Center for Strategic and International Studies

TRANSCRIPT

Event

"Commercial Space for National Security: Integration and Institutional Change"

DATE

September 18, 2024 at 2:00 p.m. ET

FEATURING

Ellen M. Pawlikowski

General (Ret.), U.S. Air Force

Mandy F. Vaughn

CEO and Founder, GXO, Inc.

CSIS EXPERT

Kari A. Bingen

Director, Aerospace Security Project and Senior Fellow, International Security Program, CSIS

Transcript By
Superior Transcriptions LLC
www.superiortranscriptions.com

CSIS | CENTER FOR STRATEGIC & INTERNATIONAL STUDIES

Kari A. Bingen: Good afternoon. Commercial space capabilities have become more prominent in national security, as we've seen on the battlefield in Ukraine. We have a burgeoning commercial space sector, including in areas where just a few years ago only governments did with government resources. And we're seeing growing threats to the space domain.

My name is Kari Bingen. I'm with CSIS as the director of the Aerospace Security Project.

And I'm so pleased today to welcome my guests, General Ellen Pawlikowski and Ms. Mandy Vaughn. They recently co-led a Defense Science Board report taking stock of these commercial trends and how to leverage such capabilities. It encapsulates many of the opportunities and challenges faced by both the U.S. government and industry, myths and perceptions, why we should care, and the report offers pragmatic recommendations for a way forward.

A bit of a spoiler: The report is really less about the technology but much more about the policy, processes, and culture. Thus, today's theme of commercial space integration and institutionalization for national security. So I'm really pleased to have these two individuals, both leaders in their own right with deep experience across national security space, the private sector, and with real technical bona fides.

So Ellen Pawlikowski is a retired Air Force four-star general, the third woman in the U.S. Air Force to achieve such a rank. She commanded the Air Force Materiel Command at Wright-Patterson Air Force Base in Ohio. She was responsible for managing end-to-end – the end-to-end lifecycle of Air Force weapons systems, including research and development, test and evaluation, and supply chains. She was one of my go-to technical and acquisition experts, who I first met when she was at the Space and Missile Systems Center – SMC – which has now been rebranded as Space Systems Command and responsible for acquiring space systems for the Department of Defense. She's a key acquisition leader across space, air, and missile defense programs during her time at SMC, at the Air Force Research Laboratory, and Missile Defense Agency, who also happens to have deep technical chops including a Ph.D. in chemical engineering. She's now an advisor to government, industry, and continues to mentor so many of us.

And then next to her, Mandy Vaughn is the CEO and founder of GXO, Inc., and an operating partner with Embedded Ventures, a venture capital firm. She brings both government and industry perspective to these issues. She was the CEO and president of VOX Space, which is a subsidiary of Virgin Orbit, and she was also with General Dynamics

Mission Systems. She served in the Air Force in both space and missile program roles, in program management, and in test and engineering. She currently serves on the National Space Council's User Advisory Group and chairs its STEM, Education, Diversity, and Inclusion Subcommittee. I'm also really pleased that she is a fellow MIT graduate. She is a graduate in mechanical engineering and a fellow Course 16 alum, which for all of you that's aerospace engineering at MIT.

So we have about 30 minutes here that we'll go through a moderated discussion with me, and then I'll leave about 20 minutes at the end for questions. So I'd encourage our online viewers, please go to our event website. There's a button there to ask a live question, and we'll get through as many as we can.

So, Mandy, I want to start with you, and let's talk about this Defense Science Board report that was published this summer. What was the study? Why was it done? And why now?

Mandy F. Vaughn: Why now. No, great. And thank you for hosting us. This is just awesome to be able to have this discussion on this product.

And, General Pawlikowski, it was an absolute pleasure to work with you on this one.

General Ellen M. Pawlikowski: With you as well.

Ms. Vaughn: I think we had a lot of fun. And we're just starting the discussions to result from it, which is really fun.

So this study came about largely in building on some other work that was done by the Defense Science Board really looking at what is – let's unpack what resiliency means, right? So how do we truly make our space systems more resilient? So that's definitely one very deep technical area that requires a lot of attention since we have to deal with space as a warfighting domain and what have you.

But in parallel with that, you have this burgeoning economy and the pace of change happening in the space industry. I mean, we just see it on the news every single day. And we're all in this environment together, right, so it's very different than the other domains in terms of how civilian, military, and commercial space are all in the same – truly in the same domain.

So we had a lot of resiliency efforts going on, and the DSB really thought, OK, we've got to make sure we're looking across the boundary

– boundaries here. And there are some burgeoning government-sponsored commercial space activities going on like the Earth observing – like Earth observation data buys and what have you, but is that enough? Is that right? Are we doing the right thing? The department just decided to take a really deep look at this.

So where I think if you look at the terms of reference of the study what was really interesting here is we weren't just asked to look at commercial space capabilities, but truly saying, OK, can we increase military – or, is there military utility we're leaving on the table? Are we truly using commercial assets in the right way? What are we not leveraging that we should leverage more of?

But then the flipside of that, of, OK, if we're going to rely more on commercial capabilities, what are the risks and vulnerabilities associated with that? And what are those trades? What can we do about it? So how do we think about the flipside of the coin?

And then where I was really excited with what honorable Heidi Shyu put in the tour for us on this one, too, is the policy bit: OK, so then if you want to take more advantage of this and exploit more of these capabilities, how do you do it? Are there acquisition or policy barriers or business models that are getting in the way? Or, basically, how do we make this full circle come together?

