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THE ARMY'S TACTICAL NETWORK MODERNIZATION STRATEGY

HEARING

BEFORE THE

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AIR AND LAND FORCES

OF THE

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HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES,
Washington, DC, Wednesday, September 27, 2017.

The subcommittee met, pursuant to call, at 2:31 p.m., in room 2212, Rayburn House Office Building, Hon. Michael R. Turner (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. MICHAEL R. TURNER, A REPRESENTATIVE FROM OHIO, CHAIRMAN, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Mr. TURNER. Please take a seat. We will call the hearing to order.

The subcommittee meets today to review the Army's tactical network modernization strategy. I would like to welcome our witnesses representing the Army: Lieutenant General Bruce Crawford, Army Deputy Chief of Staff and Chief Information Officer; Major General James Mingus, Director, Mission Command, Center of Excellence, United States Army Combined Arms Center; Mr. Gary Martin, Program Executive Officer for Command, Control and Communications–Tactical.

We thank you all for your service and we welcome you to our hearing today.

We are holding this hearing today because the Army is proposing a major shift in its tactical network modernization strategy. To begin funding the strategy, the Army has indicated that they would like to realign for fiscal year [FY] 2018 over $554 million, which would be a major change from their fiscal 2018 budget, which we had received just months ago, as well as the House-passed National Defense Authorization Act [NDAA], which was passed just months ago, including the request from the Army.

From an oversight perspective, we have been doing this—we have been down this road before with the tactical network. Since 2008, the Army has restructured its network strategy several times, to date without successful implementation. I remember in 2014 when the Army began a new modernization effort for the tactical network to improve communications, called the Simplified Tactical Army Network, or STARNet, and identified the network as its number one [modernization] priority.

Over $6 billion has been spent on the Warfighter Information Tactical Network, WIN–T, as well as many billions more on tactical radios and mission command network systems to simplify and improve the network. For at least 5 years, the Army has come before

this committee and defended the need and resources for your current network strategies and Congress has supported those requests based upon the Army's stated needs, goals, and objectives.

Just 5 months ago, you requested over $400 million in fiscal year 2018 for the WIN–T program and indicated that WIN–T Increment [Inc.] 2 was the foundation of its network modernization strategy and mobile mission command. Now, you are asking us to realign almost half-a-billion dollars from existing programs with limited details as to your long-term plan for the network.

Given the Army's previous track record with the network, I am skeptical on whether this proposed new strategy will work as intended. And we—I am concerned that we are going to be back 3 years from now discussing another approach and yet still not have full implementation by the Army for what the Army has purchased and we have paid for.

I understand the change in strategy appears to be driven by two reviews, one internal by the Army and one by the Institute of Defense Analyses [IDA], which had been requested by Congress. I understand the change in strategy appears to be driven by—excuse me—and that these reviews identified significant operational shortfalls in existing tactical network modernization programs and requirements, given current and emerging threats.

However, before we agree to anything, we better understand what it is that you plan long term for your tactical network. I think we can all agree that our first priority remains the warfighter. If we are going to send soldiers into harm's way, their communication devices should never say "service not available." So clearly, we want to be sure that we are fielding capability that works and equipment that the soldiers will use, with an understanding also of what information that they need to have available.

So just to reiterate two basic questions, which is the primary purpose of this hearing. Help us understand why what you are proposing is the right strategy this time, and why it is necessary to realign fiscal year 2018 funds after three of the four defense committees have already been on and off the floor, as opposed to waiting for the FY 2019 budget process.

Before I begin, I would like to turn to my good friend and colleague from Massachusetts, Niki Tsongas, for her comments.

[The prepared statement of Mr. Turner can be found in the Appendix on page 37.]

STATEMENT OF HON. NIKI TSONGAS, A REPRESENTATIVE FROM MASSACHUSETTS, RANKING MEMBER, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Ms. TSONGAS. Thank you, Mr. Chairman. And good afternoon to our guests, and welcome.

Recently, senior Army leaders reached out to numerous Members of Congress to notify us of some major changes they are recommending to the Army's tactical network programs. And I thank you for that. I understand that these proposed changes are based in part on the Army's view that it needs to take better advantage of telecommunications developments in the private sector and more agilely respond to rapidly changing peer threats, in particular from Russia and China.

Our witnesses here today have outlined in their prepared testimony recommendations for significant internal process and organizational changes. The proposed changes also include a request for realignment of close to half-a-billion dollars in Army research and procurement funds for fiscal year 2018, as well as realignment of billions more in future years.

The Army can, with existing authorities, reorganize itself to better develop requirements and programs to acquire equipment to meet those requirements. I would point out that this is not a new problem, and that internal Army management of what it calls, quote "the network" unquote, has been challenged for many years by an overly complex and segregated set of organizations involved in the process. If the internal Army organizational changes make things work better, I could support them.

I also support, broadly speaking, the Army adjusting its plan to adapt to changes in technology and threats. However, based on the limited information provided by the Army to Congress thus far on the details of the funding changes for fiscal year 2018, I have serious reservations about the funding-related elements of the Army's new plan.

First, I am concerned from a high-level perspective that the Army is asking Congress to, in effect, quote "drive in the dark" unquote, as it moves forward. The Army is asking Congress to take funding away from programs that in most cases have been fully developed over many years, tested thoroughly, and are now in production. The Army is asking to instead use those funds for a whole series of initiatives that are not well defined and in some cases don't even exist yet.

In short, the Army is asking us to take a significant risk in canceling several major programs; ones, by the way, that the Army has advocated in favor of for many years, in the hope that an ill-defined set of new efforts will work as planned, be on time, and stay on budget.

Second, I have questions about what little specifics have come over from the Army, particularly with regard to the WIN–T program. For example, the Army's proposal would cut close to $144 million in test, support, and management services for the network. But these programs and services will be needed regardless of the direction the Army plans to take with regard to a new network strategy. As a result, I am concerned that these planned cuts will jeopardize the Army's ability to swiftly and successfully upgrade its network.

Additionally, the Army claims that it still intends to upgrade its existing WIN–T Increment 1 equipment and buy significant amounts of WIN–T Increment 2 equipment for some units. However, it is not at all clear how the proposed funding realignment will support that plan in a way that is actually executable.

In summary, at this point the Army's proposed funding adjustment looks somewhat half-baked and not fully thought through. Before Congress agrees to move around half-a-billion dollars in funding, we need an official budget amendment proposal from the administration. That proposal should include full supporting documentation so we can be sure there are no unintended consequences to shifting around such large sums at the last minute. I look for-

ward to hearing more during today's hearing about the Army's new plans, and I yield back.

Mr. TURNER. Thank you.

I ask unanimous consent that non-subcommittee members be allowed to participate in today's briefing, after all subcommittee members have had an opportunity to ask questions. Is there any objection?

Without objection, non-members will be recognized at the appropriate time.

I also ask unanimous consent to include into the record all member statements and extraneous material. We have a statement to be offered on behalf of Representative Joe Kennedy.

[The information referred to can be found in the Appendix on page 55.]

Mr. TURNER. If there is no objection, so ordered.

I just want to note, I hope that, in the future, that Mr. Kennedy will vote for the NDAA, because that will probably have the greatest support for the program.

General Crawford—I understand he will be giving the opening remarks for the Army. General Crawford, this is not the kind of hearing that we like to have. This is where this committee was told, with full support of the Army, in May, 4 months ago, of the critical need for this program, and now you are before us in September, and I can't believe that the information that you are going to be providing us is information that wasn't known or knowable.

So we have been operating under the information that this program was critical, and you are going to meet a skeptical subcommittee and, I think, some difficult questions today. We look forward to your comments.

STATEMENT OF LTG BRUCE T. CRAWFORD, USA, ARMY DEPUTY CHIEF OF STAFF, G–6; MG JAMES J. MINGUS, USA, DIRECTOR, MISSION COMMAND CENTER OF EXCELLENCE, UNITED STATES ARMY COMBINED ARMS CENTER; AND GARY MARTIN, PROGRAM EXECUTIVE OFFICER FOR COMMAND, CONTROL AND COMMUNICATIONS–TACTICAL, DEPARTMENT OF THE ARMY

General CRAWFORD. Well, Mr. Chairman, Ranking Member, distinguished members of this committee, first and foremost, I would like to say thank you for allowing us the opportunity to come before you. Before we begin and move on with our actual testimony, I would like to take the opportunity to have the fellow members—panel members introduce themselves, and I will just start with me and talk very briefly—a little bit about what I do.

So, as the chief information officer, I am really responsible for three things for the Army. One is strategy, the other is driving the policy, and the other actually has to do with the resourcing in my role—the adviser to the Secretary of the Army and to the Chief of Staff of the Army.

That said, I will turn it over to General Mingus.

General MINGUS. Mr. Chairman, Ranking Member, distinguished members, thank you for the opportunity, also, to appear today to help tell the story of where we are going with our network path.

I am here representing Training and Doctrine Command in the operational force, and as such, the requirements side of this equation. I very much look forward to your questions. Thank you.

Mr. MARTIN. Mr. Chairman, Ranking Member, distinguished members of the committee, my name is Gary Martin. I am here representing the acquisition community. I am the Program Executive Officer for Command, Control and Communications–Tactical. I acquire much of the tactical communications equipment for the Army.

General CRAWFORD. So, Mr. Chairman, Ranking Member, distinguished members of this committee, we come before you on behalf of our soldiers and the trusted professionals of the Department of the Army civilian workforce to speak about the current state of our Army's network and to communicate a path forward.

It has been articulated in previous testimony by Army leadership that readiness is the Army's number one priority. Well, today, we would like to further state that the network is also a critical enabler to total Army readiness.

After almost a year of careful review, informed by both internal and external evaluations, and most importantly, feedback from well-informed operational commanders in the field, we have come to the conclusion that the network we have is not the network that we need to fight and win against a peer threat in a congested or contested environment.

The Army network as a whole is what we need to bring with us to communicate when we deploy. This includes people, it includes processes, and it includes technology that make it work. Our current network does not meet our warfighting needs now, nor do we believe it will meet the future warfighting needs of a high-intensity conflict.

Our forces must be able to fight, shoot, move, reliably communicate, protect, and sustain anywhere, anytime, across all domains and in any environment. The Army is committed to delivering a survivable, secure, mobile, and expeditionary network that provides situational awareness and joint interoperability to enable warfighters to fight and enable them to win.

The network also enables the Army to project forces and power from our bases, posts, camps, and stations to the most remote locations around the world. The current network was developed and fielded for the static environments of Iraq and Afghanistan in the mid- to late-2000s, but does not meet the warfighting needs of a high-end conflict against peer adversaries.

As we pivot to a new strategy, we look forward to more, not less, collaboration with our industry partners in delivering the network of the future. We owe a debt of gratitude—and I will say this upfront—we owe a debt of gratitude to our commercial and defense industry partners for stepping forward over the past decade to help address many of the capability gaps and shortfalls resulting in the current network that we have.

However, we now find ourselves in a new environment, facing new challenges and emerging threats that reflect the changing character of warfare our Chief of Staff of the Army, General Mark Milley, describes in an article about the future of warfighting.

To quote General Milley, "We have new insights into the character of future conflict, and we have had glimpses of what our Army and its soldiers must be ready to do in the coming decade. Shifts in the character of war offer an opportunity. If we can anticipate or at least recognize them, we can adopt proactively, maintaining or regaining overmatch, and forcing competitors to react to us."

The network we have currently fielded in our formation is neither simple nor intuitive, and one that demands a heavy reliance on industry-provided field service representatives that make the system work.

In addition to emerging threats that I have spoken of, we have also seen a commercial innovation explosion and exponential growth in technological advances that accelerated at a rate at which our standard acquisition processes could not keep pace. Neither current nor future adversaries are inhibited by the same processes, allowing them to better exploit new technology to their advantage.

Your Army must win the fight we are in, be ready to fight tonight against any adversary, and posture ourselves for the future fight. To improve our ability to counter evolving threats, we must adapt. Over the past year, our Chief of Staff General Mark Milley has led an assessment of the Army's entire network in parallel with the external study on the Army's tactical network directed by Congress in the National Defense Authorization Act of 2016.

The findings of both were corroborated by feedback from Department of Defense [DOD] testing agencies, combat training center rotations, joint exercises, and most importantly from operational commanders. These findings documented significant shortfalls in governance, requirements, acquisition, and innovation negatively affecting the Army's ability to provide warfighters with simple, intuitive, resilient, and protected network-enabled capabilities. Our new path forward will focus on four priorities: survivability and mobility of our command posts, tactical network transport resiliency, a unified suite of mission command assistance, and interoperability.

In order to address the two strategic problems we face, which are the requirement to be able to fight tonight, and the need to best posture our Army to win the future fight. In the written statement we said that "the Army will." What we intended to say was that the Army intends and has intent to halt programs that do not remedy operational shortfalls, fix programs required to fight tonight, and pivot to a new acquisition strategy of adapt and buy that allows for rapid insertion of new technologies and capabilities that allows the Army to best leverage the innovation and the investments of our commercial industry partners while remaining good stewards of taxpayer dollars.

This involved changes to Army culture, structure, and processes to address shortfalls. We will leverage proven joint solutions in commercial sector innovation, redefining the way the Army delivers the tactical network.

Our network must enable mission command, not encumber it. It must also ensure our leaders and soldiers, like my son, who is currently forward-stationed, along with over 180,000 other soldiers in

over 140 different countries, in support of combatant command requirements. It ensures that they can out-think and out-decide any future adversary.

We must posture our Army to rapidly maximize operational results, align resources, capitalize on technological advances and influence, shape, and leverage the innovation of the commercial industry. This new path we believe helps us do exactly that.

Mr. Chairman, Ranking Member, distinguished members of the committee, we thank you and look forward to your questions.

[The joint prepared statement of General Crawford, General Mingus, and Mr. Martin can be found in the Appendix on page 39.]

Mr. TURNER. Thank you, General.

General, if you were not a general, if you were a professor, and you had to give a letter grade to the Army's performance in this program, what letter grade would you assign?

General CRAWFORD. Sir, the best grade that I would give, given where we are, I would give the Army a C, looking at the overall performance. But I would like to add on to that question, if I may.

There have been several strategic shifts. And I make no excuses, sir, in answering this question. If we start back in 2008, and we look at what we were doing during that time, we actually had the surge that happened in Iraq, in parts of Afghanistan, so in that part of the world that was ongoing, so we had to make some strategic shifts there. And again, sir, I make no excuses.

Later on in the 2011 and 2014 timeframe, we actually had to shift the focus of where we were spending money on the network and literally purchase pretty much every capability that we can, which kind of led to where we are right now, and how we went about buying that, and get it in the hands of soldiers, given the capability that they had at the time.

Our focus—and I know this because having been the director of cyber in Europe during the timeframe—so from about the 2013 timeframe to about now, our strategic focus in terms of the network—and I am not saying it was right, I am just telling you what we did—our strategic focus at the time, sir, actually was focused on infrastructure. And it was focused on the evolution of threats in cyberspace.

And so to your question, sir, I would give us a C in terms of how we organize ourselves for this; the fact that we didn't have an overarching governance structure in place to drive. And at the time, we didn't have one single integrator in charge of the overall network. And those are things that we are trying to fix with the new strategy, sir. Thank you.

