DARPATech 2004 Wrap-Up
Bob Leheny
Deputy Director

Well it's time to start bringing the curtain down on another great DARPA Tech conference.

Bringing DARPATech 2004 to you has been great fun for all of us at DARPA.

And I hope that it's been fun for you …. and that you've been surprised and stimulated by the science, far-side ideas, and opportunities, you've heard over the last three days.

This afternoon Tony is out at the California Speedway wrapping up the Grand Challenge qualification trials and I know he'll have some great stories to tell when he returns for the banquet this evening.

DARPA Grand Challenge

The Grand Challenge is already a great story, it's been a major item on our agenda at DARPA for some time and I can certainly confirm Tony's assertion on Tuesday that it has really captured the imagination of the Nation.

We've had some great press, not only in the competitors home-town media, but around the country and indeed around the world, including feature articles in major popular science journals.

But believe me the untold story is the amazing preparations that have gone on behind the scenes, it's been a logistics challenge beyond what anyone at DARPA had anticipated.

And one that everyone connected with the Grand Challenge will never forget.

So now, with just tonight's festivities remaining, what messages am I hoping you'll take away from DARPA Tech 2004?

Bridging the Gap

Beginning with our theme for this conference, how DARPA Bridges the Gap.

About how DARPA programs shorten the time it takes to transform Far Side Dreams into Near Side Reality.

Over the past three days you've heard the Offices Directors and Program Managers talk about their dreams, and about their ambitions for near side realities.

We've structured their presentations so that we were not just presenting past accomplishments but were also defining the directions we want to take DARPA going forward,

To define where we see Far Side opportunities that can help the war fighter.

To ask for your help in finding ideas on how to Bridge the Gap.

So working together, how can we take on these challenges?

Chart 3	New Initiative Process

At DARPA, we know that our stock-in-trade is communication.

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And we've worked hard to ensure that this DARPA Tech 2004 symposium has provided you amply opportunity to communicate and interact with all of us at DARPA.

So if you want to help us Bridge the Gap, the first step is to get together with a DARPA program manager…..but getting them excited about your idea is only the first step,

you should be prepared to help them identify an executable strategy for taking it from the far side to the near side.

Because that's the real challenge in Bridging the Gap.

And, by the way, if you can't find the right, sympathetic Program Manager, try talking directly to an Office Director.

If you can get him or her interested, you might be surprised to find your self transformed into a DARPA Program Manager, Bridging the Gap yourself.

To provide some insight into the process, let me share with you the fact that since October, we've had 67 briefings on new program ideas, at this moment we have 11 open BAAs, and there are more than 10 more in the pipe-line.

And still we have money in the bank.

We'll need it.

Because if DARPA Tech 2004 has been successful the ideas are going to be flowing in.

To help get the process started, before we leave I'd like to take a few minutes to review what you've heard and share with you where do I see the opportunities?

Let's begin with the Tactical Technology Office -

TTO

TTO is where we are envisioning the battlefields of the future and are working hard to create technology that will transform these visions into tomorrows tactical operational capabilities.

Capabilities that will coordinate man and machine, that will enable unmanned ground vehicles to operate in effective man-machine teams,

Capabilities that will lead to high-efficiency aircraft propulsion and payload systems that will deliver effective tactical force multipliers,

And new, unrestricted operational capabilities that will enable the warfighter to effectively confront the complexity of the urban battlespace.

SPO

The Special Projects Office, where we're working to create system solutions across a range of emerging threats and evolving threat environments.

Systems that can defeat chemical, biological, and radiological weapons,

Systems that can defeat the protection the enemy seeks by burrowing into underground facilities,

Systems that can provide assured navigational capabilities in GPS-denied environments,

Systems that can provide superlative stand-off tactical surveillance, and

Systems that can confront the challenges of operating in urban environments.

VSO

The Virtual Space Office, the office that leads itself, -

The office where we're tapping into DARPA's collective genius to address operations in space.

Like delivering low cost access for systems that will provide space awareness,

That will enable space based engagement and mission protection,

That will allow tactical operations and space mission denial capability.

IXO

The Information Exploitation Office were we're working to enhancing the value of the information provided by sensor systems, working to shorten the Sensor-to-Shooter time line, working to create networked, federated systems integrated that perform as an efficient System of Systems.

Systems designed to lift the "Fog-of-War",

that deliver effective search and precision strike capabilities,

that can find and destroy targets- moving or not- ,

that instill supreme confidence that they are delivering the right target, and that they can do this anywhere, anytime and in any weather.

And going forward, exploit systems-of-systems to achieve more effective combat ID and enhanced after strike assessment of weapon effectiveness.

ATO

The Advanced Technology Office, were we're concentrating on what appears to be a deceptively simple fact.

That in Network Centric Warfare, the Network becomes more than a convenience, it becomes a critical, integral component of our weapon systems.

By enabling shared awareness and in-depth command understanding,

By enabling collaborative and synchronized action.

So, ensuring that Military Networks of the future have the same availability and reliability that we've come to expect from sensor and weapons platforms

This ATO goal is simply to state, but a challenge to achieve.