So it was a little bit different in terms of being able to be highly technical in terms of the utility and the risk assessment, but then also let's make it tangible and how do we actually get it done.

Ms. Bingen: Well, and what I really enjoy with these Defense Science Board studies – and it was a privilege to be a part of the cohort that supported you all and participated in the study – is that the Defense Science Board, they're given wicked-hard challenges whether they be technical, and then you just mentioned policy as well. It's sometimes challenging for leaders in the building to take that step back and look strategically or look deep at an issue. And so to have the Defense Science Board here with a dedicated focus I think is really important and valuable for the mission and for the leadership there.

Ellen, let me shift to you as well, and let's anchor for – let's anchor here to what is commercial. There's this discussion on is it buying data and services, is it buying off production lines. Can you break that down a bit for us? And we do have a graphic that we'd like to show from the report itself.

Gen. Yeah. Thanks, Kari. This is a really important point. And as we went –

Pawlikowski: started this study, we realized that there was just – (coughs) – excuse me – so many definitions of commercial. And so we decided that we needed to define it more as a spectrum of things than just one particular thing.

And if you look at the graphic, on the one end of the spectrum is what we call commercial innovation. This is something that was inspired by a potential commercial application but it doesn't exist yet. And it's something that may be of interest to the Department of Defense and may have a potential commercial market. And so we called that commercial innovation.

Then the next step is when we actually have parts and pieces of what could be a capability that have been developed for commercial, are being used in commercial, but they aren't put together in much the same way that we would want to use it in the Department of Defense. And this is similar to the type of work, frankly, that the Space Development Agency is doing, where they're taking pieces and parts that are commercial and developing a defense capability.

The next step is, basically, what we call buying a piece of equipment or a system off the shelf, ordering it from a catalog – a geostationary satellite that does satellite communication, and it's going to be owned and operated by the government. And then that we call commercial – buying a commercial product.

And then, finally, commercial services. And this – the biggest, most mature example of that is commercial SATCOM, where companies like Intelsat or SES, you buy services from them. The government doesn't own any of the assets.

And so in the study, we framed it this way. And then many of the recommendations and the approach we took really focuses on the commercial – more mature commercial product, commercial services part of this, which provide the Department of Defense the best opportunity to leverage commercial now and in the near future in a way that could have an immediate impact on our national security capabilities.

Ms. Bingen: Well, and this is really important because we tend to throw around the term commercial space very monolithically, and what you've done is add a bit more nuanced thinking to that and are helping the department think how you leverage commercial in different areas.

So, Mandy, let me tee in on that a bit further. So break that down for us into different mission areas. How do we think about commercial there?

And in general, what are some of the key trends that you're seeing, as well as remind our viewers here what is the value proposition of this suite of different commercial capabilities for the government?

Ms. Vaughn: Sure. And I think I can kind of bookend it.

So on the commercial services, the easy one that people realize is launch, right? Smoke and fire is cool, and launches are pretty – they're purchased as a commercial service, right? So this is a very mature market where the Department of Defense is procuring exactly the same thing that even commercial astronauts are too, right? So this is – it's a great example.

And then the flipside of that, again, is on the commercial innovation side. Those are more of the pure innovation activities like SpaceWERX, some of the companies that are in the TACFI/STRATFI realm that are at this point of the technology's maturing and maybe at a position to start scaling to be onramped into a larger – a larger mission that needs more volume and production capacity to actually meet the department's kind of needs and loading, if you will.

So those are really kind of the two spectrums. And again, part of – to General Pawlikowski's point, why we focused on more of the right-hand side of the graphic is because, what could we do right now to be able to really influence the department's strategic posture in the next two to five years? So these are – these are thing where there's a lot of missions about to fly, architectures are being just populated initially or repopulated at just an astounding rate. So these are the technical elements where if we change some – I hate to call policy low-hanging fruit, but if you change a couple of buying practices you could make a significant impact in terms of what we fly now that can be operational and utilized in a very different way in just two to three years. So that's part of the why now.

And a lot of this also, too, is you've heard the department and government people talk about the value of commercial and leveraging the speed of the industry – how fast can they integrate new technologies, how fast can they refresh things. So we know there's development practices happening in these companies and in this ecosystem that we need to take advantage of in these more classic mission areas of SATCOM, PNT, missile warning, missile tracking, and what have you. So it's how do we help bridge this chasm of saying, OK, we talk about wanting to emulate these behaviors and leverage this quick cycle, but we haven't changed the way in which we go acquire the products to do that. So we just kind of have this impedance mismatch from the beginning, so that was part of kind of the go-to in terms of how

do we jump – how do we bridge this gap.

Ms. Bingen: So exactly on that point – how do we bridge that gap – there is an entire section in the report that describes concerns and perceptions on both sides, both government concerns and perceptions as well as industry concerns and perceptions. Can you unpack these for us and share some of the insights that you gained? Some may be misunderstanding or misperceptions and some are legitimate concerns.

Gen. Pawlikowski: So, Kari, as you highlighted, I spent 36 years as what I used to say as an Air Force officer I don't fly 'em, I buy 'em. And so one of the key areas when it comes to adopting commercial is the whole approach that we take to using commercial and acquiring commercial capability.