Mr. TURNER. Thanks a lot. I hope you understand our skepticism when even you would give yourself a C. And I think many of us would give you a lower grade overall in what has been accomplished here.

Now, you gave us 2008 and what you were responding to there. You told us about your strategy in 2013. But as I was explaining to you before, I am really concerned about 2017, which is why I am not happy about having a hearing like this, because we are not the accounting department. We are not clerks. We don't just wait for the Army to come and give us their new paperwork to shift over a program.

We are a committee that provides oversight. And we are supposed to actually be the partner with the Army in ensuring that taxpayer dollars are applied appropriately and that the warfighter gets what they need and deserve.

Now, you said that your request before us for the—that is coming, I guess—is because of your focus on the warfighter and because of your concerns for taxpayers' dollars. Was it not your concern in May when you requested this from us? Were you not concerned about the warfighter and the taxpayers' dollars in May? Because we were.

General CRAWFORD. Sir, although this study and this assessment has been ongoing for almost a year, one of the things that drove our thinking on this is we have been receiving different feedback from commanders in the field and different organizations about our entire network, the actual ecosystem that makes up our network. But we actually just received the actual detailed study on IDA in about the March timeframe.

So you have got a couple of options. You know, I understand that IDA was only—the IDA study was only one variable in the equation because we have been collecting data.

Mr. TURNER. I have read the study, but, General, you were participating. I mean, it is not as if the information that they just went out into a field somewhere and divined it themselves. I mean, it was a collaborative process that participated with your information and your knowledge, also. So it is not as if when the report hit that it was just suddenly new knowledge to the Army, correct?

General CRAWFORD. Sir, there were different parts of the Army that was actually participating in the study. But it wasn't until the late March, early April timeframe that we got a comprehensive look at the overall study, to be able to divide the 12 different functional areas and 4 different capability areas that they outlined, and to measure ourselves against them.

And to be quite honest with you, sir, the initial briefings that we received, actually some of the things actually caught us off-guard because what IDA did is they actually did a deep dive into the different functions that we use to actually run the network.

What we had been looking at, sir, although information was coming from commanders, we had a series of symptoms that we were trying to piece together, things like the idea of complexity as we started to get our minds around that. So we had been studying the threat. We had been going to school on the threat since about the 2013—in detail. And some of the new evolutionary capabilities that the threats are developing since about the 2013, 2014 timeframe.

But what the IDA study did for us, sir, is it forced us to see ourselves. And to be quite honest with you, I don't believe that we saw ourselves well in terms of really understanding the feedback that we were getting from the National Training Centers, what operational commanders were giving us in terms of trying to—problems that they were seeing. And so we started to try and—okay, so let's train our way through this. Let's increase training to try and solve some of these problems.

What the IDA study gave us, sir, is a little bit more depth in terms of, listen—and we actually later got this feedback from operational commanders: You cannot train your way out of the current

state that you are in; increasing the number of hours that you are training on the system is not going to get you to a better state. You have some fundamental process issues; you have some fundamental threat issues that you need to address, sir.

Mr. TURNER. General, you said that there have been commercial advances, and we certainly are all very aware of that, and we are aware of the fact that there has been a huge delta between what service members coming into the military are familiar with on the use of technology and then what you are handing them. You indicated that your acquisition processes have been a problem in your ability to pull forward commercial advances.

The request that you are going to be placing forward is a funding request. How are the acquisition processes changing so that you can solve that problem that you identified?

General CRAWFORD. Sir, a couple of things that we are doing I mentioned—I alluded to one of them earlier, so I would like to further articulate. We had to fundamentally change, so there is the acquisition piece of it. We had to fundamentally change how we were organized and how were dealing with the problem.

I mentioned one thing, sir. Imagine that we had a process, and you had no single integrator of all of the different mission areas of the network. That is the warfighting mission area. That is the business mission area. That is the intelligence mission area, and the enterprise mission area that make up the network.

We did not have up until General Milley and then Secretary—or Acting Secretary of the Army directed it. We didn't have one single integrator, and that was a recommendation that came out of the IDA study, to take charge of this overall process.

The other piece was, sir, we didn't have one set of individuals at the top of a governance structure that we are implementing right now, because we had to make sure we got that right. But one of the documents that was written and directed—that was written about a month and a half ago was that the Under Secretary of the Army and the Vice Chief of Staff of the Army now be in charge of a horizontally integrated—not just the vertical integration that we had before—but a horizontally integrated governance structure that is going to oversee all strategy, all policy, and all resources for all things network.

And so I believe Mr. Martin may have a couple of comments that he wants to make, sir, but in terms of actions that we have taken in the near term to fix ourselves from a structure perspective, again, this isn't something we can just train our way through, because that would have increased risks in our formations. We had some fundamental change. Hence my mentioning of culture that needed to change inside of our formations and some physical change.

And so those are just two of the things that we have recently changed. And I believe Mr. Martin from the acquisition community may have a couple comments, sir.

Mr. MARTIN. Mr. Chairman, a couple of points. One, I think we have learned, particularly over the last 4 or 5 years, that buying a one-size-fits-all capability for all of the formations complicates part of our problem.

One of the challenges we have today is many of the networking components that we are procuring and acquiring don't fit in our heavy formations, our combat platforms. Many of those are delayed until the 2020 and beyond timeframe, and much of that is the complexity of integrating these pieces into those formations.

We believe that some of the things that Congress has done, particularly in the NDAA for 2016, will facilitate specifically in this space, in the IT [information technology] space where things move rather quickly, a couple things that will be beneficial to the way we do business, one of which is section 804 in rapid prototyping and fielding. Clearly, in this area, you have to be able to prototype it, often focused, and field it much more quickly than the process that we use today.

Other transaction agreements are also a contractual mechanism by which we can get access to innovative technology in commercial marketplace much more quickly than we do today, and certainly section 851 that offers some accelerated means for getting commercial products out to the field.

So we believe Congress has given us some tools that we can take advantage of going forward, and we look forward to applying those to what we are trying to do, sir.

Mr. TURNER. Thank you.

Ms. Tsongas.

Ms. TSONGAS. Thank you all.

Obviously, a lot of questions that we have up here. You have identified a lot of problems. Many of those problems are not new problems, but I think you have yet to demonstrate or completely articulate a way forward that gives us the confidence that you will be able to solve these issues, especially given the funding constraints that you have asked us to—and the funding changes you have asked us for.

As you rightly point out in your statement, in your joint statement, the pace of telecommunications innovation in the commercial world has outpaced the services' ability to test, acquire, and field the latest technology. So as you are dealing with this, how is the service looking to leverage available technologies and capabilities?

We know the rapid pace of change. But what you have to deal with is making sure that there is a level of security and integrity, that maybe is not the case in the commercial world. So how are you looking at this, so that you are able to be assured that whatever you take advantage of it will be secure and maintain its integrity?

General CRAWFORD. So, ma'am, to the first part in how are we taking advantage of technology, so one of the things that we have learned is, we need to be able to not only leverage industries' technology, but we need to posture ourselves to be able to leverage industries' ideas and their best practices.

And so after the IDA study and we got the results, one of the things that we have taken on is we have asked IDA to pull in—and we have had four of these sessions, with industry partners who are traditional, but we also had sessions with industry partners who were non-traditional, who don't traditionally deal with the government.

And so, what did we walk away from with? In order to improve, to get beyond the requirement, because this process—this very

rigid process is essentially we write the requirement, we patch it to industry. There is a lot that happens in there. But what we are trying to get to when I mention the idea, this idea of putting operators and developers together—this dev ops [development operations] concept, so that our industry partners can get beyond just the written, rigid, in some cases overprescribed requirements, that we have been giving them in the past.

So when you think about what we are going to do differently, we are going to put operators and developers formally together so that our industry partners are not only looking at a very rigid requirement, but what they are really able to do is understand how the user interfaces with their product.

And so, over the years that—since I have been a general officer and speaking to industry, that has been one of the things that they have been asking for. They have been asking us, if you want to leverage our technological investments, the investments that we are making from a research and development perspective, you all need to figure out how you are going to give us more access to operators so that we can study how the operator actually interfaces with our equipment.

The second piece of that, ma'am, in terms of ideas and how we are—want to better—or we are going to posture ourself to better leverage technology actually has to do with this idea of cross-functional teams, where you will have not only the operators and the developers working together, but you are going to have industry to be a part of that team to try and inform as we look at some of the challenges that we have.

We mentioned satellite, overreliance on satellite and some of the anti-jam problems that we have. Ma'am, if we could have fixed these on our own, we probably would have done it by now.

And so by bringing together these cross-functional teams of industry partners, both traditional and non-traditional, because there are a lot of very innovative things that we are seeing out there in commercial industry that we want to bring them to the table to help inform us. So this is not something—and I mentioned in my opening remarks—that we look to increase collaboration with industry, not decrease that.

And so the cross-functional teams and the dev ops concepts are where we are looking to integrate as a part of this new modernization approach that we intend to take on. And these are lessons learned from industry. And I believe General Mingus may have a couple of thoughts.

Ms. TSONGAS. And how do you overlay the security piece? Because that is an additional requirement that is unique to the military.

General CRAWFORD. Yes, ma'am. So the primary security—a couple of security challenges that we have got and how that is going to be overlaid has do with this idea of Type 1 encryption versus commercial standard encryption. And so, although we know that we are tied to Type 1 encryption because of some of the satellite capabilities and we—you know, it comes with our package, what we are looking to do is leverage, so there are many commercial standard encryption capabilities that are out there.

So our thinking on leveraging industry's ideas and technology goes beyond just the capability we provide. But in terms of some of the encryption standards that they have got up to 256K vice the 128 that we use for Type 1 encryption, those are capabilities that we are looking to integrate, ma'am, as a part of the way we do business going forward. And again, some very innovative solutions that are out there.

It is not just about the technology. It is both the ideas, but back to the technology point, we have already seen—as a matter of fact, last night, the 82nd Airborne—a portion of the 82nd Airborne actually jumped in a capability that we became aware of over the last 3 or 4 months, that has to do with security. And we got that idea from industry, ma'am.

Ms. TSONGAS. And how will you use the innovation incubators, like the DIUx [Defense Innovation Unit–Experimental] that exists both out in California and Massachusetts? How will you look to innovation incubators like that to help you deal with some of these emerging problems or newly identified issues in the context of rapid change?

General CRAWFORD. Yes, ma'am. So to the point of talking to people that we don't normally talk to, the structure of these cross-functional teams, our intent is to bring in those who are innovating at a rate which is a lot faster than we are. In addition to the DIUxs of the world and the DDSs [Defense Digital Service] which are a—the subcomponent of them, we are also looking to leverage the agencies.

So there are other three-letter agencies that have some of the very same problem sets at the enterprise level that we face on a daily basis. And so, just recently, we were in a conversation with an industry partner and several of the three-letter agencies about cloud computing and looking for alternative solutions to the way we are doing business, which will save the taxpayers' dollars and eventually make us more secure.

Ms. TSONGAS. Thank you, General. I yield back.

Mr. TURNER. Mr. LoBiondo.

Mr. LOBIONDO. Thank you, Mr. Chairman.

General, it is clear that faster fielding of modernized capabilities is necessary to keep pace with current threats. Despite the Army's intention to prioritize network modernization, programs have continued to be delayed or canceled, as we are hearing about.

Your proposed significant shifts in the FY 2018 funding, and did so, as the chairman so eloquently pointed out, 5 months after you submitted and defended your budget request, and 1 month after three of the defense committees had marked up their versions of the 2018 request. With that in mind, would it not be prudent to continue buying new, lighter versions of the WIN–T Increment 2 until you know what the new programs are?

General CRAWFORD. Sir, the feedback that we have gotten on the program had, you know, given us some concern. I mentioned earlier where, what the origin of this feedback is. And so we have got two fundamental problems that we are trying to solve, sir.

If we were trying to do any one of these alone, this wouldn't be an easy problem, but it would be an easier problem. So, we have a fight tonight responsibility and a fight tonight requirement. Some

of the feedback that we have gotten, some significant challenges with line-of-sight, some significant challenges with security of the satellite capability that exists as a part of WIN–T.

And so as we look at the WIN–T system, and we look at the two problems we have, a fight tonight, and so that we are not before you in another 2 or 3 years with the same—a different version of the same story, we have got to pivot to a new way of doing business.

Again, any one of these two problems, sir, would be easier to try and solve. And so as you look at the WIN–T system, the first thing that I will tell you, sir is the WIN–T system is an overall—it is a part of the overall ecosystem. It is not the network in its entirety. It is the transport capability.

And so what you see, you will see it in—you saw it in 2017, and you will see it in 2018. We believe that there are some purposed capabilities, as WIN–T has five different components as a system. There are two or three of those components that we believe, back to the party one, and fight tonight, while we pivot to an objective system, which WIN–T we don't believe is because of the things that I outlined earlier. We believe that there are some purposed capabilities that exist in WIN–T that we could use to support our fight tonight requirement.

And so to your question, sir, of why not until there is something else—essentially what we are doing is we are buying lighter versions of WIN–T, things that were tested out at the NIE [Network Integration Evaluation] recently. We are buying lighter versions, but understanding that that is not our objective system, based on the attributes and characteristics that we have aligned, we are looking to fix our fight tonight with those purposed capabilities, sir.

Mr. LOBIONDO. But do we really know what we are pivoting to?

General CRAWFORD. Sir, so one of the things that we have been accused of, and rightfully so—it led to the C grade that we talked about—is industry has given us feedback so you are overprescribing. So you are telling me exactly—it has got to fly at 30,000 feet, it has got to be able to operate at the depths of a submarine, so to speak. You are overprescribing your requirements.

What about Army? Describe what it is, and then let us, back to this dev ops and cross-functional teams kinds of concept, if we know that we have got some significant security considerations, then why should we stay with the program out until 2026 knowing that we have got those significant problems? Let us invest in trying to fix our fight tonight capability, while we pivot to be ready for the something different.

By doing what—repeating what we have done in the past, sir, and we have been listening to the industry about overprescribing requirements—and so our intent is—and it is only our intent at this point—is to halt the program.

As I mentioned, we had taken the opportunity to describe, in painstaking detail for us. And it was an awakening for us as we described the attributes and characteristics of this future state. But in 2018, halt procurement of WIN–T Increment 2, and then through FY 2021, sir, field that which we have already purchased to enable our fight tonight capability.

Mr. LOBIONDO. Well, I have got big question marks. But let me yield to the chairman.

Mr. TURNER. Sorry to jump in here, but, General, he asked you a very pointed question—what are you pivoting to? And what you described was a process, not a destination, not a system, not a procurement program. So, and with all due respect, I believe that the answer is, you don't know, right?

General CRAWFORD. Sir, the answer is we do not have an objective system. If there were an objective system on the shelf, sir, we would be trying to go and purchase that objective system.

What we are trying to do now is to literally fix ourselves now, leveraging what we call the purposed capabilities.

Mr. TURNER. And those are all good words, but they are processes, right, General? You don't have, to be able to put in front of us, the answer of what you are going to do instead of this. You have—what you are putting before us and the answer to Mr. LoBiondo's question is a process.

