U.S.-Japan Space Forum:

Recommendations for the Japan-U.S. Comprehensive Dialogue on Space

JULY 2016

The Maureen and Mike Mansfield Foundation

Japan-U.S. Friendship Commission

Acknowledgements

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U.S.-Japan Space Forum

The U.S.-Japan Space Forum is a standing committee of space policy experts, meeting regularly since 2014 to examine critical developments and opportunities for bilateral space-related activities. The individuals below constitute the Forum's core group. The views expressed in this document reflect the core group's discussions and findings, although they do not necessarily reflect the views of any one participant, and nor do they represent the views of their organizations, corporations, or governments.

The Forum is convened by Frank Jannuzi (Mansfield Foundation) and Saadia Pekkanen (University of Washington Jackson School of International Studies). It is sponsored by the Japan-U.S. Friendship Commission, with additional support from Boeing, IHI AeroSpace, Lockheed-Martin, Mitsubishi Electric Corporation, Mitsubishi Heavy Industries, NEC, and Raytheon.

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Framework for Forward-looking U.S.-Japan Space Cooperation

In March 2016, the Maureen and Mike Mansfield Foundation convened the fourth meeting of the U.S.-Japan Space Forum, a gathering of American and Japanese experts from the private sector, academia, and government. The Forum began its deliberations two years earlier by assessing the fluid space environment – marked by changes in the constellation of space actors, new uses of space, proliferating security threats, and persistent constraint of resources in both the United States and Japan. Inspired in part by Japan's adoption of its Basic Plan on Space Policy in January, 2013 , the members of the Forum determined early on that promoting *collaboration* between the Japanese and American space sectors would help both nations address emerging challenges and take advantage of new opportunities to use space to advance common interests.

Reflecting on the track-one "Comprehensive Dialogue on Space," which is scheduled to meet in Autumn 2016, the members of the Forum have consolidated a concise list of recommendations for consideration by Japanese and American officials. These recommendations – grouped loosely under the categories of philosophy, policies, and missions/technologies – include those areas that we consider to be the most valuable and opportune for collaboration. The Forum has also formulated six action items that represent critical, near-term opportunities.

Taken together, the recommendations and near-term action opportunities provide a framework for forward-looking U.S.-Japan space cooperation. We urge members of the Comprehensive Dialogue to endorse this framework at their next meeting in Tokyo.

Philosophy

United States and Japan as Equal Partners

Define the meaning and responsibilities associated with the United States and Japan moving forward with the aspiration of creating a more equal partnership in space. Cognizant of budget disparities and constitutional requirements (e.g. Japanese limitations on collective self-defense measures in response to space threats), work to minimize structural imbalances and improve the coordination of responsibilities between the two nations.

Politics and Public Relations

Inform citizenry about the broad benefits of space activities, including, but not limited to, Earth observation and exploration of the moon and our solar system. Earth observation has become integral not only to national security, but also to telecommunications, disaster management and response, navigation, mapping and imaging, and weather prediction and climate analysis. Beyond-Earth-observation missions such as lunar exploration and missions to Mars, asteroids, and beyond hold great promise for energy security, biomedical research, mining, manufacturing, etc.

"All of Society" Approach

Pursue a holistic approach among national security, commercial, and scientific space sectors. All sectors are crucial to achieving robust space capabilities and technological advancement.

International Norms and Practices

Even in the absence of international consensus, move forward bilaterally, and multilaterally where possible, with proposals for norms, practices, and codes of conduct that advance the stable, sustainable, peaceful use of space by all humanity.

Policies

Resiliency of Space Assets

Develop multiple approaches to the resilience of space assets to include specific agreements and joint statements between the United States and Japan. Prioritize expanding interoperability and resilience in the following areas:

- space-based positioning, navigation, and timing
- enhanced space situational awareness (SSA)
- the use of space for maritime domain awareness (MDA)
- research and development of space technologies
- use of hosted payloads

Ensure Industrial Capacity, Technical Capability, and Human Capital

Integrate the private sector into planning and definition of system requirements at an early stage. Pilot projects could help provide direction and stability of purpose to our private sectors. Promote a strong talent and human capital pipeline in both countries by investing in Science, Technology, Engineering, and Math (STEM) educational programs that include a focus on disciplines relevant to space. Expanding educational exchanges and sharing best practices in education and training would be an important complement to this effort.

