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HEARING
ON
NATIONAL DEFENSE AUTHORIZATION ACT
FOR FISCAL YEAR 2017
AND
OVERSIGHT OF PREVIOUSLY AUTHORIZED
PROGRAMS
BEFORE THE
COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED FOURTEENTH CONGRESS
SECOND SESSION
—
SUBCOMMITTEE ON TACTICAL AIR
AND LAND FORCES HEARING
ON
**GROUND FORCE MODERNIZATION
BUDGET REQUEST**
—

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GROUND FORCE MODERNIZATION BUDGET REQUEST

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES,
Washington, DC, Wednesday, March 2, 2016.

The subcommittee met, pursuant to call, at 1:02 p.m., in room 2212, Rayburn House Office Building, Hon. Michael R. Turner (chairman of the subcommittee) presiding.

Mr. TURNER. We will come to order.

General Williamson, General Murray, General Walsh, General Shrader, Mr. William Taylor, we have agreed that we are all going to put our statements into the record so we can go directly to you. I understand that we are going to be having—are the votes called or they have been?

Not yet. So it is our hope that we can get through all of the opening statements and perhaps a few questions before we have to adjourn for votes.

I believe we are turning to General Williamson first.

[The prepared statements of Mr. Turner and Ms. Tsongas can be found in the Appendix beginning on page 31.]

STATEMENT OF LTG MICHAEL E. WILLIAMSON, USA, MILITARY DEPUTY TO THE ASSISTANT SECRETARY OF THE ARMY (ACQUISITION, LOGISTICS AND TECHNOLOGY); AND LTG JOHN M. MURRAY, USA, DEPUTY CHIEF OF STAFF, G-8

General WILLIAMSON. Chairman Turner, Ranking Member Tsongas, and distinguished members of the Subcommittee on Tactical Air and Land Forces, thank you for the invitation to discuss the Army's fiscal year 2017 ground force modernization programs, and for this opportunity to appear with our Navy and Marine Corps counterparts.

We are proud to work with them in a number of critical areas, including the Joint Light Tactical Vehicle [JLTV] program. With me today is Lieutenant General Mike Murray, the Army Deputy Chief of Staff, G-8. Mr. Chairman, I thank you for making our written statement a part of the record for today's hearing.

Mr. Chairman, the Army's number one priority is readiness. This means that we can no longer equip and sustain the entire force with the most modern equipment. This is a fact based on our current fiscal situation. Still the Army will focus its investments on supporting elements of readiness, which include key modernization programs. Equipping is and will always remain a critical component of readiness.

Our equipment modernization strategy is focused on five capability areas. First, aviation, which I know we will not discuss today,

but remains a priority for the Army. Second, a robust network. That network has to be protected against cyberattacks.

Key investments in this area include the Warfighter Information Network-Tactical [WIN-T] that provides us with networking on the move; assured position, navigation, and timing for trusted information while operating in conditions that may impede or deny access to the Global Positioning System; communication security; and offensive and defensive cyber operations to protect our networks in cyberspace.

Third, integrated air and missile defense to defeat a large portfolio of threats that range from small UAVs [unmanned aerial vehicles], cruise missiles, ballistic missiles, mortars, and even threat aircraft. Key investments in this area include air and missile defense battle command systems, an indirect fire protection capability, and modernization of the Patriot system.

Fourth, our combat vehicle modernization provides future Army maneuver forces with increased mobility, survivability, and lethality. Specifically, the Army is investing in a ground mobility vehicle, mobile protective firepower, Stryker lethality upgrades, and the armored multi-purpose vehicle.

We are also incrementally modifying and modernizing existing systems to increase capabilities and to extend service life with improvements to the Abrams, the Bradley, and the Paladin systems.

Finally, the Army will continue to address emerging threats by investing in mature technologies with the greatest potential for future use. These areas include the Modular Active Protection System, electronic warfare, and combat vehicle prototyping.

We continue to protect our science and technology [S&T] funding so that the next generation of breakthrough technologies can be rapidly applied to our existing or our new equipment designs.

While other services man equipment, the Army equips soldiers. Even with our modernization budget being at historic lows, our equipping mission remains essential. We cannot put our soldiers at risk by not providing them with the right equipment at the right time and the right place to accomplish their assigned missions.

Mr. Chairman and distinguished members of this subcommittee, we greatly appreciate and thank you for your steadfast and strong support to the outstanding men and women of the United States Army, our Army civilians, and our Army families.

This concludes my opening remarks, Mr. Chairman. We look forward to your questions.

[The joint prepared statement of General Williamson and General Murray can be found in the Appendix on page 34.]

Mr. TURNER. Thank you.

General Walsh.

STATEMENT OF LTGEN ROBERT S. WALSH, USMC, COMMANDING GENERAL, MARINE CORPS COMBAT DEVELOPMENT COMMAND, DEPUTY COMMANDANT, COMBAT DEVELOPMENT AND INTEGRATION; BGEN JOSEPH SHRADER, USMC, COMMANDING GENERAL, MARINE CORPS SYSTEMS COMMAND; AND WILLIAM E. TAYLOR, PROGRAM EXECUTIVE OFFICER LAND SYSTEMS, U.S. MARINE CORPS

General WALSH. Thank you, Chairman Turner and Ranking Member Sanchez—I don't think she is here—and distinguished members of the subcommittee, for the opportunity to testify today before you on the Marine Corps ground modernization portfolio.

Joining me today is Brigadier General Joe Shrader, Commander of Marine Corps System Command, and also Mr. Bill Taylor, our program executive officer for Marine Corps Land Systems Command. I would also like to recognize our Army counterparts, Lieutenant Generals Williamson and Murray, who I work very closely with.

It is essential to comment on our shared commitment on our programs together, and I would also like to comment on our reinvigoration of our Marine Corps Board, which I think will help the subcommittee in the future to ensure that our two services remain closely aligned on our programs.

The Marine Corps faces a challenging future operating environment with the Army in which peer and near-peer adversaries approach parity with some key capabilities. Anti-access and area denial capabilities will proliferate, becoming cheaper, more lethal, and harder to target. Hybrid adversaries with masked signatures will fight in distributed fashion in densely populated urban littorals.

The U.S. satellite-based capabilities may be degraded or denied. Cyber threats will target the digital networks that are essential to the way we currently fight. And adversaries will leverage advanced commercial off-the-shelf technologies to out-cycle our acquisition process.

Information warfare will exploit global communications and social media, and we will face all of these challenges in an era of reduced manpower and fiscal austerity.

Our ground vehicle modernization strategy is to sequentially modernize priority capabilities, reduce equipment inventories wherever possible, and judiciously sustain remaining equipment. The future security environment requires a robust capability to operate from the sea and maneuver ashore to the positions of advantage. The Amphibious Combat Vehicle program enables us to do so. It is the Marine Corps highest ground modernization priority and consists of two increments.

This program when coupled with improvements to our existing fleet of assault amphibians, generates a complementary capability, set of capabilities, to meet the general support lift capability and capacity requirements of our ground combat element.

The second highest priority within our portfolio remains replacement of our HMMWV [high mobility multipurpose wheeled vehicle] fleet that is most at risk, those trucks that perform a combat function and are typically exposed to enemy fires.

In partnership with the Army, the Marine Corps has sequenced in the JLTV program to ensure affordability of the entire ground combat tactical vehicle portfolio, while replacing 5,500 units of the legacy HMMWV fleet with the modern tactical trucks prior to fielding the first increment of our Amphibious Combat Vehicle. These core Marine Corps modernization efforts have been designed in a manner to ensure their affordability.

Finally, the Ground/Air Task Oriented Radar that combines five current programs will enhance our ability to command and control across the Marine air-ground task force. This solution allows us to support an air defense, air surveillance, counter-targeting, counter-fire, air traffic control missions through simple software swaps on a single piece of hardware, a much more expeditionary solution than numerous radar solutions we currently have.

It will increase our sensing and sharing effectiveness across the range of military operations, supporting missions in high-end conflict, hybrid warfare, and low-intensity conflict, and thus enabling the command and control of our forces.

Thank you again for this opportunity. And I look forward to your questions.

[The joint prepared statement of General Walsh, General Shrader, and Mr. Taylor can be found in the Appendix on page 48.]

Mr. TURNER. Thank you both. We have been informed, by the way, that votes will not be occurring so we are going to be able to slow our pace down a bit.

As you are all aware, the budget debate is gripping Capitol Hill currently. The budget proposed by the President that was expected to come in concert with our 2-year budget deal, was expected to have a number of 574 as the base number.

It has fallen \$18 billion short of that, and Congress is dutifully working to restore that \$18 billion in the base budget number. However, it is my understanding that DOD [Department of Defense] has already been proceeding along the lines of the President's proposed budget, which is, of course, includes the \$18 billion shortfall.

It is my understanding, General Murray, as a result of our meeting yesterday that the Army's share of that shortfall was approximately \$3.1 billion. Could you please provide the subcommittee with more details as to which programs and capabilities were impacted by this reduced budget request? Since Congress is diligently working to put those dollars back it would aid us in our ability to understand what is at risk.

General MURRAY. Yes, sir. Thank you. So we went back and did some homework based upon our conversation yesterday, and it is actually closer to \$3.4 billion. And the easiest way to explain that because as you build a program and we got the BBA [Bipartisan Budget Act] about the early November timeframe, we were weeks away from dropping the 2017 budget to OSD [Office of the Secretary of Defense]. So we had a very short time to work on it.

But it is \$3.4 billion and that is based upon what we said we needed to meet the requirements we have been given versus what we got under the BBA 2015 agreement for 2017. It covers a lot of categories. It covers military personnel account, which is a very small amount. It covers operations and maintenance, training. It

covers research and development and acquisition [RDA] accounts, and it covers facilities accounts.

Specific to your question, within the RDA account it was about \$570,000—I am sorry, \$570 million and it was primarily where we took that cut was in aircraft modernization.

So we went back and took Apaches, took a cut in Apache modernization. We took a cut in Black Hawk modernization, and we took a small cut in CH-47 modernization. Kept everything in compliance with the multiyear contracts, but basically brought aircraft modernization production to the floor to account for that cut. But \$3.4 [billion] is really the answer to your question, sir.

Mr. TURNER. Thank you. That helps us again in the debate and advocacy to try to restore those dollars with an understanding of what is at risk.

General Murray, I also understand that the Army wants to redirect funding within ERI [European Reassurance Initiative] from operation and maintenance to procurement in order to begin the modernization of Abrams tanks and Bradley fighting vehicles to better deter against threats from Russian aggression. Can you please explain this plan and do you require any specific authorities from the Armed Services Committee?

General MURRAY. Sir, we are going to work with Congress, obviously, and it is a reprogramming action of the dollars that were given to us for the European Reassurance Initiative. Once again, we came up with a plan and this was a late-breaking in the program development last year. We came up with a plan to put unmodernized equipment as part of the equipment bill in Europe with the prepositioned stocks.

We went back and looked at that plan after we had some more time to do it and decided that we would be better off putting modernized equipment. So the original plan was to take unmodernized equipment, bring it to 1020 standards, and then send it over as the first installment of what will eventually become a division minus set in terms of prepositioned stocks.

In order to make modern equipment, we now have a plan to use what is already over there in the European activity set, bring that back to APS, the Army Prepositioned Stocks, use brigades to rotate into Europe on a heel-to-toe rotation, which we have the funding for in the ERI OCO [Overseas Contingency Operations] account, and then take the equipment we were going to send and use that to go to the next generation of tank and Bradley. So the Abrams A-3 and the Bradley V-4 to kind of jump-start that production.

So it is about \$250 [million], \$245 million we just need to reprogram RDA OMA [Operations and Maintenance, Army], just change that over. So it is not an ask for more money than what is already in there. It is just a reprogramming action, and we would appreciate the help with that.

Mr. TURNER. For my last question, General Williamson, I am assuming the Army's planning to start an APS [Active Protection Systems] test and evaluation program that would integrate technologically mature systems on Abrams, Bradleys, and Strykers.

Could you please provide us with an update on this program and comments on its schedule? And is this program fully funded in fiscal year 2017?

General WILLIAMSON. Sir, thank you for the question. So the Active Protection System program, we are actually taking a dual path. So we have an established program that is called the Modular Active Protection System [MAPS]. It really gives us an approach that allows us to look at a soft kill looking at obscurance, looking at electronics in order to defeat threat missiles targeted at our systems. And then it continues to graduate into the hard kill, that is kinetic, being able to shoot down missiles fired at our equipment.

The intent of the MAPS program, though, is to develop a very modular system that we can apply to the wide range of combat vehicles that we have in store. That is a 5-year program, sir, which we started last year from an S&T standpoint. And so it will be a couple of years before we are comfortable with that system being able to be applied to our combat vehicles.

So in the interim, the second part of our strategy is to look at existing active protection systems, both domestically produced and even those that our allies have. We are now bringing those in this year and characterizing those on our systems to understand the performance, understand the integration effort, so that we can have a capability a lot quicker than the 5-year timeframe. So our goal is to have capability within 2 years.

Mr. TURNER. Excellent. Well, I think the members of the committee are all well aware that Israel has already in Israel deployed systems that are at least a good starting point for our discussion. We look forward to your evaluation—

General WILLIAMSON. Yes, sir.

Mr. TURNER [continuing]. Of those systems.

Ms. Tsongas.

Ms. TSONGAS. Thank you, Mr. Chairman, and thank you all for being here. As I have served on the Armed Services Committee it has been my experience that absent oversight from Congress the services neglect to design and field equipment with specific requirements for women.

We have seen some progress in the area of body armor, important progress. We know that in the area of shoes that are issued to our service men and women there hasn't been a lot of thought about, you know, what a woman's foot might need in these challenging—given the demands on what she needs to do.

And so I think with the Department of Defense having recently opened all combat-related positions to women in the military that meet the required standards, a move that I certainly support, I would really like to ask that in the area of the newly opened positions which include infantry positions previously closed to women, how are the Army and Marines adapting their infantry equipment requirements to account for these changes in policy?

For example, will the next generation of soldier or marine protective equipment, like body armor, be provided in a range of sizes, shapes, and configurations to account for more women in infantry units?

General WILLIAMSON. So ma'am, let me start from an Army perspective. So this is one of the things we have made considerable progress in in terms of our uniforms and also in our protective equipment. So I would start by telling you that we have added

eight additional sizes based on a better understanding of the stature. And so there is a level of complexity here that it is not just being smaller. It is proportions. And so that is why there are so many additional sizes.

And as anybody who has worn a piece of body armor knows that it is inconvenient enough without being able to appropriately size it. And so in the design of our new protective equipment we have worked very hard as you look at both the torso, the hard armor protection, the extremities with the soft armor and the sizing so that we can fit both women and smaller male soldiers appropriately.

Ms. TSONGAS. General Walsh.

General MURRAY. Ma'am, if I could just real quickly to add to what General Williamson has said? I am sorry. So you mentioned infantry specifically, which is near and dear to my heart, but so it is not only the body armor that they are wearing. It is also the equipment they are carrying in terms of—and it is not a gender thing but it is lightening of the load.

So I mean, there is a very conscientious effort and we are making some pretty good progress on lightening the launch unit for the Javelin, on lightening tripods for the machine guns, on lightening the machine guns themselves.

And then something that I am very excited about we have been talking about for a long time, we are making some pretty good progress on is a, basically a robot that follows the squad that could take anywhere from 3 to 1,200 pounds off of an infantry squad, be it whatever gender it is and carries the load for them and then remote. And so they are not carrying all that equipment. And also gives them the ability to lessen the load on batteries as well because it serves as a battery charger.

So there are efforts. You know, like I said, it is not gender-specific, but there are efforts going on in a lot of different areas to try to lighten the load we are asking our soldiers to carry.

Ms. TSONGAS. Well, we have certainly seen a lot of evidence that the load of the body armor even, while it was very protective, caused long-term damage and costs that we are going to be dealing with for many years to come. So the effort to lighten the load is important across all areas of the equipment.

General WALSH. Congresswoman, very close to what General Murray and General Williamson said on our part is start off with the lightening the load piece. It is a huge piece that we are looking at with the amount of technology, as you are aware of, that we are putting on our marines to be able to operate in a distributed manner. The weight increases so we have been very focused on continuing to try to lighten that load.

And just as we talked about robotic capabilities, we are looking at we just did a limited objective experiment where we looked at taking infantry company and how they would use infantry transportation vehicles, small vehicles, ACV [Amphibious Combat Vehicle] type that would be able to carry some of the loads with them to be able to lighten that load so they are able to be more mobile in a foot-mobile, because the Marine Corps is a very foot-mobile organization and we have to travel that way.

As far as the female piece of it specifically, we are continuing to look at our policies and the gear that we have got. We originally had a policy where we had the gear we were buying for our protection systems was based on a low end of 5 percent of the Marines, Marines gender neutral to 95 percent. That was the percentage that we were buying the gear to.

Well, since then we have looked at that and right now I have got a policy change that I have got to change our requirements document to take that down to 2 percent of the lowest of the females and take that all the way up to 98 percent of the males because we were finding it was when we were at that 5 percent of buying gear just for 5 percent of the total Marine Corps that a lot of the females were falling below that and the gear wasn't fitting them accordingly.

Just as General Williamson said too, we also have looked at the size of the gear and we have added another short version of our vests, which carry a lot of our armor protection.

Ms. TSONGAS. And how are you all doing in fielding the new body armor that has been developed for women, especially the Army, but I am also curious to hear from you, General Walsh.

General MURRAY. Yes, ma'am. So the procurement objective, and we may not get there, is about 72,000 sets and 5,500 have been fielded. And we field to deploying soldiers male or female so it becomes a cascade. So as female soldiers and male soldiers deploy, the form-fitted, you know, new really IOTV [Improved Outer Tactical Vest], the vest, is fielded, so 5,500 fielded.

The acquisition objective was somewhere around 7,200, but as you know, on the body armor it is very short acquisition cycles because we want to take advantage of the newest technology as it becomes available.

General WALSH. I will just start by saying that we have added about 3,800 of those protective vests. And I will just turn it over to General Shrader for any details he would like to add.

General SHRADER. Congresswoman, thank you for the question. So General Walsh talked about we dropped below the 5 percent down into the 2 percent. What led us there was an anthropometric fit study that we did.

We started a number of years ago and the timing of it it was fortuitous that it ended along with this decision that was made. Led us to look at those extra-small sizes, the stature sizes and led us to purchase, like General Walsh said, the 3,800 extra sizes or extra sets that were down in that 2 percentile range, extra-small sizes. So we are fielding those now.

I would also mention that we are looking at how the load-bearing system integrates onto the smaller stature as well. What are the second- and third-order effects with regard to injuries and those types of issues?

So we have an organization within my command called the Marine Expeditionary Rifle Squad, or MERS, that exists in a place called Gruntworks where we have an exercise physiologist on staff that examines all of this data that we pull from the schoolhouses to look at the injuries that may be occurring and see how that can inform how we change any of our body armor and any of our load-bearing systems.

We just fielded a new pack in the Marine Corps and we are now looking at how does it ride on the body? Does it need to ride higher on smaller stature marines instead of on the hips, and those types of issues. So we are full steam ahead, ma'am, looking at those smaller sets.

Ms. TSONGAS. Well, one of the more alarming things I learned after you all first began to develop—the Army first began to develop body armor for women, was I learned that in the previous armor that they were wearing, the male version, that often it compromised a woman's ability to lift her arm appropriately to fire or whatever she needed to do.

So there are real risks to not moving ahead in that very expeditious way, especially given the opening of all these combat positions to women. So I thank you.

I yield back.

Mr. TURNER. Excellent question. Thank you.

Mr. LoBiondo.

Mr. LOBIONDO. Thank you for being here and for all that you do. General Murray, in the battle space whether air, land, or sea, it is always the tangible items that are given the most interest from the Department of Defense, Congress, and the general public because they are the things that we can reach out and touch and physically see.

However sometimes it is the invisible items, mainly C4ISR [command, control, communications, computers, intelligence, surveillance, and reconnaissance] capabilities and resiliency that determine success in the modern battle space. So along those lines can you update the committee on the tactical radio programs, specifically HMS [Handheld, Manpack, and Small-Form Fit], and what the Army is doing to move this program along as expeditiously as possible?

General MURRAY. Sir, I will kind of cover it very broadly and then General Williamson has got much more depth into it, and I will pass it over to General Williamson.

And so I mean there is within our network, which General Williamson has said was, you know, the number two priority in terms of the 2017 budget. And the overall umbrella would be our WIN-T program. There are several layers we are talking about.

The HMS manpack radio is absolutely a key component within what we are trying to do in terms of pushing command or on-the-move capability down to multiple echelons as well as connecting lower and upper mid-tier echelons of command.

So connecting companies up to battalion, to brigade and then that on-the-move capability. And basically HMS is a critical capability within that, and then General Williamson will pick it up from there.

General WILLIAMSON. So sir, really appreciate the question. The radio program is something that I have been invested in for a number of years. So I am happy to report that the HMS handheld radio, so we just had a contract award on the 26th of February. And the reason I am pleased with that is that there were multiple vendors who are now qualified, which means that we will have competition that will allow us to get the best price for the taxpayer and give the best capability to soldiers.