General CRAWFORD. We have capabilities, sir, that we have outlined. It has to be protected. It has to be expeditionary. It has to be more intuitive. So those——

Mr. TURNER. Thank you, General, I am going to move on—Mr. LoBiondo? Mr. Langevin, sir.

Mr. LANGEVIN. You are in the ballpark, Chairman. Thank you, Mr. Chairman.

And I want to thank our witnesses for the testimony. I have got to tell you, this is just a stunning hearing and turn of events. I mean, I have got to go home and now explain this to constituents back home, and it just falls into the category of, you have got to be kidding me.

I mean, this is exactly the type of thing that people back home get so worked up about when precious taxpayer dollars, apparently, are squandered, wasted, not applied and used in a judicious and effective way.

So I am just going to—again, build on Mr. LoBiondo's questions. So, again, the last several years the Army has followed a fairly defined trajectory when it comes to our communication network and modernization efforts. Now that trajectory appears to have been upended in the middle of deliberations for the coming fiscal year, leaving policymakers, I guess, certainly in the lurch. I fear that the Army keeps abandoning good networks and systems in search for the perfect system, and the perfect, as we know, is hard to find, if not impossible, in the telecom world.

So, again, to the point, would it not be more practical to field the operational WIN–T Increment 2 network while continuing the R&D [research and development] efforts to improve it? And what alternatives does the Army have today to meet the requirement for on-the-move mission command?

General CRAWFORD. Sir, the alternative system for on-the-move mission command—between now and fiscal year 2022, we have a system called Joint Battle Command, JBCP, Platform. It is actually one of the preferred at the maneuver level—systems in our formations for on-the-move mission command.

Between now—in terms of the alternative—between now and FY 2022, it is our intent to leverage the resources that we are asking

for to pure-fleet the Army—because we are not pure-fleeted with that capability between now and fiscal year 2022.

So, to your question, sir, the alternative solution for on-the-move mission command while we are leveraging the purpose capabilities of WIN–T to kind of help fix our fight tonight capability, it is actually Joint Battle Command–Platform that gives an on-the-move capability and our intent is to field the entire Army Active Guard and Reserve out to FY 2022, sir.

Mr. LANGEVIN. So, you stated in your testimony that the Army seeks to reinvest the savings from realigned dollars in order to improve survivability of electromagnetic warfare and—I am sorry—electronic warfare and cyber capabilities. The mobility of command posts, joint and coalition interoperability, a simplified network, and resolved incompatibilities in order to fight tonight.

So, because of the operational landscape changes so frequently with the advent of new technologies and emerging capabilities, how are you ensuring that the Army is not chasing a moving target when it comes to network modernization and is balancing this future state network with current on-the-ground, on-the-move requirements we are facing right now?

General CRAWFORD. Sir, in terms of chasing a future state—and if I got that wrong, please correct me, sir—that is the thing that we are trying not to do is chase a future state. But what we have not done well in the past is, we have not done a good job of describing the future state. And so, as we have dealt with our industry partners in terms of being able to leverage the technological advances, what we have done is, sir, we have limited ourselves.

We have said I want a radio and I want it to have these two waveforms, and I want it to have these two waveforms only. Then, when new technologies come along, instead of being able to integrate a new waveform, we have had to get a new radio.

And so, those are some of the things that we are trying to put in place to say listen we like to describe the future state per requests that we have got from industry. We are not going to overprescribe in terms of our requirements and allow them to build us to an objective state so that when technology comes along we are not coming back to you to ask you to literally allow us to buy new radios.

And so that is just one of the things that we are putting in place, and I believe General Mingus may have a comment on that, sir.

General MINGUS. Yes, sir. And as we have described that future state to both the acquisition community and to our industry partners, it has to start with the ability to provide command and control and mission command from home station en-route to an operation, once you have arrived at an operation, and then in several types of environments once you get there.

And as you treat it as a system of systems from the network to the physical infrastructure of our command posts, all that has to be integrated, and those are the things that we have kind of described to our industry partners and our acquisition community in terms of where we are trying to go with this future state.

Mr. LANGEVIN. It is stunning that we are so far into this—we spent so much money and we are still nowhere, it seems. I yield back. Thank you.

Mr. TURNER. Mr. Kelly.

Mr. KELLY. Thank you, Mr. Chairman.

I get some of the issues. I get that we are fighting yesterday's war. We have been at war for 16 years in a so-so environment or something different than the high-intensity conflict which is near-peer or peer, going back old school doctrine. But we have to plan better for this stuff.

And so my question is, it sounds like we are trading acquisition funds for research and development funds because we don't have a system—and I get the processes and I agree wholeheartedly that having operated with all these systems—they are too heavy, they take too long to set up, they are not dependable or defensible—I get all those things, but that is not a new problem.

And then who is left hanging without equipment unable to communicate? Is that the Guard and Reserve who aren't able to communicate with their Active Duty counterparts if they are called to war in the same environment? So who is left hanging without the products to communicate now? Because we can't stop in the military—it is constant motion. So we can't pause or take a time-out. We have got to be prepared to fight that war today with what we have got, whether we need better or not.

So, I guess, going back to the chairman's point, my suggestion would be is to either ask for part of this money to do R&D as opposed to acquisition, but not all, to continue equipping guys with what we have until we get something new, or to wait until 2017 and say this is the product we have. It makes us more maneuverable, more defensible, it is easier and all those things.

So, why are we doing this now instead of waiting until 2017 and why are we trying to shift away from acquisition to research and development? And either one of you all two generals can answer that.

General CRAWFORD. So sir, to your—I will address the part about who is left hanging if I may, sir. So, the answer to that is the Guard and Reserve will not be left hanging in any way, form, or fashion. As we are baselining on a common infrastructure and a common set of standards on Increment 1 of WIN–T, the Guard and the Reserve is going to have the same exact equipment as every heavy brigade combat team in the United States Army.

The second thing that we are looking to do is, I mentioned that one of the on-the-move tools of choice is JBCP, Joint Battle Command–Platform. I mentioned that we are going to pure fleet the entire Army and our requests—our intent would be to pure fleet the entire Army with these resources between now and FY 2022. So the Guard and Reserve would not be left hanging, sir.

They are going to have the same exact equipment that every heavy brigade combat team is going to have. The only units that will have any different equipment—and it is backwards and forwards compatible that the light units, and it will be different from the way we are configured now because it is—we had the discussion about WIN–T, the light units actually had the heavy equipment. And so we are going to take the heavy equipment and put it with the Stryker Brigades and we are going to—part of this investment that we are looking for is to get lighter versions.

And I talk about purposed capabilities that fix their fight tonight capability—lighter versions of WIN–T, and actually outfit our light units with light equipment. And I will let Mr. Martin comment if he wanted to talk about the research and development piece here, but no one will be left hanging, sir.

Mr. KELLY. Yeah, I—let me—I've got one more question. I mean—and this is why it is important to know what we are going to—you have got to have the R&D part. The shot—the shot-out-to-splash, or the flash-to-bang, that is important, and so it is a big, big deal, especially when you start talking about—we call them knuckledraggers like us dumb engineers who are not smart enough. We are cavemen, you know? We still use a chisel and stone, but to train to do the new equipment fielding, the nets, to—just the flat-out installation of that equipment across the Army to include the Guard and Reserve Components, that is difficult.

So again, I get back to—we have got to have a process and we have got to know all those answers. How long does it take to get from the capability that we have now to the capability we are seeking? And that is a long time and so—again, I go back to, why weren't we talking about this in 2016 in developmental stages that we don't know what we have rather than talking about in the 2017 NDAA?

General CRAWFORD. Sir, a part of that—and I will let General Mingus and Mr. Martin jump in here—is this urgency-of-now discussion. You talked about things like being able to initialize equipment and get equipment out. So we have got—we have been assessing in terms of facts that we have been gathering to help inform our thinking.

One of the feedback mechanisms was from the National Training Center [NTC], where we had 16 different NTC rotations of various types of units, where on average it took between 40 and 50 hours just to get the equipment up on the air. Sixteen different rotations to the National Training Center of all kinds of different units over several years, and it took on average between 40 and 50 hours talking about the complexity challenge piece of this to get the equipment up on the air.

And so we have got an urgency-of-now. When you combine the complexity problem—and I understand that these may not be new challenges, but when you look around the world, we have got some new threats that we have got to address that have been evolving and leveraging technology in a manner in which we couldn't. And as I said in my open statement, just because of some of the processes that we have. Now I will let——

Mr. KELLY. Thank you. No, my time is expired.

Thank you, Mr. Chairman.

Mr. TURNER. Thank you.

Mr. Carbajal.

Mr. CARBAJAL. Thank you, Mr. Chair.

And thank you, Mr. Martin, Lieutenant General Crawford, and Major General Mingus for being here. General Crawford and Mr. Martin, WIN–T Increment 2 passed operational testing in 2014 and achieved full-rate production in 2015, and since then, has served our soldiers in Iraq and Afghanistan.

This program has been upgraded since it first entered production, such that the Increment 2 systems you would procure today are less complex, lighter, more capable than systems you bought a couple years ago.

How does the Army plan to transition soldiers on the ground from the old to new network platform? Does the Army have plans in place to address any operational disruptions due to this transition?

And, two, General Crawford, it would appear that a universal lesson learned from the previous tactical network modernization strategy to include previous network integration evaluations was the need to simplify tactical communication systems so that they would pass the smartphone test, making it easy for soldiers to operate with minimal training. How does the new modernization strategy pass the smartphone test?

General CRAWFORD. So, sir, one of the things we are looking to take on, if you used your—as you use your smartphone at home, one of the things that you do—so you have got Wi-Fi, potentially, as a path. And then you have got the broadband that is provided by one of the commercial services.

And so when you send a text to someone, the last thing that you are worried about is what cell phone tower you are going to be off of, or did this message leave my phone and go via Wi-Fi or did this message actually go over one of the services provided by one of our commercial vendors?

And so one of the things and one of the lessons that we learned to this idea of a smartphone test, sir, is we are looking to integrate and evolve, as a part of the new strategy, this idea of a universal transport layer. So just like you do at home, you don't worry about what tower you are off of, you don't worry about whether your message or your phone call actually went over Wi-Fi or whether it actually went over services provided externally that are global. You just wanted your message to get through.

And so we want to, first, simplify the touch, look, and feel. Back to this—I talked about getting operators and developers together, sir, to understand how the user actually interfaces with equipment. That is something we haven't done very well over the last few years. And it absolutely is a lesson learned.

But the second part beyond the getting operators together to ensure we have got the infrastructure that is moved away from the operator. The infrastructure needs to sit at the enterprise instead of with the operator. And if you go and look at our formations now, almost all the infrastructure they need to send that same message or something very similar to what you would send from home, we actually have to take with us.

And so we have got to change the touch, look, and feel by getting operators and developers together, sir. But we have got to create a universal transport later so the operator doesn't care which direction the signal actually lapped and what route it took to get to the distant end.

And I will offer General Mingus an opportunity——

General MINGUS. One other point with that, sir, is that in the past, when we have written our requirements for most of the end-user devices that our soldiers use, where you need that simplicity

and that intuitiveness, we have written it in such a way that it has created the complexity that we have on the tactical end.

So as we look to the future and as we are re-crafting how we write those requirements, an example of that would be instead of after 3 weeks of training, a soldier will retain 80 percent of what he was trained. And flip that and say that with no training he would be able to pick up a device and execute 80 percent of the tasks on that device before any training. If he needed to do any kind of advance-level stuff, that is where that training would occur. And so that is a change in methodology on the requirements side. When we help, we will get after that smartphone technology.

Mr. CARBAJAL. And I guess, just to conclude, do you have any contingency plans to address the operational disruptions?

General CRAWFORD. Sir, based on our intent—and it is intent in assuming that there has been no final decision, and we acknowledge this upfront. Our intent would be, as we—and I used the example about light equipment, actually going to light units. That would be the G3 of the Army deciding, just like we do with all other operations, who should get what equipment first based on where they are in the rotations, so that we take a minimalist approach, in terms of the disruption that is pushed on to our formation.

So we are thinking through that. And when I talked about who is going to get what equipment and when between now and FY 2021, we actually took some of that into account in terms of who is on a patch chart to rotate to where in what part of world, sir.

Mr. CARBAJAL. Thank you. I am out of time.

Thank you, Mr. Chair.

Mr. TURNER. We are going next to Mr. Bacon. But I want to give the lineup. It is Bacon, Wittman, Brown, Veasey, and then Mr. Cook and others, but at least you know somewhat of the order. Mr. Bacon.

Mr. BACON. Thank you, Mr. Chairman, and thank you gentlemen for being here. I served in the Air Force CIO's [chief information officer's] office about 12, 13 years ago, and so I know the complexity of the work you are doing. How much have we spent on the WIN–T so far? What are the sunk costs, as of now?

Mr. MARTIN. So far we have spent approximately $6 billion, sir.

Mr. BACON. Six billion dollars, that is a very painful number to hear, unfortunately. Can we afford to start from scratch to get the capability that we want? Or how many years is this going to take to recover if we start this process over with a new system? In other words, what kind of—how many years gap are we talking to get this back on the rails?

Mr. MARTIN. Sir, I don't believe we will be starting from scratch. The WIN–T Increment 1 system that we have fielded throughout the Army, the WIN–T Increment 2 that we now have in our light formations and Stryker Brigades, we will retain in that formation. There are some things we are going to do in the near term.

One, for increasing the ability to operate in contested environment, one of our requests for resourcing is for RDT&E [research, development, test, and evaluation] to provide an enhanced modem capability that gives the SATCOM [satellite communication] capabilities some AJ [anti-jam] robustness.

We also have some capabilities that we were planning to field to the signal—expeditionary signal battalions, troposcatter equipment modem capability, a new multi-band, multi-functional line-of-sight radios at the WIN–T level, that we were fielding not to our combat brigades, but to our expeditionary signal battalions. We are looking to redistribute that capability and put it right inside the formation to thicken the network to offload the protection capabilities that we are lacking today.

Mr. BACON. What is the combat impact if we don't field Increment 2 versus fielding the Increment 2 with its deficiencies? If you could just give that analysis, I would be grateful.

Mr. MARTIN. I will defer that to our requirements folks.

General MINGUS. We don't believe any operational impact. Because of the baselining of Inc. 1 across the entire Army, and then select formations, the Inc. 2 that are programmed for the next 2 years, the interoperability across all of the formations will still be there.

In the adapt and buy kind of construct that are part of this approach, if you think about WIN–T and its basic components, its satellite dishes, its routing switches, its net operations and server stacks. And it is WIN–T—that architecture is going to be with us for many, many years. But we want all of industry to be able to come back in 2 years, say, or 3 years and say, we have got a new, small, better, faster satellite dish. So we can take advantage of all of it that is out there——

Mr. BACON. Right.

General MINGUS. Same thing with all the other components. So the architecture writ large will stay with us for quite some time.

Mr. BACON. So if we say that we spent $6 billion, that is on Increment 1, as well, right? So in other words, that is not lost costs. So how much have we invested that we are going to lose if we stop the Increment 2? What kind of money was invested?