Align and Leverage Regulatory Reforms to Enhance Cooperation and Competitiveness

Harmonize standards for handling sensitive information, including penalties for unauthorized disclosure of classified data. Take advantage of recent reforms in U.S. export controls to improve interoperability on space-based communications, global positioning, earth observation, etc.

Open-Door Government Procurement

DOD, MOD, and METI should build upon the recently concluded Reciprocal Defense Procurement MOU, agreed June 16, 2016, by expanding opportunities for integrating Japanese and American space technologies and equipment. Established government-to-government relationships offer an expedient way for U.S. and Japanese space businesses to expand collaboration. MOD and DOD should harmonize military procurement specifications or create a mechanism recognizing each other's systems. This will encourage off-the shelf components, reducing costs and improving reliability.

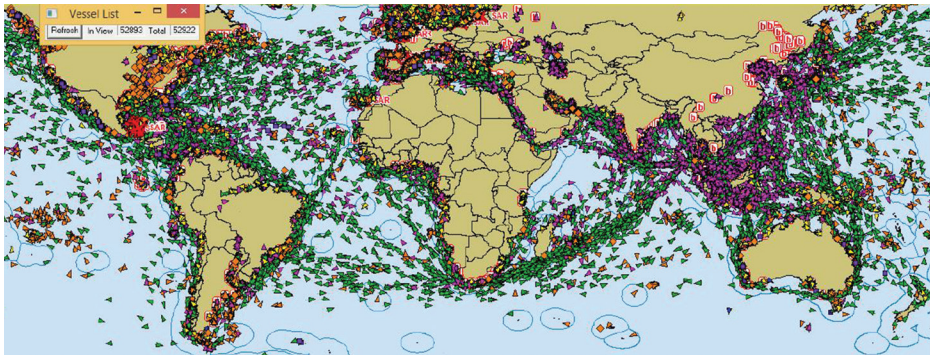
Facilitate Industrial Collaboration and Interoperability

Enable balanced industrial collaboration between the United States and Japan. The goal is to support both nations' industrial bases while simultaneously reducing schedule and technical risks, as well as costs, especially in the area of government and national security space programs. Specific measures include:

- Consistent with WTO obligations and other trade agreements, establish harmonization committees addressing Japanese and U.S. industry procurement and development standards. The pharmaceutical industry's practice provides a useful example.
- Provide stronger links between national objectives and civil research and development capabilities through establishment and funding of a framework for bilateral research and development that opens competitive bidding to Japanese and American firms (using European Union framework programs as a possible model).
- Support legislation allowing for increased collaboration at the component and subsystem levels, as well as ensuring sound competition between American and Japanese companies.

Encourage Regional Centers of Excellence (COE) in Space

"Innovation Ecosystems" exist in both Japan and the United States – locales marked by the nexus of a skilled workforce, access to higher education, a concentration of high-tech industries (including information technology, robotics, etc.), and venture capital. Seattle is one such example of a space research and development hub in the United States. As each country has its own methodology in creating such regional COEs, Tokyo and Washington should identify opportunities to integrate regional centers of the U.S. and Japanese space industries into national-level initiatives, and to facilitate commercial, R&D, and educational engagement between them.



Global maritime domain awareness contributed by terrestrial and commercial satellite AIS data

Image courtesy of the U.S. Department of Transportation, Volpe Center

Space Situational Awareness (SSA)

Continue to enhance Japanese interoperability with American SSA systems and move toward two-way data-sharing through proper networks. Gather and utilize unclassified SSA data while working towards full cooperation and use of classified data. Encourage the development of small, light-weight, low power technologies to allow small satellites to "squawk" their identities and precise locations, with the goal of making universal self-identification and GPS-quality location broadcasts feasible.

