

SPACE DEVELOPMENT AGENCY

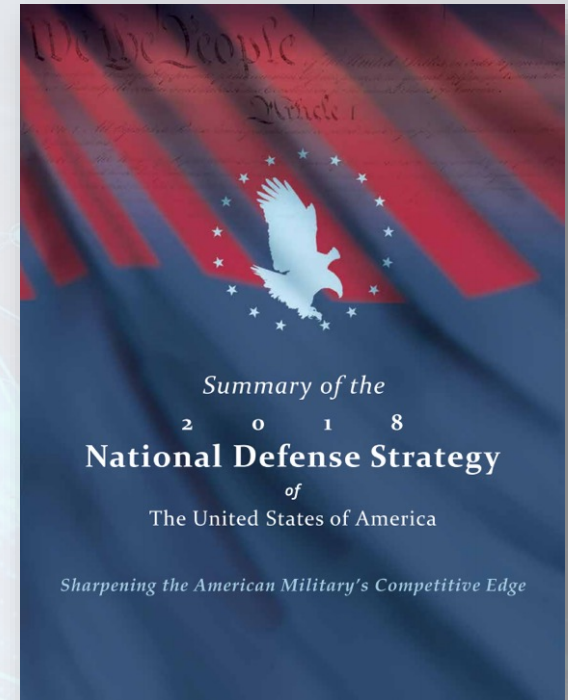
SDA OVERVIEW

Col Ryan Colburn
Chief, Support Cell
OUSD (R&E)

Motivation



- **Our adversaries are accomplished spacefaring nations**
- **Ample opportunity to study the American way of war**
- **Rightly concluded that our space assets offer a tremendous warfighting advantage for us and our allied partners**
- **Working diligently to negate these exquisite capabilities**
- **Two-pronged approach:**
 - **Systems that deny, disrupt, or degrade our access to space-based capabilities**
 - **Systems that operate within the gaps of our space-based capabilities**
- **Moreover, their ability to develop, demonstrate, and field such systems is much faster and more affordable than our ability to deploy space systems in response**



Space is vital to winning long-term strategic competition – bold moves by adversaries present a call to action

National Defense Goals

Establish readiness for the current and future fight

Modernize offensive and defensive forces against future threats

Re-establish and maintain our technical advantage

Quickly translate technology into fielded capability

Strike the right balance between developing new technology and fielding current technology

*The differentiator is not in the **technology** or **innovation**, it is in **speed of delivery** to the warfighter.*

SDA: Aligned to the National Defense Strategy



Non-negotiables for Modernization



WORK WITH THE WARFIGHTER

- Determine and satisfy current needs quickly
- Work with the Services to identify and mitigate gaps

ESTABLISH A COLLABORATIVE CULTURE

- Lean on industry and academia
- Adapt commercial advances to military needs
- Court non-traditional companies

EMBRACE RISK

- Use prototyping and testing
- Field capabilities quickly
- Push an atmosphere of innovation