And so when we talk about the HMS program it really represents two pieces. One, a manpack radio that is two channels that allows us to have satellite communications as well as direct line of sight. That program we have fielded roughly about 5,000 of those radios and we are going in now for a lighter version.

This gets to Ms. Tsongas' question is how do we lighten the load? So one of the things that we are doing with that radio is how do we make that smaller and increase range?

The radio contract that we just awarded last week will be for a smaller handheld radio that is used at the squad level. And we believe that will go through a series of tests with the three vendors and we will down-select. I can't tell you today whether that is one or two. My goal is always to maintain competition. So I think both programs are moving forward very steadily, sir.

Mr. LOBIONDO. Okay. Thank you very much.

I yield back.

Mr. TURNER. Mr. Cook.

Mr. COOK. Sleeping on the switch here. I had a couple of questions on standardization of ammo. When I am thinking about the Stryker and I am thinking about the Bradley and I am thinking about the LAV [Light Armored Vehicle] and, you know, I am not as smart as anybody in this room here. I am just a dumb grunt. But why do we have, you know, 25 mm for one and 30 [mm] for the other?

I am a big fan of the Stryker. I like going up to the 30 mm. But I have also heard some rumors that some of the troops—I have got Fort Irwin—that they are grumbling a little bit about the 25 mm, and even in the Marine Corps. Whether it is capable to standardize that equipment or whether we have to retool all those vehicles?

If you could kind of comment on that because I am going to ask the same question about why the Marine Corps has its own 5.56 and the Army has its own 5.56.

And when we go into these budget wars where we are supposed to have our act together in terms of efficiency and effectiveness and we are trying to make the argument, and you have got a lot of people here that are, you know, quite frankly, hawks. And we are going to be fighting other people that are going to want to cut your budgets. These are answers that I think are imperative to some of the discussions that we have.

So is that too much of a grenade?

General MURRAY. No, sir. So I mean, you are absolutely correct. So the 30 mm is the current weapons system. It is not done yet as you know. We are still upgrading the Strykers, 81 per BCT [brigade combat team] starting with the regiment in Germany. And the 25, I know of, and General Williamson can talk in more detail, I know of no plans to try to go back in and reengineer the Bradley for a 30 mm.

A lot of that may be the integration piece of it is just too difficult and as spending a lot of time in a Bradley myself, I personally think the 25 with the right ammo is a very effective weapon system.

The 30 and Bradleys normally are around tanks so I mean that was part of the discussion in terms of 30 mm versus a smaller gun for the Strykers. Strykers are not necessarily throw—so there is a

lot that went into it, but—and I will turn it over to General Williamson—but 30 on the Stryker, 25 on the Bradley is where we intend to stay.

General WILLIAMSON. So sir, just two points. So I do appreciate the concern about multiple weapons systems and then the associated tail that comes with multiple variations of ammunition. But the start point is the investment that would be required to go back and touch all of the 25 mms, which is a very capable weapon system. That is a significant investment.

I have spent time with our ammunition and our ballistics folks, and I would tell you that the 30 mm that gets added to the Stryker gives it an incredible capability. I mean, and part of the motivation there is it is on two fronts. So one, it gives you a capability to be able to address lightly armored, lightly skinned vehicles, but that weapon also gives you a tremendous capability in engaging enemy in the open and at range.

And so we believe it adds a tremendous amount of capability to that Stryker force, especially as you look at our desire to provide additional capabilities starting in Europe. And that is the direction that we have headed. There will be a separate decision that will be made by the leadership of the Army that talks about how far you go with that Stryker lethality package and the 30 mm.

General WALSH. Congressman, I think the first thing I would say is whenever we can, our intent is to buy with the Army in the same program. So everything going forward that is what we try to look at, and I will look forward to trying to answer that 5.56 question later when you bring that forward.

On the LAV specifically, as we look at our priorities between we have got first priority really is affordability on the ACV and the JLTV, trying to get those programs forward. Trying to give more firepower to our LAV program along with keeping them around longer, we focused really on their obsolescence and keeping them going from an obsolescence standpoint, but also the LAV anti-tank program. That is really our focus right now has been to up-gun them with this new anti-tank capability.

I think the same thing that General Murray had said it to try to up-gun and take an older vehicle like this at this point in time we are trying to bring in new programs and try to bring in a higher caliber capability in. It is just not an affordability standpoint to where we can afford to go right now.

Mr. COOK. I yield back.

Mr. TURNER. Turn to our next questions. I want to just read the list so people know where they are on the list currently for asking questions. We have got Mr. Takai, MacArthur, Graham, Gibson, Walz, McSally, Moulton, Walorski, and then Duckworth. That is the current order.

Mr. Takai.

Mr. TAKAI. Thank you, Mr. Chairman. Aloha, generals. I am concerned about the cycle we go through in upgrading and modernizing the technologies that our warfighters employ in combat on the ground. As you know, we have found ourselves in situations in the past where we had deployed troops without the proper equipment because of our modernization cycles that have been underfunded.

Today I want to ask about a couple of programs, mainly on the ground system acquisition and communication. First General Williamson, it appears the Army has issued an unfinanced requirement list which seeks 16 additional M88A2 improved recovery vehicles. Will these be the older A1 vehicles that are improved to create the A2 versions? And how many M88A1 Hercules, the older variant, will remain in the Army's inventory after completion of the current program funding?

General WILLIAMSON. So sir, I will have to come back and tell you what the total number is, but the answer to your first question is that it is an upgrade to the existing 88s.

[The information referred to can be found in the Appendix on page 67.]

Mr. TAKAI. Okay. Yes, please get back to us on the other question.

And then General Walsh, the Networking-on-the-Move [NOTM] system is a transformational command and control capability for all elements of the Marine air-ground task force. The LOC [line of credit] was received in October 2014 requiring an increase in approved acquisition objective from 56 to 140 NOTM systems. Where is the program office at with contracting production of these remaining systems?

General WALSH. Thank you, Congressman. I will start off by giving you a broad overview of where we are at on the NOTM program and then I will turn it over to General Shrader to finish the question on exactly where we are at.

What I would say is the Network-on-the-Move program is really, as you look at the modern battlefield, is really trying to connect our capabilities. So if we have been in Iraq and Afghanistan in very immovable forward operating bases, combat outposts, we have been in the same location in the same area for a long time.

We are operating on there and we have got our command operations center there. And we have been able to bring that technology and really have a lot of situational battle space awareness of what is going on in that area.

On the future battlefield, operating in a distributed manner, when we have to push our forces out they are more on the move and have to be able to distribute it more, the ability to share, sense, and share that information and enable our forces to operate as a command post on the move. And that basically is what our Network-on-the-Move capability is doing.

So as we are going through this program we started off with our ground combat vehicle program, have now moved it into our ITV [internally transportable vehicle] or smaller vehicle program, and now what we are also seeing it is we have got the urgent needs requests from our special purpose MAGTFs [Marine air-ground task forces] that are forward requesting the same type of vehicle that would tie into the aircraft that are deploying.

So we have changed the program to also add the addition of a Network-on-the-Move airborne into the Network-on-the-Move ground program that we have, so the ability to connect, mesh-net that capability from the aircraft down to the ground commanders.

And the specific requirement came out of the special purpose MAGTF was when they are en route for long hours on a mission

they want to be able to have the battlefield awareness like a moving jump CP [command post] would have when they get on the ground. So we have increased the program to also take that into consideration.

So the program is changing like that because technology is changing so rapidly, of using that Network-on-the-Move program to be able to bring more capabilities into it to give more added capabilities as technology continues to spin up. And with that, I will turn it over to General Shrader.

Mr. TAKAI. I had another question, so if you could, General, just answer the question regarding the where we are in terms of contracting?

General SHRADER. Sir, to be honest with you, specifically where we are in the contracting I will have to come back to you. I do know that the 140 systems is fully funded. Right now the issue that we are really getting at with NOTM is that that capability is really key to where the Marine Corps is trying to go with regard to distributed operations in the command and control mode.

The big thing we are getting at in NOTM is the size, weight, and power issues. We are trying to shrink the size and that weight and the amount of power that it draws on that system. But I will, if I could, sir, come back to you exactly where we are with the contracting and fully funding on the program.

[The information referred to can be found in the Appendix on page 68.]

Mr. TAKAI. Okay. Thank you. I have run out of time, so Mr. Chair, I yield back.

Mr. TURNER. Okay.

Mr. MacArthur.

Mr. MACARTHUR. Thank you, Mr. Chairman. I wanted to talk about unfunded priorities for a few moments. And just clarify before I get specific, did you base your unfunded requirements list on PB [President's budget] 2017 or on the full \$574 billion?

General MURRAY. Sir, we based it on the budget that we submitted. So part of that was the difference between what we built the POM [program objective memorandum] against and what we got in terms of the BBA, so part of that was to backfill the BBA cut, if that makes sense to you? That was a big piece of it.

Mr. MACARTHUR. I want to make sure I understand that. So was based on the lower—

General MURRAY. Oh, yes, sir.

Mr. MACARTHUR [continuing]. The lower number?

General MURRAY. Yes, sir.

General WALSH. And I would just reiterate exactly the same thing is we were working off originally what we thought we would have originally. And when the BBA came in, some things had to get pushed out, and as, you know, the pressure of the budget we had to lower, you know. The BBA helped us with 2 years of funding that gave us stability and predictability in our time period.

But the reduction of that pressure, budget pressure, ended up pushing some things that we couldn't fit into the budget numbers that we had. So the unfunded list takes into account those things that we originally would have bought, but now we are unable to buy.

Mr. MACARTHUR. So I would like to get a sense of the top two or three, four, the most important things that got left off?

General MURRAY. Yes, sir. I will start. So the first one would be what was reduced in the 2017 budget over what we said we needed, so it is the restoration of the BBA cut we took in 2017. The second one would probably be increased readiness.

As you know, the theme in this year's budget for the Army is near-term readiness. It is about a 5 percent increase in readiness, so buy back more readiness in terms of home station training, flying hours, some training ammunition.

And then probably number three would be we started to explore the recommendations based on the National Commission on the Future Army. There was 63 recommendations they made, and some of those are fairly expensive if we go with those recommendations.

Mr. MACARTHUR. General Walsh.

General WALSH. You know, I am looking at our list and I don't know if we have had a chance to really prioritize the list as far as what I would look at. I know we certainly have aircraft items that we have got in there, specific aircraft capabilities. Some of our information warfare capabilities that we have got and some of our UAS [unmanned aircraft systems] capabilities is what I would say.

But I will have to get back to you on a prioritization of it. It is more of a list that we have got blocked off by procurement areas without really prioritizing it. So I will have to get back with you on an answer on that.

[The information referred to can be found in the Appendix on page 68.]

Mr. MACARTHUR. We throw around very large numbers with these budgets. Whether it is \$18 billion more or less, these are very big numbers. And yet they make a difference. Clearly they make a difference. You mentioned readiness, training, air time, things of that sort. Does that translate in a tangible way in your mind to increased risk to the men and women we put in harm's way?

General MURRAY. In terms of the lack of that funding?

Mr. MACARTHUR. Yes.

General MURRAY. Absolutely. So I mean, and General Milley and General Allen since has testified and the Acting Secretary of the Army, the Honorable Patrick Murphy, that this budget, I mean, we are doubling down on near-term readiness. And it is based upon what is going on in the world today. It is current threats. It is emerging threats and it is the potential. And you can argue whether that potential is increasing or stays the same that we are going to send America's sons and daughters into harm's way in the near future.

And so it is going after the near-term readiness because the one thing none of us can afford to do is get up in the morning and look ourselves in the mirror and say we could have prepared them better when they go. So that is why we were very focused at the expense of everything else in the Army's budget on making sure that we are ready, as ready as we can be as quickly as we can be. And so that is where the risk is.

Mr. MACARTHUR. And so just to be really clear, we are not talking about maybe-so readiness. We are not talking about being ready for what might happen that we can't foresee, something

around the corner. We are talking about near-term readiness to face threats already upon us is tangibly compromised by these differences between the full \$574 billion and the, in your case, the \$3.4 billion reduction because of this \$18 billion cut. Is that correct?

General MURRAY. Yes, sir.

General WALSH. If I could add from the Marine Corps side on that is is that that balance we have been having to work with between, you know, a forward presence force that we are with the United States Navy and that balance of readiness because we are forward all the time along with the marines and soldiers we have got deployed in Iraq and Afghanistan, that has been a constant that we have been focusing very heavily on the readiness side at the expense of modernization.

I think if I look at the numbers between the last since 2003 to 2016 to now, our investments for readiness has remained the same. Where our continually modernization or modernization accounts or investments accounts have gone down from about 17 percent average over that time to about 10 percent now.

Mr. MACARTHUR. Thank you. I am out of time but I appreciate it.

And Mr. Chairman, I yield back.

Mr. TURNER. Ms. Graham.

Ms. GRAHAM. Thank you very much, Mr. Chairman. Congressman MacArthur just took my question, but that is okay. It was a great answer, appreciate the information. So I will ask a different question. Thank you, gentlemen, first of all, for being here very much.

As a new member of this committee, we spend a lot of time focused on the challenges we face in the Middle East, which has a unique topography. And I am sure you are training for that type of a potential conflict environment.

What would happen if something sprung up in a different part of the world? Would there be an opportunity—would the training that is going on now be in any way an additional challenge to, say, a jungle environment or something that wasn't like the Middle East? And what would we need to do to pivot to a different battlefield? Thank you.

General MURRAY. Yes, ma'am. Thank you for that. And so it is not really a budget question or a modernization question, but just based upon 33 years of doing this, it is really, you know, where you are and what the geography looks like, the conditions that you fight in is really what we would call conditions.

So we train to a common standard for specific tasks, and those are really applicable no matter where you employ those, both individually and collectively. Would the jungle versus the desert versus the Arctic have an impact? Yes. We would have to account for that. But, you know, how we perform a certain task doesn't necessarily change and the standards we perform that task to doesn't change. It is the conditions that really change, if that answers your question.

General WILLIAMSON. I just wanted to add a modernization piece to that, and it really gets to some of the questions that we have

had in the past regarding the time it takes and the investment it takes in modernization.

And so what we don't have the luxury of is building systems that are very specific to a particular environment. And that is why we design systems that have multiple uses and can operate in cold weather regions as well as in the jungle.

And to do that and to make sure that you have the reliability that that weapon system needs to give you in a cold weather, as well as a hot weather region, requires us to make an investment on the engineering side and on the testing side to ensure that we don't put a soldier in harm's way because we have placed them in an environment where the effects of the geography, of the weather, all of those factors can put them at risk.

General WALSH. Yes, Congressman, I think, you know, we have been focused very much on the Middle East for good reason for a long time, but we are changing that. There is obviously from the administration with the rebalance to the Pacific, we have taken a lot of our forces out of the Pacific region, which we did a lot of jungle training when we were in there. And we have got four full battalions back there. We have really kind of regenerated that force.

Today as we speak we have got 1,900 marines up north of the Arctic Circle, up in an exercise called Cold Response with our NATO [North Atlantic Treaty Organization] allies and working with the Norwegians. We are looking at our cold weather gear and we are relearning our cold weather capabilities that we have not had since really the Cold War and really used significantly. General Shrader is looking very closely at what gear we still need to reconstitute to be able to be where we are capable in those areas.

Right now the Commandant has got me responsible for a program called Marine Corps Force 2025. And we are looking at this future operating environment which is looked at not just what we have been looking at with counterinsurgency, counterterrorism operations in the Middle East, but how will we fight in the future against this hybrid threat, against a high-end near-peer competitor that we see both from the capabilities that Russia and China proliferate and how we will operate in that environment?

So right now, we are going through a detailed look at our force unit by unit and see how are we structured from a capability standpoint. Do we have the right formations and do we have the right capabilities to go with that? But it is certainly this operating environment today is forcing us to look at things completely different than we have in the last 15 years.

General SHRADER. Yes, ma'am. I would just say just exactly what Lieutenant General Williamson said. You know, when it comes to a system, designing it and testing it for the full spectrum across all the environments. That is really what takes a lot of time. You know, we will have a system specifically designed to do one thing, but then when we put it through the environmental-type testing is what really will sometimes make us go back and have to redesign it. So yes, ma'am.

Ms. GRAHAM. Well, I thank you and I have 17, 16, 15 seconds left. So I want to put in a shameless plug. I have a wonderful company in my district that is developing improved batteries. You know, we are all tethered to our units today. And I look forward

to working with you all and talking about the benefits that these batteries will bring. And I think you may have already had some discussions, but I look forward to the future opportunities. Thank you and my time is now out.

So thank you, Mr. Chairman.

Mr. TURNER. Mr. Gibson.

Mr. GIBSON. Well, thanks, Mr. Chairman, and gentlemen, thank you for your service, your leadership, the sacrifices of your families. And the question I have is going to be for both the Army and the Marine Corps. And as a premise for that, myself, the chairman, Sergeant Major, Congressman Walz and others here on the committee, we have introduced a bill to stop the drawdown for the land forces.

We know that this is a very serious bill because it has consequences. It has impacts all the way across the budget. But it is our judgment that, you know, given the assumptions that were in place when decisions were made on the sizing of the land forces, we think there has been significant change and much more risk today such that the risk to deterrence, the risk to fighting and winning the war, and the risk to families in terms of the dwell time and impacts are such that we feel the need to come forward with the bill.

My question to the witnesses today has to do with impacts on modernization. So the staff we are in the process of collecting information as to what the price tag would be for that because the leaders of both the Army and the Marine Corps have been very clear that while concurring with risk assessments it is paramount that we not hollow out the force so that we have the resources necessary to not only man the force but to equip it, to modernize it and to still make the investments across the full spectrum, family readiness, and also R&D.

So I throw it over to the panel in terms of what that means in as much specificity as you can give today, but then of course for the record if you want to follow that up because we are going through this in great detail here in the committee.

General MURRAY. So Congressman Gibson, thank you for that question, and you took away my line. So both General Milley and General Allen have talked about this specific issue and I think what both of them said, and you have alluded to it all along, that is an increase in end strength without an increase in topline would just make the problems we have right now even worse in terms of how do you balance structure versus readiness versus modernization?

And I really think it talks about, you know, if this were to come to pass as to what type of formations would be built with that increase in terms of a modernization bill. So until we get a little bit further down the road and if it happens, you know, what specifically are we talking about? I could come back to you with a lot greater detail in terms of what it would take to equip and modernize those additional formations if that gets a little bit at your question.

General WALSH. Congressman Gibson, thank you also for that question. I think looking back, you know, when the Marine Corps was downsizing from 202,000 and we were on that slope down try-

ing to figure out what was a good number for us, I think we came up with a number of about 186 at that time. And we ended up with 182, which we are probably at about 183 right now on that slope down to 182.

As we looked at that is what are the trades as you start to come down? And just as General Murray said, you start, you know, balancing readiness, force structure, modernization. So I think as we look at that, deployment-to-dwell is one of those things. What are we being challenged to do with right now? And our OPTEMPO [operation tempo] certainly has not changed a lot. I mean, we are a very busy force, a very busy Marine Corps.

So from a structure standpoint you can only push the troops so hard, so any increase in strength I think it certainly, like you talked about, is going to have to have some cost to it, some increase in resources. So it can't just be an end strength add. We have got to be able to have the resource.

So to going back to that Marine Corps Force 2025 that we are in the middle of doing right now is the assumption right now that we are going at is we maintain the 182,000 number structure. And how do we gain in added capabilities that we need within that structure? So the trades we are looking at in there as we drill down right now, things such as, you know, information warfare, as quickly as that is moving the technology in that area with cyber electronic warfare, information operations, more command and control capabilities.

All those come at a cost and a lot of those marines that come in that area that are signals intelligence, electronic warfare capability, and our communications and computer capabilities, those are more senior marines. So we are trying the process of trying to grow a more senior force in a lot of ways and try to retain more seniors. That also comes with a cost.

So I think it, just like General Murray said, we would have to get back to you. We are right in the middle of this, really, this drill-down in it and what we need in the future force. The goal where we are at right now is if we had to maintain at 182, knowing what adds we would have to get, what capabilities we would have, knowing that we are going to have to take risk and try to determine where the risk would come in that area.

So as we go through this and we start moving towards a Quadrennial Defense Review position, we are going to already have kind of in our mind what are things we need to have to be a more modern force? We are then going to have to determine is do we have to take risk from other areas to be that more modern force? Or would there be a topline add increase in force structure, like you suggest, and what would be the bill that would go with it?

Mr. GIBSON. And Chairman, if I could just close here. I had a chance to talk to the Commandant last week about this and for situational awareness it is 184 is the number in the bill. And I know that the Marine Corps right now is struggling with and even looking at some what I would consider uncomfortable questions as to what would have to be decremented to meet some of the priorities. So I think the 184 is probably a good number for the Marine Corps, better than the 182, but knowing that we have to get this overarching cost filtered into that.

General WALSH. And if I could just follow up? And I know the Commandant testified to this also that, you know, as we look at that he is looking at even within our formation such as our infantry battalions.

