Implementation of U.S. Space Traffic Management Policy

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Recent US Space Policy Activities

- President Trump revived the National Space Council to coordinate and focus US space activities
  - Special emphasis on leveraging commercial capabilities to achieve national and international goals
- "Whole-of-government" approach to decision-making

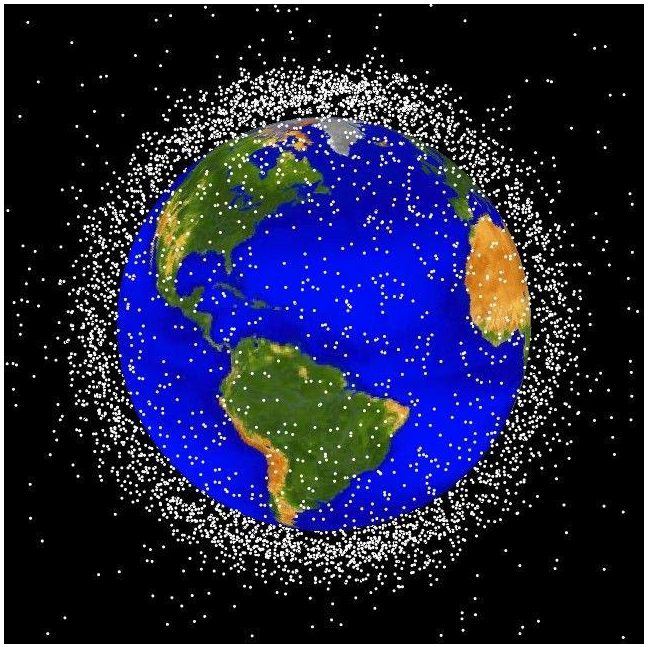
- Space Policy Directives:
  - Space Policy Directive 1(December 2017): Calls for the United States to lead an innovative and sustainable program of exploration with commercial and international partners, beginning with the return of humans to the Moon, followed by crewed missions to Mars
  - Space Policy Directive 2(May 2018): Calls for the streamlining of regulations on commercial use of space
  - Space Policy Directive 3(June 2018): Calls for a new approach to space situational awareness (SSA) and space traffic management (STM)
    - Designates the Department of Commerce (DOC) as new ***civil*** lead for SSA/STM
- These policies have also stimulated academic and think tank focus on commercial space

Global Focus on Commercial Space

- The global space economy is currently estimated at roughly $400 billion and is projected to be worth US$1 trillion-3 trillion by 2040
- The U.S. views the future of space as being predominantly commercial
  - Governments will always play a role in space, but increasingly as partners and customers of commercial companies
  - Expect innovation in traditional commercial space activities – communications, remote sensing, etc., as well as wholly new areas
- US Department of Commerce's Office of Space Commerce is responsible for "fostering the conditions for the economic growth and technological advancement of the U.S. commercial space industry"
- Many countries strive to leverage some part of the space economy, especially through commercial activities

The Spaceflight Safety Challenge

- Space debris creates significant physical and operational risk to all space systems, including human spaceflight
  - Including strong, steady growth of commercial space markets and their impact on Earth
- Our understanding of spaceflight safety hazards remains limited. Our ability to effectively warn spacecraft owners and operators is even more limited
- New technologies such as cubesats, large-constellations, maneuverable satellites, and increased launches will likely complicate the situation



Responding to the Spaceflight Safety Challenge

Principle: Safety, stability and operational sustainability are foundational to space activities

Historically, spaceflight safety has been a governmental function; however,

- Global commercial sector holds many keys to effective SSA and STM
  - STM, while conducted by individual spacecraft owners and operators, will be enabled by improved SSA data from a wide range of sources
- Innovative new capabilities and technologies in space sensing, data visualization and analytics are already commercially available
- Commercial service offerings to satellite owners and operators for improved collision avoidance are advancing
  - Data sources and decision aids for improved SSA could also enable new markets for satellite servicing and active debris removal

Key SSA/STM Initiatives (1/2)

1. Establish a DOC capability for SSA/STM by 2024
   - Responsible for the analysis and dissemination of US Government and private sector SSA data as well as “basic” STM services
   - New capability for SSA/STM will use “authoritative catalog” provided by U.S. Department of Defense as foundation
   - Basic SSA data and STM services will continue to be provided to the public free of direct user fees
   - DOC capability enriched by commercial and non-profit contributions and international collaboration
   - DOD retains lead for military-to-military SSA/STM data sharing
2. Outreach and engagement
   - Understand emerging commercial and other private sector capabilities
   - Use commercially collected data as the basis for new SSA and STM products and services
   - Draw from numerous commercial and private sector sources to drive innovations in SSA and STM
   - Private sector data contributions would be rigorously evaluated to ensure accuracy, availability and compatibility with standardized formats
   - Expanded avenues for collaboration with international partners

Key SSA/STM Initiatives (2/2)

3. Establish a DOC-administered open architecture data repository for SSA/STM data
   - Draw upon expertise located across DOC
     - National Oceanic and Atmospheric Administration
     - National Institute for Standards and Technology
     - National Technical Information Service
   - Create a state-of-the-art, cloud-based flexible architecture that will allow for routine experimentation and innovation
4. Develop STM standards and best practices
   - Begin with development of U.S.-led minimum safety standards and best practices to coordinate space traffic
     - Draw upon work and expertise of the Consultative Committee for Space Data Systems (CCSDS), International Organization for Standardization (ISO) and other competent organizations
     - Encourage input and participation of national and international standards-making organizations, including industry organizations
   - Adopt resulting standards and best practices in domestic regulatory frameworks
   - Inform and help shape international consensus practices and standards

Contribute to international implementation of 21 COPUOS guidelines for long-term sustainability of outer space activities