



TRADOC G2 Future Trends Watch

1 APRIL 2016

SPECIAL POINTS OF INTEREST:

- Rise of the Super-Soldiers
- Will China's Urbanization Plan Influence Rest-of-World?
- Quantum Encryption a Game-Changer

The 12 Trends

TRADOC has identified the following 12 Trends as ongoing operational environment characteristics that will significantly affect the Army's future battlefield environment.

The Future Trends Watch provides an update on statuses and developments of these trends. The trends are in four groups, as follows:

A. The Strategic World:

- 1) Economic Rebalancing
- 2) Resource Competition
- 3) Demographics & Urbanization

B. Society

- 4) Collective Intelligence/Action
- 5) Human Performance
- 6) Complexity

C. Information

- 7) Human-Computer Interaction
- 8) Cyber and Space
- 9) Big Data

D. Science and Technology

- 10) Robotics
- 11) Engineering & Manufacturing
- 12) Power Generation & Storage

Rise of the Super-Soldiers

Concern Growing Over Russia and China's 'Enhanced Human Operations'

33rd Square
24 FEB 2016

Super Soldiers

During a recent press event, a representative from the US Defense Department suggested that the country may be compelled to develop what he called 'enhanced human operations' as part of the Third Offset Strategy aimed at maintaining technological superiority. Robert O.

Work put forward that other nations would not be impeded by ethics in the development of 'super soldiers.'

At a recent press conference the US Defense Department's future research and development strategy was outlined by Deputy Defense Secretary Robert O. Work. During the meeting he warned that America would soon lose its military competitive advantage if it does not pursue technologies like artificial intelligence. The 'Third Offset Strategy,' aims to reassert America's military technological edge globally. He

also suggested that other nations are working on so-called 'super-soldiers' through "enhanced human operations."

"Now our adversaries, quite frankly, are pursuing enhanced human operations, and it scares the crap out of us," Work said.

The ethical concerns surrounding enhancing human performance are wide and complex. Work says those ethical concerns typically don't apply to authoritarian governments like Russia's or China's, but their lack of hesitation in pushing this development may force America's



MAD SCIENTIST CONFERENCE SCHEDULE:

21-22 APR:
Megacities,
Arizona State
Univ.

27-28 JUL:
Strategic Security
Environment,
Georgetown Univ.

Fall '16:
Cyber, MIT

QUESTIONS?
TRADOC G2
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Rise of the Super-Soldiers cont.



DARPA's Warrior Web Project

"Now our adversaries, quite frankly, are pursuing enhanced human operations, and it scares the crap out of us"

hand.

"We're going to have to have a big, big decision on whether we're comfortable going that way," Work admits.

The Pentagon was not specific on the transhumanist work being done by Russia and China, but several possibilities can be inferred.

..."In this environment there will be a lot of fast followers; I'm okay with that as long as we're a fast leader," Work said. "If people are chasing our exhaust, that's okay with me." Will the US Pursue Enhanced Human Operations?

According to Work, the US technology advantage is not likely to last long. With the revolution in artificial intelligence and robotics is being driven by the commercial sector, and with global distribution of software, it's

entirely possible for almost any nation or non-state actor to exploit the same technologies rapidly. Moreover, Work suggests that such actors' 'flexible ethics' may allow them to exploit technologies others may be hesitant to pursue.

"Nothing can match the destructive potential of high-end war between great powers," Work said, and while cooperation with Russia and China is the goal, "we want to make sure we can ensure our national leaders that we are ready in case someone makes a miscalculation."

In the US, studies are already well underway in developing transhumanist technology. During his talk, Work was careful to differentiate between the US and others in terms of enhanced human operations, but

how long will this separation be maintained?

Analyst Comment: Currently, even low-tech adversaries are using means to improve soldier performance. The drug Captagon is used in Syria to improved combatants' performance on the battlefield. As more discoveries are made, we can expect greater use of drugs, biological manipulations, and human accessories to be used in the operational environment. Consequently, the US may face enemies with much improved physical, mental, and emotional abilities on the battlefield. Though the US is unlikely to adopt the more ethically questionable enhancements, it must stay abreast of others' developments so that it is able to develop countermeasures against those who do.

Full article : <http://www.33rdsquare.com/2015/12/concern-growing-over-russia-and-chinas.html>

Will China's Urbanization Plan Influence Rest-of-World?

China Adopts New Urbanization Guidelines

By CC Huang, Triple Pundit

16 MAR 2016

Last week, China's State Council and the Communist Party's Central Committee released a new set of guidelines (English coverage) for strengthening urban planning

and development. These guidelines were borne out of recommendations from the Central Urban Work Conference this past December reflecting the nation's new emphasis on urban sustainability. The last such meeting was held in 1978 when China's cities were home to less than 20 percent of its population. By contrast, that number today is 57 percent.

Last week, China's State Council and the Communist Party's Central Committee re-

Will China's Urbanization Plan Influence Rest-of-World? Cont.

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These guidelines were borne out of recommendations from the Central Urban Work Conference this past December reflecting the nation's new emphasis on urban sustainability. The last such meeting was held in 1978 when China's cities were home to less than 20 percent of its population. By contrast, that number today is 57 percent.

This announcement represents a major step forward for urban development in China. For the past few decades, city planning was based on a car-dependent, Soviet model dominated by superblocks, wide roads and single-use districts. By comparison, the new guidelines prioritize walking and public transit options over car use, preserve historical and cultural characteristics, and grow cities only within the means of their natural resources.