General MINGUS. I think the answer is the same—is there is no lost costs.

Mr. BACON. okay.

General MINGUS. Because we will be baselined either at Inc. 1 or Inc. 2 across the Army. And that will stay as the baseline architecture until——

Mr. BACON. Okay.

General MINGUS [continuing]. Some of these more innovative things come online.

Mr. BACON. Okay, thank you very much. I yield the balance of my time.

Mr. TURNER. Mr. Wittman.

Mr. WITTMAN. Thank you, Mr. Chairman.

Mr. Martin, I want to follow up on General Bacon's question. And in proposing this major shift in network strategy, the Army has relied upon some of the congressionally mandated findings that were in the Institute of Defense Analyses on the network.

And the report made a number of significant recommendations regarding tactical radio programs. However, the report didn't say a whole lot about WIN–T or that program specifically. And looking at those report findings, can you let me know—let us know—what led you to the conclusion that accelerating the tactical radio pro-

curement was the right way to go and halting the WIN–T program was, based on those findings, the proper decision?

Mr. MARTIN. One of the capabilities that we have not delivered on in the last few years is fielding tactical radio capability to our lower formations, specifically battalion and below. We have been very prescriptive in the past of what capabilities we expected. We prescribed the waveform software capability that we were expecting to use, which was limited to only a few folks in industry. In fact, we actually provided them source code for them to actually port onto the radios.

What we have found, and particularly as we engage with other activities, SOCOM [U.S. Special Operations Command] in particular, there are innovative capabilities that have been developed in the commercial marketplace that have done a much better job than we have at adapting it. And they are far more resilient. They significantly reduced the complexity that soldiers have in managing the capability and very consistent with what the IDA report recommended we do.

Mr. WITTMAN. The Army has begun to embrace the non-developmental item initiative, so essentially, going to off-the-shelf or commercial technology in that acquisition model, where you have the industry invest its own money, develop technology, look at how that can be applied to meet the warfighter's needs. Can you tell me how you envision utilizing this model to support Army network modernization and communications conduits, as well as hardware?

Mr. MARTIN. Many of the components across the entire network are, in fact, commercial offerings that we adopt, particularly in the tactical radio community. One of the things that we have recently done, we released the request for proposals for a two-channel leader radio. Previously, we would have very much prescribed the capability wanted at a minimum capability and that was the only thing industry had to bid with.

What we did this time is we offered industry the ability to propose to us some objective capabilities, some of which we identified in terms of things we would like to see, and also offered them the ability to bring forward any capability that they have developed, or have access to, and offer that above-baseline capability to the Army. Pretty much what SOCOM does, I think they have been very successful along those paths and we are looking to implement a very similar approach.

Mr. WITTMAN. It just seemed like there is a tremendous amount of capability out there——

Mr. MARTIN. There is.

Mr. WITTMAN. And for the Army to be able to take that off the shelf, to be able to operationalize it much more quickly, yet also have it upgradable and modular in its components, I think is absolutely critical. So to be able to look at that model, I think, is key.

Lieutenant General Crawford, do you have any—or Major General Mingus?

General MINGUS. Yes, sir. I was just going to offer that in the adapt-to-buy approach, it is getting after that very thing that you described, the non-developmental. We in this analysis determined that we cannot keep pace with commercial industry when it comes to information technology.

And so, as we identify a gap, we do the market research, we find something that is close. We try it. It may work, it may not. If it works, then there is an adaptation process so that it works in the military environment. And then, if that works, then we move forward.

Mr. WITTMAN. Very good.

General Crawford, it is my understanding, based on the Army's new strategy and looking at capitalizing, again, on industry innovation, looking at technology that is out there, and existing special operations and joint solutions that are going on wherever possible. So looking at integrating all those different ideas, could you elaborate maybe on some of the lessons learned from the commercial sector in how you plan to utilize this cutting-edge technology and industry innovation as you look to not only create the network capability today, but what the Army will be looking at in capability in years to come?

As you talked about, technology changes almost on a daily basis. And I know from my days of having to carry an authentication book with me, as an old RTO [radio transmission operator], and authenticate, we have come a long ways from there.

General CRAWFORD. Sir, in terms of lessons learned from industry, the biggest one has to be governance. I mentioned earlier that it wasn't that we didn't have governance, sir. It is that we had multiple governing bodies all attempting to oversee the resourcing and strategy of different aspects of the network.

The other thing we have learned from both industry and our special operations teammates in the joint community, Special Operations Command does buy, try, decide, vice the risk-averse mindset that we have had in terms of—instead of taking advantage of industries, fail early and often—or fail fast kind of mindset, we have taken a very risk-averse mindset in terms of adapting to change.

And so, those are the two, the governance and that it needs to be horizontally integrated. And then this buy, try, decide kind of mentality, in small increments and spiraling into our formations, is the best posture that allows us and the greatest lessons we have learned in terms of being able to integrate technology and leveraging innovation of industry vice reacting to it, sir.

Mr. WITTMAN. Thank you, Mr. Chairman. I yield back.

Mr. TURNER. Mr. Brown.

Mr. BROWN. Thank you, Mr. Chairman. Let me just start by saying that—I mean, I think disappointed is just an understatement for me. I have been on this committee for 9 months and senior service component leaders come in to the committee with a great deal of confidence and say, we are ready to fight tonight, and with a great degree of confidence, lay out visions and ideas and plans about what it takes in terms of R&D and modernization, so that we will be ready to fight tomorrow night, and the night after, and 20 years down the road.

Six billion dollars, that is the number I heard, $544 million that you came in and requested, and we said, sure, here you go, which represents—and maybe my numbers are not particularly accurate—more than 3 percent of the Army's budget. And you come in and say, we want to halt the program; we want to pivot because

the confidence that we exuded was a little bit misplaced, and we have got new information.

It is concerning, I can tell you. We have a responsibility in Congress to make sure that we appropriate the money that you need, and we are wrestling with our responsibility, and we have fallen short. But as I've said before, you have a responsibility to manage those funds that we appropriate.

I appreciate what you are doing. I really do. I know it is complicated, it is complex. But in the context of billions of dollars, we have got to do better.

So I think my question is maybe a follow-up to Mr. LoBiondo's and Mr. Bacon's, and—but I just want to clarify. This pivot—are we going to be able to build on existing technologies? We spend a lot of time and funding and energy on research and development. Are we going to turn the existing technologies into something useful? Or when you say "pivot," that technology, the equipment and everything that $6 billion represents, are we leaving that in the dust?

General CRAWFORD. Sir, to your comment that we have to do better, sir, our promise to you is we will do better. To your question about leaving technology, and so absolutely, sir, we will not be abandoning technology.

As we look at the challenges, and I won't go through those again. We—you heard me mention those. The resources that we are asking for is to fix the problems that we have identified so that we can fight tonight or tomorrow. We believe that, based on what Mr. Martin said about our line-of-sight capability, what he talked about in terms of our overreliance—and that is what we have become, overly reliant on satellite capability—he mentioned the anti-jam type problems that we have got.

We are looking to reinvest these dollars to buy the commercial modem that Mr. Martin talked about, which is not the end-state fix, because there are some other things that have to be done, working with our Air Force teammates in terms of space for more protected communications capability.

But we are going to be leveraging the technology that we currently have, sir. We will baseline the entire Army. As I said, we are asking to halt in FY 2018, but we will be fielding WIN–T out through FY 2021. It will be the baseline on which we build for the future.

What we are asking, sir, is that we be allowed to describe an objective state because we know—we believe based on feedback that we have got, and we won't go through all the different feedbacks—we do not believe this is the objective state in its current configuration.

General Dynamics, the company that makes WIN–T, sir, has been since I have been a signal officer for 31 years, they have been one of the lead integrators in this space. And I would be very surprised if in the future, this company and others who have been teammates with us integrating this technology won't be involved in this. And——

Mr. BROWN. Let me jump to one other thing.

General CRAWFORD. Yes, sir.

Mr. BROWN. Let me jump to one other thing, the Manpack radio program. And can you confirm that the Army is still committed to going forward with the Manpack program?

Mr. MARTIN. Yes, sir. We are currently in competition with the Manpack. We have two vendors. That is our primary mechanism that we are going to provide support for the mobile user objective system. The satellite goes operational after the OT [operational threshold] in 2019. So that will be our primary Manpack and vehicular radio.

Mr. BROWN. All right. Thanks.

And, Mr. Chairman, let me say in concluding, Mr. Martin is a familiar face. We worked together at Aberdeen. Nice to see you here today.

Mr. MARTIN. Thank you, sir.

Mr. TURNER. Thank you.

Mr. Cook, and then to Mr. Veasey, Mr. Panetta, and Mr. O'Halleran.

Mr. COOK. Thank you, Mr. Chairman.

This is tough to hear this committee very, very upset. The timing couldn't be worse right now. There are a lot of us that are trying to get this budget passed and then we have this happen, particularly with the amount of money.

And, you know, Congressman Kelly talked about his being a—was a knuckledragger. He was an engineer. He was a rocket scientist. I am, you know, infantry; real, real basic some of the terms you are talking about. I only have—it is like the same language we use around here, you know, with acronyms and this and that.

And I am saying to myself, and no offense, generals and everybody else, I want like 20 troops out there, 20 soldiers that have worked with this. And I am going to say, what do you think of this system? And I have been there going back a long while, and they would say, "Well, it is not worth a crap." And then I would say, "Why?"

Give it to me in grunt terms that even Paul Cook, who is not very bright, and I am not in your league at all, nor—I will never, you know, get there—but I think that we should have been asking those people over and over and over again, because I know this is painful for you guys to come in here and testify at this critical time and say, oh, by the way, it costs this much and this much, and we are not sure if we are going to get this, and it is going to be—what, 2026—I don't know the dates, I am going to be long dead. I just don't want my grandkids being in a convalescent home by the time we get this straightened out.

And the reason I am so angry right now is the same thing was happening when I was a second lieutenant, different service. It is still the DOD, same country, I think. But here we go again, rolling out something like this, and you know, it gets down to the field and the troops say, "This thing is just a mess, it doesn't work for the following reasons."

So I obviously am venting, upset, and I don't have the technical questions, because I am last on the point—second-to-last. So all the good questions have been used up, by the way, and which were one- and two-syllable words. But what I am saying is we have got

to track that with the people that use that. And then it has got to come back, and not at this time.

Now, I am going to support it—I always support the Army. By the way, yeah, I am growling, but General Milley, there is no one more convinced of the fact that readiness is the name of the game. And my fear is that this is going to affect readiness levels of certain units. They are not going to be C1 or 2, or C1 or C2. They are going to be C3 or C4. And he has talked about that enough.

So I don't know how you can correct it. I don't think that—I obviously don't think this is all industry's fault. I think this is—we have got to go back because this is not the first time. And I am not going to bore you with systems that have been terrible. I only know the Marine Corps ones, boy the billions that were spent on some of them. The crap that was put out there in the field that didn't work is unpardonable. It is one thing for us to be upset, but when some soldiers—when some Marine, sailor, airman, whatever—if they die because they don't have the best equipment, then that is on us.

So I would like to make sure that we evaluate that, not from—I want to go back to the troop level, soldiers, what have you, because usually they will give you the straight scoop. And if you ask them the questions with a case of beer, you will probably get a straight answer. I don't know where you can do that, but you know what I am saying.

So let's get it fixed, and never violate the—one of my main principles, and that is the doctrine of surprises, because you surprised me today and it is not good for me and it is not good for you.

Thank you.

Mr. TURNER. Mr. Veasey.

Mr. VEASEY. Thank you, Mr. Chairman. General Crawford, I wanted to ask you if you could describe the improvements to WIN–T Increment 2, over the initial Increment 1 that the Army or the manufacturer have made?

General CRAWFORD. Sir, one of the improvements that they have made is, there have been some steps taken, over the last couple of years, and most recently, in terms of a lighter version, two components of WIN–T. So I mentioned one of the problems that we had initially is, we gave the initial instantiation to WIN–T Increment 2, to light units.

The only problem with that is, on the back of a very large vehicle—so you had situations like in the Pacific, a unit, literally, as they were deploying, went out and purchased, on their own, some equipment because their heavier version of WIN–T, it was too big to take with them.

And so, recently, at the NIE, one of the things that has occurred, and this is a good news story—they developed a lighter version of two components. It is called a NOSC and a TCN, a Tactical Communications Node, and a Network Operations Center, that we intend, as a part of this fixing our fight tonight problem, when I talked about the purpose capabilities, sir, that we believe had value in the future, between now and FY 2021 that we would like to field, we would like to field these lighter versions of these two components of WIN–T to fix our fight tonight capability, and actually

give them to our light units who can actually use them, vice the heavy equipment that they have now.

And so, of the fixes, and Mr. Martin may have a couple of comments to make, but the one that goes to the very front of the line has to do with lighter versions of the capabilities, so that we can actually give our light formations light equipment vice the heavier equipment that slows them down and impacts readiness, sir.

Mr. MARTIN. If I understood your question, sir, you are looking at what are the two differences between Inc. 1 and Inc. 2. Predominantly, the communications capability are interoperable and compatible, but what Inc. 2 does is it actually puts that capability onto mobile platforms. It has a satellite on the move capability and a directional line-of-sight capability, so it allows the commander to be mobile, rather than at the command post.

Mr. VEASEY. And also I wanted to ask you another question, as well. Given the Army's track record on modernization programs over the last two decades, including the multiple iterations of the network modernization strategy, what can you tell us that can help convince us that this is the best course of action?

Mr. MARTIN. Sir, I have been in and out of this environment for most of my career, so I have had a role to play in acquisition of components of what we have done. The first thing that I would say is, in my experience, 34 years in acquisitions, this is the first time that we have taken the entirety of this on as a major thrust. And in my 34 years, I have not seen a Chief of Staff personally engaged to the degree that he has to ensure that the requirements, the acquisition across the entire community that we are part of this endeavor.

Two, I think we have realized—and we should have realized this a long time ago—that we have been way too prescriptive in trying to tell industry what to deliver as opposed to asking industry how to meet the capabilities that we need.

We still have elements of the Joint Tactical Radio System, which were, essentially, capabilities that are no longer modern. These are 10-year-old capabilities that we were trying to make work in this environment. Those are the things that we are trying to halt. The MNVR, the maneuver radio, the core of that radio is capability that was developed in the early 2000s.

It is not applicable. Industry has moved on. And so, we have taken a step back, we have taken a hard look at what others have done to fix some of these problems to include, as the ranking member mentioned earlier, security is a big issue. But we have treated security as a one size fits all.

And so, things like platoon and below, where dismounted soldiers can deal with a different level of security and open their options to a significantly greater set of tools and capabilities is something we are looking at very heavily right now. And this is what our SOCOM friends have really brought to us.

Mr. VEASEY. Thank you very much. And one more quick question, General Crawford. What led you—or what were the factors of you conducting the review now?

General CRAWFORD. Sir, it was realization of the threat. It was understanding and developing and understanding over the last 24 to 18 months of the second- and third-order effects of things like

a near-peer adversary who not only has an electronic warfare capability, who not only has a cyber capability, but what they have been able to do is combine electronic warfare, information operations, and cyber and leverage that against our forces.