And as part of our study, we talked to a number of organizations within the Department of Defense about, you know, what was their approach and what were their concerns. And overall, my old community – you know, the buyer community – is concerned about how do I go about doing this and getting the best price. I want to have competition, because what my culture has taught me is that the more competition I have the better price I get, the better product I'll get. And so there's a concern about making sure that the commercial market truly is competitive.

In addition to that, there is a concern about whether the commercial market will continue to be there. As things evolve, if I make an integral part of my architecture commercial SATCOM and a decision's made to get out of that business because of other opportunities, the department doesn't want to be left without anything.

And then a third concern has to do with the power to control it. I want to be able to get it when I need it and use it how I want to use it. And there is a concern – and this is probably highlighted while we were in the middle of our study by the use of Starlink in Ukraine and the actions of SpaceX to divert the use of it for certain Ukrainian operations. So that kind of captures the – what we heard from the government in terms of concern about being able to really embrace and use commercial.

Ms. Bingen: And, Mandy, you've sat on both sides of this, government and industry. I'm just thinking here about Assistant Secretary of the Air Force Frank Calvelli's memo to program managers on "Guidance to Program Managers: Understand How Industry Operates and What Motivates Them." So what did you see on both sides of this?

Ms. Vaughn: No, this is where the study was fascinating. We thank everyone that came and spoke to us on this for being so forthright, too.

But one thing on the industry side that was a recurring theme is that they can sell their services to foreign governments, commercial providers, commercial customers, what have you, and the U.S. government – specifically the Department of Defense in many cases – just does it differently, right? So they just – it's an outmoded and outmodeled buying system.

So I think one classic example is SATCOM, right? So most of the other industry has really moved into managed services where you can – basically, it's just I need availability and I need bandwidth and, you know, help – just figure it out. Meanwhile, the government still procures satellites and ground segments separately. And then it'll – for the commercial SATCOM, it'll basically just buy a big transponder to have just a big swath of bandwidth available over a certain part of the globe. That's not really responsive, but it fits into how some of the funding models, some of the contract models – so, basically, when we unpacked some of these examples, it came out that some of these old buying practices really are just because that's how the RFP was previously written, or that's how the money flows, that's the line item. The buying practices have not kept up with the technology developments.

And then another big part of this is information flow. So industry is super concerned just, hey, tell me what I should worry about. And in some cases, if there's limitations or areas where they may be vulnerable, they'd like to know that because it makes a good business case for them to shore that up. So we talked to many companies who were like, hey, we don't need to know, you know, all spooky secret stuff, but if it makes good business case for us to make our systems more inherently resilient we'll do that. So there's a lack of information flow in terms of – and in the case of Ukraine, some timely threat scenarios where this should be we're all in this together and some of these information flows just weren't happening at all.

Gen. Pawlikowski: And there was another aspect to the information, which is: What is it that the government really needs? We tend to go through this process which gets us to the requirements definition side of how the DOD does business where we neck-down those things that we want to ask the commercial companies to do. And there's a frustration on their part that, hey, we think we can do more, but you're only giving us this small piece. So that combination of what they framed as the transactional approach, the way we do business from a business perspective, combined with us making, in their – in industry's view, uninformed decisions about what they can really provide because we don't share everything with them. So it really boils down to this issue of trust and the risk associated with trusting each other.

Ms. Vaughn: And in that kind of example, I always kind of call it being architected out from the beginning, right? The government makes these assumptions on what can the commercial providers bring to the table, so they get limited into what can be addressable to them because this – it's not a two-way dialogue from the very beginning.

Ms. Bingen: Well, and on trust and risk, Mandy, you mentioned what we're seeing in Ukraine. You think about the first shot in the Ukraine war, it was cyber against a communications system. The Russians continued to seek to jam GPS and satellite communications. There was – Ellen, you mentioned – Starlink not being turned on in certain areas. So one of the concerns of government that we had talked about in the study was, you know, can it trust that commercial will be there when it's needed? Can it trust the data, the algorithm, the networks? Has the commercial sector taken enough measures to address cybersecurity risks? So kind of refresh our memories here: How did we talk about that in the course of this study?

Gen. Pawlikowski: Well, the trust issue comes down to understanding how things are going to operate when the shooting starts way before that point. So when we talked about it in the study and in our recommendations, it gets to the need for commercial capabilities to be upfront in planning processes. It has to be exercised. If you're going to use commercial SATCOM in combat operations or commercial capability of any kind in combat operations, we train the way we fight, so we need to have integration of commercial capabilities in our exercises, in our wargames. And that informs both sides as to what the expectation is before you're in the middle of a crisis, which is what happened in Ukraine.

And then, from the buyer perspective – us acquisition folks – it then informs us as to what are the things that need to be in the contract so it's clear upfront what the expectations are when you start this. And the only way to do that is to go all the way back to the beginning for when you're defining the requirements and you're exercising. So in the operations side, it's really critical that we get commercial integrated in right upfront. You can't wait and decide, OK, I need to go buy some SATCOM because I'm in this part of the world and I didn't – and I don't have any. It's got to be done from the beginning. If you do that, then that relationship and that trust gets built right from the beginning. That's one key aspect.

Ms. Bingen: And that was my big takeaway, is none of the issues you're describing are technology challenges. It really is process, institution. So what has prevented us from doing that frontend architecting with commercial at the outset, building it into requirements, building it into exercises?

Ms. Vaughn: I think twofold.