Mr. GIBSON. Right.

General WALSH. So if you take an infantry battalion that has 950 marines today, a very formidable fighting force, but know that we don't have the 21st century-type capabilities that we need in the future to fight on that modern battlefield against near-peer threats and hybrid competitors. So if you are going to have to do a zero sum trade in there you are going to have to take away some of your infantry firepower capabilities that you have got right now to bring in—

Mr. GIBSON. And that concerned me.

General WALSH [continuing]. To bring in some of those other ones.

Mr. GIBSON. Right. Thanks so much. I yield back.

Mr. TURNER. Ms. Duckworth.

Ms. DUCKWORTH. Thank you, Mr. Chairman. General Williamson, I would like to talk a little bit about the tactical wheeled vehicle fleet and the Army's plans on divesting 26,000 HMMWVs in fiscal year 2016, but then also in terms of the shortage that I see we are having with shortage of heavy equipment prime movers. That was something that was brought up in the National Commission on the Future of the Army's report.

I am just going to read from it. It says, "There seems to be some commanders indicated to the Commission that tactical wheeled vehicle shortages in their units are creating significant risks. And these shortages are most pronounced in heavy equipment prime movers." Giving an anecdotal story even that we have had to rely on our European allies to transport our tanks in support of the European Reassurance Initiative.

So we are facing readiness issues in tactical wheeled mobility. What is the rationale for such a large HMMWV divestiture? And where in the fleet are you accepting the most risk? Is it HMMWVs, medium lift, heavy lift?

General WILLIAMSON. So, ma'am, I am going to ask General Murray to talk the bigger modernization strategy, and then I would like to come back to talk to you about a specific set of tactical vehicles.

Ms. DUCKWORTH. Okay.

General MURRAY. So, ma'am, and I will address this with the European HETs [heavy equipment transporters] first. So it is not a numbers issue for the HETs in Europe. It is the restrictions on the road networks in Europe. So the European HETs have more axles, distributes the weight differently than U.S. HETs, and so it becomes a weight issue. And that is specifically with the move into Eastern Europe with the European activity set of equipment is where we first discovered that.

Ms. DUCKWORTH. Okay. Fair enough.

General MURRAY. On the National Commission report, ma'am, and I am very familiar with that because we are working that within the G-8. And I can't remember the specific number of that recommendation, but I believe the Commission asked us to come

back and do a study on that and then come back to Congress and report out, which we will absolutely do.

Our numbers don't necessarily agree with the Commission's report. It is for both the light, the medium, and the heavy we are showing excess wheeled vehicles. So we have got some work to do to figure out where the disconnect between what the Commission is—it might have been as simple as they went to a unit and that unit just hadn't fielded yet or the distribution wasn't right within that post, camp, or station.

We have got some work to do to figure out where the disconnect is, and we are looking at that right now. And we are very happy to come back and as the report asks for to kind of lay out for you and others where we see ourselves in terms of wheeled vehicles in all three categories.

Ms. DUCKWORTH. Okay. Well, before we go back to General Williamson, could you address a little bit the HMMWV modernization in the Guard, in the Guard and Reserve? Congress provided \$523 million for that.

My understanding is that the HMMWV will remain in the fleet until at least 2035. So could you tell us what the status of the funds are and what the Army's strategy is for obligating that money? And how does Army plan on using that money to address the HMMWV modernization shortfalls in the Guard and Reserve? And then back to General Williamson, or whoever wants to answer that.

General WILLIAMSON. So, ma'am, let me talk to HMMWVs specifically. So what I would say, with the help of Congress we have had the opportunity to really do two things in the HMMWV fleet. One, we have been able to do a recap, so as you look at the existing set of up-armored HMMWVs, there was an issue with weight, you know, when you looked at the suspension, when you added all of that armor.

So that money allowed us to go back in and do an upgrade to the suspensions, the powertrain, in order to bring those vehicles up. So that is part one. Part two is that it also allowed us to procure a number of ambulances, a significant number of ambulances for the Reserve and the National Guard. So as I look at 2016, 2017 and 2018, that funding has given us a great ability to upgrade over 400 vehicles in the Reserve and about 1,000 in the National Guard.

That program is on track. And the only other comment I would make, ma'am, is that it has also been a great example of the public partnership that we have had with with industry and with our organic industrial base. And so being able to tear them down in an organic facility and then be able to have them built back up with our vendors has given us some true cost efficiency. And we have done a great job getting those capabilities back out to the force.

Ms. DUCKWORTH. Thank you.

I yield back, Mr. Chairman.

Mr. TURNER. Ms. McSally.

Ms. MCSALLY. Thank you, Mr. Chairman. Thank you, gentlemen. I do want to follow up just to clarify on the question about the female PPE [personal protective equipment], just in case any Neanderthals try and seize what you said to use it for unintended purposes, the lightening of the load that you all talked about has noth-

ing to do with women being in your units, right? These are efforts that have been ongoing because it is in our best interests to have the lightest load possible for our soldiers and marines?

General WILLIAMSON. Absolutely, ma'am. And so we approach the soldier protection system from the level that we always want to find ways to improve its capability, but also lighten the load, whether you are talking about the protective vest or whether you are talking about the helmet. It has nothing to do with whether you are a male or a female. We can't burden our soldiers with more weight.

Ms. MCSALLY. So we all agree that a lighter load on any soldier regardless of your gender is going to make him a better warfighting capability. So this is a great effort having nothing to do with women's integration.

General WILLIAMSON. Yes, ma'am.

Ms. MCSALLY. And you agree, General Walsh?

General WALSH. Yes, Congresswoman, same thing. I mean, we are looking at the same things. It is how do we lighten it for all the marines? So if you are a 100-pound 5-foot artillery person out there and you have got to lift artillery shells or charges up and get them up into the cannon or up onto the truck that is going to move them, it is the same thing whether it is a male or a female. It is the standards we have and how can we help them to lighten those capabilities in all MOSes [military occupational specialties]? It is not just the infantry MOS. It is how do we make it easier for them?

Ms. MCSALLY. Great. And similarly, obviously, you can both agree that having equipment and PPE that fits you as an individual regardless of your gender, you could be a 120-pound guy that is short who is also serving, that it is best to have everybody fit their equipment in order for them to be the best fighting force. Correct?

General MURRAY. Yes, ma'am.

Ms. MCSALLY. All right. I just wanted to make sure.

General WALSH. I think it has forced us to look at that real hard.

Ms. MCSALLY. On the record, so Neanderthals alert there. Okay. My next question is about the capabilities that we are talking about with the JAGM [joint] air-to-ground missile. It is an incremental approach in the budget with the dual-mode seeker being the one that is focused on in fiscal year 2017, whereas the tri-mode seeker, you know, provides obviously greater capabilities.

So just wanted to get some thoughts on whether there is, you know, an opportunity or what your thoughts are on maybe accelerating the increment to modernization or just your input on that?

General WILLIAMSON. So, ma'am, the only comment I would make is that we have looked at the JAGM capability both from a funding, but also from an engineering effort. And so we are very comfortable that programmatically the timeline that we have used is really about addressing risk. And I think I would be concerned programmatically about trying to accelerate it too much at this point. We will monitor it.

Ms. MCSALLY. Okay.

General WILLIAMSON. And I can provide additional details as required. But right now we are very comfortable with the JAGM approach.

Ms. MCSALLY. And just focusing on Increment 1 then, the dual-mode seeker right now?

General WILLIAMSON. That is correct. Yes.

Ms. MCSALLY. Okay. Thank you. Next question, I don't have your unfunded list. I just want to follow up on Congressman MacArthur and just clarify, do either the Army or the Marines, do you have anything related to counter-IED [improvised explosive device] technology on your unfunded list? Or have you asked or received everything in the President's budget that you need related to counter-IED?

General MURRAY. Ma'am, I don't have all the details of the UFR [unfunded requirement list]. I will have to come back to you.

Ms. MCSALLY. Okay.

General MURRAY. And I can't recall off the top of my head whether we do or not. So I will take that for a do up.

[The information referred to can be found in the Appendix on page 67.]

Ms. MCSALLY. Okay. Thanks. In the past we have had some discussions here about counter-IED funding versus other types of funding, which we all agree we should probably be able to do both for supporting our troops. So just want to make sure we are clear that there is no unfunded request there.

Can we also follow back up on WIN-T? Is everything that is in the President's budget request what you would recommend or is there anything related to WIN-T acceleration or additional funding on your unfunded request list?

General WILLIAMSON. So, ma'am, as you know, on the WIN-T program we just recently last year received a production decision that allowed us to go into full-rate production. What the Army has done though, and this is not related to the technology associated with the WIN-T, but what we have done with the program is spaced it so that we have the ability to field the system to units in a priority order. I am very comfortable where we are at with the WIN-T program right now.

Ms. MCSALLY. Okay.

General WILLIAMSON. I am not tracking a desire to accelerate that at this point, but I will go back and look at it.

Ms. MCSALLY. Okay. Great. Thank you. And last question is the [National Commission on the] Future of the Army talked about a gap in electronic warfare [EW] capability for the Army. Do you have any comments related to the EW capabilities that could be addressed or accelerated?

General WILLIAMSON. I do, ma'am. So it is one of the areas as we talked about in our opening statement. Electronic warfare is one of those areas that we are concerned with from it is an effect on our ability to operate. And the concern that I would have, ma'am, is that as you look at the access to technologies. So our current adversaries and our potential adversaries have the ability to draw from the Internet, from the available technology that is out there and develop counters—

Ms. MCSALLY. Right.

General WILLIAMSON [continuing]. To some of our very important systems. It is critical for us to make an investment in EW and electronic warfare.

Ms. MCSALLY. Okay. Great. I am out of time, but I appreciate following up on that maybe with you later.

General WILLIAMSON. Yes, ma'am.

Ms. MCSALLY. Thank you. Thank you, Mr. Chairman.

Mr. TURNER. Thank you. Let us begin our second round of questions.

General Walsh, in the beginning of the questioning I asked General Murray to respond to the issue of the budget debate that is ongoing. As you are aware, there is an expectation that the 2-year budget deal had a floor base budget amount of 574. The President's budget request came in \$18 billion under that. Congress has continued to have a debate about replacing that \$18 billion taking us back to 574.

General Murray and the Army had given us numbers indicating that their portion of that \$18 billion, if it is restored, was \$3.1 billion. And I understand in response to your questions to Mr. MacArthur on the unfunded requirements list that you have not yet prioritized. Have you yet determined what your portion of the \$18 billion shortfall will be?

General WALSH. Specifically the \$18 billion no, I would have to get back with you an answer on what we figured out. We have got our unfunded list and what that priority and how much we have on that, but I don't think it is tied exactly to the \$18 billion.

[The information referred to can be found in the Appendix on page 67.]

Mr. TURNER. But as when my questioning to——

General WALSH. Right.

Mr. TURNER [continuing]. General Murray obviously it would be helpful because as we go to restore the \$18 billion, being able to understand to what extent that restores a portion of your budget and what the priorities would be on the unfunded requirement list it gives us an ability to evaluate the benefit of being able to restore those funds. Thank you, General.

Turning to Ms. Tsongas.

Ms. TSONGAS. Thank you, Mr. Chairman. I wanted to ask a question about the soldier protection system. The 2017 budget request shows a significant research and development increase from about \$5 million to \$16 million, not a lot in the context of everything else you fund, but for this system, important. And it is for continued work on Increment 2 of the next generation soldier protection system.

Some of the planned work cited in the budget materials refers to work on integrating communications, continuing to reduce weight, which we have heard in general is an effort that you are paying a lot of attention to, and possible integration of other advanced technologies into this system in the future.

The Army's Natick Soldier System Center has been doing work for some time on future technologies. And while it is not in my district, I am aware of it and have visited there several times and have seen the extraordinary research that is taking place there.

And some of those future technologies would include communications, health monitoring. At one point I learned about injecting sensors so you could detect an injury and send some material to it to help stop the bleeding. Excuse me for my throat. In other areas it

could be miniaturized. So can you provide some details? And I will drink some water. Sorry.

General WILLIAMSON. Ma'am, I will. So let me talk to the funding and the acceleration piece. So it goes back to your point about the nature of this integrated system. You have to start with the integration.

So five key components, right, the hard armor that protects the torso, the vest, all of those things associated with the torso, the extremities, the helmet, which will be lighter and also include upgrades to the blast detection as well as hearing protection. And then this integrated sensor system that you talked about, and I want to talk about that a little more. And then the eye protection.

And so although we are looking at these systems simultaneously, the way the funding was allocated it was going to take us starting in 2016 for the torso, but it wasn't until 2019 that we were going to get to the integrated sensor suite that you saw at Picatinny. It is a really important component because what that will allow you to do is not only measure things like heart rate, but it will also give you feedback on things like hydration. So when you put a load on a soldier and they are operating in a combat environment, how do we have the mechanisms to monitor?

In order to do that you also have to tie in the network communications systems. And so we start with this notion of integration, but how do we also—if you are going to add those five different components together, how do you make sure that you are continuing to lighten the load? The goal for the entire system is to make it 10 percent to 15 percent less weight than what the soldier carries today even with adding those capabilities.

But the last piece I would like to talk about is the eye protection. So one of the more impressive things that they are doing is building transitional eyewear that allows a soldier to move from a dark environment into the light and back and forth without the disorientation that occurs because of that change in environment while adding about 10 percent more fragmentation blast protection.

And so it is all of those components that make this system and soldier protection so important. So the additional funding helps to get us there sooner.

General MURRAY. Yes. I would just add that as a soldier that has carried two pairs of glasses for the last 15 years, been in—I was going to say that doesn't sound like much, but that is a huge deal to not have to worry about transitioning, physical transitioning eye protection. The actual lenses do it for you.

Ms. TSONGAS. I have seen some of the plastics engineering that is going into that lens and it is pretty remarkable. And I am curious how the Marine Corps is working with—are you working across services? Are you part of this process?

General SHRADER. Yes, ma'am. We are. And so I can tell you I have been working body armor systems, protective systems for the last 10 years within the Marine Corps Systems Command, and on a number of systems collaborating with the Army. For example, the enhanced combat helmet that we developed and now we are in the final stages of fielding the first 77,000 of those. We worked with the Army on that, and they are also fielding that helmet. So we are working with them.

We have formal forums that we meet quarterly with the Army and then informally. My program offices and their program offices probably a weekly basis if not more, and then monthly also. So yes, ma'am, we are working with them.

Ms. TSONGAS. I don't want to keep you all, but I would encourage you, and I assume you are thinking about different climates because it is not only weight. I don't know what the temperature issues will be. And that you will also be mindful of women making their way, ever more women making their way into serving and to not leave that to an afterthought.

Thank you all.

Mr. TURNER. Thank you. We appreciate your presentations today, and we will be adjourned.

[Whereupon, at 2:14 p.m., the subcommittee was adjourned.]

A P P E N D I X

MARCH 2, 2016

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MARCH 2, 2016

Statement of the Honorable Michael Turner
Chairman, Subcommittee on Tactical Air and Land Forces
Ground Force Modernization Programs
March 2, 2016

The hearing will come to order.

The Subcommittee convenes to review the current posture of ground force modernization programs and receive testimony on the Fiscal Year 2017 Budget Request.

I am pleased to welcome our distinguished panel of witnesses:

- Lieutenant General Michael E. Williamson, Military Deputy to the Assistant Secretary of the Army (Acquisition, Logistics and Technology),
- Lieutenant General John M. Murray, Deputy Chief of Staff, G-8
- Lieutenant General Robert S. Walsh, Commanding General, Marine Corps Combat Development Command, and Deputy Commandant, Combat Development and Integration,
- Brigadier General Joseph Shrader, Commanding General, Marine Corps Systems Command, and
- Mr. William E. Taylor, Program Executive Officer–Land Systems

Gentlemen thank you for being with us today, and thank you for your service.

Today the subcommittee will address a broad portfolio of ground force modernization programs and their associated acquisition strategies.

We expect to gain a better understanding of Army and Marine Corps modernization priorities in fiscal year (FY) 2017 and beyond, and also learn of the challenges they are facing in modernization as a result of the current budget environment.

The reality is the military is caught between rising obligations and shrinking budgets. Commitments for land forces have increased, and threats have worsened.

We know the Department's budget request of \$556.0 billion for base requirements reflects an \$18.0 billion funding shortfall.

The proposed budget request for fiscal year 2017 does NOT follow the Balanced Budget Agreement (BBA) of 2015.

As a result this budget request cuts force structure and modernization programs from the Department's base programs.

This committee is working to restore this critically needed funding.

With regards to Army ground force modernization the Army's budget overview states that their current modernization program for fiscal year 2017... "slows the pace of

near term development and accepts risk in reduced operational overmatch in the mid-term.”

Similar to the Army, the Marine Corps has continued to assume risk in ground force modernization in order to fund near term readiness priorities, essentially robbing Peter to pay Paul.

We’ve heard senior civilian and military leaders testify that near-peer adversaries are “closing the gap” in capabilities and technology.

In an increasingly dangerous world I’m concerned that the tradeoffs and funding reductions being made in modernization are going to have significant consequences to military capability.

It is critically important that we sustain our ground forces and meet contingency operations requirements through robust modernization so that we can provide our next President with viable strategic options.

We either make smart, targeted investments now, or pay for that failure down the road.

I would now like to recognize my good friend from Massachusetts who is filling in for the Ranking Member of the Subcommittee, Ms. Niki Tsongas for any comments she would like to make.

Hon. Niki Tsongas
Subcommittee on Tactical Air and Land Forces
Ground Force Modernization Programs
March 2, 2016

Thank you, Mr. Chairman, and good afternoon. Welcome to our witnesses and thank you for taking the time to speak with us about these important issues.

While this part of the budget request doesn't have the large, big ticket-price items (such as major aircraft or ship programs) that draw the most attention, it is in many ways the most important part of the budget when it comes to providing for the protection of the men and women we send into harm's way.

And as many of us on this subcommittee are well aware, the men and women of the Army and Marine Corps are being asked to do more with less against an array of ever-changing and complex adversaries.

In the face of these challenges, the Department of Defense and Congress cannot lose sight of the need to continuously improve the equipment that protects our service-members when we send them into harm's way.

Additionally, the Department and the military services must continue to prioritize the testing and fielding of equipment specifically designed for female servicemembers as women continue to fill more and more combat roles. This historic decision deserves a commitment to ensure that women on the frontlines are prepared and equipped to serve in combat. And it has been my experience that absent oversight from Congress, the services neglect to design and field equipment with specific requirements for women.

Thank you and I look forward to hearing from each of the witnesses.

RECORD VERSION

STATEMENT BY

**LIEUTENANT GENERAL MICHAEL E. WILLIAMSON
PRINCIPAL MILITARY DEPUTY TO THE ASSISTANT SECRETARY OF THE ARMY
FOR ACQUISITION, LOGISTICS AND TECHNOLOGY AND
DIRECTOR, ACQUISITION CAREER MANAGEMENT**

AND

**LIEUTENANT GENERAL JOHN M. MURRAY
DEPUTY CHIEF OF STAFF OF THE ARMY, G-8**

BEFORE THE

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

SECOND SESSION, 114TH CONGRESS

ON

FISCAL YEAR 2017 GROUND FORCE MODERNIZATION PROGRAMS

MARCH 2, 2016

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

Introduction

Chairman Turner, Ranking Member Sanchez, distinguished Members of the Subcommittee on Tactical Air and Land Forces, thank you for this opportunity to discuss the Fiscal Year 2017 (FY17) President's Budget request on Army Ground Force Modernization Programs.

In support of Joint operations to counter acts of aggression, combat terrorism, and defend the Homeland, the Army provides critical capabilities – command and control, communications, intelligence, logistics, and special operations. Effective Joint operations against any land threat will not be possible without ready Army ground combat forces and the supporting units that enable them. A properly sized, equipped, and ready Army makes it possible for the Joint Force to deploy in sufficient scale and duration to prevent conflict, shape security environments, and provide multiple options for resolving crises and winning decisively.

Over the past several years and into the near future, fiscal constraints and an unpredictable budget have caused the Army to reduce end strength and prioritize readiness at the expense of modernization programs. Despite these measures, the Army still requires equipment to fight, and modernized equipment to win in the future. Equipping is, and will continue to be, a critical component of readiness. An unintended consequence of our current fiscal constraints is that the Army can no longer afford to equip and sustain the force with the most modern equipment and, as a result, risks falling behind near-peers in critical areas. Instead, we are forced to selectively modernize equipment to counter our adversary's most significant technological advances.

Therefore, for FY17, the Army equipment modernization objective remains focused on maintaining technological overmatch in our combat formations to deter and defeat potential adversaries. We plan to achieve this by ensuring we have the proper mix of necessary capabilities enabled by a flexible and rapid acquisition process attained by

working with Congress. We are also exploring the activation of a rapid capabilities office to address the immediate and near-term equipping needs of our Warfighters through rapid Programs of Record. Currently, near-term capability gaps are mostly mitigated through incremental improvements to existing platforms and systems, while we make prudent investments in emerging and breakthrough technologies to address future gaps.

