment, government incentives to drive state-owned enterprises into the industry – the EV industry – is really what happened, in my view.

Mr. Reinsch: I think there’s a lot of that. If you – if you were a resident of a big Chinese city, the problem was not so much buying a car as it was getting a – winning
the lottery to buy a car. And if you were willing to buy an EV, you would go to the head of the line and get permission to buy a car. If you were buying an electric vehicle in Beijing or Shanghai, you entered a lottery and chances were it would be five years before you could buy a car. So China really pushed EVs in very real ways. We allowed the market to do it, and like any huge market – (laughs) – you know, companies basically protect what they have. They’re familiar with it. And they say, well, as soon as people change their minds, but you know, what change have you see in automobile advertising aside from, you know, long-limbed women rolling over the – rolling over the trunks of huge muscle cars? I mean, that’s still what companies push and – because that’s the way they make their money.

Dr. Lewis: I was talking – I was talking to one of the –

Mr. Bozzella: Just something before you go to another question. I think what you have seen, though, is a shift: $515 billion, which even in Washington is real money, is going to be invested in EV technology over this decade. We are seeing product leadership. Sales of EVs doubled in the United States over the – over the last year. Seventy-eight individual electric vehicle models are in the marketplace today. That number will be 130 or so by mid-decade. And so you’re seeing this.

But the China story does suggest that this private-sector leadership ought to be supported by a national strategy that includes other aspects of the private sector – utilities developing infrastructure and the like to be able to make sure this market develops, and also to make sure that there are the appropriate alignments and incentives for the private sector to transition the industrial base to an EV industrial base. That’s really the area of focus that we need with regard to government policy because we are competing with the Chinese government, not Chinese auto manufacturers.

Dr. Lewis: In some ways, Bill, this is inevitable. And so I was talking to one of the big car manufacturers. A modern car has about 35,000 engineered parts. It’s expensive. It takes skill. It’s not even a third of that for an electric vehicle. So we’ve seen this with turboprops driving other kinds of engines out of the airplane market.

The question for policy is: Do we want to accelerate this? Because, inevitably – I don’t – I don’t want to give a number, 10 years, 20 years – every car will be an electric car and every car will have autonomous features on it. We can accelerate that, but the pricing alone means it’s inevitable.

Mr. Reinsch OK.

Here's another one. I want to get through these, if we can. Is there room or appetite to collaborate with China on AV development? One thing China has
in troves is data. They’re testing AVs on Chinese roads in large numbers. Wouldn’t that data and learning be helpful for U.S. regulatory development? On the flip side, what if any are the concerns about collaborating with China or Chinese companies on AV deployment in the U.S?

Dr. Lewis

I’ll start with that one because you have to remember in these things – and having talked a few times this year to various Chinese officials – it takes two, and the Chinese may not want to cooperate with us. They may not want to share data. Eventually, the two countries are going to need to find a way to work together, but right now the Chinese kind of feel like, what do we get that we don’t already have? If we can test in California, why would we give you things that will make you more competitive against us? So that could change, but right now they don’t seem to be that interested in talking.

Mr. Reinsch

OK.

Here’s another one. The employment issue for existing truck drivers for AV is key and is not being addressed. Sure, jobs of the future – engineers, software, more college-educated – will be dislocated. It is THE issue and it’s not even – it’s not ever discussed. We’re all for new tech, new skills, upskilling, but the, I guess, 50- to 65-year-old truck driver who makes big bucks will not be rehired. This is reality. John, you want to comment on that?

Mr. Bozzella

Well, the last time I looked we have a shortage of truck drivers in the country. And so, you know, I think that whether that shortage is a result of the pandemic and other things happening that are temporal. I’m not entirely sure, but I can tell you right now we’re short truck drivers. And so, you know, frankly, AV technology, V2V technology that allows platooning, those types of technologies, I think, can help address a shortage of drivers.

With regard to drivers that might not be able to be reskilled or, you know, as – and might find themselves out of a job, I mean, you know, frankly, we’ll have to see, you know, how that plays out. But, you know, I think, as Jim said, you know, this is sort of something we’ve continued to face as we continue to see productivity, as we continue to see automation, you know, play itself out over the course of the economy, which means we do need to focus, as a matter of policy, on education at the front end of the pipeline, and also provide retraining opportunities as much as we can.

Dr. Lewis

And this is wildly optimistic and a little ideal, but we now know the WTO story, which is open to China, made a lot of money, but failed to protect the people who were displaced. And so hopefully – maybe this time we’ll get it right. I wouldn’t bet a lot on that, but I’m more optimistic than I was some years ago.
Mr. Reinsch: All right, this next one I think we dealt with in part, but I want to get a couple of you – particularly, I think, Admiral Blair and Jim to comment on part of this. If a robust U.S. auto EV and AV industry is critical to U.S. national security, what should the U.S. government commit to the industry? And what is the auto industry asking for? I think John’s already laid out what the industry’s asking for, so I don’t think we need to repeat that.

Should the U.S. government be expected to fund the technology R&D, charging infrastructure, materials ecosystem, for the industry? Anybody?