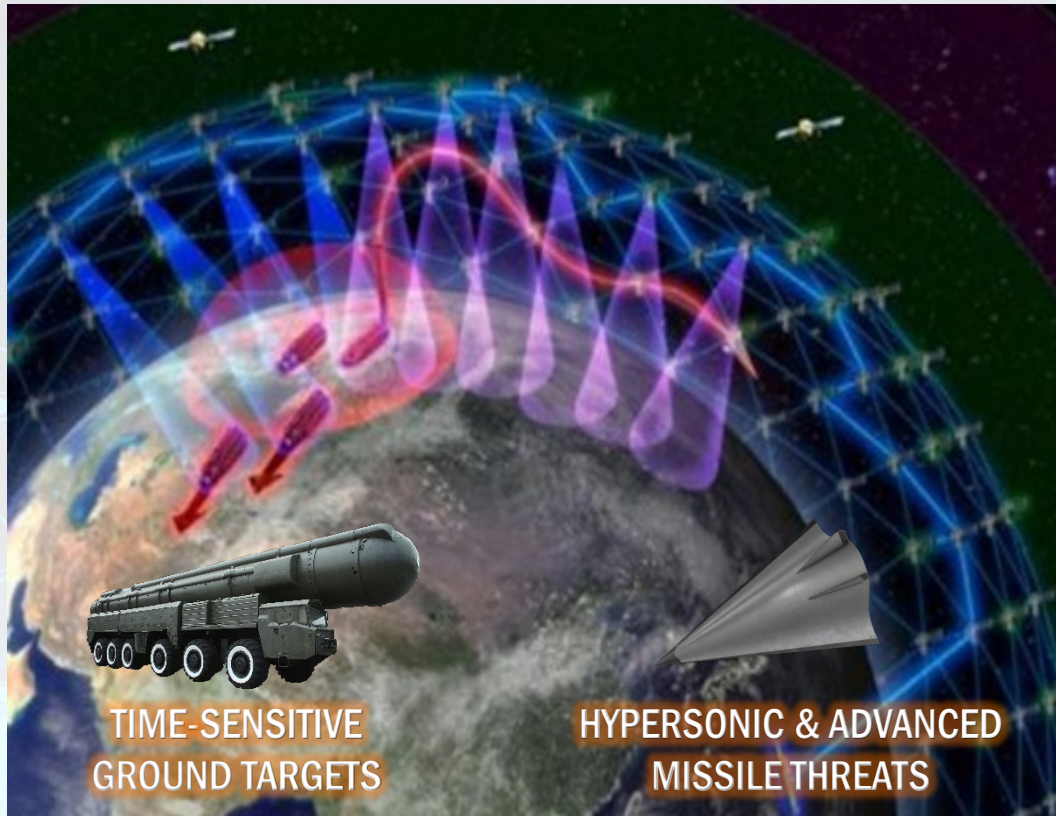
THINK BIG, THINK FUTURE

- Develop innovative capabilities AND innovative processes
- Make bold, risk-tolerant investments in high impact technologies

Space Development Agency Overview



Defining and monitoring the Department's future, **threat-driven space architecture** and **accelerating** the development and fielding of **next-generation space capabilities**



Resilient military sensing and low-latency data transport by means of a proliferated low-earth space architecture



THREAT-DRIVEN TO DELIVER CAPABILITIES TO WARFIGHTER AT THE SPEED OF RELEVANCE



IMPROVED RESILIENCY AND RESPONSIVENESS THROUGH PROLIFERATION



AGILE DEVELOPMENT AND FIELDING – CAPABILITIES IN TWO-YEAR TRANCHES



LEVERAGE PARTNERSHIPS WITHIN DOD AND COMMERCIAL TO ACHIEVE SUCCESS



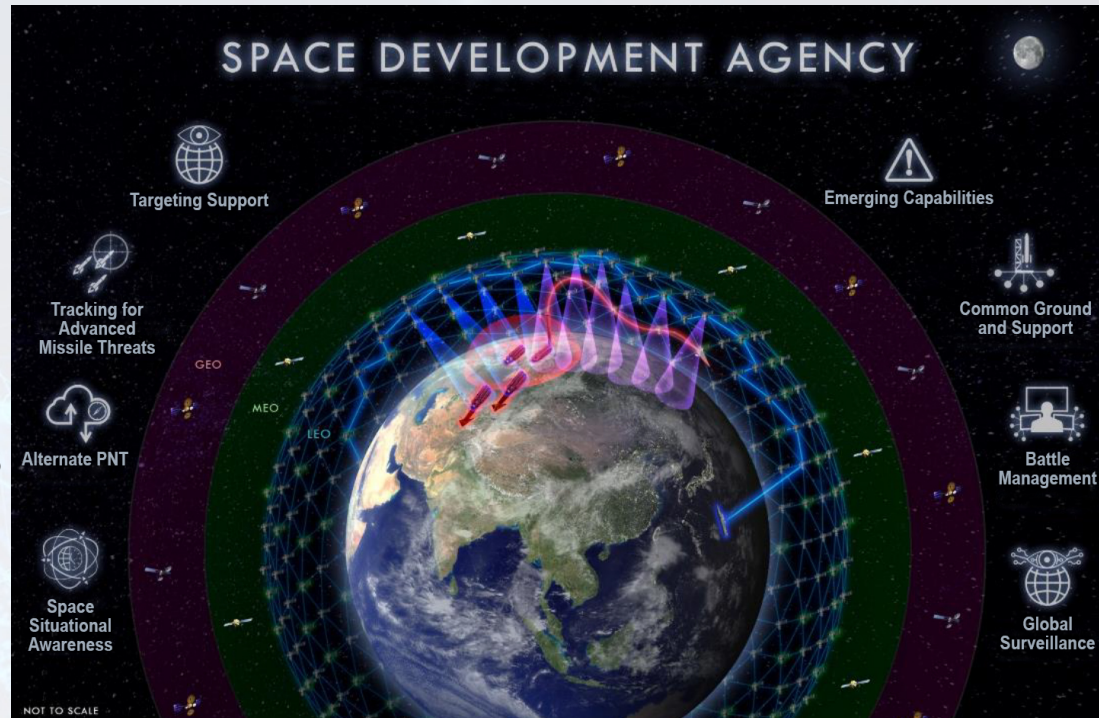
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SDA Focus