While the Army's modernization budget remains near historic lows, our modernization mission remains essential. We must always ensure our Soldiers have the right equipment, at the right time, and at the right place to accomplish the assigned mission.

On behalf of our Acting Secretary, the Honorable Patrick Murphy, and our Chief of Staff, General Mark Milley, we look forward to discussing with you the Army's FY17 modernization budget request.

Army Equipment Modernization Objectives

As the nation's principal land force, the Army deploys multiple, different formations to conduct complementary and expeditionary combined arms maneuver as part of the Joint Force and coalition forces.

As a result, Army leaders and units must react, decide, and act at the speed of information. Mission Command ensures the Army has a common understanding of the situation and mission with agile and expeditionary command posts supported by robust home station architecture, reliable cyber security, and connectivity with our Joint Force partners.

Other Services man equipment, the Army equips Soldiers. The Army ensures our Soldiers are provided with the equipment and capabilities they require to support broad Joint missions anywhere they are sent. When we do so, we empower these Soldiers and their squads with improved lethality, protection, and situational awareness.

Resourcing Army Modernization

Because of resource constraints, today's Army prioritizes readiness while assuming risk to modernization. The Army cannot equip and sustain the entire force with the most modern equipment. Still, it is the Army's responsibility to address current and emerging threats and to ensure every deployed Soldier is equipped to achieve decisive overmatch, regardless of the situation.

In FY17, the President's Budget request totals \$22.6 billion for the Army's Research, Development, and Acquisition (RDA) program, which includes \$15.1 billion for Procurement and \$7.5 billion for Research, Development, Test and Evaluation (RDT&E). In support of the Combat Vehicle Modernization Strategy, the Procurement request modernizes the Abrams fleet; prioritizes the Bradley Mods, Stryker (Double V-Hull and Lethality), Paladin Integrated Management, and the Joint Light Tactical Vehicle. The RDT&E request provides for key S&T investments in combat vehicle and automotive technologies, as well as high energy lasers. Major engineering and development efforts includes combat vehicles; air and missile defense; Assured Position, Navigation and Timing; and cyberspace operations.

Our RDA resources are focused on the following areas:

1. **Science and Technology (S&T).** Protected S&T funding ensures the next generation of breakthrough technologies can be rapidly applied to existing or new equipment designs. We are implementing a strategic approach to modernization that includes an awareness of existing and potential gaps; an understanding of emerging threats; knowledge of state-of-the-art commercial, academic, and Government research; and an understanding of competing needs for limited resources.
2. **New Systems.** The Army is making modest developmental investments based on critical operational requirements and capability shortfalls. Fiscal realities have led to the delay or discontinuance of new systems. Two key investments

that remain in the next generation of ground vehicle capabilities include the Armored Multi-Purpose Vehicle and the Joint Light Tactical Vehicle, a critical program for the Army and the U.S. Marine Corps.

3. **Modification/Modernization.** The Army must incrementally modify or modernize existing systems in order to increase capabilities and extend service life. In addition, the continuous improvement of existing systems helps to sustain the industrial base. In this area, we are focused on improving the Abrams, Bradley, and Stryker Families of Vehicles, as well as Paladin, Improved Turbine Engine Program, and the Guided Multiple Launch Rocket System Unitary.
4. **Reset and Sustain.** Returning Army equipment to the required level of combat capability remains central to both regenerating and maintaining equipment near-term readiness for contingencies.
5. **Divest.** The Army divestment process seeks to identify equipment and systems that are excess across the Total Army in order to reduce and eliminate associated sustainment costs. For example, we are divesting the aging M113 armored personnel carriers. Additionally, the Army's Mine Resistant Ambush Protected (MRAP) vehicles divestiture will eliminate a large portion of the fleet through Foreign Military Sales, distribution to other agencies, and demilitarization of older, battle-worn, excess vehicles.

FY17 Budget Priorities

The President's budget request for FY17 prioritizes the following five capability areas:

- **Aviation.** The Army continues to invest in Aviation to sustain fleet modernization and close key capability gaps in survivability and lethality.

- **Network.** The Army must maintain a robust Network that is protected against cyber-attacks to execute uninterrupted mission command. Key investments supporting the Network include:
 - *Warfighter Information Network-Tactical (WIN-T)* provides “networking-on-the-move” capability. WIN-T also provides Soldiers and leaders a mobile infrastructure that employs military and commercial satellite connectivity, and high capacity line-of-sight (terrestrial) connectivity. It extends the tactical wide area network throughout division, brigade, battalion, and company levels in the maneuver force. The WIN-T Increment 2 program is in Full Rate Production and fielding following a successful operational test and performing well in operations in theater.
 - *Assured Position, Navigation and Timing (A-PNT)* is a critical enabler for Army warfighting functions and virtually all Army weapon systems. Program Manager Positioning, Navigation and Timing (PM PNT) and Army S&T are developing technologies to provide Dismounted and Mounted Soldiers the capability to attain trusted PNT information while operating in conditions that impede or deny access to the Global Positioning System (GPS). These technologies include non-GPS augmentation for distributed Mounted and Dismounted PNT capabilities, pseudolite transceivers (an alternative source of GPS-like signals), and anti-jam capabilities. Both the Mounted and Dismounted efforts are structured to provide a hub capability, that distributes an A-PNT solution to vehicles and Soldier systems. In FY17, Army S&T will transition A-PNT technologies for Mounted and Dismounted application to PM PNT with the Program of Record Milestone B scheduled in mid-FY18.
 - *Communications Security* supports the implementation of the National Security Agency (NSA) developed Communications Security (COMSEC) technologies into the Army by providing COMSEC systems capabilities

through development and integration of encryption, trusted software, and/or standard operating procedures into specified systems in support of securing Army and Department of Defense Networks and capabilities.

- *Offensive Cyber Operations (OCO) and Defensive Cyber Operations (DCO)* allow the Army to protect its networks and project force in cyberspace. The Army has positioned itself with U.S. Army Cyber Command (ARCYBER) and the Cyber Center of Excellence to provide capabilities in both mission areas and will continue to do so. In the area of DCO, the Army will continue to invest in infrastructure and tools to set conditions for increased defensive capabilities. We are in the initial stages for fielding capability and FY17 will be critical in further development.
- *Cyber Situational Awareness* is integral to OCO, DCO, and Department of Defense Information Network operations that support commanders in the conduct of unified land operations. These capabilities range from system status to mission and threat awareness to targeting and engagement data to influence cyber and electromagnetic effects. We are currently working with the Cyber Center of Excellence and ARCYBER to address these requirements.
- **Integrated Air Missile Defense.** The Army must be able to defeat a large portfolio of threats ranging from micro unmanned aerial vehicles and mortars, to cruise missiles and sophisticated short and medium range ballistic missiles. The Army will support this priority by investing in an Integrated Air and Missile Defense Battle Command System, an Indirect Fire Protection Capability, and modernization of the Patriot system.
- **Combat Vehicles.** The Army fixes gaps in its tactical formations by improvements in combat vehicles to increase mobility, protection, and lethality. Key areas of investment are:

- *Ground Mobility Vehicle (GMV)* will be procured as a Commercial/Government Off-the-Shelf (C/GOTS) solution to address a significant mobility gap in the Infantry Brigade Combat Teams (IBCT). The Army's current analysis of alternatives for GMV is expected to be complete in mid-FY16 and inform the acquisition of a commercial, non-developmental solution beginning in FY17.
- *Stryker Lethality Upgrades* address capability gaps resulting from more than 12 years of combat through an incremental Engineering Change Proposal (ECP) strategy currently focused on increasing mobility, electrical power, and the need to accept future network upgrades. Efforts also include upgrades to increase the lethality of the Stryker Family of Vehicles and Double V-Hull upgrades to increase vehicle protection. The Army plans to increase lethality by having half of the Infantry Carrier Vehicles equipped with a 30 mm cannon and the other half equipped with a Javelin missile on the existing Remote Weapons Station in each brigade. The Army plans to increase protection by upgrading Stryker vehicles to a Double-V Hull (DVH) architecture. DVH production utilizes an exchange process, removing select components and mission equipment packages from flat bottom Strykers and installing them into a new DVH.
- *Mobile Protected Firepower* will provide protected, long-range, direct fire capabilities to the Infantry Brigade Combat Team (IBCT) to defeat enemy prepared positions, destroy enemy armored vehicles, close with the enemy through fire and maneuver, and ensure freedom of maneuver and action in close contact with the enemy. The Army plans to conduct the Mobile Protected Firepower Analysis of Alternative in FY17 to assess the operational effectiveness, suitability and life-cycle cost of both

developmental and non-development materiel solutions that satisfy requirements contained within the Initial Capabilities Document.

- *Armored Multi-Purpose Vehicle* will replace the legacy M113s at the brigade level and below to support the Armored Brigade Combat Team and will consist of five mission roles: General Purpose, Mortar Carrier, Mission Command, Medical Evacuation, and Medical Treatment variants. The Engineering and Manufacturing Development contract was awarded in December 2014, and we anticipate the first prototype delivery vehicle in December 2016.
- **Emerging Threats.** As mentioned earlier, the Army invests in S&T to focus on critical capability gaps and allow our Soldiers to operate in contested environments and win decisively against any potential adversary. There are several areas of Army S&T investment, including the Modular Active Protection System program to increase vehicle survivability and protection against current and emerging advanced threats, Electronic Warfare efforts focused on designing countermeasures to address threats against Army rotorcraft, ground mounted platforms and dismounted Soldiers, and the Combat Vehicle Prototyping program to mature technologies that address technical and integration challenges facing our ground combat fleets. Other areas to help ensure that our Soldiers are protected against emerging threats include Degraded Visual Environment Mitigation to inform leadership on improvements to platform survivability; Red Teaming and Vulnerability Analysis to know our weaknesses and fix them; and sensor protection to ensure more consistent situational awareness.

Other Major Programs for FY17

The Army is constantly working to reduce the weight and improve the performance of the Soldier's *individual equipment*. Currently, we are researching improved ways to help redistribute the weight carried by Soldiers so they can carry their load with less

stress on their backs or knees. Plans include the development of new rucksacks and other equipment so Soldiers can more comfortably carry their supplies, ammunition, and equipment. Research is also taking place on a new load-bearing system. Every effort undergoes extensive user evaluations by Soldiers throughout the development process. The Army is also working to reduce the weight of the clothing and equipment Soldiers carry by developing lighter body armor, helmets, and other equipment while addressing a wide-range of threats to our Soldiers, including ballistics, blast overpressure, concealment, fragmentation, and heat.

In addition to the above efforts, the Army's Soldier Protection System (SPS) is an integrated personal protection system that integrates head, torso, and extremity protection. It maintains current standards of personal protection but with lighter weight than current systems. It is also scalable, allowing Soldiers to increase the level of protection or reduce weight depending upon mission requirements. SPS consists of five major subcomponents: (1) the Integrated Head Protection System is a new helmet concept which allows the Soldier to add additional protection, such as an additional layer of armor or facial protection, depending upon mission requirements; (2) Transitional Combat Eye Protection is eyewear that electronically either automatically or manually adjusts for darkness or light, which is critical when a Soldier exits a sunlit street into a darkened structure; (3) Torso Protection features a new combat vest with pelvic protection that provides modular levels of protection that can be scaled up or down depending on mission requirements; (4) Vital Torso Protection provides lighter weight hard armor plates; and (5) the Integrated Soldier Sensor System will provide sensor technology to record forces that affect the Soldier, as well as monitor the Soldier's health status. Other important initiatives include the Lightweight Advanced Combat Helmet, which provides the same levels of protection as the Advanced Combat Helmet but with less weight and the Enhanced Combat Helmet, which provides significantly better head protection without additional weight.

The Army is committed to providing Soldiers with the best intelligence tools and technology available. As we continue to refine and improve the current version of the *Distributed Common Ground System-Army* (DCGS-A), we are committed to a full and

open competition in FY16 to develop, test, and produce the next version of this intelligence software system. FY17 funding will provide for the fielding of enhanced Increment 1, Release 2 capabilities to the Force, which improves the tools currently used by Soldiers to analyze, process, and visualize the information on the battlefield, and support Increment 2 development and testing. DCGS-A Increment 2 will provide a modernized data management architecture that complies with the Common Operating Environment, the Intelligence Community Information Technology Enterprise, and the Joint Information Environment; the integration of emerging sensor and automation technology; and enhanced ease of use and analytic capabilities. Funding also provides for the procurement of DCGS-A Tactical Intelligence Ground Stations to equip activating Expeditionary Military Intelligence battalions in all components.

The *Joint Light Tactical Vehicle* (JLTV), a Joint program with the U.S. Marine Corps, is the centerpiece of the Army's Tactical Wheeled Vehicle modernization strategy and a key enabler of Joint Combined Arms operations. JLTV provides the necessary leap in protection, performance, and payload – the Iron Triangle – to fill the capability gap remaining between the High Mobility Multipurpose Wheeled Vehicle and the Mine Resistant Ambush Protected Family of Vehicles. The JLTV is in Low-Rate Initial Production.

The Army is working to ensure that system requirements are affordable and do not add excess technical risk to our acquisition programs. We have instituted processes known as *Knowledge Points* to identify necessary requirements trade-offs at key decision points. This process is mandatory across all major programs and is a critical factor in achieving a more effective, more affordable, and more responsive acquisition system. Knowledge Points enable the Army Chief of Staff to formally review system requirements throughout the development phase. In addition, the Army has instituted *affordability caps* on new programs when they start to make sure that we can sustainably afford the development and production costs. For example, we made certain that we could afford AMPV at the same time we were producing the Paladin Improvement Management howitzer and JLTV.

Conclusion

The generous support from Members of Congress for our efforts to strengthen the Army Acquisition Workforce, a critical component in the success of a well-equipped, ready force, is greatly appreciated. With more than 37,000 Army military and civilian acquisition professionals worldwide, this dedicated component of the Defense acquisition workforce is comprised of engineers, scientists, logisticians, contract specialists, testers, program managers, cost estimators, and many other acquisition career field specialties who effectively manage the Army RDA enterprise in a challenging budget environment. Army Acquisition Workforce professionals are the critical assets to the Army's ability to design, develop, and deliver capability to the Soldiers so they can dominate on the battlefield.

We are also grateful for your continued advice and support. These are challenging times. In the end, the security challenges of tomorrow will be met with the equipment we develop, modernize, and procure today. Because adversaries will continue to invest in technology to counter or evade U.S. strengths and exploit vulnerabilities, resource reductions and insufficient force modernization will place the Army's ability to overmatch its opponents at risk.

We can assure you that the Army's senior leaders are working hard to address current challenges and the needs of the Army now and in the future. We are doing so with affordability as our watchword as we endeavor to remain good stewards of our nation's resources while meeting the equipping needs of our Soldiers.

Mr. Chairman and distinguished Members of this Subcommittee, thank you for your steadfast and strong support of the outstanding men and women in uniform, our Army Civilians, and their Families.

LIEUTENANT GENERAL MICHAEL E. WILLIAMSON

Lt. Gen. Michael E. Williamson assumed his duties as the Principal Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA(ALT)) and Director of Acquisition Career Management on April 4, 2014.

Born in Tucson, Arizona, he was commissioned at the University of Maine as a Second Lieutenant in the Air Defense Artillery in 1983.

His earliest assignments include Chaparral Platoon Leader, Vulcan Platoon Leader, Maintenance Officer and Executive Officer in C Battery, 108th Brigade, Hahn Air Force Base, Germany. After attending the Air Defense Artillery Advanced Course, he commanded B Battery, 3/1 ADA (Hawk) in the 11th Brigade at Fort Bliss, Texas and B Battery, 3/1 ADA BN, 31st ADA BDE at Ft. Hood, Texas. His acquisition experience began as Senior Military Software Analyst at NATO's military headquarters in Mons, Belgium. After attending Command and General Staff College, Lt. Gen. Williamson served as the Chief of Information Technology, Acquisition Career Management, within the Office of the ASA(ALT). As a Congressional Fellow he served as a legislative assistant on Capitol Hill. LTG Williamson has served as Product Manager for the Global Command and Control System-Army; the Acquisition Military Assistant to the Secretary of the Army; Commander of Software Engineering Center-Belvoir; Project Manager Network Systems Integration within Program Manager, Future Combat Systems (Brigade Combat Team); Director of Systems Integration within ASA(ALT); Deputy Program Executive Officer, Integration and Joint Program Executive Officer for the Joint Tactical Radio Systems. After serving as the Assistant Deputy for Acquisition and Systems Management, Lt. Gen. Williamson was selected to be the Assistant Military Deputy to the ASA(ALT). His most recent assignment was as the Deputy Commanding General, Combined Security Transition Command-Afghanistan.

Lt. Gen. Williamson's awards and decorations include the Defense Superior Service Medal, the Legion of Merit with three Oak Leaf Clusters, the Bronze Star Medal, the Meritorious Service Medal with two Oak Leaf Clusters, the Joint Service Commendation Medal, the Army Commendation Medal with two Oak Leaf Clusters, the Joint Service Achievement Medal, the Army Achievement Medal with two Oak Leaf Clusters, and the Army Staff Identification Badge.

Lt. Gen. Williamson's education includes a Bachelor of Science from Husson College in Business Administration, a Master of Science in Material Acquisition Management from the Naval Postgraduate School and a PhD in Business Administration from Madison University. He also has graduate certificates in Public Policy from the JFK School of Government at Harvard University and the Government Affairs Institute at Georgetown University. He is a graduate of the Army Command and General Staff College, the Advanced Management Program at the Harvard Business School and was a Senior Service College Fellow at the University of Texas at Austin. Lt. Gen. Williamson is Level III certified in Program Management and Information Technology.

Lieutenant General John M. Murray
Deputy Chief of Staff, G-8

Lieutenant General Murray was commissioned as an Infantry officer in the U.S. Army upon graduation from the Ohio State University in 1982. Throughout his career, Lieutenant General Murray has served in leadership positions and commanded from Company through Division, with various staff assignments at the highest levels of the Army.

Lieutenant General Murray has held numerous command positions. His command assignments include: Commanding General Joint Task Force-3; Deputy Commanding General–Support for U.S. Forces Afghanistan; Commander Bagram Airfield; Commanding General 3rd Infantry Division at Fort Stewart, Georgia; Commander, 3rd Brigade, 1st Cavalry Division, at Fort Hood, Texas while serving in Operation IRAQI FREEDOM; Commander, 1st Battalion, 18th Infantry, 1st Infantry Division, United States Army Europe and Seventh Army, Germany; Commander, C Company, 1-12th Infantry Battalion, 4th Infantry Division (Mechanized), Fort Carson, Colorado.

Previously, he was the Director, Force Management, the Pentagon; Assistant Deputy Director for Joint Training, J-7, Joint Staff, Suffolk, Virginia; Director, Joint Center for Operational Analysis, United States Joint Forces Command, Suffolk, Virginia; Deputy Commanding General (Maneuver), 1st Cavalry Division, Fort Hood, Texas; Deputy Commanding General (Maneuver), Multi-National Division-Baghdad OPERATION IRAQI FREEDOM, Iraq; G-3 (Operations), III Corps, Fort Hood, Texas; Chief of Staff, III Corps and Fort Hood, Fort Hood, Texas; C-3, Multi-National Corps-Iraq, OPERATION IRAQI FREEDOM, Iraq; G-3 (Operations), 1st Infantry Division, United States Army Europe and Seventh Army, Germany; Chief, Space Control Protection Section, J-33, United States Space Command, Peterson Air Force Base, Colorado; S-3 (Operations), later Executive Officer, 1st Battalion, 5th Cavalry, 1st Cavalry Division, Fort Hood, Texas; Chief, Plans, G-1, III Corps and Fort Hood, Fort Hood, Texas.

Lieutenant General Murray's awards and decorations include: the Distinguished Service Medal w/ Oak Leaf Cluster, the Defense Superior Service Medal with Oak Leaf Cluster, the Legion of Merit with two Oak Leaf Clusters, the Bronze Star Medal with three Oak Leaf Clusters, the Defense Meritorious Service Medal, the Meritorious Service Medal with two Oak Leaf Clusters, the Army Commendation Medal with Oak Leaf Cluster, the Joint Service Achievement Medal, the Army Achievement Medal with Oak Leaf Cluster, the Ranger Tab, the Combat Infantryman Badge, the Expert Infantryman Badge, the Parachutist Badge, the Air Assault Badge, the Joint Chiefs of Staff Identification Badge and the Army Staff Identification Badge.

Lieutenant General Murray hails from Kenton, Ohio. He and his wife, Jane, have three lovely daughters and seven grandchildren.