In 2008, for the first time in human history, more than half of the global population was living in urban areas, and the United

Nations predicts two-thirds of the world's population, about 6 billion people, will be city-dwellers by 2050. As the world's most populous nation, China's urban development will set the tone as urban populations continue to grow worldwide.

The comprehensive principles included in China's new guidelines range widely in scale, covering a city's entire geographic boundary down to its streets, blocks and buildings. They also offer guidance on municipal water, waste and energy systems, which are important at all scales. Below, we elaborate on five of the key principles included in the guidelines:

- 1. "Narrow roads, dense street networks"**
- 2. Enforcing urban growth boundaries**
- 3. Expanding mixed-use development**
- 4. Increasing use of public transit**

5. Focusing on historical preservation and city character

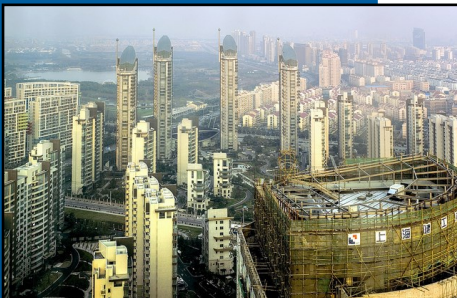
Peter Calthorpe's idea of transit-oriented development has been integrated into previous central government policy, and his book with Yang Baojun, one of the foremost urban thinkers in China, was one of the first combining theory and practice in sustainable urban design principles.

The Institute for Transportation and Development Policy helped establish Guangzhou's BRT system in 2010. The Paulson Institute's "Cities of the Future" prize has shaped and defined scalable, bold and successful projects in urban China. C40 has recruited some of the most ambitious cities in China to work alongside international cities, creating a mutually beneficial platform to share best practices on sustainable urbanization.

...While China has accomplished a great deal on sustainable urban design, much more work remains. It is now up to local governments and developers to implement these policies. Doing this well will take new management structures, financial tools, and talent.

(SEE FULL ARTICLE FOR DETAILS)

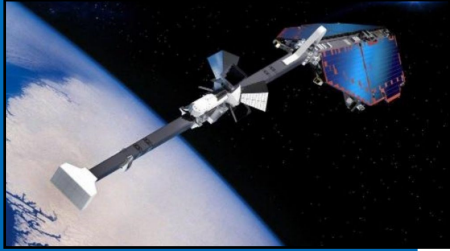
Analyst Comment: Given China's rising influence, megacity experience, and ability to quickly implement policies, China will likely affect how other countries manage the development of their megacities. Other nations addressing megacity development will likely use lessons learned from China to develop their models. Therefore, monitoring China's experience may provide insight on how future megacities will look; and by extension, the megacity operational environment.



Shanghai is just one Chinese city slated for sustainable revitalization

Full Article: <http://www.triplepundit.com/2016/03/china-adopts-new-urbanization-guidelines/>

"Quantum keys are theoretically impossible to crack"



QUESS Satellite

"China is poised to launch a project that may provide the path to an uncrackable communications system, by turning messages quantum and taking them into space"

Quantum Encryption a Game-Changer

China's Quantum Satellite Could Change Cryptography Forever

Popular Science

3 MAR 2016

By Jeffrey Lin, PW Singer, and John Costello

In the age of relentless cyberattacks and global electronic surveillance, nations and citizens are looking for any means to secure their communications. China is poised to launch a project that may provide the path to an uncrackable communications system, by turning messages quantum and taking them into space. The new Quantum Space Satellite (QUESS) program is no mere science experiment. China is already becoming a world leader in quantum communications technology; a satellite that delivers quantum communications will be a cornerstone for translating cutting-edge research into a strategic asset for Chinese power worldwide.

Cryptography operates through the use of an encryption key (such as a numbers pad), which, when applied to an encryption algorithm, can be used to decrypt or encrypt a message. Quantum entanglement is the act of fusing two or more particles into complementary "quantum

states." In such states, no particle can be independently described, instead the particles exist in a hazy shared quantum state that "collapses" when observed. Quantum encryption thus takes advantage of this feature, using it to detect would-be eavesdroppers, whose presence causes quantum states to collapse and reveal their spying to legitimate parties. Additionally, the complexity of quantum mechanics makes it virtually impossible to reverse engineer the quantum key generated through quantum entanglement.

Quantum keys are thus theoretically impossible to crack by even quantum computing -- a theoretical form of supercomputing that promises to defeat traditional forms of encryption. (It is important to note, however, that all is not perfectly secure. Quantum secured communications, like other forms of encryption, are vulnerable to denial of service, physically tampering of the quantum communications device, human failures in operational security and impersonation of sender).

The Quantum Space Satellite, aka Quantum Experiments at Space Scale (QUESS), will seek to

turn this theory into reality. It will be launched in July 2016. Chief scientist Pan Jianwei remarks that QUESS will complete China's growing quantum communications network, which includes a 2,000-kilometer-long network between Beijing and Shanghai.

...QUESS fits into a broader series of experimental quantum encryption programs which may be intended to address concerns over China's information security, particularly in the post Snowden era. Government, military, and financial networks are juicy targets for espionage, and quantum encryption promises to provide a level of potentially unbreakable encryption for these systems, as well as a sure-fire method to detect any attempts at intrusion.

(SEE FULL ARTICLE FOR DETAILS)

Analyst Comment: The competition by world powers to achieve full quantum mastery is intense. Those who succeed first will likely initiate another digital revolution and gain a decided advantage in numerous related fields. Such advances will dramatically affect military technology and shape the future operational environment.

Full Article: <http://www.popsci.com/chinas-quantum-satellite-could-change-cryptography-forever>