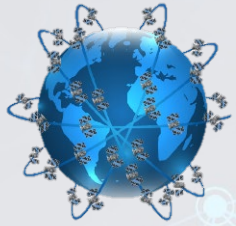


- The US military/industrial complex has finely tuned its ability to develop highly capable space systems
- SDA along with current space acquisition organizations represent a balanced risk approach across the Department
- SDA charged with providing eight capabilities – called out in Sec 1601(c) Report to Congress aka “DoD Space Vision” – Aug 2018



A small but necessary pivot for the military space community from risk aversion toward innovation

Layered Architecture Approach



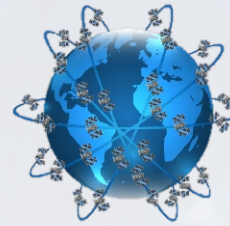
A global, persistent, low-latency data and communications **transport** layer



Indications, warning, **tracking**, and targeting of advanced missile threats



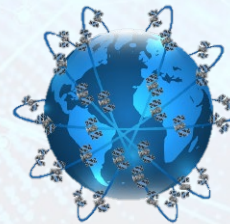
24x7, all-weather constant **custody** of time-sensitive targets



Low-latency **battle management** to enable time-sensitive kill chain closure



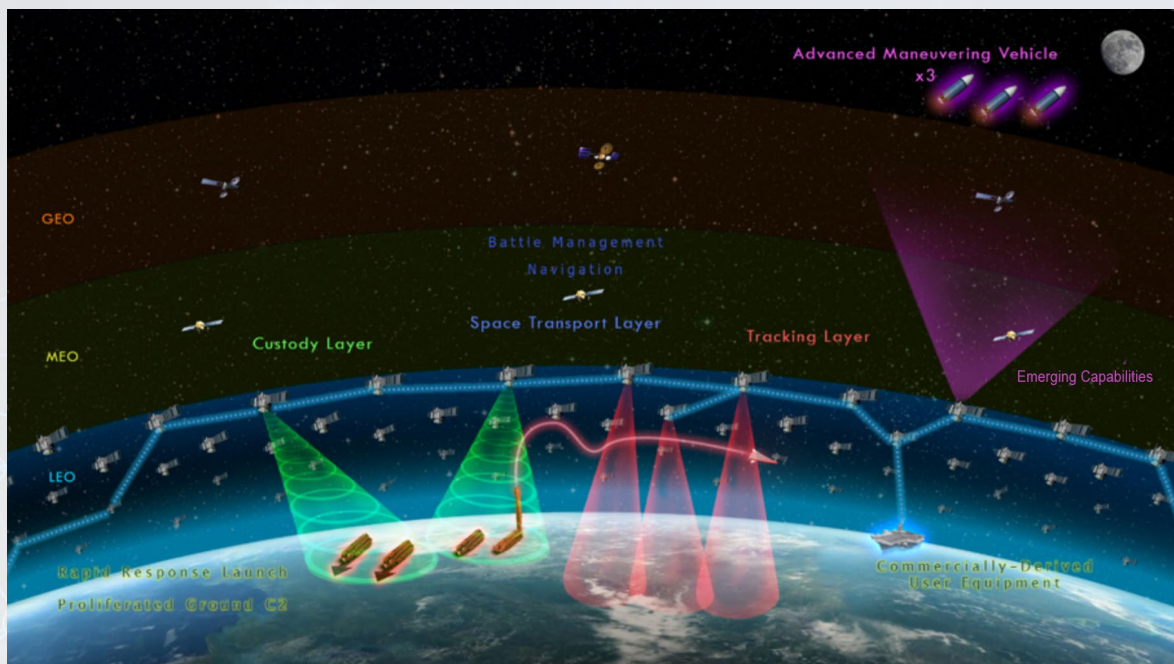
Emerging capabilities such as space situational awareness and rapid access in cislunar volume