NOT FOR PUBLICATION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE
TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

STATEMENT OF
LIEUTENANT GENERAL ROBERT WALSH
DEPUTY COMMANDANT FOR COMBAT DEVELOPMENT AND INTEGRATION

AND

BRIGADIER GENERAL JOSEPH SHRADER
COMMANDER, MARINE CORPS SYSTEMS COMMAND

AND

MR. WILLIAM TAYLOR
PROGRAM EXECUTIVE OFFICER, MARINE CORPS LAND SYSTEMS

BEFORE THE
TACTICAL AIR AND LAND FORCES SUBCOMMITTEE
OF THE
HOUSE ARMED SERVICES COMMITTEE

ON

MARINE CORPS GROUND FORCES MODERNIZATION
MODERNIZATION PROGRAMS

March 2, 2016

NOT FOR PUBLICATION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE
TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

INTRODUCTION

Mr. Chairman, Ranking Member Sanchez, and distinguished members of the Subcommittee, we thank you for the opportunity to appear before you today to discuss the Marine Corps Ground Force Modernization. Our testimony will provide background and rationale for the Marine Corps' Fiscal Year 2017 budget request aligning to our strategic priorities and budgetary goals.

The United States is a maritime nation with global responsibilities. Our Navy and Marine Corps persistent presence and multi-mission capability represent U.S. power projection across the global commons. We seek to move at will across the world's oceans, seas and littorals, and extend the effects of the sea-base deep inland. We enable global reach and access, regardless of changing circumstances, and will continue to be the nation's preeminent solution for employing deterrence through global presence, sea control, mission flexibility and when necessary, interdiction. We are an agile strike and amphibious power projection force in readiness, and such agility requires that our Naval expeditionary forces remain strong.

The Marine Corps is the Nation's expeditionary force-in-readiness. By congressional mandate, it has a unique role and structure as a "...balanced force-in-readiness, air and ground." This mandate results in the requirement for the Marine Corps to maintain a high state of combat readiness to be "most ready, when the Nation is least ready."

The Marine Corps executed over 100 operations, 20 amphibious operations, 140 Theater Security Cooperation (TSC) events, and participated in 160 exercises during calendar year 2015. Marine Corps units deployed to every Geographic Combatant Command (GCC) and executed numerous TSC exercises to help strengthen relationships with allies and build partner capacity. In Syria and Iraq, Marine squadrons continued over 1,275 total sorties and 325 strikes in support of Operation Inherent Resolve (OIR). 300 Marines from Special Purpose Marine Air Ground Task Force – Crisis Response – Central Command (SPMAGTF –CR-CC) and Advise and Assist (AA) teams advised and enabled the Iraqi Army. SPMAGTF-CR-AF incident response force (IRF) maintained various alert postures from NASSIG, Italy, Souda Bay, Greece, and Moron Air Base, Spain during multiple iterations of SOCAF operations, and provided fixed site security forces to US embassy Bangui, Central African Republic, to assist in the reopening of the embassy. In addition, SECFOR provided security at Diplomatic Transit Facility, Sana'a, Yemen and AMEMB Yemen.

Marine Expeditionary Units (MEU) provided support to the U.S. Embassy Sana'a, Yemen to safeguard American civilians and facilities including facilitating the evacuation of the Embassy in February and March. The 31st MEU also deployed to Saipan to provide Defense Support to Civil Authorities (DSCA) as Typhoon Soudelor passed through the Commonwealth of the Northern Marianas killing 30 and displacing 150,000 people. The 15th MEU and III MEF supported POTUS's travel in Kenya, Ethiopia, and Malaysia. Additionally, the 15th MEU provided support to SOCCENT by offloading air combat assets into Djibouti to make room on

the USS ANCHORAGE to provide an Afloat Forward Staging Base (AFSB) capability in support of SOF taskings in the region.

Marine Security Augmentation Units (MSAU) teams deployed 33 times in 2015 at the request of the State Department executing 12 Embassy/Consulate security missions and 21 VIP (POTUS/VPOTUS/SECSTATE) security missions. MSAU Marines deployed to Iraq, Burundi, South Sudan, Belgium, Egypt, Philippines, Kenya, Ethiopia, Turkey, Uruguay, Canada, Tajikistan, Chile, Switzerland, Jamaica, Panama, Sri Lanka, Germany, Jordan, Kyrgyzstan, France, Burkina Faso and Ukraine. Additionally, Joint Task Force-505 (JTF-505) was activated in response to a magnitude 7.8 earthquake in Nepal in April 2015 that killed over 8,000 people and injured more than 21,000. JTF-505 Forward assumed command of all DOD assets in support of Foreign Disaster Relief operations in Nepal and delivered about 114 tons of emergency relief supplies, transported 534 personnel and conducted 63 casualty evacuations.

Marines must be ready to respond anywhere in the world, at any time, with the full spectrum of expeditionary capabilities across a range of operations, to include, crisis response, disaster relief, or armed conflict. Consequently, we man, train, and equip our force and prioritize resources for readiness. As one of the five pillars of readiness, equipment modernization is a critical factor in our ability to support our capability requirements. But under current fiscal constraints, we have prioritized near-term readiness while assuming risk in other areas, including equipment modernization. The support of this committee is greatly appreciated in relieving this budgetary pressure.

We are committed to delivering required warfighting capabilities to Marines in a timely and affordable manner. Continued funding shortfalls in our investments will force reliance on aging equipment and diminish our technical advantage over our adversaries. The continuing need to maintain and update legacy systems takes the focus off innovation and is costly in its own right. Experience tells us that investing in new capabilities and technologies is a proven cornerstone for your Marines and Sailors to achieve mission success today and into an uncertain, but no less demanding future.

Additionally, as we face risks to our investments, we also see an adverse impact on the industrial base placing at risk our future modernization efforts. Working as a team, and with your support, we can prevail over these challenges on behalf of our service men and women and our Nation's readiness.

A fundamental strength we have working for us is the close partnership between Navy and Marine Corps. Naval integration is a critical factor in our mission performance. The Marine Corps also works closely with the Army, other Services, and industry to provide the most effective and affordable capabilities to your Marines and Sailors. The Marine Corps and the Army have worked together on programs such as the Joint Light Tactical Vehicle (JLTV), the Enhanced Combat Helmet and the Modular Scalable Vest. To improve our collaborative

relationship, this year we are resuming use of the Army Marine Corps Board, with regularly scheduled meetings at the 3-star level, to identify, develop, review, and resolve issues with concepts, capabilities, service approved requirements and programs.

Ground force modernization is focused on high-priority programs such as the Amphibious Combat Vehicle (ACV) 1.1, Amphibious Assault Vehicle (AAV) survivability upgrades, Ground/Air Task Oriented Radar (G/ATOR), and Joint Light Tactical Vehicle (JLTV).

Ground Combat and Tactical Vehicles (GCTV)

The overarching priority within the GCTV portfolio is the replacement of the legacy Amphibious Assault Vehicle (AAV) with modern armored personnel carriers through a combination of complementary systems. The ACV program is the Marine Corps highest ground modernization priority and will use an incremental approach that consists of two Phases: ACV Phase 1 Increment 1 (ACV 1.1) and ACV Phase 1 Increment 2 (ACV 1.2). Phase 1 Increment 1 will field a personnel carrier while Increment 2 will deliver improved personnel carrier capabilities, a command and control variant, and a recovery variant. Phase 2 will examine High Water Speed.

The second highest priority within the portfolio remains the replacement of a portion of the high mobility multi-purpose wheeled vehicle (HMMWV) fleet that is most at risk; those vehicles that perform a combat function and are typically exposed to enemy fires. In partnership with the Army, the Marine Corps has sequenced the JLTV procurement so as to ensure affordability of the entire GCTV portfolio while replacing one third of the legacy HMMWV fleet with modern tactical vehicles.

Amphibious Combat Vehicle (ACV) 1.1

The Fiscal Year 2017 President's Budget requests \$158.7 million in RDT&E for ACV 1.1. The Marine Corps appreciates the support of the Congress and this Committee in the restructuring of the ACV program in the Fiscal Year 2015 defense authorization. The Marine Requirements Oversight Council (MROC) approved ACV 1.1 on March 6th, 2015, Milestone B was certified on November 17th, 2015, and a two Competitive Contract were awarded to industry on November 24th 2015. Those vendors are scheduled to deliver 16 prototype vehicles each in FY2017. The ACV 1.1 program successfully leveraged technology demonstrations and competitive prototyping to create a set of realistic requirements that are achievable with a non-developmental vehicle. Market research and extensive discussions with industry confirmed that requirements could be met with low-risk, affordable solutions. The use of demonstrated mature technologies and stable requirements reduced technical risk and allowed foregoing the Technology Maturation and Risk Reduction (TMRR) phase, accelerating Initial Operational Capability (IOC). The condensed Engineering and Manufacturing Development (EMD) phase will focus on manufacturing and testing rather than system design. An acquisition strategy that included affordability constraints and competition through to Low Rate Initial Production (LRIP) will continue to ensure affordability. We have developed a program to field a capability to our

Marines in (6) years. The Acquisition Objective (AO) for ACV 1.1 is 204 vehicles. This AO provides lift for two infantry battalions and is planned to achieve Initial Operational Capability (IOC) in Fiscal Year 2020. This aggressive schedule for ACV 1.1 requires full funding and the continued support of this Committee and Congress.

The Marine Corps is also investing in the exploration of a range of high water speed technology approaches to provide for an affordable, phased modernization of legacy capability to enable extended range littoral maneuver. These efforts will develop the knowledge necessary to reach an informed decision point in the mid-2020s on the feasibility, affordability, and options for developing a high water speed capability for maneuver from ship-to-shore.

Amphibious Assault Vehicle (AAV) Survivability Upgrade (SU)

The Fiscal Year 2017 President's Budget requests \$38 million for RDT&E and \$74 million for PMC for the AAV program. To restore much needed survivability and mobility to the current AAVs, approximately one third of that fleet will undergo a survivability upgrade. The AAV Survivability Upgrade (SU) improves AAV capability in order to support Marine Expeditionary Unit (MEU) deployments, and when globally sourced, provide the essential capacity necessary for the assault echelons of two Marine Expeditionary Brigades. The combination of a modern amphibious armored personnel carrier alongside the improved AAV generates a complementary set of capabilities to meet general support lift capability and capacity requirements of our Ground Combat Element.

Joint Light Tactical Vehicle (JLTV)

The Fiscal Year 2017 President's Budget requests \$23 million in RDT&E and \$113 million in PMC for the Marine Corps portion of the JLTV program. The Department remains firmly partnered with the U.S. Army in fielding a JLTV that meets requirements of both services while remaining affordable. The JLTV program strives to control ownership costs by maximizing commonality, increasing reliability over the legacy HMMWV fleet, improving fuel efficiency, and achieving additional reduced costs through effective competition in all phases of program execution. The program completed the EMD phase in November 2014. The program received a Milestone C decision on August 25th 2015 and the LRIP contract was awarded to Oshkosh Defense. The remaining acquisition objective of 5,500 will be procured in the first increment. Our ultimate goal is to replace our entire HMMWV fleet through multiple purchase increments in the out-years.

Ground Force Command and Control (C2)

The ability to coordinate and synchronize distributed Command and Control (C2) sensors and systems is critical to the success ashore of the MAGTF. Modernization priorities in this area are the Ground/Air Task Oriented Radar (G/ATOR), the Common Aviation Command and Control System (CAC2S), and Networking on the Move (NOTM). These systems will provide modern-

day, interoperable technologies that support real-time surveillance, detection, targeting and force protection, in addition to the common C2 suite required to enable the effective employment and situational awareness of the MAGTF.

Ground/Air Task Oriented Radar (G/ATOR)

The Fiscal Year 2017 President's Budget requests \$84 million in RDT&E and \$135 million in PMC for the G/ATOR program. G/ATOR is the Marine Corps short and medium range multi-role radar designed to detect aircraft, unmanned aerial systems, cruise missiles, air breathing targets, rockets, artillery and mortars. G/ATOR Block 1 provides air defense and air surveillance capability, and achieved Milestone C in 2014. Block 2 is in the EMD phase and will provide counter-battery and target acquisition capability. RDT&E funding resources Block 2 development. PMC funding resources procure three LRIP assets. This program is critical to replacing radars that have exceeded their expected life cycle and technological relevance and we appreciate the continued support of the committee in furthering the capability.

Common Aviation Command and Control System (CAC2S)

The Fiscal Year 2017 President's Budget requests \$12 million in RDT&E and \$47 million in PMC for CAC2S. CAC2S Increment 1 is a modernization effort to replace existing Marine Air Command and Control System (MACCS) equipment. Increment 1/Phase 1 successfully fielded a product baseline Processing and Display Subsystem (PDS) and Communications Subsystem (CS) during 4th Quarter Fiscal Year 2013. Increment 1/Phase 2, covers the integration of sensor capabilities with the PDS and addresses the remaining Air Combat Element (ACE) Battle Management and C2 requirements through integrating the Air Command and Control Subsystem.

Phase 2 completed a successful Milestone C in February 2015. Funding in this budget supports the assembly and Initial Operational Test and Evaluation (IOT&E) of the first four Limited Deployment Units and the required government furnished equipment. IOT&E is scheduled for Fiscal Year 2016. Phase 2 completion will result in the delivery of the full CAC2S Increment 1 capabilities and is planned to begin fielding in Fiscal Year 2017. The approved AO is 50 systems.

Networking on the Move (NOTM)

The Fiscal Year 2017 President's Budget requests \$9 million in RDT&E and \$37M in PMC for the NOTM program. NOTM provides the MAGTF with a robust, over-the-horizon/beyond line-of-sight digital command and control capability while on-the-move and at-the-halt. RDT&E funding resources the development of a NOTM Airborne variant for MV-22 and KC-130J systems in support of the SPMAGTF-Crisis Response forces, and the development of a NOTM Internally Transportable Vehicle (ITV) variant on a vehicle internally transportable in a MV-22.

PMC funding is focused on production of the current NOTM Ground Combat Vehicle (GCV) variant towards its Approved Acquisition Objective (AAO).

Small Arms Modernization

Informed by operational lessons, technological maturity, industrial capabilities, and guided by concepts and initiatives such as Expeditionary Force 21 and Marine Expeditionary Rifle Squad, the Marine Corps is aligned with the Joint strategy for weapons modernization to improve accuracy, lethality and mobility. Initially prioritizing selective modernization and sustainment of critical legacy capabilities, longer-term goals will capitalize on technological advances to deliver modern replacements for critical weapon systems. Our end state is to develop improved lethality while also improving the mobility of the individual marine, the Marine Rifle Squad, and the MAGTF.

In the near term, we will selectively modernize systems and conduct a prioritized sustainment of legacy capabilities. For example, an adjustable stock of the M16A4 has been fielded in limited quantities while Commanders have been authorized to procure and modify rifles as necessary to improve the ergonomics of the rifle. In 3rd Quarter FY16 we will achieve IOC on the quick change barrel for our M2A1 heavy machine gun, an improved capability, common to all the services. We are realigning our M4 inventory to provide our infantry battalions with our most capable service rifle. We anticipate completion in 3rd Quarter FY16. Finally, the Marine Corps will participate in the Army's Precision Sniper Rifle (PSR) program in addition to fielding the M40A6 Sniper Rifle, ensuring accurate and lethal fires for our Scout Sniper community.

In the long term, we will look to make larger gains in capability through pursuit of next generation weapons with the other services. This includes working with the Army to explore the Modular Handgun System to develop a pistol that feature increased accuracy, improved ergonomics, and a higher degree of reliability/durability over legacy systems. We will also evaluate the next generation of infantry squad weapons by taking a holistic approach to integrating technological and materiel advancements for small arms to improve accuracy and increase lethality out to 600m.

Family of Ballistic Protective Systems (BPS)

Coupled with our infantry weapons systems, we seek to improve the protection and lethality of our Marines through BPS. BPS provides technologically advanced ballistic protection at the lightest possible weight. It provides the critical ballistic protective systems to save lives, reduce the severity of combat injuries, and increase combat effectiveness by keeping more Marines in the fight. Major BPS programs include: Plate Carrier (PC); Improved Modular Tactical Vest (IMTV); Enhanced Small Arms Protective Inserts (ESAPI); Enhanced Combat Helmet (ECH); Improved Ballistic Eyewear (IBE); and hearing protection. As in small arms, we are actively working with the Army to develop improved protection systems that maximize mobility while providing the requisite protection through the active sharing of novel designs and materials. A key component of all of the BPS programs is that as new threats emerge on the battlefield, BPS equipment will be ready to adapt and meet these new threats. This initiative

supports this requisite adaptability as well as sustaining currently fielded protection. Continued Congressional support is critical to enable this capability.

CONCLUSION

The Marine Corps continues to improve our essential ground capabilities through a strategy that is stable and affordable. We recognize the need for continued vigilance in achievement of a proper balance between current readiness and the long-term imperatives of modernization and innovation. This balance is critical to ensuring the Marine Corps and the individual Marine has the capability to fight and win future battles while being prepared to respond today as our Nation's force in readiness. Mr. Chairman, and distinguished committee members, on behalf of your Marines, we request your continued support for our modernization strategy.

Lieutenant General Robert S. Walsh
Commanding General, Marine Corps Combat Development Command, and
Deputy Commandant, Combat Development and Integration

Lieutenant General Walsh was commissioned a Second Lieutenant from the United States Naval Academy in May 1979. After completing The Basic School he was assigned as an infantry platoon commander in 1st Battalion, 7th Marines. He reported to Pensacola, FL for flight training and was designated a Naval Aviator in October 1981. Upon completion of an assignment to VT-26 as a Selectively Retained Graduate and the F-4 training syllabus he was ordered to VMFA-115 at Marine Corps Air Station Beaufort, SC in November 1983.

While in VMFA-115 he transitioned to the F/A-18 Hornet, attended the U.S. Navy Fighter Weapons School, and made two deployments before assuming duties as a flight instructor at TOPGUN in 1987. He returned to MCAS Beaufort in January 1990 and was assigned to VMFA-251, making two WSTPAC deployments, and was selected as the 1st Marine Aircraft Wing Aviator of the Year.

In July 1993, he reported to the 9th Marine Regiment as the Air Officer. He attended the Air Command and Staff College at Maxwell AFB before reporting to Headquarters, U.S. European Command, Stuttgart, Germany in 1995 where he served in the Plans and Policy Directorate. In 1998, he returned to MCAS Beaufort for a third tour in Marine Aircraft Group 31 where he served as the Commanding Officer of VMFA-115 and deployed to both the European and Western Pacific Theaters.

He graduated from the National War College in Washington D.C. in June 2002 with a Masters of Science in National Security Strategy. From there he reported to Headquarters, U.S. Marine Corps, where he served in the Aviation Department. After his Branch head tour, Lieutenant General Walsh returned to MCAS Beaufort as the Commanding Officer of Marine Aircraft Group 31 from June 2004 to May 2006.

Following command, he returned to Headquarters, U.S. Marine Corps, as the Assistant Deputy Commandant for Aviation. In May 2008, Lieutenant General Walsh became the Commanding General of the 2d Marine Aircraft Wing and deployed to Operation Iraqi Freedom 09 as the Commanding General of the 2d Marine Aircraft Wing (Forward). In August 2010 he assumed the duties as the Director of Operations, United States Northern Command. In June 2012 he became the Deputy Commanding General, Marine Corps Combat Development Command.

In July 2013, Lieutenant General Walsh assumed duties as Director, Expeditionary Warfare Division for the Chief of Naval Operations. In August 2015, Lieutenant General Walsh became the Commanding General, Marine Corps Combat Development Command; Commander, Marine Corps Forces Strategic Command, and the Deputy Commandant for Combat Development and Integration.

Brigadier General Joseph Shrader
 Commander, Marine Corps Systems Command

Brigadier General Joseph Shrader, a native of Princeton, West Virginia, enlisted in the Marine Corps in January 1981. He served for three years with 3rd Battalion, 5th Marines as an infantryman and was promoted to corporal. After his enlistment, he returned to West Virginia where he earned an associate degree in Mechanical Engineering Technology and a Bachelor of Science degree in Electrical Engineering Technology from Bluefield State College. He was commissioned a second lieutenant through the Platoon Leaders Course commissioning program in 1989.

Upon graduation from The Basic School, Brigadier General Shrader attended the Artillery Officer Basic Course in Fort Sill, Oklahoma, and then reported to 5th Battalion, 10th Marines (5/10). While assigned to 5/10, Brigadier General Shrader served as a Guns Platoon Commander, Battery Executive Officer and Battery Commander, and deployed to Southwest Asia during operations Desert Shield, Desert Storm and Provide Comfort.

Brigadier General Shrader reported in June 1993 to Marine Corps Recruit Depot, Parris Island, South Carolina, where he served as a recruit training company Series Commander, Company Executive Officer and Company Commander. He then attended the Field Artillery Advanced Officer Course in Fort Sill, and in August 1996, reported to the III Marine Expeditionary Force (III MEF), Okinawa, Japan. While there, he was promoted to Major and served as Assistant Operations Officer, 4th Marine Regiment, and Battalion Operations Officer and Battalion Executive Officer with 3rd Battalion, 12th Marines.

He then attended the Marine Corps Command and Staff College on Marine Corps Base Quantico, Virginia, where he earned a Master of Military Studies degree. In June 2001, he was transferred to Marine Corps Systems Command where he served as the Armor and Fire Support Targeting Team Lead. Upon promotion to Lieutenant Colonel, he was reassigned to serve as the Deputy Program Manager for the Expeditionary Fire Support System.