When you think about some of the SATCOM vulnerabilities that we talked about and some of the line-of-sight vulnerabilities, you have got a near-peer adversary that is developing the ability to disrupt our forces. You combine what I just explained, talked about, sir, with information ops, cyber and electronic warfare capability, with some of the indirect fire capabilities, where our TOCs [tactical operations centers] are now needing to move every 30 minutes, every hour, you combine all those capabilities, sir, that is a pretty significant adversary.

And so it was actually understanding and developing a deeper level of understanding of the threat that really got our attention. That, combined with feedback from operational commanders with—as I mentioned earlier, sir—symptoms, initially, they were symptoms—complexity, training issues, et cetera, that were brought to us.

And then we actually got a study that said, here is what we think your root cause issues are. So the urgency-of-now, sir, is connected to our deeper level of understanding of what the threat is and the need to enable our fight tonight capabilities, sir.

Mr. TURNER. Gentlemen, we need to move on.

Mr. Panetta.

Mr. PANETTA. Mr. Chairman, thank you for this opportunity.

Gentlemen, Mr. Martin, Generals Crawford and Mingus, thanks for being here and obviously thanks for your service. I am a new member to the Armed Services. I have only been here a month, so I wasn't here back in May when you had your report.

And so, therefore, I am not necessarily disappointed. I am very surprised, though, to hear about this and the developments that you have talked about today.

Most of the questions have been asked and so—you know, I am just going to go off the cuff here, and just bear with me. I am from the central coast of California. Just north of us is Silicon Valley, obviously DIUx is there, but also many of the companies in the industry that you talked about, General.

Clearly, it seems to me, based on this limited information that I have received before and during this hearing, is that part of the problem is trying to keep up with the technology that is constantly thrown at, basically, all of us, and seeing that there are better ways to do things. We see it every day as civilians, and it is good to know that you are seeing it in the military services.

But what—talk to me about some of the industries, some of the companies that you have been or plan to reach out to in order to help you keep up with the speed of technology?

General CRAWFORD. Sir, I know Mr. Martin and General Mingus will have some commentary here, and I will try to be short and leave time for them. But the satellite industry, a specific company—so I mentioned, sir, that we have hosted four industry forums to try and help inform our thinking.

We have taken our problems to industry and said, tell us we are wrong. In terms—when I talked about processes, sir, it is not just

a technology, but we are trying to leverage their ideas on how to get to the technology, how to best posture ourselves to be able to leverage the exponential growth in investments that they are making.

And so we—these industry forums that I talked about are where we took—literally took our problems, and everything you heard today, essentially we had a conversation with them. And so, without getting into a laundry list of different companies, we have gone to virtually every sector of the commercial IT technology portion of industry to say help us, help us think through this particular problem set.

And I can tell you that the response has been tremendous in terms of helping us fix our problems.

And I will turn to General Mingus to add a little bit more, sir.

General MINGUS. Thank you, sir. Since you mentioned DIUx, I will give you a vignette of what we have done recently with them. It is not foreign to anybody here that it is a tremendous human endeavor to digest the amount of data that is out there.

And it is no different in a military application and the speed in which that data is available. And so it is our belief that as we try and—and General Crawford mentioned this in his opening statement—how do we get better, faster, smarter than the enemy.

And so as you look at the artificial intelligence, machine learning, big data kind of stuff that is coming online, DIUx has the greatest feel, inside of our organization in terms of who in industry is working this problem.

And so we recently reached out to them to set up a couple of forums framing the problem of how the military is trying to solve that problem, allow them to go out to the leaders in that industry and bring them together in a forum so we can have a dialogue and begin to figure out how to solve this for the future.

Mr. PANETTA. Mr. Martin.

Mr. MARTIN. If I could add, we will continue to use a large portion of the commercial IT technology. I mean, routers and switches and those kinds of things are always going to be something we use.

One of the things that is most complicated in our network is the services on the backend. So we talk about the iPhone-like approach to simplifying the network to the user. One of the toughest things we have in a tactical space today is we have to bring our infrastructure, the people who initialize, operate, and maintain the networks, the towers that you—that service cell phones today, we bring that structure with us.

We try to develop and build our own management tools, net ops [operations] tools to actually coordinate, manage, and so forth. Service providers—Verizon, AT&T—have recently met with us and they are looking at how to automate what we currently require soldiers to spend an inordinate amount of energy trying to manage and execute this network, and to try to automate it with software-defined networking technology, and things that they have applied onto the enterprise that you and I use every day at home.

Mr. PANETTA. Great. Thank you, gentlemen. Thank you, Mr. Chairman. I yield back.

Mr. TURNER. Mr. O'Halleran.

Mr. O'HALLERAN. Thank you, Mr. Chairman. Thank you, gentlemen, for being here today, General Crawford, General Mingus, and Mr. Martin.

Like Mr. Panetta, I have a bunch of notes. Most of my questions have been either answered to my satisfaction or not. But thank you for coming into what you knew was going to be a difficult environment, and I appreciate that.

I don't—my problem is I don't see a plan. I don't know where you are really going. I see a concept. I see some ideas. But it is concerning to me when I also hear the words consistently "we believe," "I think"—all those types of words that were said over and over again today.

And, General Crawford, you had mentioned earlier about when this all started, it was a static environment. We never have a static environment anywhere. You plan for the entire breadth, I would think, of the environment that we are in and potentially going to be in.

So I—the question was before to convince us that this is the right course of action. I don't know that it is. I know I am not convinced. I am concerned that this may be the third or fourth change the Army has proposed for its network modernization program. How do we know you won't just change the network strategy again next year and the year after that?

The changing technology aspect of this process—there is really no end line, I don't think. And so we don't know when the next deployment of the communications equipment will really take place. And so to stop one program and start another one, understanding that the base is there, but we don't know anything about what the rest of it is going to look like.

And I understand that, but it is really concerning that we have gone down $6 billion-plus, probably, and gotten to this level.

So, General, I want to give you the ability to once more try to convince us that this is the right direction. And when can you have a real plan to us so that we can identify and analyze, that that is the way you are going to go?

General CRAWFORD. Sir, thank you very much for the opportunity to follow up. And so this idea of developing a real plan, sir, when we look at when we started, to develop the concept, what we owe back to you and to the chairman and to the ranking member is the details of an execution plan. What we have laid out for you to date, sir, is the recognition that we have got a real problem in our formations in our Army today.

And so one of the things that General Milley has challenged us with is you have got to ground yourselves in fact. And so the discussion and the points that I made about we believe, what we have done is we have actually gone back to pull together the facts. What I mentioned about the combat training center, sir, that is a real thing that we have been collecting data on over the last couple of years.

And so, to the point, sir—and I appreciate the opportunity to follow up to convince you that this is the way ahead, and the right way ahead. We have got a near-term fight tonight problem that we can't get past and so we have got to fix that, sir.

To the future of it, it is literally being informed and it has been informed over the last 90 days by our realization that we have got some internal processes that we needed to fix. Governance, we think we have put something in place for that. Putting an integrator in charge? We have done that; that is directed by our former Acting Secretary of the Army.

So, in terms of the details of this, sir, we owe you the actual execution plan for this and we look forward to the opportunity, sir, to come back and lay out the execution plan. Because I know that is what you want to see—we are talking concept for what we are asking for—I understand the risks associated with it—but we would owe you an actual execution plan in how we plan to accomplish this, sir.

Mr. O'HALLERAN. I would appreciate that, General, but I also would appreciate the structure in which you made the decision to move this in a written form or a more formal form. But we all share the same issue here, I mean, to ensure the safety of our service people. And I look forward to continuing this discussion, but I think that we need much more information before we should go down the road of which way to go. Thank you.

Mr. TURNER. Thank you.

General, just a couple of issues I want to clarify. The WIN–T 1 and 2—they work, right? I mean we want to make sure certain that you have accepted these things, they have been delivered to you, they were tested—there was not a failure of a test. Your issues that you are raising are those in the IDA report, which I have read also that go to the issues of vulnerabilities, near-peer flexibility issues, technology. It is not an issue that this doesn't work, correct?

General CRAWFORD. Sir, to the question of does it work, based on the requirements that we wrote, it meets the requirements.

Mr. TURNER. Great. Next, speaking of those requirements, you said they had bigger—I wrote it down as you were saying it—meaning that in WIN–T 2, that the mobile vehicle was bigger and heavier. Wasn't that a result of the Army's requirements? Because you said they now have smaller or lighter—but isn't that a result of the Army working with respect to the requirements of the ability to withstand a blast, what the requirements were of the first WIN–T 2 mobile unit that was delivered?

General CRAWFORD. Sir, a part of it actually had to do with the availability of the weapons system platform to actually place it on. So that is factual, sir.

Mr. TURNER. So it was the Army's issue of it being bigger and heavier and now it is lighter and smaller?

General CRAWFORD. Sir, that is the entirety of the problem set wasn't just about the platform. There have been some additional modifications made to the systems that are well documented over the last couple of years.

Mr. TURNER. I am aware of that.

General CRAWFORD. Yes, sir.

Mr. TURNER. I have seen both.

General CRAWFORD. Yes, sir.

Mr. TURNER. Thank you.

Ms. Tsongas.

Ms. TSONGAS. Thank you, Mr. Chairman.

Thank you for your testimony here today. You have all talked about how—registered all your concerns with the WIN–T program, essentially its many shortcomings. And yet you have also said WIN–T will be the baseline of the future. So in essence there is an inherent contradiction and as we are at the end of this hearing it is just something I would like to put out there.

So I do believe it is clear the complexity of the challenge is real and not so easily fixed. Even after testimony today, I still feel that your way forward is half-baked, not fully developed, and overly optimistic. My father used to have the saying, "You may not be right, but you are positive." And in essence, I think you are being very positive, but it is not clear that the way forward is actually right.

So I think there is real risk in abruptly moving to a new network strategy, and like Mr. O'Halleran, I think we just have to have a much clearer way forward before I know I could support the funding changes you are proposing.

With that, I yield back.

Mr. TURNER. Thank you.

Gentlemen, when I began this hearing, I said I don't like having hearings like this because it is an abrupt change, it is months after we were told with firm conviction from the Army in what direction you were going and now an undefined, unclear, new direction.

This hearing could have been a positive hearing. It could have been a result of the IDA study. It could have been the focus that Congress had placed on it, the focus that you are placing on it, and what your strategy was going to be going forward in 2019 instead of the abrupt—we have asked you for one thing now we are going to ask you for another in mere months.

So I can tell you that this is a very skeptical subcommittee, and I, too, find that the information you provided us today does not justify the abrupt shift. It certainly justifies the assessment that we requested and that you are looking at what you are going to do in the future.

In technology, you should always be looking at what you are doing in the future. It shouldn't take every 10 years or every 5 years for you to decide what the future is going to be in technology.

But this has been very disappointing, and I know that just every member of this subcommittee has registered that with you. So, with that, we will be adjourned.

[Whereupon, at 4:09 p.m., the subcommittee was adjourned.]

A P P E N D I X

SEPTEMBER 27, 2017

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

SEPTEMBER 27, 2017

Statement of the Honorable Michael R. Turner
Chairman, Subcommittee on Tactical Air and Land Forces
Hearing: The Army's Tactical Network Modernization Strategy
September 27, 2017

The hearing will come to order.

The Subcommittee meets today to review the Army's Tactical Network modernization strategy.

I'd like to welcome our witnesses representing the Army:

- Lieutenant General Bruce T. Crawford, Army Deputy Chief of Staff and Chief Information Officer
- Major General James J. Mingus, Director, Mission Command Center of Excellence, United States Army Combined Arms Center
- Mr. Gary Martin, Program Executive Officer for Command, Control and Communications-Tactical

We thank you all for your service and look forward to hearing your testimony today.

We're holding this hearing because the Army is proposing a major shift in its tactical network modernization strategy.

To begin funding this strategy the Army has indicated they would need to realign funds for fiscal year 2018, over $544.0 million, which would be a major change from their fiscal year 2018 budget request as well as the House passed National Defense Authorization Act.

From an oversight perspective, we've been down this road before with the tactical network.

Since 2008 the Army has restructured its network strategy several times.

I recall in 2014 when the Army began a new modernization effort for the tactical network to improve communications called the Simplified Tactical Army Network or Star Net, and identified the network as its number one modernization priority.

Over $6.0 billion has been spent on the Warfighter Information Tactical-Network (WIN-T), as well as many billions more on tactical radios and mission command network systems to simplify and improve the network.

For at least five years, the Army has come before this committee and defended the need and resources for your current network strategy and Congress has supported those requests.

Just 5 months ago, you requested over $400 million in Fiscal Year 2018 for the WIN-T program, and indicated that WIN-T Increment 2 was the foundation of your network modernization strategy and mobile mission command.

Now you are asking us to realign almost half a billion dollars from existing programs with only limited details as to what your long term plan is for the network.

Given the Army's previous track record with the network, I am skeptical on whether this proposed new strategy will work as intended. And will we back here 3 years from now discussing another new approach.

I understand the change in strategy appears to be driven by two reviews, one internal by the Army and one by the Institute of Defense Analyses.

And, that these reviews identified significant operational shortfalls in existing tactical network modernization programs and requirements given current and emerging threats.

However, before we agree to anything we need to better understand what the long term plan is for the tactical network.

I think we can all agree that our first priority remains the warfighter.

If we are going to send soldiers into harm's way, their communication devices should never say "service not available."

Clearly we want to be sure that we are fielding capability that works and equipment that the soldiers will use.

So in closing, I want to reiterate two basic questions for which is the primary purpose of this hearing, help us understand why what you are proposing is the right strategy this time and why it is necessary to realign fiscal year 2018 funds after 3 of the 4 defense committees have already been on and off the floor as opposed to waiting for the fiscal year 2019 budget process.

Before we begin, I would like to turn to my good friend and colleague from Massachusetts, Ms. Niki Tsongas, for any comments she may want to make.

RECORD VERSION

STATEMENT BY

LIEUTENANT GENERAL BRUCE T. CRAWFORD
ARMY CHIEF INFORMATION OFFICER/G-6

AND

MAJOR GENERAL JAMES J. MINGUS
U.S. ARMY MISSION COMMAND CENTER OF EXCELLENCE

AND

MR. GARY P. MARTIN
U.S. ARMY PROGRAM EXECUTIVE OFFICER,
COMMAND, CONTROL, AND COMMUNICATIONS-TACTICAL

BEFORE THE

SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES
COMMITTEE ON THE ARMED SERVICES
UNITED STATES HOUSE OF REPRESENTATIVES

ON

THE UNITED STATES ARMY NETWORK MODERNIZATION STRATEGY

FIRST SESSION, 115TH CONGRESS
SEPTEMBER 27, 2017

NOT FOR PUBLICATION UNTIL RELEASED BY THE
COMMITTEE ON THE ARMED SERVICES

Introduction

Chairman Turner, Ranking Member Tsongas, and distinguished members of the House Subcommittee on Tactical Air and Land Forces, thank you for your continued support for our Soldiers, Army Civilians, Families, and Veterans. It is an honor to address this subcommittee. On behalf of our Acting Secretary of the Army, the Honorable Ryan McCarthy, and our Chief of Staff, General Mark Milley, we thank you for the opportunity to provide an update on the new modernization path forward for the Army's Mission Command Tactical Network.