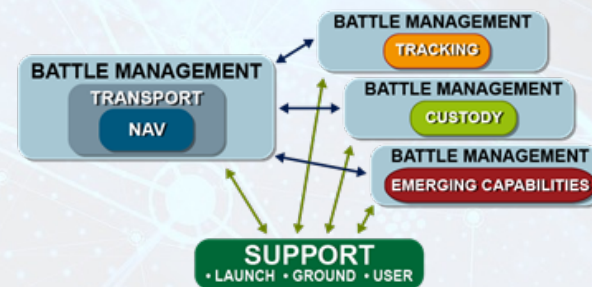
Alternate position, **navigation**, and timing for GPS-denied environments

Delivering space-based capabilities at the speed of relevance for our evolving threat environment

Notional Architecture



- Integrated architecture
- Multiple constellations or architecture “layers”
- Each layer addresses a critical, unmet gap in the national security space enterprise
- Predicated on a global, persistent, low-latency data and communications “mesh network”
- Leverages industry best practices and commercial development models
- Considering the use of transport layer spacecraft as substrates for other layers
- Proliferated, distributed approach enables resiliency (to direct threats) and responsiveness (to emerging terrestrial threats)

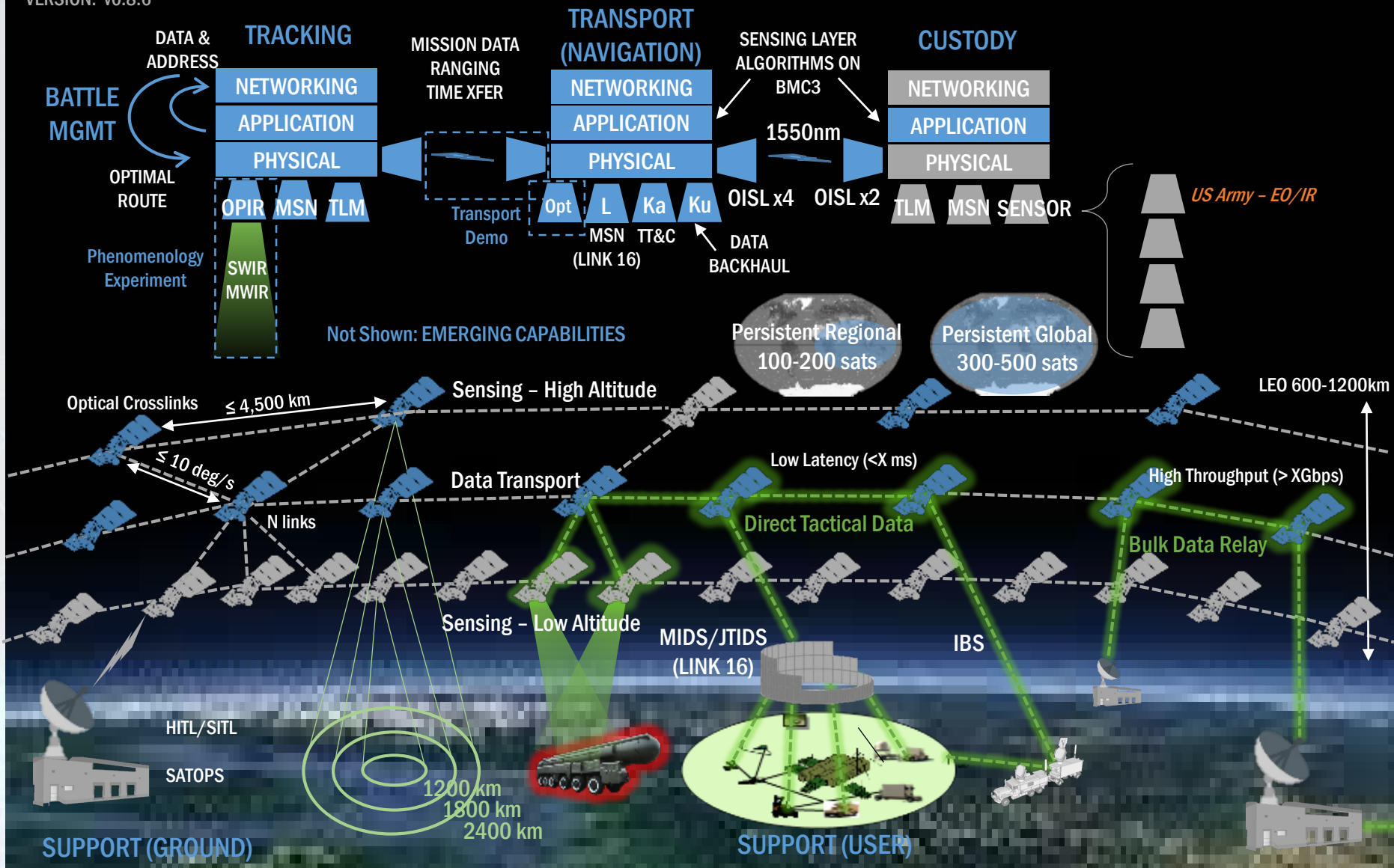


SDA will orchestrate the development and fielding of the future National Defense Space Architecture

ARCHITECTURE OVERVIEW



VERSION: v0.8.6



CAPABILITY BASELINE



NDSA Layer	Risk Reduction Demo (FY20-21)	Tranche 0 Capability (FY22)	Tranche 1 Capability (FY24)
Transport	Demonstrate very low latency data transport, to include optical satellite crosslink and direct downlink	<u>Periodic regional access</u> low-latency data connectivity	<u>Persistent regional access</u> low-latency data connectivity
Battle Management	<ul style="list-style-type: none"> Begin development of HITL/SITL Flight HW/SW for mesh networking 	<ul style="list-style-type: none"> C2 messages to BMDS <u>C2BMC</u> BLOS targeting support over <u>TDL</u> 	Provide data over legacy TDL for <u>90% of fielded weapon systems</u>
Tracking	Flight experiment to collect WFOV data in wavebands of interest at LEO	<u>Periodic regional access</u> for detection of HGVs	<u>Persistent regional access</u> for detection of HGVs