In July 2004, Brigadier General Shrader returned to III MEF where he served as 12th Marines Operations Officer and later that same year deployed to Sumatra, Indonesia, in support of Operation Unified Assistance. In May 2005, Brigadier General Shrader received orders to stand up 5th ANGLICO, III MEF. In early 2007, he deployed in support of Operation Iraqi Freedom. In October 2007, he relinquished command of 5th ANGLICO and was reassigned as the III MEF Force Fires Coordinator.

In August 2009, he was promoted to Colonel after graduating from the Industrial College of the Armed Forces at National Defense University in Washington, D.C. He was then designated primary military occupational specialty (8061) Acquisition Professional Officer and assigned to Marine Corps Systems Command. Over the next four years he served as Product Group Director for Combat Equipment and Support Systems, and Product Group Director and Program Manager for Armor and Fire Support Systems.

In May 2013, he transferred to the Office of the Deputy Assistant Secretary of the Navy for Expeditionary Programs and Logistics Management to serve as Chief of Staff. In July 2014, Brigadier General Shrader took the helm as Commander of Marine Corps Systems Command. In August 2014, he was frocked to Brigadier General.

William E. Taylor
 Program Executive Officer
 Land Systems Marine Corps

Mr. William E. Taylor currently serves as Program Executive Officer Land Systems Marine Corps (PEO LS), where he has been assigned since December 2008. He is the principal advisor to the Assistant Secretary of the Navy (Research Development & Acquisition) for the PEO portfolio of assigned major (ACAT I and II) Marine Corps Programs.

Mr. Taylor was appointed to the Senior Executive Service (SES) in December 2008.

Commissioned a second lieutenant in the United States Marine Corps in May 1979, he retired from active duty in September 2008 with the rank of Colonel after capping his 29-year career by establishing and serving as the first Program Executive Officer Land Systems.

While in uniform Mr. Taylor's extensive experience in acquisition management included assignments at every level within the Department of the Navy from program office IPT Leader to the staff of the Secretariat. His acquisition career is highlighted by distinguished service as NAVAIRSYSCOM's V-22 Joint Program Manager, leading the MV-22 Osprey Program from full-rate production to operational fielding. Prior to that, as H-46 Program Manager, he successfully forged a critical industry and government partnership, leading to the highly successful Engine Reliability Improvement Program. He also served in various capacities on the Assistant Secretary of the Navy for Research, Development & Acquisition staff, including a tour as the Marine Military Assistant.

A veteran Marine helicopter pilot with nearly 5000 flight hours, Mr. Taylor's operational experiences include combat operations in Beirut, Lebanon; missions in Cambodia in support of Joint Task Force Full Accounting; and presidential support as a Marine One Pilot assigned to Marine Helicopter Squadron One (HMX-1).

He holds a bachelor's degree from Rutgers University and a master's of science in defense systems acquisition management from the Naval Postgraduate School in Monterey, California.

Mr. Taylor's military decorations include the Defense Superior Service Medal in 2007, Legion of Merit with two gold stars in 2008, 2003 and 2002, Meritorious Service Medal in 1999, two Strike Flight Air Medals in 1983, Navy-Marine Corps Commendation Medal with gold star in 1987 and 1991 and Combat Action Ribbon in 1983.

Mr. Taylor is a member of the Senior Executive Association, the Marine Corps Association and the Marine Corps Aviation Association.

DOCUMENTS SUBMITTED FOR THE RECORD

MARCH 2, 2016



UNITED STATES MARINE CORPS
HEADQUARTERS UNITED STATES MARINE CORPS
3000 Marine Corps
WASHINGTON, DC 20350-3000

IN REPLY REFER TO:
5700
P&R

15-16-16

The Honorable Mac Thornberry
Chairman, Committee on Armed Services
House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

On behalf of the Nation's Force in Readiness, and at the request of Chairman McCain in his letter dated 10 February 2016, I am submitting a list of the Marine Corps' Unfunded Priorities for FY 2017. The items on this list reflect my best professional military judgment of the Marine Corps' shortfalls for the upcoming year and will provide the needed enhancements to current readiness and investment in future capabilities.

Over the last few years, we have protected the near-term operational readiness of our forward-deployed forces at the expense of investments in our non-deployed unit readiness, modernization and infrastructure. While the Marine Corps' FY 2017 President's Budget request continues to provide a ready force that is forward postured and capable across the range of military operations, this readiness comes with risk that is exacerbated by a diminished topline.

I believe this list, if funded, can begin to address these challenges. Included in this list are investments in facilities to slow the degradation resulting from chronic underfunding in this area; additional funds for theater security cooperation, joint bilateral and multilateral exercises to maintain readiness in support of Combatant Command objectives; funding for unit-level equipment maintenance shortfalls; procurement of needed communications and intelligence, surveillance, and reconnaissance equipment; and aviation construction projects associated with the delivery of the F-35 and other military construction projects to improve quality of life for our Marines. Coupled with the FY 2017 President's Budget request, these programs represent our anticipated requirement for the coming year and should not replace or in any way supersede the request.

A similar letter has been sent to Chairmen McCain, Frelinghuysen, Rogers, and Cochran. I thank you for your continued support for the Marine Corps and look forward to further dialogue to ensure that we remain the nation's Force in Readiness.

Very respectfully,

Robert B. Neller
General, U.S. Marine Corps
Commandant of the Marine Corps

Enclosure: (1) FY 2017 Marine Corps Unfunded Priority List

Copy to:

The Honorable Adam Smith
Ranking Minority Member

FY 2017
Marine Corps UPL
Prioritization as of 25 March 2016

| Tranche | CMC Rank | Cat | Title of UPL Submission | APPN | Total | | |
|---------|----------|---------|-------------------------|--|---------|---------|-----------|
| 1 | | 1 | Readiness | Exercise Program Shortfalls | OMMC | 58,000 | |
| | | 2 | Readiness | Maintenance Shortfalls | OMMC | 47,200 | |
| | | 3 | Readiness | Facilities Sustainment to 90% | OMMC | 121,387 | |
| | | 4 | Readiness | Facilities Sustainment to 90% | OMMCR | 4,075 | |
| | | 5 | MCN Miramar - JSF | Aircraft Maintenance Hangar MCAS Miramar, CA | MCN | 118,900 | |
| | | 6 | MCN Miramar - JSF | F-35 Aircraft Parking Apron MCAS Miramar, CA | MCN | 40,000 | |
| | | 7 | MCN Miramar - JSF | Comm Complex & Infrastructure Upgrade MCAS Miramar, CA | MCN | 34,700 | |
| | | 8 | Readiness | Facilities Demolition | OMMC | 39,200 | |
| | | 9 | Readiness | Depot Maintenance | OMMC | 7,800 | |
| | | 10 | Readiness | SPMAGTF En-route C4 UUNS | APN | 39,390 | |
| | | | | | OMMC | 8,250 | |
| | | | | | PMC | 40,480 | |
| 1 | | 11 | Readiness | POM 17 Buy Back - Bachelor Enlisted Quarters NWS Yorktown, VA | MCN | 24,200 | |
| | | 12 | Readiness | Over The Snow (OTS) Mobility for Marine Corps Mountain Warfare Training Center (MCMWTC) | OMMC | 58 | |
| | | | | | PMC | 6,110 | |
| 1 Total | | | | | 589,750 | | |
| 2 | | 13 | Buy Back | POM17 Buy Back - PCS | MPMC | 49,000 | |
| | | 14 | Buy Back | POM 17 Buy Back - Foreign Language Proficiency Bonus Pay | MPMC | 8,000 | |
| | | 15 | Buy Back | POM17 Buy Back - MV-22 | APN | 150,000 | |
| | | 16 | Buy Back | POM17 Buy Back - KC-130J Operation Tomodachi Engine RADCON | APN | 36,000 | |
| | | 17 | Buy Back | POM17 Buy Back - KC-130J Operation Tomodachi Engine RADCON | OMN | 6,800 | |
| | | 18 | Enhancements | F-35B Spares | APN | 50,800 | |
| | | 19 | Enhancements | KC-130J Aircraft | APN | 158,000 | |
| | | 20 | Enhancements | C-40 as C-9 Replacements | APN | 207,500 | |
| | | 21 | Enhancements | AH-1Z | APN | 57,000 | |
| | | 22 | Enhancements | UC-12W | APN | 32,600 | |
| | | 23 | Enhancements | Enhanced Combat Helmet (ECH) | OMMC | 22,000 | |
| | | 24 | Enhancements | Lightweight 155mm Chrome Tubes | PMC | 14,000 | |
| | | 25 | Enhancements | CESAS II | PMC | 7,054 | |
| | | 26 | Enhancements | DoD Enterprise Network Defense Technologies Integration and Sustainment (HBSS/ACAS) | OMMC | 5,689 | |
| | | 27 | Enhancements | Full Spectrum Cyber Operations | PMC | 7,104 | |
| | | 28 | Enhancements | Full Spectrum Cyber Operations | RD TEN | 1,784 | |
| | | 29 | Enhancements | Rifle Combat Optic Modernization | OMMC | 13,281 | |
| | | 30 | Enhancements | Identity Intelligence (I2) | OMMC | 1,230 | |
| | | 31 | Enhancements | Force on Force Training Systems (FoFTS) | PMC | 3,400 | |
| | | 32 | Enhancements | Joint Processing, Exploitation, and Dissemination (JPED) Center | OMMC | 1,855 | |
| | | 33 | Enhancements | Open Source Intelligence (OSINT) | OMMC | 830 | |
| | | 34 | Enhancements | GMRLS AW munition for HIMARS | PMC | 19,290 | |
| | | 35 | Enhancements | Broadband Meshable Data Link (BMDL) | PMC | 2,500 | |
| | | 36 | Enhancements | Master Reference Terminals (MRT) | PMC | 315 | |
| | | 37 | Enhancements | Unified Command suite Block 2 | PMC | 689 | |
| | | 38 | Enhancements | Selective Reenlistment Bonus (SRB) | MPMC | 18,600 | |
| | | 39 | Enhancements | KC-130J Digital Interoperability Block7 (LINK16, CNS ATM, Long Range Navigation mandates) kits | APN | 20,800 | |
| | | 40 | Enhancements | Procure 2XF-35B and 2XF35C | APN | 750,000 | |
| | | 2 Total | | | | | 1,646,121 |

Note: The unfunded priority list was divided into two parts, in order to be more readable.

| | | | | | |
|--------------------|----|--------------|---|--------|------------------|
| 3 | 41 | Enhancements | Defense Systems LAIRCM/DAIRCM/APR-39DV2 | APN | 100,400 |
| | 42 | Enhancements | APKWS II F/A-18A-D Capability | APN | 25,900 |
| | 43 | Enhancements | CH-53E Degraded Visual Environment (Brown Out) landing enhancements | APN | 13,300 |
| | 44 | Enhancements | H1 Technical Refresh Mission Computer (TRMC) Retrofit | APN | 23,400 |
| | 45 | Enhancements | AH-1Z Digitally Interoperable Full Motion Video (DI-FMV) kits | APN | 5,400 |
| | 46 | Enhancements | MV-22 Aft Sponson Fuel Tank | APN | 5,000 |
| | 47 | Enhancements | MV-22 Propeller Blade Erosion Mitigation | APN | 21,000 |
| | 48 | Enhancements | Increases carry capacity of GBU (Bombs) from 1 to 4 for F-18 A-D (BRU55) | RD TEN | 10,400 |
| | 49 | Enhancements | 20mm High Explosive Incendiary (HEI) Point Detonating (PD) Round for soft targets | RD TEN | 9,300 |
| | 50 | Enhancements | V-22 Joint Performance Based Logistics (JPBL) Support-Improve Supply Support | OMN | 5,410 |
| | 51 | Enhancements | CTN-Common Block Array-Antenna (CAB-E) | RD TEN | 1,400 |
| | 52 | Enhancements | JSF-Tactical-Special Access Program Shelters | APN | 1,000 |
| | 53 | Enhancements | Link-16 (Digital Interoperability) for ATN-16 | OPN | 1,000 |
| | 54 | Enhancements | "Critical/No Fail" EOD Mission Equipment | OMMC | 550 |
| | 55 | Enhancements | "Critical/No Fail" EOD Mission Equipment | PMC | 21,300 |
| | 56 | Enhancements | Consolidated Emergency Response System | PMC | 1,000 |
| | 57 | Enhancements | Enlisted Bachelor's Quarters: FMTB-E MCB Camp Lejeune, NC | MCN | 40,700 |
| | 58 | Enhancements | Installation Emergency Management (IEM) | OMMC | 4,400 |
| | 59 | Enhancements | Installation Security Systems | PMC | 2,200 |
| | 60 | Enhancements | Installation Security Systems | PMC | 4,000 |
| | 61 | Enhancements | SECNAV Task DoN Talent Management Initiative Extending Gym Hours | OMMC | 3,300 |
| | 62 | Enhancements | Common Analytical Laboratory System (CALS) | PMC | 352 |
| | 63 | Enhancements | Enterprise Development and Test Environment (EDTE) | OMMC | 734 |
| | | | | PMC | 1,902 |
| | 64 | Enhancements | IAMs for Rigid Shelters | OMMC | 4,325 |
| | 65 | Enhancements | Target Handoff System | PMC | 38,400 |
| | 66 | Enhancements | Technical Surveillance Countermeasures (TSCM) | PMC | 22,770 |
| | 67 | Enhancements | NGEN | PMC | 8,965 |
| | 68 | Enhancements | Application Server Modules (ASM) | PMC | 150 |
| | 69 | Enhancements | Rapid response Kit (RRK) Terminals | PMC | 4,600 |
| | 70 | Enhancements | Nano/VTOL Small Unmanned Aircraft Systems (UUNS) | OMMC | 14,200 |
| | 71 | Enhancements | RQ-21 Blackjack TIPS BLK III | PMC | 8,960 |
| | 72 | MCN Buy Back | POM 17 Buy Back - LHD Pad Conversion & New MV-22 LZ's MCB Hawaii, HI | MCN | 12,800 |
| | 73 | MCN Buy Back | POM 17 Buy Back - Combat Vehicle Repair Facility MCLB Barstow MCLB Barstow, CA | MCN | 35,500 |
| | 74 | MCN Buy Back | POM 17 Buy Back - Enlisted Dining Fac & Community Bldgs MCAS Yuma, AZ | MCN | 34,500 |
| | 75 | MCN Buy Back | POM 17 Buy Back - TBS Fire Station MCB Quantico, VA | MCN | 17,200 |
| 3 Total | | | | | 505,718 |
| Grand Total | | | | | 2,741,589 |

**WITNESS RESPONSES TO QUESTIONS ASKED DURING
THE HEARING**

MARCH 2, 2016

RESPONSE TO QUESTION SUBMITTED BY MR. TURNER

General WALSH. We cannot determine what portion of the \$18B additional topline would have been allocated to the Marine Corps; however, attached is a prioritized list of our unfunded requirements in FY17, totaling \$2.7B. This list, together with the President's Budget request, would provide adequate funding to cover our requirements in FY17. [See page 23.]

[The list referred to can be found in the Appendix beginning on page 61.]

RESPONSES TO QUESTIONS SUBMITTED BY MS. McSALLY

General MURRAY. No, the Army does not have any Counter-Improvised Explosive Device (C-IED) technologies on the unfunded requirements list. The Army understands the critical need for Counter-IED capabilities and continues to program funding to support this effort. The Army is funding the recapitalization of Route Clearance and Explosive Ordnance Disposal vehicles (Buffalo, Husky and Medium Mine Protected Vehicle Type I), the procurement/recapitalization of Counter-IED Enablers (Rollers, Debris Blowers, Wire Neutralization Systems and Vehicle Optics Sensor System) and the development of new Counter-IED capabilities (Route Clearance Interrogation System) and Husky Mounted Detection System in the Fiscal Year 2017 (FY17) President's Budget Submission.

The Army continues to utilize Overseas Contingency Operations (OCO) Other Procurement, Army (OPA) funding for the recapitalization of repurposed Mine Resistant Ambush Protected vehicles into Program of Record Medium Mine Protected Vehicles Type II to round out the Route Clearance formations and expects to request OCO OPA funding through FY19 to complete this effort. Additionally, the Army has fully procured Counter Radio-Controlled Improvised Explosive Devices and continues to fund Research, Development, Testing, and Evaluation to maintain relevancy and keep pace with the ever-changing threat. The Army is also funding the Double-V Hull for the Stryker vehicle to mitigate underbelly IED blasts and will complete the fielding of the third Stryker Brigade Combat Team (SBCT) in FY17 and the fourth and final SBCT in FY20. [See page 22.]

General WALSH. Yes, our Unfunded Priorities List (UPL) does have Counter Improvised Explosive Device items included. Attached you will find a letter from the Commandant of the Marine Corps to Chairman Thornberry and the Marine Corps' Unfunded Priorities List, organized by priority. You will note that items 54 and 55 comprise Explosive Ordnance Disposal Mission Equipment. This consists of both procurement and operations & maintenance funding. That equipment will include:

- Video Fiber Optic Scopes—a lightweight safety compliant means of searching/identifying devices and components.
- MD82 Firing Device—a lightweight firing device with multiple means of initiation.
- AN/PVS-31 with Enhanced Clip-on Thermal Imager—a removal system for thermally controlled explosives.
- Kukri & Saber Detonator Diagnostic Kits
- Grid Aim Kit—an enhancement to our x-ray kit.
- AN/PDX-2 Kits—high fidelity capability upgrades and additional systems for Marine Special Operations Command.

[See page 22.]

RESPONSES TO QUESTIONS SUBMITTED BY MR. TAKAI

General WILLIAMSON. M88A2 Heavy Equipment Recovery Combat Utility Lift and Evacuation System (HERCULES)

Base funding for Fiscal Year 2017 (FY17) provides for procurement of 22 M88A2 HERCULES. With these 22 in FY17, the Army will have procured 839 of its 933 Authorized Acquisition Objective (AAO). To maintain a minimum sustaining rate on the production line and continue procurement to the AAO, the Army submitted a

UFR for 16 additional M88A2s in FY17. The Army converts M88A1s vehicles to the M88A2 configurations.

At completion of the current funding (Fiscal Year 2016), the Army will have 353 M88A1s remaining in the inventory. After achieving the M88A2 AAO of 933, the Army plans to retain 237 M88A1s for operational use across the Army. In addition, we have several hundred M88A1s, in varying conditions, at Anniston Army Depot that will be excess to Army needs and subsequently available for Foreign Military Sales. [See page 12.]

General SHRADER. Currently 132 of 140 are funded. Funding for the other 8 has been reallocated to meet Type 1 encryption requirement. Type 1 Encryption is to protect and ensure the safe transmission and receipt of classified data; including full motion video from ISR platforms. NOTM has NIPR and SIPR capability.

There is no prime contractor. SSC LANT is our integrator and they will assemble the NOTMs through FY20 per the following execution profile, which totals 69 across the FYs. This plus the 63 we have already bought gives us the aforementioned total of 132.

FY17: 23 FY18: 9 FY19: 20 FY20: 17

The remaining 8 will cost \$12M. We will work to have the delta addressed in future POM cycles and also continue to pursue cost reductions that enable us to reduce that delta. [See page 13.]

RESPONSE TO QUESTION SUBMITTED BY MR. MacARTHUR

General MURRAY and General WALSH. Attached you will find a letter from the Commandant of the Marine Corps to Chairman Thornberry and the Marine Corps' Unfunded Priority List, organized by priority. [See page 14.]

[The information referred to can be found in the Appendix beginning on page 61.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

MARCH 2, 2016

QUESTIONS SUBMITTED BY MR. TURNER

Mr. TURNER. Please provide the subcommittee with an update on the Army's expedited non-developmental item vehicle active protection system program, to include its schedule. And, is this program fully funded in FY17?

General WILLIAMSON. On February 18, 2016, the Army Acquisition Executive approved an Acquisition Decision Memorandum authorizing expedited experimentation and characterization of non-developmental items (NDI) Active Protective Systems (APS) on the M1 Abrams, M2 Bradley, and the Stryker Family of Vehicles to assess maturity, performance, and integration risks. This expedited installation and characterization effort will inform a future decision to fully integrate onto Abrams, Bradley, and Stryker platforms. To date, NDI APS vendors have been selected for the M1 Abrams and Stryker. Selection of the NDI APS for Bradley is expected by April 30, 2016. Following receipt of hardware, the installation and characterization effort is expected to take approximately 12 months per platform.

Abrams currently has Fiscal Year 2016 (FY16) program funding and execution authority to begin the effort. An Above Threshold Reprogramming (ATR) action for Bradley and Stryker is being initiated to request execution authority as a new start, and reprogramming FY16 Research, Development, Test and Evaluation (RDT&E) funds in the amounts of \$11.0 million (M) for Bradley and \$16.8M for Stryker. In the FY17 President's Budget, Abrams requested \$15.3M, Bradley requested \$15.3M, and Stryker requested \$14.4M. Additionally, the Chief of Staff of the Army has submitted an Unfunded Requirement request that includes \$10M (RDT&E) and \$80M (Wheeled and Tracked Combat Vehicles) for Abrams. The receipt of the requested FY16 and FY17 funding will fully fund the expedited APS NDI effort to complete installation and characterization for Abrams, Bradley, and Stryker.