One area is kind of a lack of understanding that in a time of crisis these really will be capabilities that we want to leverage, right? So I think the Ukraine crisis has really highlighted that the role here isn't just because it helps you with information sharing, which of course it does, but it's just different. What's in space, the capabilities that are out there, the numbers, the commercial space sector has almost the entire world instrumented; let's leverage it.

So I think it's part of that, coupled with this procurement culture and this inherent – this want of control of the government systems, right? So there's just kind of – we call it our scope-creep part of the study where we really unpacked why the government felt like they needed to control more and more of the architecture to be able to have that trust in the data. So it was really kind of an interesting interpretation of what is inherently governmental in a space system as a space system is providing a capability to a joint force or a warfighter somewhere else.

So we saw through the budgeting and the acquisition processes just this inherent need to need to control the data flows from end to end or control all of the assets that were part of the decision-making process under their own guise. So that was a really interesting thing that we unearthed through the study. It's like, OK, this is part of what's making them then have to think they have to acquire all of this stuff as their own thing, their own – their own system.

Ms. Bingen: That was one of the most interesting discussions that we had. It was with the general counsels on how should we think about and even challenge the current policy on what truly is inherently governmental.

Ms. Vaughn: Right. Yeah.

Gen. Pawlikowski: Right. That was a really – a real eye opener, I think, for all of us. You know, we – the term inherently government was thrown out quite a bit by both the government side and the commercial side. And then when we got the lawyers in the room, and what was truly inherently government is the decision to take action. It has nothing to do with where the information that goes into that decision, how that information, if you will where the electrons flow, and what action it takes to make that action happen.

But what we found is that you have what is basically in the law, defined – you know, as interpreted by the lawyers. Then you have what the Department of Defense decides by policy they want to be inherently

government. And then you go down to the services, and then you go to the Space Force. And each one of them, as we found, would make it a smaller and smaller piece that we could use commercial for, even though when you really peeled it back inherently government had a lot more opportunities to leverage commercial than any of the policies were allowing it to happen.

Ms. Bingen: And this goes back to we self-limit at the outset.

Gen. Pawlikowski: Right.

Ms. Vaughn: So kind of from the rhetoric to the RFP it's just broken, right.

Ms. Bingen: Yeah, yeah.

You know, another thing, too, that we – I remember we talked about is so long as commercial space capabilities are treated as this separate thing – a separate cost center, a bolt-on – the buyers, the users, there will always be this extra hurdle and it'll be difficult. So can you talk through a little bit of that and how that conversation evolved?

Ms. Vaughn: Certainly. And that's one thing, like – there's been much discussion through the last couple years about the Commercial Augmentation Space Reserve, right? And I think within our team it's one, like, oh, hate the name, because by calling it "augmentation" from the onset you're already making that assumption that this is – this is an additional thing, it's surge capacity, what have you. So you're already kind of putting it in a limiting bucket in terms of the way the general described it before, that we need to exercise, we need to train, we need to practice; this needs to be part of our everyday operation, not just an augmentation. So I think there's some misnomers there.

But what we – we looked at kind of the aircraft equivalent and how do the other services – how do the other military services buy their services, and how can we normalize some of the buying power. So how can the Space Force procure these data flows and these services in the same way that they procure airlift to move people or cargo, or the same way that you can procure ships over a longer period of time, what have you? So how do we normalize that buying power is something we really had to unpack.

Gen. Pawlikowski: And when we looked at it, one of our major recommendations was that we needed an end-to-end framework to truly do the integration you referred to, starting with defining the requirements. So the first question is not, OK, what do I need and how much of that can I carve out

that commercial can do; is start out with what is it that commercial – what can I do with commercial, and then what's left that I absolutely can't do with commercial, as opposed to the other way around.

And as Mandy highlighted, when it comes to integrating it in, our budgeting processes need to look at this differently. Giving you an example, again, SATCOM, probably because it's one of the more mature ones. If you're using a government-owned system like Wideband Global SATCOM and you're a combatant commander, you just order it and you get it for free because it's being funded under a different budget line for the Space Force. However, if you need commercial SATCOM, then you need to provide operation and maintenance funding that will then be put on the contract. And so you can't – you have to go all the way back into how did we bin and budget the dollars in order to truly tackle the integration.

And one of our recommendations on that particular example was to go to a working capital fund approach for SATCOM just as a starting point, where the dollars are all in one place whether you're operating a government system or you're doing a commercial system. And in that way it's transparent to the ultimate user, which is the combatant commander, where the money's coming from and how – and how it's being spent. That shouldn't matter to them. All they need is knowing that they're going to get the comm when they need it.

Ms. Bingen: Well, and it will challenge our traditional way of thinking about how we even buy space systems. We're used to buying an end item, a satellite, with a one-year procurement spike. But now, you know, this is where Space Development Agency, I think, is really leading edge in this, is now we're going to buy hundreds of satellites at a steady pace every year, and how you think about budgeting and cost estimating. It's a much broader ecosystem that also has to adapt to this different way of doing business.

Gen. Pawlikowski: You're absolutely right, because one of the things that the SDA shared with us as one of their challenges is when they go into the Pentagon to get approval for their program, the Pentagon doesn't know how to do a cost estimate that isn't a lifecycle cost estimate for something like that. It's like, well, how much is this going to cost? Well, it's going to be this much every year. And so it's not – that's why the framework is so important, because it's not just one piece that has to be addressed. It's not just requirements. It's not just the contracting. It's the cost estimating. It's the budgeting. All of this has to incorporate commercial into their processes and their practices if we're going to truly get the integration that we want to.