Our current Network does not meet our Warfighting needs now or in the projected future. To protect the homeland, foster security abroad, and win in current and future conflicts, Army forces must be able to fight, shoot, move, communicate, protect, and sustain. All of these capabilities require the ability to reliably communicate anywhere, anytime, across all domains and in any environment. The Army is committed to delivering a survivable, secure, mobile, and expeditionary network capable of providing situational awareness and joint interoperability to enable warfighters to fight and win against adversaries in all domains.

To get to a new modernization path forward, we must first understand the current network challenges and how we got here, along with the readiness challenges and the risk we face due to emerging threats. Based on these challenges and risks to the solider and the findings and recommendations from internal and external assessments, the Army plans to embark on a new network modernization path forward.

Current Network Challenges

The Army's current network was conceived, developed and fielded for the static environments of Iraq and Afghanistan but it does not meet the future warfighting needs of a high-end conflict. The network evolved over the past 16 years to address numerous challenges, including a common operating picture that could not be shared among all formations at echelon, data storage and transport challenges, warfighting systems that lacked the ability to work together, the absence of Coalition and Joint interoperability, and limited friendly force situational awareness tools. Since that time, industry has stepped forward to assist the Army and address these areas. Thanks to resourcing

provided by Congress, the Army was able to acquire technology to meet the mission requirements of the early 2000s in a static environment. This resulted in the network that we have today. Fortunately, our soldiers were operating in an environment where they were relatively uncontested in spectrum, cyber and space. Unfortunately, our current network is too complex, fragile, not sufficiently mobile nor expeditionary, and one that will not survive against current and future peer threats, or in contested environments. We find ourselves in a position now, within a new environment and facing new challenges, where our network is not user-friendly, intuitive, or flexible enough to support our mission in the most effective manner and demands a heavy reliance on industry field service representatives to operate and sustain these systems.

In addition to the emerging threats, we have also seen a commercial innovation explosion that accelerated at a rate with which our standard acquisition process could not keep pace. Future adversaries are not inhibited by the same processes, allowing them to better exploit new technology to their advantage.

Readiness Challenges

Based on the emerging threat and the explosion of technology, we are seeing a change in warfare of the future. As our 39th Chief of Staff of the Army, Gen. Mark Milley shared in his posture hearing in May, "the character of war does change on occasion. And one of the drivers – not the only driver – is technology." In other forums, he has elaborated that "we have new insights into the character of future conflict, and we have had glimpses of what our Army and its Soldier must be ready to do in the coming decade." Shifts in the character of war offer an opportunity: if we can anticipate or at least recognize them, we can adapt proactively, maintaining or regaining overmatch and forcing competitors to react to us.

Acting Secretary of the Army McCarthy, and Gen. Milley have also made it crystal clear across the Army that readiness is our number one priority. We must win the fight we are in, be ready to "fight tonight" against any adversary and posture the Army for the future fight. The network is a critical enabler for our Army to generate readiness and project forces and power from our posts, camps, bases and stations to the most remote and disadvantaged locations of the world.

Network Assessments

In the rapidly changing world of information technology, it is a best business practice to continuously assess technology and processes. To remain relevant and improve our ability to counter evolving threats we must review and adapt. Over the past year, the Chief of Staff of the Army led an assessment of the Army's network and modernization plans. These network assessments involved all four network mission areas – the Enterprise Information Environment Mission Area, Intelligence Mission Area, Business Mission Area and the focus of today's testimony, which is the Warfighting Mission Area.

The Army conducted this internal assessment in parallel with the study directed by Congress in the FY 2016 National Defense Authorization Act on the Army's tactical network, which was carried out by the Institute for Defense Analyses (IDA). The findings of the internal Army assessment were corroborated by the IDA study as well as feedback from Department of Defense testing agencies, combat training center rotations, joint exercises, and feedback from operational commanders. The internal and external assessments have revealed high risk challenges that we feel must be mitigated to enable our Army to "fight tonight" against peer adversaries. These findings documented significant challenges across four broad areas of network governance, requirements, acquisition, and innovation, which continue to negatively affect the Army's ability to provide its Warfighters with simple, intuitive, resilient and protected network-enabled capabilities.

Specifically, in the area of governance, the assessments revealed that the lack of a single Army network integrator has resulted in multiple "stove-piped" mission command systems and networks, with multiple, duplicative, and non-integrated information technology programs. This has yielded inadequate integration across the four mission areas, as well as poorly conceived network architectures, resulting in inefficiency and ineffective integration of readiness priorities.

These assessments also found that current requirement processes are not completely synchronized and integrated to ensure capabilities delivered adequately meet the operational needs of our warfighters. The studies found that the Army has

multiple methods for requirements development across the network mission areas, and lacked a central requirements clearinghouse to review and approve all submitted requirements. This resulted in unnecessary duplicative efforts. In addition, they identified our self-limiting, over-prescriptive requirements that reduced our ability to maximize use of available spectrum. The assessments noted an emphasis on technical specifications, rather than clearly defined operational requirements leading to disconnects between the acquisition community and the operational force.

Our current acquisition process does not allow the Army to rapidly acquire and integrate emerging capabilities, allowing the warfighter to keep pace with technology and stay ahead of the evolving threat. The current acquisition processes' traditional emphasis on a legacy program of record approach for developing, testing, and procuring mission command systems and applications has limited our ability to anticipate and rapidly integrate Joint and industry solutions through non-traditional acquisition models. This prevented the Army from effectively leveraging the exponential growth of investments by commercial industry partners over the past decade and capitalizing on the robust Research, Development, Testing and Evaluation (RDT&E) capabilities of our Joint partners. Additionally, the extensive developmental and operational testing required for programs of record has prolonged development and delayed delivery of network-enabled capabilities. The IDA study recommended a shift to a more flexible and agile acquisition process for information technology.

Finally, in the area of innovation, the assessments found that the Army is not capitalizing on industry best practices and must increase integration between developers and operators. This lack of direct engagement with the actual users of the network-enabled capabilities has reduced the Army's ability to assess and provide immediate feedback to the acquisition community in order to influence the development of improved solutions to network challenges.

The recent internal and external assessments has helped the Army better see ourselves and the conclusions we've come to are that the status quo is unacceptable. Our network has not sufficiently evolved over the past 16 years while we fought counter-terrorism and counter-insurgency wars in Afghanistan and Iraq. Therefore, the Army must adapt and change its mission command tactical network path forward to enable it

to fight and win the current fight while pivoting to a new modernization path that better postures our soldiers to be successful in the future fight.

Army Network Priorities

As the Army has looked at developing its new network path forward, we have focused on four priorities: command posts, tactical network transport, mission command systems, and interoperability. For command posts, the new path will seek to improve survivability and mobility. For tactical network transport, the Army will take steps to integrate multiple network transmission paths into a unified transport layer to increase survivability against evolving electronic warfare threats. For mission command systems, the Army will take steps aimed at delivering a common operating environment through a unified mission command suite of systems and applications. Finally, to improve our joint interoperability, the Army will integrate proven and available solutions starting in Fiscal Year 2018 being used today by some of our mission partners.

New Mission Command Tactical Network Path Forward

In assessing what is needed, the Army developed a set of first principles, characteristics, requirements and attributes that describe the objective network needed to enable the current fight while positioning for the future fight. To meet our needs, the Army extensively reviewed several potential courses of action to maximize operational results as quickly as possible and best align resources. These options ranged from maintaining the status quo to accelerating legacy capabilities to reinvesting to address the current threats.

After comprehensive senior Army leadership consideration and review of potential alternatives, the Army's new network modernization path forward will be to halt programs that do not remedy operational shortfalls identified by internal and external assessments, fix those programs required to "fight tonight" and then pivot to a new acquisition strategy of "adapt and buy" that allows for rapid insertion of new technologies. This requires us to leverage industry best practices by creating and enforcing a standards-based open architecture that is both coherent and flexible enough to define standards while not limiting possibilities for insertion of new technologies; and

alignment to new governance, acquisition reform, testing reciprocity, innovation venues, and initial 'adopt and buy' capabilities. This approach enables the Army to leverage resources and maximize network survivability, effectiveness and suitability. It also best supports what we consider to be the most pressing aspects of this effort, fixing our ability to "fight tonight," halting programs that are not needed, and pivoting to a modernization approach that better leverages available technologies and capabilities, while remaining good stewards of tax payer dollars. This path forward involves changes to Army structure and processes to address its shortfalls in governance, requirements, acquisition, and ability to leverage the innovation of the commercial sector.

In FY18, the Army will immediately halt procurement of the Mid-Tier Network Vehicular Radio (MNVR) and legacy Command Post of the Future (CPOF). The Army will also halt procurement of Warfighter Information Network-Tactical (WIN-T) Increment 2 at the end of FY18; however, there are purposed capabilities and elements of the overall WIN-T program that can be used and will be fielded to some of our formations through FY21. This approach allows the Army to reinvest $544.9M. This is not a request for "new money" but a realignment of existing resources. The Army will plan to apply $413.8M to fix the network's most pressing interoperability and security concerns, and $131.1M to "adapt and buy" better systems. The Army will reinvest the savings from WIN-T Increment 2, MNVR, and CPOF to fix the network by improving survivability to electronic warfare, cyber capabilities and the mobility of command posts. Furthermore, these savings will aim to improve Joint/coalition interoperability, simplify the network, and resolve incompatibilities in Mission Command systems between echelons in our warfighting formations.

The acquisition program office will fix programs required to "fight tonight" against a peer adversary and fix those programs that will be part of the Army's future vision. As part of our "adapt and buy" approach, the Army will leverage a modernization-in-service funding concept that provides increased flexibility to leverage available technology while fixing, upgrading and augmenting existing capabilities. The Army will maximize available Commercial-off-the-Shelf (COTS) and available solutions to improve the survivability and mobility of command posts. Use of existing joint COTS solutions will allow us to address some our most pressing joint interoperability issues. Additionally,

we will incorporate solutions to increase survivability against electronic warfare and cyber threats. In FY18, we will upgrade our Mission Command systems to deliver a common operating picture into a unified application suite. The Army will also deliver coalition and Joint radio gateways with access to tactical data links aimed at integrating air-to-ground communications to improve Joint and Army interoperability and close air support.

The Army's pivot to an "adapt and buy" acquisition approach will enable us to deliver a "future state" network to counter the high-end threats and to keep pace with technology. This new approach will help us leverage proven Joint, Special Operations Forces (SOF), and industry solutions that are readily available. It is important that we partner with Congress and industry and encourage experimentation and demonstration. The Army's intent is to develop programs only when necessary and to use innovation and rapid prototyping with operational units to speed up the procurement cycle and keep pace with technology.

To mitigate oversight-related risk identified in the IDA study, the Army will provide clear governance and unity of command by establishing a senior review group, the Information Technology Oversight Council (ITOC), co-chaired by the Under Secretary of the Army and the Vice Chief of Staff of the Army. This council will integrate activities and assessments across all four network mission areas, provide guidance and direction, prioritize investments, and allocate resources. To improve horizontal integration, the Army is establishing Cross Functional Teams that will support integrated requirements, focused procurement as well as increased leadership for experimentation, demonstrations and evaluations by operational units. Finally, to improve standards and architecture governance, the Army has designated the Army Chief Information Officer (CIO)/G-6, to be the lead integrator for Army IT integration and governance.

Recognizing the importance of establishing a more synchronized and integrated network requirements validation system, all Army mission command and network requirements will now be synchronized and integrated by the Mission Command Center of Excellence (MCCoE), with the Cyber Center of Excellence (CCoE) as a supporting command. To address the issue of network standardization, the Army CIO/G-6 will establish a standards-based network architecture for programs to use as a baseline to

modernize. Mission command systems will now have operational, threat-based requirements, rather than just technical requirements to address this shortfall from the studies. Finally, Army Assistant Chief of Staff for Operations will have the final authority and responsibility for reviewing, prioritizing, aligning and validating requirements with operational needs.

The new network path forward acquisition approach aligns to the priorities laid out in acquisition reform to focus on ensuring the warfighter has the network they need. The future network must be built with real-time feedback from Soldiers on the ground and immediately address jamming, cyber, electronic warfare, power and spectrum consumption, joint and interagency interoperability, and air-to-ground communications shortfalls. In the near term, the Army will focus on a less-complex tactical network, moving complexity to the enterprise, freeing up Soldiers to focus on warfighting tasks rather than integrating information technology. This improves current network capability that includes satellite communications, network mobility and security, tactical radios, mission command applications and Position, Navigation and Timing capacity.

The new path will also improve innovation and the synchronization of acquisition and testing of new systems with the warfighter through greater experimentation and demonstration. Systems will be sent to operational units during development to obtain their assessments and to gain their immediate feedback.

Conclusion

We sincerely appreciate the opportunity to describe for you the Army's new mission command tactical network path forward. We are committed to constantly seeking better ways to fix what we have to enable the current fight and to prepare for the future fight. The Army has taken the first steps towards improving its processes for acquiring its mission command tactical networks. The results of the internal Army assessment of networks, the IDA study, and multiple Army deep dives with the Acting Secretary of the Army and our Chief of Staff to assess current capabilities and gaps have provided the Army with a clear picture of where it is, and where it needs to go. By establishing this new network path forward, the Army is redefining the way it does business.

Rep. Mac Thornberry recently stated, "America faces a wider array of serious threats to our security than at any other time in our history. Maintaining our technological edge is central to our ability to meet those threats and to defend the country. Unfortunately, technological change is outpacing our ability to field cutting edge equipment for our troops." Our network "must enable" mission command and our future network, not encumber it, as well as ensure our leaders and soldiers can outthink and out-decide any future adversary.

Our new governance and requirements initiatives and processes, as well as the focus on a halt, fix, and pivot to "adapt and buy" strategy will align to acquisition reform efforts, make the Army more agile, help us keep pace with technology to counter current and future threats, and provide our soldiers with the best information technology we can to enable them to "fight tonight" and win our Nation's wars.

We must continue to posture the Army to capitalize on technological advances, and to influence, shape, and leverage the innovation of industry. This new path helps us do exactly that.

Mr. Chairman and distinguished Members of the Subcommittee, we sincerely appreciate your commitment and strong support for our brave men and women in uniform, our Army Civilians, and their Families.

Lieutenant General Bruce T. Crawford
Army Chief Information Officer/G-6

Lieutenant General Bruce T. Crawford became the Army Chief Information Officer (CIO)/G-6 on 1 August 2017.

As the CIO, LTG Crawford reports directly to the Secretary of the Army, setting strategic direction and objectives for the Army network, and supervises all Army C4 (command, control, communications, and computers) and Information Technology (IT) functions. He also oversees the Army's $10 billion IT investments, manages enterprise IT architecture, establishes and enforces IT policies, and directs delivery of operational C4IT capabilities to support warfighters and business users. As the G-6, he advises the Chief of Staff of the Army on the network, communications, signal operations, information security, force structure, and equipping.