Mr. TURNER. How did the Department's reinterpretation of the BBA 2015 impact your modernization strategies in FY17?

General WILLIAMSON. To fund our Army at \$1.4 billion less than the Fiscal Year 2016 (FY16) enacted level of \$126.5 billion, the Army preserved current readiness levels, but assumed risk in long-term modernization and sustainment. As a result, we reduced investments in procurement by purchasing lower quantities than previously planned. To reduce risk, the Chief of Staff of the Army's FY17 unfunded requirements (UFR of \$7.5 billion) includes \$3.1 billion to address several of the programs impacted by the funding reduction. The \$3.1 billion in modernization UFRs, as well as all of the remaining UFRs, should come as an additive increase to the Army's topline and should not displace funding that is part of the President's budget.

Mr. TURNER. What are your top unfunded requirements in fiscal year 2017 for ground force modernization?

General WILLIAMSON. The top unfunded modernization programs are a subset of the Chief of Staff of the Army's Fiscal Year 2017 unfunded requirements (UFRs). These programs are the AH-64 Apache Block IIIB New Build, AH-64 Apache Block IIIB Advanced Procurement, Light Utility Helicopter, Vehicle Protection System and War Reserve Ammunition for a total of \$616 million.

Providing funding for the top modernization UFRs would greatly enhance the readiness and modernization of the nation's land forces. However, the \$616 million in UFRs, as well as all of the remaining UFRs, should come as an additive increase to the Army's topline and should not displace funding that is part of the President's budget.

Mr. TURNER. How will the acquisition authorities in the NDAA FY16 assist the Army with providing modernized equipment to soldiers in a more timely manner?

General WILLIAMSON. The Army is reinvigorating command centric Army Requirements Oversight Council as a venue for National Defense Authorization Act requirements. We are aligning modernization efforts with current Soldier needs by balancing modernization requirements against current resourcing. The Army will expand experimentation and prototyping, improve sustainment, and develop a Rapid Capability Office.

Mr. TURNER. Would you consider body armor to be a defensive weapon system that requires continued technology development? If so, then why is body armor managed and procured like a commodity?

General WILLIAMSON. The Army will continue to invest in improvements for body armor through research and development of advanced ballistic fibers, improved ceramics, and integration optimization to continue reducing weight and meeting emerging threats. Body armor is managed similar to cold weather clothing, body armor is like types of products which vary in ranges of sizes, and the supply, and issuing mechanism. Like a commodity due to being expendable, individual equipment much like cold weather clothing.

Mr. TURNER. Now that virtually all combat roles are available for women, what are your commands doing to design and develop PPE and OCIE for female combatants?

General WILLIAMSON. The Army has undertaken many initiatives to provide properly fitting uniforms and OCIE and PPE to female Soldiers. Such initiatives include providing a better fitting Army Combat Uniform-Female, Army Physical Fitness Uniform, and Flame Resistant Environmental Ensemble Undergarments. The Army also provides Soldiers with a Tactical Assault Panel for their Modular Lightweight Load-carrying Equipment (MOLLE) that enables each Soldier to adjust the straps, enabling the MOLLE to fit all ranges of the Soldier population. Regarding PPE, the Female-Improved Outer Tactical Vest (F-IOTV) is a variant of the Generation 3 IOTV that provides female Soldiers with a better fit, allowing them to perform their missions more effectively. The F-IOTV provides the same unsurpassed ballistic protection of existing Army body armor, while providing eight additional sizes in conjunction with other modifications designed to provide a better fit. Similarly, the new Soldier Protection System Torso and Extremity Protection (TEP) subsystem will account for a wide population including small statured Soldiers, both male and female. TEP features include smaller shoulder width, adjustable cummerbund, and a shorter length. The TEP ballistic combat shirt will also encompass female specific sizing and will mitigate compatibility issues with hair buns in comparison to the legacy yoke and collar.

Mr. TURNER. Could you please comment on how the Army plans to implement warhead technology on small guided rocket munitions that are capable of neutralizing a wider spectrum of targets such as light and up armored vehicles, bunkers, and structures?

General WILLIAMSON. Research into precursor warheads for larger anti-tank munitions suggests their suitability for penetrating warheads for small guided munitions. A feasibility study of a small diameter penetrator coupled with a follow-through grenade also indicated suitability against personnel in urban structures, bunkers, and medium armor. This feasibility study served as the basis for long term plans for a new warhead for the Modular Missile Technologies (MMT) 70-mm diameter guided munition and Army Science and Technology efforts to demonstrate a modular open systems architecture for guided missiles that support light weight, rapidly-tailorable product line approaches aimed at scalability of size and effects for affordable precision multi-role missiles.

Mr. TURNER. Please walk us through some of the next generation cluster munition programs currently in development that will be in compliance with current DOD policy, and when do you expect these compliant systems to begin production and fielding?

General WILLIAMSON. Army Science and Technology (S&T) is investing in both Applied Research and Advanced Development to demonstrate three potential Cluster Munition (CM) Replacement technologies: Munition for Armored Combat Engagement (MACE), Proximity Initiated Submunition (PRAXIS), and Dual-Purpose Improved Conventional Munition—Enhanced Lethality (DPICM-XL). These Cluster Munition alternatives will be compliant with signed DoD CM Policy and the Convention on Cluster Munition, commonly referred to as the “Oslo Treaty.”

MACE is a unitary round which will exploit superior fragmentation spray angle and penetrator design geared towards well located, point targets. PRAXIS is geared to poorly located, large area targets, and consists of four full-bore submunitions designed to fit within the M483A1 DPICM projectile payload volume. DPICM-XL, like PRAXIS, is geared to poorly located, large area targets, and consists of 63 submunitions also designed to fit within the M483A1 DPICM projectile payload volume.

Army S&T plans to demonstrate all three technologies in the fourth quarter of Fiscal Year 2019.

Mr. TURNER. From FY13–FY16, Congress has provided the Army approximately \$520.0 million in additional funding to address HMMWV recapitalization and modernization requirements for the Guard and Reserve. What is the status of these

funds, and how is the Army using these funds to address HMMWV modernization shortfalls in the Guard and Reserve?

General WILLIAMSON. The \$360 million in Congressional funding provided between fiscal year 2013 (FY13)–FY15 procured 455 Ambulances for the Army National Guard (ARNG) and 155 Ambulances for the United States Army Reserve (USAR), modernized and/or recapitalized 1,083 Up-Armored High Mobility Multipurpose Wheeled Vehicle (HMMWV) (Up Armored HMMWV (UAH)) Troop Carriers, and converted 126 UAH Armament Carriers to UAH Tube-launched Optically-tracked Wire-guided missile variants. The \$160 million in Congressional funding provided in FY16 will be used to buy 517 HMMWV Ambulances (\$140 million for 452 Ambulances for the ARNG; and \$20 million for 65 Ambulances for the USAR.

Mr. TURNER. What is your current acquisition strategy for the Ground Mobility Vehicle (GMV) program, and are there ways to expedite the procurement and fielding of this vehicle to infantry brigade combat teams?

General WILLIAMSON. The current acquisition strategy for the GMV is for the program to enter in at Milestone C in Fiscal Year 2017 (FY17). Full and Open Competition will be utilized to select the vendor to produce the GMV. The current plan to fulfill requirements is by using a commercial off-the-shelf or non-developmental item vehicle. The current procurement quantity is 150 vehicles, plus two additional vehicles for destructive testing. First Unit Equipped will be in FY19. This schedule already makes use of a streamlined process to bring this capability to the Soldier as soon as possible.

Mr. TURNER. Please provide the subcommittee with more details as to which programs and capabilities were impacted by DOD's reduced topline budget request for fiscal year 2017?

General WALSH. Attached is a prioritized list of our unfunded requirements in FY17, totaling \$2.7B. This list, together with the President's Budget request, would provide adequate funding to cover our requirements in FY17.

[The list referred to can be found in the Appendix beginning on page 61.]

Mr. TURNER. Would you consider body armor to be a defensive weapon system that requires continued technology development? If so, then why is body armor managed and procured like a commodity?

General WALSH. Yes, and we do in fact design and procure our Ballistic Protection Systems (BPS) as a system. We fully understand and realize the importance of ensuring that the various pieces of equipment integrate well together to ensure both effective protection and the mobility and agility of our Marines on the battlefield. In fact we have developed several means for evaluating the various components of the system to ensure that we continue to enhance our mobility. For example the Marine Corps Load Effects Assessment Program (MCLEAP) requires Marines to maneuver obstacles similar to those encountered in an operational environment to ensure that any new equipment or modification to equipment does not negatively impact mobility. These systems are managed and purchased as a commodity to allow flexibility both in the incremental improvements of the system and because of the semi-consumable nature of the equipment.

Mr. TURNER. Now that virtually all combat roles are available for women, what are your commands doing to design and develop PPE and OCIE for female combatants?

General WALSH. The Marine Corps is fully committed to the importance of ensuring that all of our Marines, regardless of gender and occupational specialty have effective Ballistic Protection Systems (BPS), Personal Protective Equipment (PPE), and Organizational Clothing & Individual Equipment.

The Marine Corps continuously works to improve current clothing, protection and equipment capabilities to decrease size, weight and bulk while improving design and fit in order to provide increased protection and mobility. This work is informed by government and industry efforts to develop materials that will help achieve these goals. These efforts also inform our path towards future capabilities that seek to move beyond incremental improvements to true next generation systems that incorporate novel designs and materials. In addition to seeking to reduce size, weight and bulk of materials, the systems approach looks to find efficiencies through better integration of components and design of all the capabilities together. We keep the Army and other services apprised of our near term efforts, while working together jointly towards future capabilities.

In order to inform our actions on this matter, the Marine Corps conducted a Smart Adaptation Study, which provided us anthropometric data on the various statures of our Marines. Based on the Smart Adaptation Study recommendations, the Marines Corps will expand its fit requirement range from the 2nd percentile smallest female to the 98th percentile largest male in order to properly fit as much of our service population as possible. Where feasible, we will procure the additional

sizing of current capabilities to meet the new requirement and will ensure compliance of all future individual clothing, equipment and protection. Additional efforts include an initiative to procure a smaller adjustable pack frame sized to better fit the range of Marines under the current requirement of 5th percentile female to 95th percentile male population.

Mr. TURNER. How did the Department's reinterpretation of the BBA 2015 impact your modernization strategies in FY17?

General WALSH. The ongoing fiscal uncertainty facing the nation, including reductions associated with the 2015 BBA, have required us to take some risk in our modernization accounts (procurement, research and development, and infrastructure investments) in order to protect the near-term readiness of our deployed and next-to-deploy forces. The attached list of FY17 unfunded requirements, ranked by priority, reflects some of this risk. It includes several MILCON projects, procurement of airframes, and procurement of aviation and ground equipment, either to buy back BBA reductions or to enhance programs that have suffered under the ongoing fiscal constraints.

Mr. TURNER. Please provide the subcommittee with more details as to which programs and capabilities were impacted by DOD's reduced topline budget request for fiscal year 2017?

General MURRAY. The Army's Fiscal Year 2017 (FY17) request is \$1.4 billion less than FY16 enacted \$126.5 billion. To fund our Army at \$1.4 billion less than the FY16 base funding level, we preserved current readiness levels, reduced investments in procurement by purchasing lower quantities than previously planned, assumed risk in long-term modernization and sustainment, and reduced funding in facilities sustainment and military construction accounts.

Mr. TURNER. Current DOD policy requires that the failure rate of cluster munitions must be 1 percent or less after 2018. It's my understanding that cluster munitions are a military necessity. What impacts will this policy enactment have on current cluster munition inventories and programs?

General MURRAY. The policy inhibits our ability to employ effective indirect fires, in support of ground forces, operating in many likely threat contingencies in the European and Pacific Command areas of operation. Indirect fires are essential to neutralize or destroy massed armored combat formations, deny them terrain or degrade their ability to maneuver.

When the policy is enacted, the Army will lose 100 percent of its unguided Multiple Launch Rocket System (MLRS) munitions, 12 percent of its Guided MLRS (GMLRS) munitions, 58 percent of its Army Tactical Missiles System (ATACMS), and 51 percent of its lethal cannon munitions.

To mitigate the impact of the policy, the Army is pursuing a variety of options in the near-term (FY17 to FY21). These options include, but are not limited to \$1.3 billion for the GMLRS-Alternative Warhead and \$118 million for applied research and advanced development for cluster munition replacement technology and the development of a low cost tactical extended range missile to replace our aging ATACMS.

Mr. TURNER. The budget request contained \$3.4 billion for the European Reassurance Initiative (ERI). Of the total request, \$2.8 billion is directed towards the Army, and out of this amount almost \$1.0 billion is for Army procurement. What major end-items do you plan to procure and field with this funding?

General MURRAY. The major end-items included are: 14 modernized M1 Abrams Tanks; 14 M2 Bradleys; 12 Paladin Integrated Management; more than 600 various medium tactical vehicles, such as cargo trucks, tractor trailers, palletized load system, wreckers, Heavy Expanded Mobility Tactical Trucks; and 14 Assault Bridge Systems. These procurements begin to fill the Armored Brigade Combat Team equipment set supporting the European Command Commander's request for Army Prepositioned Stock to deter aggression in the region.

Mr. TURNER. What are your top unfunded requirements in FY17 for ground force modernization?

General SHRADER. The following are the Marine Corps top unfunded ground modernization priorities: 1. Special Purpose MAGTF En-route C4 Urgent Universal Need Statement 2. Enhanced Combat Helmet 3. Lightweight 155 Chrome Tubes 4. Communication Emitter Sensing and Attack Systems II 5. Rifle Combat Optic Modernization 6. Guided Multiple Launch Rocket System—Alternate Warhead munition for HIMARS 7. Broadband Meshable Data Link 8. Composite Tracking Network-Common Block Array-Antenna 9. Internal Appointment Modules for Rigid Shelters 10. Target Handoff System 11. Rapid Response Kit Terminals 12. Nano/Vertical Takeoff and Landing Small Unmanned Aircraft Systems 13. RQ-21 Blackjack Technology Insertion Program for Savings BLK III

Mr. TURNER. Do the Marines plan to upgrade their M1A1 tanks? If not, why?

Mr. TAYLOR. The Marine Corps has chosen to selectively modify the M1A1 vice pursuing the M1A2, primarily due to affordability and the increased weight of the M1A2. USMC M1A1s have the improved Abrams suspension, 2nd Gen Forward Looking Infrared (FLIR) and the Stabilized Commander's Weapons Station. Currently the Abrams Integrated Display and Targeting Systems (AIDATS) is in development and will achieve MS C/LRIP in June 2016; Slew-to-Cue (STC) for the Stabilized Commander's Weapon Station (SCWS) begins production in March 2016; Generation IV Ammunition Racks are in the middle of fielding; the Ammunition Data Link (ADL) has begun fielding and will achieve IOC in March 2016; Firepower Enhancement Program (FEP) modernization and obsolescence mitigation will begin in 1st Qtr FY17. Research and development of survivability upgrades to include examination of armor alternatives, 3rd Generation FLIR and a Service Life Extension Program are being planned for in the future. All of these efforts are coordinated with US Army PM Abrams.

Mr. TURNER. The Army is currently funding a lethality program for their Stryker Combat vehicles. What are the Marine Corps plans to pursue a similar program as part of their LAV modification acquisition strategy?

Mr. TAYLOR. The Marine Corps maintains close coordination with U.S. Army programs to improve the lethality of its Stryker Infantry Carrier Vehicle (ICV). Our Light Armored Reconnaissance formations are equipped with the LAV-25 and supporting mission role variants (MRV). Unlike the Striker ICV, which is equipped with a heavy machine gun or automatic grenade launcher in a remote weapons station (RWS), the LAV-25 is equipped with the M242 25mm automatic cannon in a manned turret.

The Marine Corps is currently upgrading its M242 systems to the enhanced configuration mounted in the Army's Bradley Fighting Vehicle. This upgrade will enable LAV-25 crews to fire depleted uranium (DU) ammunition. The capability of firing DU combined with fire control system improvements constitute a significant increase in LAV-25 lethality and serve to further extend the effectiveness of the system well into the 2020's.

LAV-25s do not fight alone, but rather as part of a family of vehicles; MRVs enable critical supporting capabilities. The LAV-Antitank (LAV-AT) provides heavy anti-armor and anti-material fires. LAR formation lethality is being further improved by the fielding of a modern TOW missile launcher mounted in an RWS on the LAV-AT. The upgraded LAV-AT will be capable of firing advance generation anti-armor and anti-materiel TOW munitions. These improved systems are in production and will begin fielding in 2017.

Additionally, our LAV-Command & Control (LAV-C2) systems were upgraded with modern C2 suites in the last decade and are currently undergoing hardware and software technical refresh. The LAV-C2 carries a fire support team capable of coordinating and directing surface and air delivered fires as well as directing the organic fires delivered by LAV-Mortar MRVs.

As the Army fields improved lethality systems in its SBCT and ABCT formations, normalizing new weapons and ground ammunition types, the Marine Corps will continue to closely monitor their progress, exploit joint opportunities to improve our capabilities, and work to ensure the continued operational effectiveness of our LAV equipped formations.

QUESTIONS SUBMITTED BY MR. GIBSON

Mr. GIBSON. I am concerned with maintaining sustainable readiness at our arsenals. Watervliet Arsenal is just outside of my district and the key to maintaining the critical skills needed to support sustained readiness of our cannon and mortar production capability is through adequate workload. Unfortunately, the minimum sustaining rate at Watervliet is 323,000 direct labor hours annually while the projected FY16 workload will provide only 185,000 direct labor hours. While Army Materiel Command has been very proactive in utilizing congressionally mandated Arsenal Sustainment funding to provide multi-year cannon workload, continued budget uncertainty and defense spending drawdowns undermine the ability for Watervliet to establish firm baselines. I welcome your remarks on this issue and any thoughts on what more can be done in order to maintain this critical capability within our industrial base, given the current budget environment. Additionally, I ask that you comment on your perception of the added risk taken on by underutilizing our arsenals and therefore dropping drastically below the direct labor hours needed to maintain critical skills.

General WILLIAMSON and General MURRAY. The Army is dedicated to sustaining Organic Industrial Base core logistics capabilities which maintain and generate

combat power for the Joint Force Commanders. The Army continues to work with the Office of the Secretary of Defense to provide to Soldiers processes that support critical manufacturing capabilities for Army arsenals and to improve our capabilities to meet joint readiness requirements. These improvements will result in strengthening the workload levels to sustain these capabilities.

The Army is attempting to close this gap by qualifying the arsenals as second manufacturing facilities which will support new equipment production. An example would include a partnership between Army Materiel Command (AMC) and the Defense Logistics Agency (DLA) to establish the arsenals as a DLA source of supply for Army-related parts managed by DLA.

The Materiel Enterprise Capabilities Database was developed to enable new and current customers quick access to information regarding the OIB equipment, facilities, capacities, and skills available to satisfy customer manufacturing or repair requirements and perform make-or-buy analysis. This capability is a statutory requirement under the authority of Title 10 U.S. Code 4532, it also allows work with AMC regarding the OIB requirements.

With the support of AMC, Watervliet Arsenal is able to pursue workload outside of Department of Defense. This includes Public-Private Partnerships (in which the Arsenal works as a subcontractor to a commercial company under Title 10 U.S. Code 2474), Federal Agencies (under Title 10 U.S. Code 2470) and Foreign Military Sales.

If the Army receives the funding requested for Fiscal Year 2017 (FY17), about 1.4 million (M) Direct Labor Hours (DLHs) will be executed across the arsenals. We estimate that the arsenals require ~3M DLH to effectively support equipment readiness, control costs, and maintain essential skill sets.

Workload at Watervliet Arsenal peaked at 442 thousand DLH in 2009. For FY17, the Army projects 200K DLH, which brings us below our average peacetime workload of 225K DLH. If critical manufacturing capabilities within the OIB are not maintained, there exists a degree of risk exists to the Nation. The Army is at risk to lose capabilities to manufacture unique, hard to produce items and those items not profitable in private industry production. Private industry may most likely not have the same ability to rapidly react and surge during

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General WALSH, General SHRADER, and Mr. TAYLOR. We share your concern for the continued viability of Watervliet Arsenal and the risk associated with a reduction in work levels. As the question noted, Army funding of the multi-year cannon workload is a key element for sustaining the Arsenal's readiness. In addition, Foreign Military Sales (FMS) also offers a potential source of work demand. For example, our Light Armored Vehicle FMS program for Saudi Arabia is using Betne Labs at Watervliet for mortar tube and breech fatigue testing. This is a 24-month, approximately \$4 million effort. The Marine Corps Armor and Fire Support Systems Program also utilizes Watervliet for the M1A1 M256 Cannon. The workload is mainly through our Enterprise Logistics Management Program and when evacuation criteria is met on the M256 cannon.