Ms. Bingen: OK, Mandy, I'm going to turn to you here. Any kudos? Are you seeing any organizations, leaders, initiatives, where they get it? What's being done well here? You know, where do we still have challenges? And, for those things being done well, how do we scale that?

Ms. Vaughn: Yeah, sure. No, I think there's glimmers of hope. (Laughter.) But I think, like – we mentioned CASR before. So I think the COMSO office, what they've tried to tackle over the last couple of years, they've made strides. There's definitely a change to the discussion, which is great. They're seeking input on what will be their CASR framework, which is great. There's elements in the framework that reflect some of what we discussed here in terms of information exchange, participating in war games, what have you. So those are good elements.

I think another good element recently is this last cycle of STRATFIs that were announced from SpaceWERX, where there were 10 companies awarded STRATFIs that were very well curated and worked with the PEOs, with the program line items, to say, no kidding, these are really technologies that can help this larger body of work and this technical maturation. So it's like glimmers of hope.

But then the flipside, in terms of what hasn't happened, OK, like, we're still talking about, relatively speaking, very, very small dollar values. There hasn't been a major line item change in any of these discussions. And then, in things like some of the more classic mission areas, like ISR, there's still data buy is happening in little pockets and little surge capabilities. I think General Saltzman even talked about TacSRT in his remarks at AFA yesterday. There's glimmers of hope.

But at the same time, it's, like, OK, where the rubber meets the road, it's still a small dollar value. And it doesn't address what the general mentioned earlier in terms of that requirements flow. So for the next major program of record in one of these mission areas, did you cleave off something in your requirements baseline that now you, Space Force or NRO, will not do, and you will let the commercial provider provide it as a service? I don't think that's happened yet.

So we have yet to see a change in a force design into a requirements baseline yet. So it's still – there's glimmers of hope showing the utility, but it hasn't yet made it into a circle in terms of how has that changed a requirement?

Ms. Bingen: So then what's your reaction to the Department of Defense and Space Forces commercial space strategies? They were both released earlier this year. Do they hit the mark?

Ms. Vaughn: You know, we actually worked pretty closely with the teams behind the scenes, because we did release – the first version of this, the classified version, was finished in August of '23, I think. So we worked with the teams on why did we come up with the framework that we did, and why this life-cycle thinking about the problem is different. And both the OSD policy and the Space Force policy, I think, grasp some of the – some of the same thinking, and in some cases some of the same nomenclature, which is really exciting to see in terms of this is an institutional change. This isn't just a program technology change.

But then the question then goes to, OK, how are we going to implement it? What are some actions? How do we measure it? How will we challenge ourselves when the next program baseline is ready to be established to say, did we think about that requirements flow differently? Are we looking at what can commercial do now versus what we think it can do in 10 years? And do that kind of cost basis of, should we cede this capability, because then we don't have to spend our funding on that part of the system? We can focus on something that is a little more exquisite, or harder, or more unique. That's the challenge.

Ms. Bingen: And I really – and I get to tout your all's horn. But I think when I look at the timing of this Defense Science Board study, as you mentioned, although the final report came out in May of this year, all the work was done last year. So I think it did have an impact in terms of informing exactly where that DOD and Space Force commercial strategy – where they went. I think the question now is, we've got really good verbiage there. How do we implement it? So what – Ellen, what are you going to be watching for there?

Gen. Pawlikowski: Well, we made a couple of very specific recommendations in there to – for lack of a better way of saying, to prime the pump. You know, because the way I described this, you could easily be overwhelmed. How do I – how do I go after this? One little piece here, a little piece there. And so there's a couple of recommendations that we were hoping we can – we can see implemented. Obviously, we recommended a working capital fund just to begin with a small aspect of satcom. That's a big lift. I'm not optimistic that's going to happen in the next year because it involves all the way up through Congress.

But we made a recommendation, for example, for the department to implement something similar to what is called the TENCAP program. And the TENCAP program is some funding that's allocated that allows the combatant commanders to try to use our national space assets in ways that are new and innovative to help them. So we called it the Commercial Capabilities Program, where there's funding provided that provide – that the combatant commanders can use that as an

opportunity to try to work commercial into their operation. And that would be a way to prime the pump a little bit, to get them involved in the war games and the exercises and everything.

So that's one of the recommend – those are two of the examples. And another one, as Mandy alluded to, is in a big program of record, because those are very difficult. The program executive officers are given this go by this, and the money's all in research and development and in procurement dollars. Well, we suggested that a small percentage of that get carved out. And the program executive officers incentivized to try to accomplish some of that with commercial capability. It's a small step forward, but both of those examples will drive – both first in the operation side and then second in the buyer side – a change in the culture. So that they see an opportunity, can see the benefit of commercial, without – while the, for lack of a better term, the bureaucracy in the Pentagon can see some examples that will allow them to say, yes, this is a real benefit.

Ms. Bingen: Well, and that's a really great point. And I – one of the, I think, highlights of the report is that it puts on the table very discrete, actionable recommendations that you can do in the near term. And just channeling the time from when I was in the Pentagon and in the E Ring, you know, you have so much on your plate. You're there for a limited time. Many times when we'd have these commercial space discussions it's we have to fix PPBE or fix the acquisition process. But when you're there in those seats, that's just – that's too broad. So it's how do we figure out a way to bite this elephant off in manageable chunks? And so that's why I really – I really liked those type of recommendations.