IPTO

The Information Processing Technology Office-

where in a back-to-the-future exercise, we've redefined DARPA's historic leadership in Information Technology research onto one of our original goals for investing in computer science,

that of creating computers that have cognitive ability,

that ask not what you can do for them, but rather what can they do for you,

computers that overcome complexity and vulnerability, that know what their doing and why,

that learn from experience, that can reason, that are self-aware, and that ultimately can adapt to people as partners rather than requiring that people adapt to them.

 "DARPA–Hard" goals that are more easily articulated then realized.

MTO

The Microsystems Technology Office- where we're working to drive DARPA far out ahead of the commercial sector by exploiting capabilities at the limits of device scaling and integration.

Where we're seeking innovations in the scale and performance of microelectronic, photonic and MEMS components that will enable a whole new generation of system capabilities,

that will result in future Integrated Microsystems that can interact intelligently with their environment.

Microsystems that will be more effective against dynamic signatures and rapidly changing treats,

That will deliver unparalleled, affordable benefits to every war fighter.

DSO

And in the Defense Science Office- where we continue to mine the FAR SIDE of the FAR SIDE;

Bringing forth a steady stream of technology nuggets,

Most recently expanding our search into the biological sciences,

And now we're making exploratory probes into new disciplines for DARPA- psychology, sociology and cognitive behavior.

But, at the same time, we're continuing to mine the still rich old veins,

finding breakthroughs that are dramatically changing the way we think about science and technology,

maintaining a steady stream of innovations in material science, mathematics, the physical sciences and engineering.

J-UCAS

And finally J-UCAS, DARPA's newest Office, the Joint- Unmanned Combat Air Systems Office - where as you've just heard the Mike Francis, who pioneered unmanned air vehicles at DARPA a decade ago,

is leading a Joint effort with the Air Force and Navy, to create a common, highly autonomous, unmanned air vehicle system that can serve both services needs.

and that provides the kind of interdependent-leverage that results in true force amplification.

And that, in a nutshell, is an office by office view of the challenges and opportunities DARPA is addressing.

But incorporated in what we have been discussing is a broad, emerging challenge;

one that doesn't fall within the purview of a single DARPA office, but demands the kind of flexibility and drive that only an agency like DARPA can bring to national challenges,

That addresses the kind of challenges that keep our senior leaders awake at nights,

Remember, DARPA was created to answer the challenge posed by a Soviet Sputnik surprise,

and that DARPA innovation led the way during the Cold War, supporting the strategy that met Soviet numerical superiority with American technological superiority:

But now we face new adversaries, adversaries who are more diverse than the old Soviet Bloc.

What are the emerging challenges these adversaries present and what broad gaps need to be bridged to deal with them?

We need go no further that the morning news headlines to find answers. Consider, as a first example, urban warfare.

Urban Warfare

After rolling over Iraq's army in the field,

the fourth largest army in the world,

we find that we still have to deal with a host of individual combatants and terrorists groups,

Adversaries skilled in asymmetric warfare and operations in urban areas.

Adversaries who seek refuge in the cities, who blend in with the civilian population, who hide behind woman and children, behind schools and hospitals, hoping to escape our sensors and weapons.

This shift in the battlefield has created a new, complex environment, that is unhealthy for our warriors, and unhealthy for civilization.

Absent the advantages of force multiplication that served so well over the past decades,

we need to devote increased numbers of troops to the fight,

increasing our vulnerabilities and our losses.

So the fundamental question us becomes, "What technologies and what innovations will deliver the force multipliers for operations in urban areas?"

Again a challenge that is easy to articulate, but we're going to need your help in addressing.

IED

And now IEDs, what has emerged as a truly "DARPA-Hard" problem; the detection and defeat of Improvised Explosive Devices,

IEDs, and in their most insidious form, Suicide Bombers.

Using street market technology, roadside IEDs are a poor-man's precision weapon.

And in the case of the Suicide Bomber, we're encountering a threat that in many respects is even more challenging.

Finding technologies to detect and defeat these challenges, is critically important today, and as in the case of the threats we faced in the Cold War, will remain so for the foreseeable future.

While the solutions are hard, the agenda is simple.

DARPA exists to implement the process.

We must find and develop those force multipliers that can significantly increase our power and flexibility for operating in urban environments, and for defeating IEDs.

We must adapt and exploit the far side concepts embodied in information superiority and precision strike that have served us so well in the past. And, we look to you for the ideas on how to make this happen, how to bridge the gap to the near side capabilities that will enable us to defeat these challenges.

For just as DARPA's response to Sputnik resulted in a generation of technology advances.

Bridging the Gap

And in the faith that DARPA has always been successful when we support innovative ideas, ideas that bridge the gap, ideas that deliver new war fighter capabilities.

As we go forward to confront our 21st Century adversaries, and a whole new set of challenges, with your help and ingenuity we will overcome these as well.

To paraphrase the great English Statesman, Winston Churchill;

….we will fight in the air, and in space, and in the littoral, and in the underground, and on the rooftops, and around the corners….,

in the dark of night and in the fog, in the rain and in sandstorms....,

alone and in networked systems.. ..,

from afar and up close…

and we will succeed!

So if you are able to take away from this conference even a small handful of worthwhile ideas,

And if as a result we create one breakthrough in the coming months,

then we can all declare DARPA Tech 2004 to have been a spectacular success.

Thank you all, and I look forward to your joining us at the Awards Banquet tonight. It's going to be a great party.