A native of Columbia, South Carolina, LTG Crawford was commissioned through South Carolina State University's Reserve Officer Training Corps program on May 28, 1986, after graduating as a Distinguished Military Graduate with a Bachelor of Science in Electrical Engineering. He also holds a Master of Science in Administration from Central Michigan University, and a Master of Science in National Resource Strategy from the Industrial College of the Armed Forces.

During his 31 years of service, LTG Crawford has served in a variety of leadership positions at the tactical, operational, and strategic levels. In his previous assignment, he served as a Special Assistant to the Director of the Army Staff, Pentagon, Washington, D.C. Prior to that, he served as the 14th Commander, U.S. Army Communications-Electronics Command and Aberdeen Proving Ground Senior Mission Commander, Aberdeen, Maryland. Prior to that, he served in the posts of J6, Director of C4/Cyber and Chief Information Officer, U.S. European Command; Commanding General, 5th Signal Command (Theater); and G-6, U.S. Army Europe in Wiesbaden, Germany. His command assignments include the 516th Signal Brigade, Fort Shafter, Hawaii; 82nd Signal Battalion, 82nd Airborne Division, Fort Bragg, North Carolina, and Operation Iraqi Freedom, Iraq; and B Company, 51st Signal Battalion, 35th Signal Brigade, XVIII Airborne Corps, Fort Bragg, North Carolina.

His key staff assignments include Director of the Coordination Group for the Chief of Staff of the Army, Pentagon, Washington D.C.; Division Chief of LandWarNet Integration for the Army CIO/G-6, Pentagon, Washington D.C.; Division Chief for Net Centric Assessments/Analysis Branch, later Executive Assistant to the J6, Joint Chiefs of Staff, Washington D.C.; and Assistant Operations Officer, and later Corps Emergency Deployment Readiness Officer, for the 35th Signal Brigade, XVIII Airborne Corps, Fort Bragg, North Carolina, and Operations DESERT SHIELD and DESERT STORM, Saudi Arabia.

LTG Crawford's awards and decorations include the Distinguished Service Medal (with one Oak Leaf Cluster), the Defense Superior Service Medal, the Legion of Merit, the Bronze Star Medal, the Defense Meritorious Service Medal (with one Oak Leaf Cluster), the Meritorious Service Medal (with four Oak Leaf Clusters), the Army Commendation Medal (with one Oak Leaf Cluster), and the Army Achievement Medal (with four Oak Leaf Clusters). LTG Crawford is authorized to wear the Combat Action Badge, the Master Parachutist Badge, the Ranger Tab, the Joint Chiefs of Staff Identification Badge, and the Army Staff Identification Badge.

LTG Crawford and his wife, Dianne, have two sons, Bruce, Jr., and Corey.

Brigadier General James J. Mingus
Director
Mission Command Center of Excellence
Fort Leavenworth

Brigadier General James Mingus enlisted into the Iowa Army National Guard in 1981. He was commissioned in the Field Artillery Branch in 1985 from Winona State University and later branched Infantry after he entered active duty in 1987. During more than 33 years of service, Brig. Gen. Mingus has commanded at every echelon from company to brigade in addition to working in key staff positions in both Army, Special Operations Forces and joint units.

He served as a platoon leader, executive officer, and battalion maintenance officer at 2nd Battalion, 30th Infantry, 3rd Infantry Division in Germany from 1988 to 1991. After promotion to captain, he returned to the United States where he served as a rifle company commander, 2nd Battalion, 505th Parachute Infantry Regiment, Division Long Range Surveillance Detachment commander, aide-de-camp to the commanding general, and finally, commander of the XVIII Airborne Corps Long Range Surveillance Company at Fort Bragg, North Carolina.

Brig. Gen. Mingus subsequently moved to Tennessee where he served as an ROTC Assistant Professor of Military Science instructor for the University of Tennessee-Knoxville from 1997 to 1999. He was then selected to be the liaison officer, and later battalion operations officer, at 1st Battalion, 75th Ranger Regiment at Hunter Army Airfield, Georgia from 2000 to 2003. He was promoted to lieutenant colonel and served as the chief, Joint Planning Group, and later chief, Current Operations, at Joint Special Operations Command at Fort Bragg, North Carolina. He then took command of 4th Ranger Training Battalion at Fort Benning, Georgia, from 2005 to 2007. Subsequently, he commanded the Regimental Special Troops Battalion, 75th Ranger Regiment at Fort Benning, Georgia from 2007 to 2009. In August 2010, he assumed command of 4th Brigade Combat Team, 4th Infantry Division in Fort Carson, Colorado, where he deployed the brigade in support of Operation Enduring Freedom. He deployed in support of Operation Iraqi Freedom and Operation Enduring Freedom 12 times from 2001 to 2012.

He also served as the deputy J5, Plans, United States Central Command (US CENTCOM). He previously served there as director of the Commander's Action Group and executive officer to the commander US CENTCOM. Most recently, Brig. Gen Mingus served as the Deputy Commanding General (Maneuver), 4th Infantry Division, where he also served as the Mission Command Director for U.S. Army Europe in support of Atlantic Resolve.

His military education includes the Field Artillery Officer Basic Course, Infantry Officer Basic and Advanced Courses, the Command and General Staff College, and the Army War College.

Mr. Gary Martin

Program Executive Officer for Command, Control and Communications-Tactical

For more than 30 years, Mr. Gary Martin has worked for various Army missions delivering information and communications technology that Soldiers need now and in the future.

As Program Executive Officer for Command, Control, Communications-Tactical (PEO C3T), Mr. Martin guides a workforce of more than 1,600 personnel who acquire, field and support the communications networks, radios, satellite systems and other hardware and software Soldiers require for information dominance on the battlefield. Mr. Martin took command of PEO C3T on June 19, 2015.

Mr. Martin comes to PEO C3T after serving as the U.S. Army Communications-Electronics Command (CECOM) Deputy to the Commanding General, where he worked with the commander in the development and execution of organizational goals, objectives, and policies aimed at providing world-class, integrated Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) solutions to the Soldier.

From 2008 to 2011 Mr. Martin served as the Executive Director to the Commanding General of the U.S. Army Research, Development, and Engineering Command where he served as AMC Corporate Leader for technology generation, development and integration while implementing engineering policies and procedures, formulating and overseeing strategic planning and execution of approximately $2.5 billion annual investment in research, development and engineering programs.

Other positions include serving as the Technical Director, Communications-Electronics, Research Development and Engineering Center (CERDEC) from August 2005 until February 2008 where he was responsible for Science and Technology programs involving the development of advanced Command, Control, Communication, Computers, Intelligence, and Information Warfare, and Night Vision and Electronic Sensors technology for the U.S. Army. Mr. Martin also served as the Associate Technical Director, CERDEC; the Deputy Project Manager for Tactical Radio Systems from May 2000 to July 2002 and the Acting Project Manager from August 2002 to June 2003.

Mr. Martin served on active duty as a Signal Corps Officer in the Satellite Communications Agency from May 1984 through May 1988. His military education includes the Program Manager's Course at the Defense Systems Management College, the Signal Officer's Basic Course, and the Radio Systems Officer Course.

He holds a Bachelor of Science Degree in Electrical Engineering from Norwich University and a Master of Science in Engineering Management from the University of Pennsylvania. Mr. Martin attended the Harvard Business School where he graduated from the Program for Management Development.

His awards include the Senior Executive Service (SES) Presidential Rank Award (Distinguished Level and Meritorious Level), the Decoration for Exceptional Civilian Service, the Meritorious Civilian Service Award (2), the Army Diversity and Leadership Award, the Northeastern Maryland Technology Council Visionary Award, and the Armed Forces Communications Electronics Association's Benjamin H. Oliver Gold Medal for Engineering.

Mr. Martin is a member of the Armed Forces Communications Electronics Association (AFCEA), the Association of the United States Army (AUSA), the Signal Corps Regimental Association (SCRA), and the Field Artillery Association.

DOCUMENTS SUBMITTED FOR THE RECORD

SEPTEMBER 27, 2017

September 27, 2017

House Armed Services Committee – Tactical Air and Land Forces Subcommittee
Hearing: The Army's Tactical Network Modernization Strategy

Rep. Joseph P. Kennedy, III
Statement for the Record:

Chairman Turner and Ranking Member Tsongas, thank you for the opportunity to submit this statement for the record. I sincerely appreciate both of your efforts in leading this Subcommittee and for this important hearing on the Army's proposal to overhaul its communications network.

In this debate, nothing is more important than the safety and security of our servicemembers, and network capabilities and interoperability are undoubtedly a key component. With rapid technological advances occurring on a regular basis, flexibility and the ability to upgrade rapidly are more possible than ever.

Network modernization and capabilities have been a focus of the Army for a long time. But I am particularly concerned about the impact of the proposal under discussion today on the WIN-T Increment 2 program. This technology was developed over a series of testing and evaluation procedures lasting several years. In its first operational test in May 2012, the system lacked in the areas of reliability, maintainability, and usability. Feedback from the Army and servicemembers continued for several years including two more rounds of operational tests before the Army authorized the program to begin full rate production in June 2015.

The Army made this decision to engage in full rate production, with a goal of fielding WIN-T Increment 2 across as many as fifty-six brigade combat teams and eighteen divisions, not even two and a half years ago. Understanding the rapid advancements of technology, the Army made this decision with a long-term plan to field this program across the Army. Yet today, in just a few years' time, the Army has drastically changed course.

As you are likely aware, a significant portion of the technological backbone and manufacturing of WIN-T Increment 2 is based in my district. Hundreds of workers have spent years researching, developing, and building this technology to meet the specific needs the Army established. They have worked, and reworked, the technology per the Army's request. I can say with absolute confidence that I have no doubt the workers would have gladly, and successfully, met any needs the Army imposed. Yet, with this decision, the workers and their families face significant uncertainty because of a dramatic change in direction that this decision reflects.

During my time in Congress, I have listened closely to the requests and recommendations coming from the Pentagon. Each year, as we debate the National Defense Authorization Act and Department of Defense appropriations levels, I carefully consider these recommendations to inform my votes, particularly on specific programs. I will continue to do so. However, it is also Congress's responsibility to evaluate each years' budget request, and authorize and appropriate accordingly.

I am submitting this statement to the record for two purposes. First, to express my concern about the impact of such a drastic change in direction regarding network capabilities, despite the Army having just approved a major acquisition program less than three years ago.

Second, I want to directly state my commitment to working with the Army on the next generation of network capabilities. The hardworking families in Taunton, Massachusetts stand ready to serve their country, including the development of any technology that will keep our servicemembers safe and secure. We have the workforce and technology available. We have done it before, and we will do it again.

Thank you for your service. Thank you for your consideration of these comments. I look forward to working with you.

Joseph P. Kennedy, III

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

SEPTEMBER 27, 2017

QUESTIONS SUBMITTED BY MR. TURNER

Mr. TURNER. What alternatives does the Army have today to meet the requirement for on-the-move mission command?

General CRAWFORD. In our tactical formations, the Army currently relies on the Nett Warrior program to provide dismounted mission command on-the-move capability, the Joint Battle Command–Platform program for mounted mission command on-the-move capability, and secure voice communications through tactical radios to support dismounted and on-the-move elements. The current plan will accelerate fielding of Joint Battle Command–Platform, pure fleeting all Army elements no later than FY22.

Mr. TURNER. This may be the third or fourth change the Army has proposed for its network modernization strategy. How do we know you won't just change the network strategy again next year or the year after that?

General CRAWFORD. The Army is not only proposing a new way forward for the network, but also proposing a new process whereby it can acquire emerging technologies without having to once again change its strategy. Recent announcements by the Acting Secretary of the Army and the Chief of Staff of the Army have directed policy to drive this change. The Army is proactively taking steps to streamline its governance requirements through the establishment of an Information Technology Oversight Council and the consolidation of requirements through one center of excellence. This is the first time in many years that network reform policies have been supported by the highest levels of the Department of the Army and the Department of Defense and will result in not only changes to policy, but also institutional and cultural change. The change we are proposing at this time is absolutely necessary because the Army requires a network that can adapt to the changing character of war and a business practice that leverages the speed and innovation already resident within the IT industry. In order to avoid having to face this situation again next year or the year after that, the Army will pursue a proven industry practice of incorporating developmental operations (DEVOPS) that allow the network to evolve at the pace of commercial innovation.

Mr. TURNER. Does the Army keep abandoning "good" networks systems in the search for a "perfect" system? "Perfect" is hard to find in the telecom world, would it not be more practical to field the operational ready WIN–T Inc 2 network while continuing the R&D efforts to make it a more perfect system.

General CRAWFORD. The Army acknowledges that there is no such thing as a "perfect" solution in a complex, dynamic world. Pursuit of perfection is not the driver for the Army's decision to change course; rather, it is the determination to equip the warfighter with the ability to communicate on the battlefield with the goal of fighting and winning America's wars. Feedback from the Network Integration Evaluation and operational units has indicated that the system is too complex in terms of planning, maintenance, training and initialization, and the complexity is impeding the mission. The line-of-sight systems are not effective in sustaining the network in a Satellite communications denied environment. Reports have shown that in its current form, WIN–T is not optimized against current EW and Cyber threats, nor will it be prepared to meet future more complex ones. The Army has taken steps to improve WIN–T simplicity with software and hardware enhancements, while also reducing the size, weight and power of key components and hardening the system against threats. We will continue to cascade these improvements into units that currently have WIN–T Inc2, while also fielding out the remaining regular component Stryker and Infantry Brigade Combat Teams with WIN–T Inc2 to bring these units to a standard baseline. For those aspects of the system that cannot be fixed, and for those units where platform integration is infeasible, the Army will invest in programs that incorporate the flexibility to apply funds to alternative solutions.

Mr. TURNER. The Army's written statement states that the Army wants to halt the WIN–T Inc 2 program. However, the Army has also stated that they will take some attributes or capabilities from WIN–T Inc 2 and integrate it with WIN–T Inc 1b. Please further explain this approach and what makes this a "halt" instead of a modification or restructure to WIN–T Inc 2? Why would you need to realign fund-

ing out of the WIN–T Inc 2 budget line item to continue to procure these capabilities?

General CRAWFORD. The urgency of now will not allow Army to wait and continue on its current path with WIN–T (fielding WIN–T Inc 2 through FY32, or accelerate the fielding in order to complete fielding in FY26) given the systems' vulnerabilities and existing threats. The Army intends to halt procurement of WIN–T Increment (Inc) 2 at the end of FY 18 and continue fielding that which we have already purchased until complete in FY21 to the Active Component Infantry and Stryker Brigade Combat Teams. WIN–T Inc2 will then enter sustainment in FY21. We will cascade purposed capability improvements into select formations. This means the heavy variants of WIN–T Inc 2 will align with our Active Component Stryker Brigades and the light variants will be fielded with Infantry Brigades. This will enable the Army to fix other portions of the entire network ecosystem required to fight tonight. The "halt" is associated with halting long-term procurement of additional WIN–T Inc2 capability for Armored Brigade Combat Teams and Army National Guard units. Armored Brigade Combat Teams and Army National Guard units will remain on WIN–T Inc1b and transition to sustainment of the Inc1b once fielding is complete. Under the new modernization strategy, the Army will leverage a Modernization-in-Service budget line giving the Army the flexibility to improve its tactical network, to include WIN–T and all of the other systems that comprise the Army's tactical network.