Mandy, if you have thoughts on it.

Ms. Vaughn: No, we actually went through the acquisition – the life cycle of a program, from requirements, definition, acquisition, test, ops, sustainment, and also PPBE, to be able to say, OK, how can we take a few small bites at the apple to move the needle? I think another, like, near term, smaller action we proposed to is the STRATFI concept is really interesting in terms of you bring forward small-business funding, program executive office funding, and then it's matched by private funds. It's a powerful example to send a good demand signal about a company's tech, as well as you're then leveraging – you're basically helping vector private money into a program or a technology that a PEO has skin in the game for, right?

So it's a cool feedback mechanism. But why is it so small, and why is it only small business, right? So how can we increase the scope of what could be awarded under that kind of mechanism, because that can

really – I call it effective TOA, right? The department can vector the private money that is coming into this field in a more targeted way, using those sorts of mechanisms. So, again, it's something that we think is doable and doesn't literally require an act of Congress, but. (Laughs.)

Ms. Bingen: Well, and, Mandy, you – I'm going to start going to audience questions here because you mentioned TOA, total obligatory authority. So basically, your top line spending within your program. And you mentioned PEOs, the program executive officers. So this is a question from Brian Bone at The Aerospace Corporation. Hi, Brian.

With DOD budgets expected to remain flat or gross lower than inflation, what is the best way to create that financial headroom within the TOA, that top line, to allow PEOs to invest in commercial capabilities? Does this require congressional action or do PEOs already have the necessary authorities to do this?

Ms. Vaughn: That's a great question. Do you want to talk to the PEO authorities?

Gen. Pawlikowski: Well, the PEO has the authority to spend the dollars based on achieving the requirements. What I think – so I don't believe that we necessarily need Congress or even an increase in TOA. It has to be an empowerment of the PEOs and the program managers to be able to shift their dollars. What typically gets a program executive officer and a program manager trapped is we get this multibillion dollar program of record, and we award a contract to a prime contractor, and every single dollar in that PEO's budget is allocated towards that contract. And so if there's an effort to try to spend that money somewhere else, oh, you're going to delay the program because the contract.

So if the PEO, when you establish the program, is told that, OK, this amount of money doesn't – is not going to go on that prime contract. It's there for you to explore other applications. Then it's a different – so we can do an empowerment. Now that means that we need to start small, because we can't take huge chunks out of this because the program executive officer's got congressionally allocated budget, right?

Ms. Bingen: I was going to ask you about Congress, yes.

Gen. Pawlikowski: Congressionally allocated budget. And so if he takes 2 percent off and explores this, the whole infrastructure will scream a little bit, to include the prime who's, like, wait a minute, that funding was for my contract. But if it's – again, if it's established up front that this is what we're going to do, then the PEO is empowered to do that. Now it would have to be carved out of that TOA. And so there might be a little bit less that gets accomplished on the prime contract for those years. But maybe a little

less needs to get done as the commercial matures, right? So it forces the – not forces – but it gives the program executive officer the opportunity to explore what commercial can do.

Ms. Bingen: And back to that, that definition discussion that we had at the outset with the spectrum, there's a lot of different ways for all – a whole range of different companies with different capabilities to play in that space, and just to bring in innovation into those programs.

Gen. Pawlikowski: Exactly.

Ms. Vaughn: And I think it does go back into it helps vector the private investment that wants to come into this sector. So by having that kind of construct, you can make it a lot more clear in terms of these are the technology areas where private investment can help further a cause, rather than just a whole bunch of well-meaning investors kind of taking their best shot at it without real insight into what are the hard problems that the department needs help solving?

Ms. Bingen: OK, so put your venture capital hat on as well, Mandy. We spend a lot of time talking about how does the government send the right demand signal to not just the companies, but really those investors who are committed to investing in national security capabilities? Is it as simple as program of record and fund it? Or what other – so talk through that. But also, there are other tools in the toolkit that the government has. You know, you as an investor, what do you see there?

Ms. Vaughn: Well, this is definitely one of them, right? So as we're talking about this kind of construct. The other is you really have to show – put the marker out there on the table. I think a great example is what NASA did on commercial cargo, commercial crew, right? It wasn't just saying, OK, I'm going to – I want to have commercial services to get up and down mass to space station.

They had a manifest. Like, here's the missions. Here's the cycle. Here's the up mass and down mass in each year. And here's our strategy. So basically – and here's the budget. Here's the budget line that aligns it. So you really need to have your strategy, your policy, and your budget aligned to show that we mean it. Like, we actually want to have commercial services to get up and down mass. And they did it. It's kind of – kind of cool. So I think that's a huge example.

So what is that mission are that – where could the Space Force take that same kind of – kind of movement, to say, yeah, policy, strategy, and budget are all aligned, that this is a part of the architecture that we can

procure as a service. And I think we go back to the wideband satcom is kind of a good example. Space domain awareness might be another one. So there's a few examples where the commercial market and technologies are pretty darn mature. So what's the doctrine aligned with the change, and how the funding is allocated from its classic budget lines, to say, OK, here's something that can be of service.

Gen. Pawlikowski: You know, there's a – it occurred to me, we're not talking about technical on this, because it is a very small part, but technical sometimes plays a role. Just recently, the Air Force Research Lab announced that they awarded contracts for a hybrid terminal. The hybrid in that is that these terminals will be able to use both government and commercial satcom. And there is an opportunity because now I don't have to worry about what kind of comm my satellite is going to have. And that sends a great signal to the commercial industry that says, OK, I have an opportunity now to compete for that comm business.