Custody	Demonstrate multi-phenomenology, on-orbit sensor fusion	<u>Periodic regional access</u> with <u>multiple sensing types</u> through mission partner contribution	<u>Persistent regional access</u> with <u>multiple sensing types</u> through mission partner contribution
Navigation	Demonstrate dissemination of PNT information over TDL	<u>Periodic regional access</u> of alternate PNT	<u>Persistent regional access</u> of alternate PNT
Emerging Capabilities	Demonstrate relevant sensitivities and processing	<u>Periodic access</u> of cislunar volume for object detection	<u>Periodic access</u> of cislunar volume for object detection
Support	Launch and operate demo and experiment satellites	<ul style="list-style-type: none"> Launch initial tranche of satellites Demonstrate scalable satellite operations 	Launch, operate, and transition capabilities

CURRENT OPPORTUNITIES



Open Date	Close Date	Action	Title	URL
02/11/2020	03/04/2020	RFI (SDA-SN-20-0004)	SDA Transport Layer Optical Crosslink Risk Reduction Demonstration RFI	https://go.usa.gov/xdNj8
01/21/2020	01/20/2021	BAA (HQ085020S0001)	National Defense Space Architecture (NDSA), Systems, Technologies, and Emerging Capabilities (STEC)	https://go.usa.gov/xdYu5
01/27/2020	02/17/2020	RFI (SDA-SN-20-0002)	SDA Space Mesh Networking Capabilities and Interoperability RFI	https://go.usa.gov/xd2fQ

SDA will host a Transport Layer Tranche 0 Industry Day on April 2, 2020 in Colorado Springs.

More information and registration here: <https://go.usa.gov/xd9yN>

Find additional info about these and future activities:

<https://www.SDA.mil>



SPACE DEVELOPMENT AGENCY

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