Mr. TURNER. We all realize the threat environment has changed and peer competitors have increasing electronic warfare capability. The Army presently has a heavy reliance on satellite communications. I'm concerned that soldiers may be limited to communicate in a satellite denied environment. The Mid-Tier Vehicular Radio program was originally designed to be the Army's line-of-sight alternative to satellites. However, this new proposed strategy appears to terminate this program. So, what's the alternative to this program, and what actions are you taking that will improve soldiers abilities to operate in a satellite denied environment?

General CRAWFORD. The Mid-tier Networking Vehicular Radio (MNVR) has not demonstrated itself to be an effective line-of-sight alternative to satellites during operational testing at several Network Integration Evaluation (NIE) events. Nor does it provide effective air-ground integration, which is an important aspect of multi-domain battle. The Army is looking to leverage the mounted Manpack radio with an improved LOS waveform for wideband Line of sight (LOS) communication as an interim solution. Longer term solutions to mitigate the threat of a satellite denied environment include: (1) a more robust integration of upper and lower tiers to obviate the need for an explicit mid-tier network, (2) resilient satellite strategies, and (3) the pursuit of technologies that reduce the amount of power required with LOS systems. The Army intends to redirect MNVR funding to fulfill urgent capability gaps that the MNVR radio did not prove sufficient to address, including: Air/ground integration, Joint interoperability, and a LOS waveform with reliable connectivity at operationally relevant ranges.

Mr. TURNER. It's my understanding the Army has a requirement to field approximately 282,000 radios, but to date the Army has procured less than 10 percent of your goal. That's not good. First, why is taking so long to procure and field these radios. Second, I'm assuming you're familiar with some of IDA's recommendations and findings regarding tactical radio modernization. What actions are you currently taking to accelerate fielding of improved tactical radios and will these actions incorporate some of the IDA recommendations?

General CRAWFORD. Requirements changes, testing requirements and changes to basis of issue slowed the procurement and fielding of the tactical radio modernization. The Army intends to revise its requirements by reducing the heavily prescriptive targeted requirements which will allow industry more opportunity to demonstrate the value of off-the shelf available solutions, and eliminate barriers to procurement. The Army is also considering how it can leverage the success of technology acquisition by Special Operations Forces and Joint Forces, instead of trying to develop, procure, and then field Army-unique solution. Tried and true capabilities exist, particularly in the area of tactical radios. Testing reciprocity between acquiring Department of Defense organizations is also essential to avoid unnecessary re-evaluation of proven technology, reduce test schedule and burdens, and expedite acquisition.

Mr. TURNER. How did the Army's review of the tactical network cover Signal Modernization programs?

General CRAWFORD. The Signal Modernization programs turned out to be good news for the Army. These capabilities are covered in the Transmission Capability Production Document and were reviewed and selected to be accelerated to the Brigade Combat Teams/Divisions/CORPs. These programs are part of the near term

strategy to help offset satellite reliance, to improve mobility of the command posts and to greatly enhance convergence and coalition interoperability. These programs are also part the Army's pivot to bring in commercial offerings to mitigate current gaps in both the WIN–T Increment (Inc) 1 and 2 equipped units.

Mr. TURNER. Please address what impact this decision has on the National Guard. How will National Guard brigades be able to communicate with their associated Active Component brigades?

General CRAWFORD. National Guard brigades will have the same exact equipment as every Active Component heavy armored brigade combat team. General Milley is committed to ensuring Active, Reserve and National Guard units are able to effectively communicate and operate with their associated Active Component brigade combat team counter parts. The National Guard will be equipped with WIN-Inc1b, the Army's baseline upper tactical network, which is fully interoperable with WIN–T Inc2. All of the associated Active Component units are equipped with one of these Increments. At lower echelons, the Army is addressing interoperability between units by planning a pure-fleeting of the Joint Battle Command–Platform system across the total Army and placing mission command information systems on the same software baseline.

Mr. TURNER. You have proposed a collection of new network programs that are not defined and don't appear to have formal requirements. For instance, the Army's proposal references a new initiative called Situational Information Transport? What is the acquisition strategy for this new program?

General CRAWFORD. Our approach going forward is to modernize the network architecture with carefully targeted modifications, rather than attempting to modernize large, monolithic programs of record. The Situational Information Transport funding line is not a new program. It is where the Army has aligned procurement dollars to purchase capabilities that support the final procurement and fielding of purposed components of WIN–T Increment 2 (Inc2) specifically, Tactical Command Node-Light and Network Operations Security Center-Light. Funding for this effort will be terminated following FY21. Future upgrades to the tactical network will be funded through the Tactical Network Modernization in Service line.

Mr. TURNER. How is the Army redefining tactical network requirements to better reflect the type of tactical network that is needed for future conflicts given emerging and current threats?

General CRAWFORD. The Army's Training and Doctrine Command (TRADOC) is synchronizing all tactical network requirements from across all of the Centers of Excellence through the Mission Command Center of Excellence in order to streamline and focus requirements, align resources and enable the acquisition community to procure capabilities to meet operational need. The Army is updating capability criteria in existing requirements documents so as not to exclude viable options from Joint, Special Operations, and Industry. The new capability criteria intends to avoid overly prescriptive technical system performance requirements and focus on the operational requirements, in accordance with IDA recommendations. The four priorities of effort of the Army's network modernization plan are designed to provide the network needed for future conflicts given emerging and current threats include: transport, command post mobility and survivability, mission command application suite and Joint/Coalition interoperability. All operational requirements are intended to enable formations rather than hinder them, allowing more effective mission command in the congested and contested environments we envision for multi-domain battle.

Mr. TURNER. When developing these new network requirements, how are you considering platform integration challenges with respect to size, weight, and power?

General CRAWFORD. The guiding principle is to provide new capabilities at minimum size, weight, power, cooling, and cost. For new platforms, the network providers and the platform program managers have created a unified design. The Joint Light Tactical Vehicle (JLTV) and the Armored Multi-Purposed Vehicle (AMPV) are examples of platforms which are being optimized for network system integration. The Army will collaborate with the Research & Development (R&D) community on universal installation kits. In the case of older vehicles, plans are in place to increase the power generation capability to accommodate additional systems beyond their original baseline. New networking systems and platform upgrade schedules are synchronized and aligned to provide upgraded capability as fast as possible to the Soldier. Additionally, the Army Science & Technology (S&T) community is working across network and platform program offices and industry to assess and provide a future common hardware and software environment in which radios, computing, storage, and electronic warfare components can exist on separate electronic cards within a common chassis. If implemented this effort could greatly reduce the size and power requirements of network and computer systems onboard combat and tac-

tical vehicles. The Army demonstrated a prototype of this environment in an S&T version of a Stryker in October 2017 and will continue prototype work to define a universal solution to better integrate interoperability at the hardware, software, and network layers.

Mr. TURNER. How can we be assured the changes you are recommending to the Army's tactical network strategy will allow you to operate in a contested environment?

General CRAWFORD. Based on what we now know of the threat and we acknowledge that we cannot assume one hundred percent mitigation, we do know that the current path does not address the issues we face but induces increased risk. By pivoting from the ACAT 1 Programs of Record to a modernization-in-service approach the Army will gain resource flexibility to quickly integrate cutting edge technologies into the network to rapidly address evolving threats. Cross Functional Teams as described in the new modernization strategy outlined by the Chief of Staff and Acting Secretary of the Army during AUSA will leverage operational lessons learned, Science and Technology, Research and Development as well as Industry Research and Development to quickly develop, demonstrate and experiment cutting edge technologies to counter emerging threats. For example, if a given waveform is no longer effective or compromised we can work with our industry partners to leverage a new commercial waveform and replace that waveform, instead of replacing the entire network.

Mr. TURNER. How will this new tactical network modernization strategy change or modify the Army's current acquisition strategy to competitively procure advanced networking radios?

General CRAWFORD. Past radio acquisition efforts have been heavily prescriptive in terms of targeted requirements in some cases limiting competition and disincentivizing industry innovation. The Army is moving towards a competitive 'best value' approach to procuring radios vice specifying detailed technical requirements that may overlook industry innovations from consideration. The Army intends to compete radio delivery orders to incentivize and on-ramp state of the art capabilities as they become mature and available. These competitions can be as frequent as annual but frequency will be driven by technology and industry conditions. The Army will harness industry innovation and adapt/leverage existing solutions wherever possible instead of trying to develop, procure, and then field our own unique solutions. Testing reciprocity with partner organizations including SOF/Joint and industry is essential to avoid unnecessary re-evaluation of proven technology.

QUESTIONS SUBMITTED BY MS. TSONGAS

Ms. TSONGAS. What impact will the Army's request for realignment have on the telecommunications defense industrial base? What will the immediate and long-term impacts be on the supplier base? What is the Army doing to mitigate disruptions that could have lasting impacts on our nation's ability to acquire and field next generation telecommunications systems that meet the unique requirements of our military?

General CRAWFORD. If the realignments are approved, the Army will continue to rely on industry and the telecommunications industrial base to innovate and procure new capabilities, sustain previously fielded capabilities/investments, make required upgrades, modernize and simplify the network, and increase resiliency. The Army has no reason to believe the actions we are taking to develop a new path forward for the network to meet emerging requirements will negatively impact the defense supplier base nor the organic industrial base. In the near term, the Army will begin to procure systems in FY18 to immediately address operational shortfalls to fight tonight and begin experimentation to determine how to best integrate efforts such as radio gateways and mobile command posts for adaption into the army network to address shortcomings. Concurrently, the Army intends to revise our requirements documents as recommended by the Institute of Defense Analyses NDAA 2016 study that address operational needs but written less prescriptively to industry. The Army will fully embrace competition where possible to allow industry to come forward with innovative ideas. To mitigate disruptions, we will evaluate industry-developed solutions while leveraging industry's Research and Development efforts for further improvements in the Army network simplification that could reduce network complexity, increase protection and improve interoperability further. Through the establishment of the Tactical Network Modernization in Service funding line, the Army will have greater resource flexibility to work with the industrial base to more rapidly procure items to upgrade our networks. Finally, we will harness the indus-

try innovations that have led to working SOF/Joint solutions wherever possible instead of trying to develop, procure and then field our own unique solutions.

QUESTIONS SUBMITTED BY MR. GALLEGO

Mr. GALLEGO. In April, I sent a letter to GEN Milley along with 177 other House Members encouraging the production and fielding of WIN–T. The House-passed NDAA also included funding for WIN–T, with the then-recommendation of the Army. Now we understand that GEN Milley would zero out WIN–T funding for FY2018. What is the reason for this late change of tune, and why are we making massive decisions about these critical communications systems on the Congressional version of a "no-notice" timeline?

General CRAWFORD. The urgency for change is based on the detailed and Congressionally-mandated National Defense Authorization Act (NDAA) 2016 analysis conducted by the Institute of Defense Analyses, along with the study conducted internally by the Army that validated those findings. These studies identified critical vulnerabilities within the tactical network, to include WIN–T. Recent conflicts in Ukraine and Syria highlighted how these critical vulnerabilities can be exploited. The Army must adapt our Network modernization approach to mitigate current and emerging threats and address critical gaps and vulnerabilities that the current Network modernization strategy does not account for. The Army intends to halt procurement of WIN–T Inc 2 at the end of FY 18, and with remaining funds continue to field purposed components of the WIN–T Inc 2 program already purchased to the Active Infantry and Stryker Brigade Combat Teams through 2021.

Mr. GALLEGO. WIN–T Increment 2, the dismounted generation of the system, was intended to provide Soldiers with the ability to communicate effectively in the field. As early as this spring, the Army was, or seemed to be, content with the progress of this program and was prepared to expand its fielding. With the reassignment of FY2018 funds that GEN Milley now recommends, that assessment has changed. Is he suggesting that we have squandered the billions of dollars that we have put into the program over the past decade?

General CRAWFORD. The Army began fielding WIN–T 16 years ago to address the challenges the Army faced in Iraq and Afghanistan, and the capability gaps of its predecessor, the Mobile Subscriber Equipment (MSE) system. The Army has assessed that future conflicts will not be the same the conditions encountered in those theaters, and has a responsibility to the warfighter and to the American people to do everything possible to keep pace with the threat and changes to the way we must fight. In this case, meeting the emerging threat has forced the Army to come to terms with the urgency of modernizing its tactical network. Regarding past investment, funds have not been squandered. The WIN–T Inc1 program established the baseline for the high bandwidth network supporting battalion and above, and remains the foundation upon which future modernization will occur. Furthermore, critical components developed within the WIN–T Inc2 program will be inserted into the baseline to increase satellite communications on-the-move capability for the warfighter.

Mr. GALLEGO. Please explain why GEN Milley believes that the reassignment of funds should occur after virtually all of the Congressional committees that have jurisdiction have already completed their normal budgetary business for the year. The proposed timeline does not allow Congress to proceed on this decision via regular order, so to change course we need an ironclad justification. Can you provide one?

General CRAWFORD. The Army acknowledges that the FY18 submission for a realignment of funds is ill-timed but necessary to put the proper equipment in the hands of the warfighter as quickly as possible. Current tensions around the world have drawn focus on operational readiness concerns involving our most pressing Operational Plans. The Army's increased self-awareness was bolstered by the findings of the Institute of Defense Analyses' congressionally mandated study, which identified the alarming state of its tactical network and demanded an urgent decision for change. While a realignment of funds in the FY19 budget submission, would have better lined up with the normal budgetary business timeline, the Army could not responsibly wait a full budget year to implement critical capabilities improvements, while continuing to fund solutions that do not meet the immediate needs of our warfighters.

QUESTIONS SUBMITTED BY MR. BANKS

Mr. BANKS. General Crawford, in the hearing you stated that the National Guard and Heavy Brigade Combat Teams would be equipped with the same version of

WIN–T but active duty, LIGHT Infantry Brigade Combat Teams would receive something different.

However, in Indiana one of our National Guard battalions is paired with a light Brigade Combat Team (2 BCT 25 ID) under the Army's "Associated Unit" pilot program.

How will "Associated Units" be equipped to ensure they are able to effectively communicate and operate with their light BCT counterparts to fully meet General Milley's "One Army" philosophy?

General CRAWFORD. General Milley is committed to ensuring associated units are able to effectively communicate and operate with their light brigade combat team counter parts, and that is one of the very reasons why he has determined that the network challenges must be addressed immediately. Currently, the network is extremely complex, and that complexity is impeding effective communication between units. The changes the Army is planning to make are, among other things, directly targeting General Milley's objective to fight as "One Army." The Army's upper tactical network is baselined with WIN–T Increment 1b which is fully interoperable with WIN–T Inc2. All of the associated units are equipped with one of these Increments. At battalion and below, the Army is addressing interoperability between units by planning a pure-fleeting of the Joint Battle Command–Platform (JBC–P) system. JBC–P provides on the move mission command applications, situational awareness, chat and other communications features across the force and placing mission command information systems on the same software baseline.

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