Ms. Bingen: So I'm going to ask another question here from the audience. One of your recommendations is to avoid overregulation of U.S. companies to enable international competitiveness. What areas do you see as being over regulated, and how does the U.S. government begin to scale back? And I will pair that with a question from one of our interns here at CSIS, Jacob Bradley, which is: How do you see ITAR controls hampering commercial space integration?

Ms. Vaughn: No, that's a great couple of questions, and very timely. And it was interesting, because one part of the study that we haven't talked about here too much here yet is how do you address the risks and the vulnerabilities associated with leveraging commercial space capabilities more inherently, right? So, of course, we went through a lot of thinking of, like, OK, what are some of the resiliency or survivability measures that people are putting into place for the government systems? And do any of those apply to commercial systems?

And some yes, some no, in terms of, like, some cyber hardening. Of course, things can still apply. But then the real flipside of it too is, OK, and when you're dealing with the threat space associated with things, just economic controls alone, as we've learned with ITAR, it's, like, economic controls alone basically just help kind of spur the business out of our industrial base and overseas, where it's less regulated. And I think you'll be talking about this more in some of your upcoming work too, but it's just how do we ensure that we're balancing the technical development and pace of change with what are smart export controls that really are aligned with what should we be worried about from a vulnerability perspective today. And those two time cycles are certainly

not aligned.

Gen. Pawlikowski: I think the best example on the issue of regulation that really had an impact on the commercial industry in the United States was radar. You know, where we imposed regulation about what kind of resolution. And the result of that was that other countries invested and developed capabilities. And that left our industry a little bit flat-footed when it came to understanding the value of – now, it's not a huge commercial market for radar right now, but it is an international market, and one where we really were on the leading edge. But because of government regulation, we were not able to – you know, we were not first to market elsewhere.

Ms. Bingen: Right. Right.

Gen. Pawlikowski: It's not an easy question, Kari. I mean, it becomes an issue of, you know, I was thinking, as Mandy was talking about, the launch business. Now, we did not necessarily overly regulate our launch business as we were doing the commercial services, although we did have very stringent safety and reliability requirements which left us with – until the most recent launch companies – left us not competitive commercially with other – with other international companies. Particularly, you know, Europe, which heavily subsidized theirs.

So regulation is – there is no, OK, don't do any regulation. If we're not involved at all, we can have a negative impact on it. If we're too involved, we can have a negative impact. So it's just one tool that the government has when it comes to helping the United States to be a successful commercial space – in the commercial space enterprise.

Ms. Bingen: Well, and, Mandy, thank you for highlighting a report that we're working on. So on October 1st here at CSIS we will be unveiling a report called "Gold Rush: The 2024 Commercial Remote Sensing Global Rankings." We drew inspiration from the Olympics to assess worldwide commercial remote sensing systems that are available, their services, their products are available on the commercial market. And we assign a gold, silver, bronze medal to them.

The bigger narrative in all of that, really, though, is this competition vis-a-vis the United States and China, and what that means for U.S. leadership in the world. So you're absolutely right. As, you know, a large part of this is, you know, ensuring that we have a healthy industrial base and innovation sector in the space ecosystem that's able to vie internationally for business, and so that they're not solely reliant on the U.S. government. And that is a much broader perspective, I think, that we need to take nowadays.

I want to come back to that, but I want to make sure I get through a couple more questions here from the audience. Jeff Trauberman from Velos, who's a friend of all of ours here. What advice do you have for DOD officials trying to distinguish viable commercial capabilities that have non-government markets from capabilities that really rely entirely on DOD funding and markets to come to fruition?

Ms. Vaughn: Great question. And I think we can get to that – and part of how we kind of talk about the role of the government in the study is the government is a regulator, an investor, and a customer, right? So it's different things that the government agencies need to do in each one of those roles. And in terms of, how do you help kind of find the right investment, I think it goes back to the demand signal question. And it also goes into some of the education of the acquisition workforce as well, right?

So one thing that that, with my Embedded Ventures hat on, we have a CRADA with the SpaceWERX team, where we work with the SpaceWERX team in terms of how do VCs diligence companies? What do we look for? What do we ask about? Because we're not looking at the response to an RFP. We're looking at the bones of a company. Not just the technology but the leadership, the strategy, the chemistry, their go to market strategies, is the addressable market actually real, what have you. So I think there's some interesting education to be had on the government buyer side in terms of leveraging some of that thinking in terms of helping them guide their investment strategy as well. So it's – we need to learn from each other in terms of how we can – we can figure that out.

Ms. Bingen: And that's what's really different here, too. Is you – it's no longer just taxpayer dollars. You have private capital going into advanced capabilities that the U.S. government can leverage. We need to do that in a smart way. What's at stake if we don't act with urgency here?

Gen. Pawlikowski: We don't – or we are – I think, first and foremost, when I think about it, you know, as a war fighter, is we don't get the opportunity to take advantage of what the commercial market is bringing, I think is the bottom line. So we don't have the increased capacity. We don't have the global coverage that we could benefit from if we leverage – if we don't leverage what's currently available in commercial, and then, in addition to that, what could be available in commercial, which is the investor part. And I think that's the biggest risk.