Watervliet does represent a critical core capability. We are sensitive to the current utilization trends experienced by the Arsenal. When opportunities have presented themselves to use Watervliet, such as our Ammunition Data Link modification to the M1A1 Tank, we directed the work to Watervliet even though it could have been completed elsewhere. Unfortunately, a further reduction to throughput may occur as the Marine Corps completes our reset requirements for the M1A1.

A decrease in capability from Watervliet would also impact Marine Corps infantry weapon systems. Specifically, we depend on the Arsenal to produce our gunner protective kits (turret protection for HMMWV's, MRAP's and JLTV's) as well as M253 81mm mortar cannons as the government's primary cannon producer. If capability

is lost at Watervliet we do not know of an alternative source with the ability to produce steel mortar tubes at this time. Our partner and supported Program Executive Officer (PEO) Mr. Taylor also shares the congressman's thoughts and concerns about the importance of Watervliet Arsenal, as they are a key supplier to the Marine Corps, manufacturing the cannon assembly for the M777A2 Lightweight 155mm Howitzer. The PEO's program management office for this weapon, located at Picatinny Arsenal, New Jersey has purchased more than 1,000 cannon assemblies plus spares for the Marine Corps, Army, and partner nations. Watervliet is currently working on a \$7.3M modification for the M777 Spindle, a critical component for the cannon assembly. The program office has requested pricing from Watervliet for an additional 145 cannon assemblies to support a foreign military sale with India for the M777A2. The Letter of Offer and Acceptance is currently with the Indian Government and the program office is anticipating final signature later this year. Additionally, to address wear issues identified with the newest artillery charges the program office has submitted an unfunded request for FY17 to purchase approximately 114 of Watervliet's new M777 chrome cannon tubes which have just successfully completed testing. We look forward to a continued partnership with Watervliet and the work they do for our military.

Mr. GIBSON. Is modernization of equipment, technology and infrastructure a replacement for force structure and does the current force structure allow for a modernized force that is capable of meeting major modern conventional threats, such as Russia, China, North Korea, and Iran? Additionally, to clarify, in the modern era is it appropriate to no longer size the United States Land Forces "to conduct large-scale, prolonged stability operations" as mentioned in the 2012 Defense Strategic Guidance, and instead rely solely on modernization and readiness to achieve and maintain peace, assure our allies and partners, and respond decisively to global threats and crises?

General WALSH. Both modernization and force structure are important. Without adequate modernization, we will be outpaced by our adversaries and placed a position of disadvantage on the battlefield. However, while increased capability as a result of modernization provides many advantages, there is no replacement for the world wide coverage and dwell rate that force structure provides. In fact, we are currently conducting a Commandant of the Marine Corps directed study of our force, termed Marine Corps Force 2025 to evaluate exactly what force structure the Marine Corps needs to fulfill its mission for the Nation in the future. I look forward to discussing that initiative with you in more detail.

While the Marine Corps is postured to conduct operations across the range of military operations, our highest priority modernization efforts are those associated with our core competencies: amphibious forcible entry and crisis response. These core competencies require continued development of our capabilities for surface and air ship-to-shore movement, command and control from a seabase, operational reach, and Marine Expeditionary Units, Marine Expeditionary Brigades, and Special Purpose Marine Air-Ground Task Forces. Our high priority modernization programs have been protected at the expense of both lower priority modernization and infrastructure maintenance or development. Moreover, fiscal constraints and rapidly changing technology and our current acquisition processes prevent necessary and timely investment in critical capabilities such as: intelligence, surveillance, reconnaissance, cyber, electronic warfare, and information warfare. In the end, we must maintain the warfighting capacity to ensure that our combined arms Marine Expeditionary Forces are trained and equipped to meet an uncertain future.

Furthermore, a return to BCA-level spending/full sequestration would further exacerbate institutional readiness imbalances. More tradeoffs would be made in acquisitions of needed equipment, essential training, living and work spaces, family support centers, and end strength to protect the Marine Corps' performance of its statutory obligations. Sequestration impacts on key modernization programs will have catastrophic effects on achieving desired capabilities to defeat emerging threats and will place an unacceptable burden on legacy programs such as the AAV (40 + years old) and the HMMWV (out of production since 2012).

Mr. GIBSON. Is modernization of equipment, technology and infrastructure a replacement for force structure and does the current force structure allow for a modernized force that is capable of meeting major modern conventional threats, such as Russia, China, North Korea, and Iran? Additionally, to clarify, in the modern era is it appropriate to no longer size the United States Land Forces "to conduct large-scale, prolonged stability operations" as mentioned in the 2012 Defense Strategic Guidance, and instead rely solely on modernization and readiness to achieve and maintain peace, assure our allies and partners, and respond decisively to global threats and crises?

General MURRAY. No, modernization is not a replacement for force structure. The Army requires both capacity (force structure) and capability (modernization) in the correct balance to meet current strategic guidance, maintain a technological edge over adversaries, and prepare for future threats. Reduced funding has forced the Army to reduce manpower to prevent a hollow force and the 980,000 force is the minimally adequate force required to meet modern conventional threats, but with significant military risk. In the modern era, we can no longer substitute mass for modernization.

QUESTIONS SUBMITTED BY MR. COOK

Mr. COOK. Why do the Army and the Marine Corps use two separate types of 5.56mm ammunition. What service specific requirement makes both types essential? How much would we save by only procuring one type?

General WALSH. The Marine Corps is fully integrated with the US Army and agrees on the value in procuring a common 5.56mm ammunition. We are committed to working with our Army partners on this issue.

The Special Operations Command (SOCOM) and US Army have each developed an enhanced round that is "blind to barriers" and has better accuracy and terminal ballistics than the current M855 round. The Army's M855A1 Enhanced Performance Round (EPR) and SOCOM's MK318 Mod 1 Special Operations Science and Technology (SOST) round both provide improved performance over the current M855 5.56 mm round in a lead free form factor.

Due to concerns with increased wear and degradation of weapons performance with the sustained use of M855A1, the Army (with USMC participation) began a series of tests in July 2014 to determine root cause of increased degradation of the weapons being used. Through these tests, the USMC determined that the Mk318 Mod 1 ammunition is more reliable and does not cause undue wear on our weapons, as a result the Marine Corps chose to procure this round as an interim solution for improved performance during contingency operations.

Results of the most recent testing lend credibility to the premise that the increased pressure associated with the M855A1 ammunition is reducing the reliability and longevity of weapons systems, especially in the M4 series of weapons. Weapons reliability issues (e.g., gas ring erosion and breakage, bolt locking lug cracks, and barrel erosion) have increased along with a drop in accuracy due to barrel erosion.

Marine Corps Systems Command asked Aberdeen Test Center to conduct additional reliability and durability testing on our M16A4, M4, M4A1, and M27 rifles with both MK318 Mod 0 and M855A1 ammunition. The purpose is to provide for side by side comparison of the effects the two ammunition types have on our weapons. The testing procedures for USMC weapons will be identical to the Army's continued testing of M855A1 through their M4A1 and will, at times, occur simultaneously. The test of Marine Corps weapons and the test of Army weapons are separate evolutions; the test data will, however, be shared between services. Representatives from Marine Corps Systems Command and the Marine Corps Operational Test and Evaluation Activity will witness the Army's testing. The Army intends to begin testing in March and to be complete by the end of the 1st Qtr FY 17. An interim test report is expected at the beginning of 1st Qtr FY17 with the final test report expected by the end of the 2nd Qtr.

There is National Defense Authorization Act language that requires a federally funded research and development center to conduct a study on the use of different types of enhanced 5.56mm ammunition. The OSD study is ongoing and is expected to be completed in 3rd Quarter, FY16. Within 150 days of the enactment of the Act, OSD will submit a report on the following:

- An explanation of the reasons for the Army and the Marine Corps to use in combat two different types of enhanced 5.56mm ammunition.
- An explanation of the appropriateness, effectiveness, and suitability issues that may arise from the use of such different types of ammunition.
- An explanation of any additional costs that have resulted from the use of such different types of ammunition.
 - Cost of additional magazines
 - Testing
 - Early destruction of weapons
 - New gages needed for M855A1
- An explanation of any future plans of the Army or the Marine Corps to eventually transition to using in combat one standard type of enhanced 5.56mm ammunition.

Specific figures on overall savings as a result of procuring a single type of ammunition are not yet available, because that contract would have to be negotiated for a full joint service purchase, although the increased volume would likely generate savings. It should be noted that the business case remains only one part of the overall analysis. The variables of greatest importance remain achieving common ammunition to facilitate training and operational interoperability between the two services with a round that provides both acceptable reliability and improved performance.

Mr. COOK. Why are we not considering 30mm cannons for Bradleys and LAVs the way we intend to place them on Strykers. Does the Bradley have sufficient lethality on its own to defeat its peer adversaries?

General WALSH. The Marine Corps maintains close coordination with U.S. Army programs to improve the lethality of its Stryker Infantry Carrier Vehicle (ICV). Our Light Armored Reconnaissance formations are equipped with the LAV-25 and supporting mission role variants (MRV). Unlike the Striker ICV, which is equipped with a heavy machine gun or automatic grenade launcher in a remote weapons station (RWS), the LAV-25 is equipped with the M242 25mm automatic cannon in a manned turret.

The Marine Corps is currently upgrading its M242 systems to the enhanced configuration mounted in the Army's Bradley Fighting Vehicle. This upgrade will enable LAV-25 crews to fire depleted uranium (DU) ammunition. The capability of firing DU combined with fire control system improvements constitute a significant increase in LAV-25 lethality and serve to further extend the effectiveness of the system well into the 2020's. Due to the swimming requirements and overall weight of the vehicle to include the weight a full upload of 30mm ammunition the Marine Corps feels that the DU upgrade to the 25mm cannon is the most balanced and effective means to increase lethality.

Further, LAV-25s do not fight alone, but rather as part of a family of vehicles; MRVs enable critical supporting capabilities. The LAV-Antitank (LAV-AT) provides heavy anti-armor and anti-material fires. LAR formation lethality is being further improved by the fielding of a modern TOW missile launcher mounted in an RWS on the LAV-AT. The upgraded LAV-AT will be capable of firing advance generation anti-armor and anti-materiel TOW munitions. These improved systems are in production and will begin fielding in 2017.

Additionally, our LAV-Command & Control (LAV-C2) systems were upgraded with modern C2 suites in the last decade and are currently undergoing hardware and software technical refresh. The LAV-C2 carries a fire support team capable of coordinating and directing surface and air delivered fires as well as directing the organic fires delivered by LAV-Mortar MRVs.

As the Army fields improved lethality systems in its SBCT and ABCT formations, normalizing new weapons and ground ammunition types, the Marine Corps will continue to closely monitor their progress, exploit joint opportunities to improve our capabilities, and work to ensure the continued operational effectiveness of our LAV equipped formations.

Mr. COOK. Why do the Army and the Marine Corps use two separate types of 5.56mm ammunition. What service specific requirement makes both types essential? How much would we save by only procuring one type?

General MURRAY. The Army uses the M855A1 Enhanced Performance Round (EPR) while the USMC continues to use the M855 Ball round for training and the 5.56mm Mk318 (also known as Special Operations Science and Technology (SOST)) round for war reserve. The Army initiated development of the M855A1 5.56mm EPR to address inconsistent performance of the M855 Ball while removing lead from the projectile. The resulting general purpose M855A1 EPR provides consistent probability of incapacitation, improved behind-barrier effects and a higher probability of hit; thereby ensuring the Warfighter retains a tactical advantage. US Air Force, US Coast Guard, as well as contingents within USSOCOM are using the M855A1 EPR. The Army has offered the M855A1 EPR to all Services, including the USMC, USSOCOM, and JSOC. The Army has provided and shared supporting test reports, including those from qualification, live fire test evaluation, and weapons reliability, as well as the overwhelmingly positive feedback on the performance of EPR in combat reports. In accordance with Section 163 of the 2016 National Defense Authorization Act, the Office of the Secretary of Defense (OSD) has contracted with a Federally Funded Research and Development Center to conduct a study regarding the use of different types of enhanced 5.56mm ammunition by the Army and the Marine Corps.

Mr. COOK. Why are we not considering 30mm cannons for Bradleys and LAVs the way we intend to place them on Strykers. Does the Bradley have sufficient lethality on its own to defeat its peer adversaries?

General MURRAY. The Army does not have a requirement to increase the armament on the Bradley Fighting Vehicle (BFV). The BFV can defeat peer adversaries and main battle tanks through the use of the 25mm and Tube-launched Optically-tracked Wire-guided missile systems.

Mr. COOK. I understand that the Army's Tank Automotive Research, Development and Engineering Center (TARDEC) recognizes Active Blast Mitigation as a valuable technology to enhance occupant survivability during IED events, and that TARDEC recently identified an active underbody threat protection solution, ABDS Sentinel, as having achieved TRL-6. Has the Army identified key contemporary platforms for an integration demonstration of this blast mitigation technology? What plans does the Army currently have to pursue this integration and demonstration work on contemporary vehicles? How does active blast mitigation technology fit into the Army's future modernization efforts?

General MURRAY. Based on limited testing, the incorporation of active blast mitigation technology, such as ABDSTM, could reduce occupant injuries, reduce the forces and damage to other vehicle technologies, and may avoid costly retrofits to the legacy vehicle fleet when upgrading to meet increasing blast threats. The technology could also be utilized to reduce the integration burden on other blast mitigating components such as energy absorbing seating systems and sensitive electronics.

While the Army is encouraged by the promising results of this limited testing, the technology has not yet reached a sufficient maturity level to develop specific plans for procurement. Additional research and testing is still required to incorporate this technology into Army ground vehicles. Moreover, the effort did not evaluate additional requirements for engineering and integration activities that might be necessary to enable incorporation on various vehicles, including the conditions necessary to account for the higher weight and design differences of ground combat vehicles. It is important that the Army has a clear understanding of system procurement, integration, and sustainment costs to inform any acquisition decision.

While the Army has no funding for this technology within the Fiscal Year Defense Programming for 2017–2021, we will continue to evaluate the technology's cost and maturity should a warfighter requirement arise to drive insertion into a vehicle program in the future.

QUESTIONS SUBMITTED BY MRS. WALORSKI

Mrs. WALORSKI. Given the growing operational demand in multiple theaters for U.S. electronic warfare capability, does this necessitate additional electronic warfare countermeasure purchases beyond the amount requested in the President's budget?

General WILLIAMSON. Electronic Warfare countermeasure purchases to date meet current Army-validated requirements in both quantity and capability. However, the Chief of Staff of the Army has also asked for \$2.6 million within the Army unfunded requirement list to address emerging requirements for the Multifunction Electronic Warfare systems and an Electronic Attack capability. These capabilities are essential to future Electronic Warfare capabilities in any theater.

Mrs. WALORSKI. Congress has expressed keen interest in empowering the services to streamline the requirements and budget process to further the rapid acquisition of electronic warfare capability. How great of a role does industry competition play in maintaining our technological edge in electronic warfare?

General WILLIAMSON. For enduring capabilities that are not constrained by time a competitive industrial base plays a vital role in maintaining our technological edge in many areas, including electronic warfare. There is a robust industrial base to support rapid acquisition to select and acquire the most relevant capabilities to meet immediate warfighting needs for electronic warfare. Competition encourages and drives industry to be more creative, innovative, and cost effective. It promotes economic growth and the chances for industry to achieve more by seeking breakthrough technological advances and future opportunities and investments. It is this enduring competitive environment that will best support the rapid acquisition process when the need arises.

Rapid acquisition also means meeting the warfighter's requirements and being available in the quantities and time needed. For critical and urgent warfighting needs, an expeditious non-competitive process is often best suited to deliver these time-sensitive capabilities to the warfighter. In order to achieve its purpose, rapid acquisition means quickly acquiring a capability that already exists, since there is little to no time for development. Title 10 U.S.C. 2304(c) authorizes, under certain conditions, contracting without providing for full and open competition. The sole source justification for the rapid acquisition of electronic warfare capabilities would

be “unusual and compelling urgency.” That applies when a delay in award would result in serious injury, financial or other, to the government (Federal Acquisition Regulations 6.302–2).

Mrs. WALORSKI. General Williamson, the Army’s Combat Vehicle Modernization Strategy identified that the Army will not start a new Bradley replacement program until FY29 with likely fielding in the mid-late 2030s. a. What is the Army’s plan to address Bradley modernization for the next 10–20 years? b. Does the Army have any intention of modernizing the Bradley beyond the Engineering Change Proposals identified in the budget exhibits?

General WILLIAMSON. The Army plans to address the Bradley program for the next 10–20 years through a combination of current Engineering Change Proposal (ECP) efforts and a robust modernization effort in the early 2020s.

Current Bradley efforts include ECP1 (in production and fielding now), ECP2 (entering government test now), and ECP2b scheduled for development contract award in the fourth quarter of Fiscal Year 2016 (FY16). ECP1 and ECP2 will address the size, weight, and power (SWAP) challenges created during Operation Iraqi Freedom. They will allow the Bradley to recover lost mobility performance and provide the capability to host the future Army Network. ECP2 will achieve First Unit Equipped (FUE) in FY20. ECP2b, in conjunction with Abrams, is integrating the 3rd Generation Forward Looking Infrared sensors as well as other lethality, hit avoidance, and situational awareness capabilities. ECP2b will achieve FUE in FY25.

Beyond the current ECPs, the Army anticipates a decision in the FY22 timeframe to determine whether to pursue additional ECP upgrades to the Bradley, and/or begin development of a Future Fighting Vehicle.

Mrs. WALORSKI. During the Iraq War, the Army adapted to the growing threat of Improvised Explosive Devices (IED’s) with a massive up-armoring program for tactical vehicles like the HMMWV. There were also new vehicle designs like the various forms of the MRAP (Mine Resistant Ambush Protected) Vehicle. The HMMWV vehicle, while extremely capable, the frame and components were not originally designed to carry armor, and the addition of 2000 pounds of armor to the HMMWV created other issues, such as reducing service life, performance, and efficiency. Likewise, MRAPs are even heavier, and can have limited mobility and deploy-ability due to their weight and size. I understand the Army has done some testing with new materials and technology like Metal Matrix Composites to reduce the weight of components, while seeking to extend service life and reduce fuel consumption. I understand that some of the components tested have reduced component weight by nearly 50% while improving performance and extending the service life by three to four times that of steel components.

a. Could you comment on the importance of this type of technology and is developing high performance light weighting technologies a priority for the Army? b. In what areas do you believe this could add the most value? c. What benefits would be gained if you could reduce the empty weight of a vehicle like an FMTV or JLTV by several hundred pounds, if there was no degradation to performance or protection systems?

General WILLIAMSON. The development of light weighting technologies is important to the U.S. Army, but one that must be balanced with mission capability and affordability. In October 2014, the U.S. Army Science and Technology community investigated and identified a set of processes, tools, technologies, and materials for vehicle light-weighting and published the Lightweight Combat Vehicle Science and Technology Campaign (LCVSTC). The LCVSTC focused primarily on technologies that would enable material substitution approaches without changes in doctrine. Specifically, Metal Matrix Composite technologies are an important research area for the Army as they could provide significant weight reduction, longer life, and improved performance of components as well as allow for, in certain conditions, an increased payload.

Assessing the value of applying a material substitution (e.g. a Metal Matrix Composite) on an existing or future military platform would require a detailed engineering analysis of the specific platform—taking a system-level perspective to examine the weight reduction potential in all subsystems and components across an entire platform. Absent such a system level analysis, attempts to achieve light weighting may be sub-optimized in terms of lifecycle cost, performance, and overall weight savings. Currently Aluminum Metal Matrix Composites have shown to be most useful in the area of brake drum technologies. This technology offers lower operating temperatures compared to cast iron brake drums as well as decreased wear on the drum itself, reducing the life cycle cost by providing for longer lasting brake drums/shoes. Quantifying the full range of operational benefits of weight reduction is complex and is an area of on-going research at the Tank Automotive Research, Development and Engineering Center. Beyond the direct effect of increasing payload capacity for a

tactical vehicle second order benefits of light weighting are expected to be realized in operational energy effectiveness, air transportability/expeditionary operations, route access, reliability, and operation and maintenance costs.

Mrs. WALORSKI. Over the past several budgets, the Army has requested funds in the Bradley modernization budget line for conversion of M3A3 Bradley Calvary fighting vehicles into M2A2 Bradley Infantry fighting vehicles. There is no request for this work in the FY17 budget.

a. Wouldn't continuing this conversion program lend itself to the objectives the Army is supporting in the European Reassurance Initiative?

General WILLIAMSON and General MURRAY. The funding provided through Fiscal Year 2016 allowed the Army to mitigate the risk to the Bradley industrial base, leaving an acceptable six to eight month gap before Bradley Engineering Change Proposal 2 production starts. The remaining M3 Bradleys will be converted to an M2 variant through a future, more cost effective, conversion program that will be applied in field locations. This conversion effort is not part of the European Reassurance Initiative. This effort converts Calvary versions of the Bradley into Infantry fighting versions by removing some of the ammunition storage capacity and increasing the seating capacity.