Adm. Blair: I think John’s basic prescription of just get out of the way with rules that allow the testing and the real identification of problems and alternatives is the right one. I know on EVs we are going to need some sort of government subsidy to get charging infrastructure into place. I know some people who have put up charging networks around the world, and you can’t pay for your bonds with the revenues that you get from people charging. So there’s got to be a government subsidy role there to get the charging infrastructure rolling.

But that’s really the one that – and I would personally favor the government tax breaks on covering what I think is a short-term price differential between electric vehicles and automobiles now. It was, what, 7,500 bucks for a while for the first 200,000 vehicles. I think that ought to be extended in some fashion. I think it should be means tested so we’re not subsidizing the rich Tesla buyers, but we are making it possible for average families to buy electric vehicles and have a place to charge them.

So I think there are spot places like that for a strong government role to push EVs. But I think the greater part, as John has described, is setting the regulatory framework so that we can deploy, gather data and scale.

Mr. Bozella: Yeah, and I would just add one thing on the AV side, if I could. We really do need to figure out how to get control of raw materials, the EV supply chain. We’ve got to figure out how to permit mines here in the United States. We have to figure out how to process raw materials here in the United States so that we don’t revisit the auto-grade computer-chip shortage that we have today because we’re not in control of our own destiny there. We do need to control the EV supply chain here.

So there’s a government-policy imperative there with regard to the things I just talked about, and then providing in the form of maybe investment tax credits or other supportive measures, the transition of the industrial base. There are companies that make fuel pumps that aren’t going to need to make fuel pumps anymore or, you know, other, you know, turbochargers. Those companies need to be converted into the EV economy. And I think there can be government tools in the toolbox to support that conversion and support American workers.
Dr. Lewis: At a high level, the prescription is pretty much the same it is for a lot of technology.

Government needs to support R&D and workforce development. That means funding tertiary education. We need to look at infrastructure. That might be more local government.

A lot of it might be market. We mentioned 5G. But spectrum allocation, the development of more communications networks, that’s partially government, not always federal.

And then, finally, the regulatory obstacles that we’ve brought up over and over again. That’s a hard one to do. It’s hard to get anything out of Congress sometimes. But removing regulatory obstacles, whether it’s for raw materials or production.

So there’s three things the federal government can do that, really, nobody else can.

Mr. Reinsch: Yeah. We’re at our time. Let me just pick up on one thing Jim said and ask for a quick response. On the regulatory issues and, particularly, the exemption issue and the 2,500 limit that we were talking about earlier, there’s sort of a question about this. That seems to – the questioner seemed to feel this is sort of an obvious thing that people should be rallying around but it hasn’t happened. Is this a partisan issue? Is there some congressional problem with fixing this?

Mr. Bozzella: You know, there’s bipartisan support for expanding the exemption program. But like many other things in Washington, there are some special interests who see a bill on AV policy moving and decide to throw their particular issue onto the top of it. It slows the whole process down. That’s what we’re living with here.

I do think there’s bipartisan support for this, and we need to find a way forward and a vehicle to move this as soon as possible.

Mr. Reinsch: Well, we’ve reached the end. Let me ask each of you, do you want to do, anybody, a 15-second closing wise comment? Admiral Blair, say something profound.

Adm. Blair: I would say that – I would say that we ought to be excited about this time we’re in in the American transportation industry. It feels to me more like, you know, 1905, 1910, 1912 when there are all sorts of possibilities that are – as automobiles were replacing horses, and so I think it’s going to be a good time and we’re going to go to a whole new level of transportation which will
allow a great quality and better quality of life in the future than we have now. So it’s all good.

Mr. Reinsch That was a great era except for the buggy whip manufacturers.

Dr. Lewis (Laughs.) Right.

Mr. Reinsch And this is what Jim was talking about earlier, that transition always raises these issues.

John, a final 15 seconds and then I’ll turn everything back to Jim.

Mr. Bozzella Yeah. So I think the benefits – we shouldn’t lose sight of the benefits of highly automated vehicle technology – safety, access to mobility, efficiency, emissions, and environment. These are really important public goods that we’ll get as we deploy highly automated vehicles. I just want to thank CSIS. Great, great discussion today. Thank you.

Mr. Reinsch Jim, over to you to close.

Dr. Lewis Sure. Let me start by saying that if I was picking a city to test drive in I would not pick San Francisco or Pittsburgh, having driven in them both. So, hey, if it works there it’ll work anywhere. I mean, when they say Arizona, it’s, like, it’s flat – who cares.

Mr. Reinsch There’s an active testing program in Pittsburgh, you know.

Dr. Lewis Yeah, I do. SFO – San Francisco and Pittsburgh. Couldn’t think – one thing we didn’t talk about is demand and I think that early studies show that demand for autonomous vehicles is probably going to be higher than we expect. So this is going to happen. The question for policy is how quickly do we want it to happen – how do we want to stack up against China.

And we’ve had a good discussion. Let me thank our panelists. Let me thank Bill. Everyone in the audience, thank you, and have a good afternoon.