We can end up – if we keep going the way we're going and we spend multi-billion dollars on these very bespoke, sophisticated systems, but have limited capability, you know, quantity is a quality all in itself. And I

think that's the biggest thing that commercial provides for us that is really important as we look to the future, is being able to have a sufficient quantity of space capabilities, in addition to the quality that we have always treasured.

Ms. Bingen: And the threats continue to grow in this domain. And we've seen some of those threats be employed in Ukraine. It begs the question of what is the government's role in protecting these commercial assets? And I know we've had some discussions on that. So if I can ask you, how should commercial operators be thinking about this and the role of – and the role of government in protecting commercial space capabilities. And, incorporating a question from the audience, is the lack of war risk insurance and indemnification for space companies a significant barrier to improving integration of commercial space for national security?

Gen. Pawlikowski: Do you want to start with that on?

Ms. Vaughn: We spent a lot of time talking about this within the – within the team. But what it really boiled down to that we – and we heard from a lot of commercial providers. Some really want indemnification. They think it's critical. And some don't. So it was really kind of all over the spectrum in terms of what did commercial think they needed there. But one thing that is clear is in order for this larger, integrated operational construct to be a thing, you have to have financial incentives for the company to join. Basically, this is, like, OK, you get data buys. You're providing your service in peace time in exchange for maybe doing some cyber hardening or other resiliency measures. And then what is that financial protection at the back end, right?

But we didn't think indemnification was the answer, because in this circumstance it was – it's being used in kind of a weird way. And the flipside, with the war risk insurance, is if the craft-like framework and construct is legally mandated, then that can become an option, right? So if we actually have the contractual mechanisms in place with the companies that this is how things will be priced, we can have that discussion. And it becomes a financial protection that could be leveraged.

Gen. Pawlikowski: One of the things that we learned from the industry is the most important thing we can do is to improve the way we communicate what the risks are. Because regardless of whether they have government business or they're operating commercially, they're in that environment. It's not like we can have no fly zones in space. The satellites are going to be there at some point during their orbit, right? And so one of the strongest recommendations that came out of the

study was that we needed to improve the way we communicate across the board to the commercial vendors what are the risks to them?

We can help to – and then, we can advocate for them for the war insurance. And part of that is to take what we can do in terms of hardening measures, warning measures that we are aware of. These are technical things that we can advise them that they might want to incorporate onto – into their systems in order to provide more robustness. So I think those are two things that we absolutely have to do in order to recognize the fact that space is no longer this, you know, area where you don't have to worry about risks. Whether they're on contract with the government or they're operating on their own, they are vulnerable to many of the same risks that our systems are.

Ms. Bingen: Yeah. That's a great point. So we're winding down here. I want to ask one more question, and really give you the last word in this. And I'd say I thought this was an incredibly valuable study. It helped inform the Department of Defense as they were putting together their commercial space strategy. I thought it was very insightful. We received tremendous access, I think, from a range of government experts, as well as industry experts that informed the product that has been publicly released.

But in terms of last word, give advice to that next PEO or policymaker in DOD – one that's there now or one that may be coming in here in the next couple of months. What's something that they can tangibly do? And I think it just goes back to the report was very much focused – it painted a much broader picture, but it was also focused on what are actionable things that we can do in the near term?

Ellen, we'll start with you.

Gen. Pawlikowski: I think, for my mind, it's a quote that's under the requirements. And I mentioned it earlier. Start out from the beginning of, what can I do with what commercial is out there? And then the next question is, in my policy, or in my practice, or how am I budgeting, what am I doing to enable that to happen? And, you know, just ask that question. You know, you may not – there may be so many other things, Kari, because I completely understand you're on the third floor. You only got a couple years. Maybe so many other things. But if you ask yourself that question, and say how hard is it if I can modify my policy, adapt my cost estimating, look at how – what can I do in my contract to be more recognition of the commercial practices? Little steps can go a long way.

Ms. Vaughn: And I think it's an acknowledgement to help enable that. One of the aha moments in the study too is, in the light of resiliency and making all of these missions more resilient, a truly hybrid architecture helps with

that. And when we say hybrid in the report, we mean supplier diversity, orbital diversity, mission diversity, backups, all kinds of creative measures. Basically, it's we need to rethink – break the mold of rethinking from these classic mission areas into it's just a truly integrated connective space. And how can we be much more imaginative in what those architectures could truly be from the beginning? How can we use what's actually out there and leverage that to the hilt?

Ms. Bingen: Well, and you both have said it throughout this discussion, is if we don't get this right and we don't pedal to the metal here, the military loses out on this capability. We lose out on the technological advancements being made within this ecosystem. And there's also the economic benefit here too, as our industry and our overall industrial health loses out and, frankly, we lose market share to China, because that is what's in front of us.

Gen. Pawlikowski: Yeah. And that's a really good point, Kari. You know, we focus on national security and defense piece of it, but our ability to operate in space, leverage space capabilities across the economic spectrum, is critical to us as a nation. And in order for us to be successful in doing that, the Department of Defense needs to look at this and take it seriously.

Ms. Bingen: Well, thank you both so much for everything you've done in service to the country, for all of your wisdom. Frankly, both of you as being just phenomenal mentors to many of – myself included – but to so many folks coming up in the ranks. And I will encourage everyone to come back to us on October 1st when we unveil our report, "Gold Rush: The 2024 Commercial Remote Sensing Global Rankings." Thank you very much.

(END.)