Maritime Domain Awareness (MDA)

MDA has emerged as a high priority topic for both nations' national security and commercial sectors (see image on previous page). In October, 2015, Japan took an important step by adopting a national MDA concept paper that clarifies its approach to wide-area maritime surveillance and the challenges it faces incorporating space and terrestrial assets into its MDA architecture. The following steps could enhance their capacity in this area:

- Deepen discussions between Japanese and American defense industry organizations and governments in order to clarify essential requirements for MDA and associated systems, and the roles and responsibilities of each country.
- Extend existing U.S. information-sharing policy regarding maritime data to include Japan.
- Consider establishing a Japanese body to promote regional coordination and information-sharing among Asia Pacific nations' maritime forces (law enforcement, and relevant regulatory entities).
- Offer opportunities for Japan to build a foundation of knowledge and experience through maritime exercises, operational experimentation, and demonstrations involving the use of space for MDA. We note that the allies held their first "Use of space for Maritime Domain Awareness" tabletop exercise in 2014.

Small Satellites and Big Data

As data collection in both the civil and commercial sectors expands rapidly, the United States and Japan should establish norms and practices in managing data, seeking to set global standards with respect to intellectual property and privacy. The United States and Japan should also lead by legislating a link between satellite introduction and the ability to eventually de-orbit that satellite so as to minimize the creation of space debris.

Japanese Role at the Joint Space Operations Center (JSpOC)

Invite participation from the Japan (MOD) in the Joint Space Operations Center to enhance operational compatibility consistent with the U.S.-Japan Mutual Defense Treaty.

GPS & QZSS

Continue to work towards greater interoperability and cooperation on GPS and QZSS, improving resiliency of these systems and thereby strengthening the tangible partnership in space between the United States and Japan.

International Space Station

Building on the Japan-U.S. Open Platform Partnership Program (OP3), examine the political and national security benefits of the International Space Station (ISS) in addition to its scientific value. Ensure commitment in the future by improving the cost-benefit balance of the space station for Japan. Increase industry involvement with the ISS to strengthen the industrial base and enable creative new uses for the ISS in space exploration.

Earth Observation

Earth observation missions – an area where Japan and the United States have long collaborated – are collecting data from space that is vital to our understanding of our planet and its future. For instance, NOAA scientists use data collected from JAXA's Global Change Observation Mission satellites to help forecast severe storms, monitor the decline of arctic sea ice, and predict the onset of El Nino and other climate phenomena. Furthermore, NASA and JAXA launched the Global Precipitation Measurement (GPM) Core Observatory on February 27, 2014. Consistent with a holistic, "all of society" approach to utilizing space, the allies should build on the success of projects such as GCOM, providing significant and lasting benefits to scientists in both countries and around the world.

Space Exploration and SSPS

Consider collaboration on Lunar and Mars exploration, NASA's Orion project, as well as other scientific missions in space. Large scale space exploration missions serve to bolster technological, policy, and legal capacity for broader bilateral and multilateral efforts. Emphasis should be placed on advancing key technologies, such as space solar power systems (SSPS), both to support space exploration and, potentially, to provide a zero-carbon alternative energy source on Earth. Japan has world-leading SSPS technologies. Cooperation on SSPS projects would inspire the public and generate creative solutions for addressing global challenges such as climate change.

Immediate Action Items for 2016 Comprehensive Dialog

Track 1.5 - Comprehensive Dialogue on Space

Include the private sector in the Comprehensive Dialogue on Space to promote communication and more efficient planning concerning government contracts. Create a session for government agencies to report requirements and intentions to industry contractors and trade associations.

Critical Infrastructure Definition

Classify space assets and architecture as National Critical Infrastructure, reflecting the profound importance of these assets to our national interests. Take care to structure such protection to permit innovation in technology and business models and not obstruct market-driven progress.

Collective Self-Defense in Space

Ensure that the Treaty of Mutual Cooperation and Security between the United States and Japan applies in the event of a hostile attack on U.S. or Japanese space assets. Host exercises to clarify the definition and approaches to self-defense in space in the context of the current political and technological environment. Close loopholes and remove barriers to the application of collective self-defense principles to space activities.

Direct Legislative Exchange

Create a U.S.-Japan space standing caucus comprised of members of the Diet of Japan and the U.S. Congress. Elected leaders should increase their dialogue and strengthen cooperation on space issues, thereby improving transparency and promoting equality of the partnership.

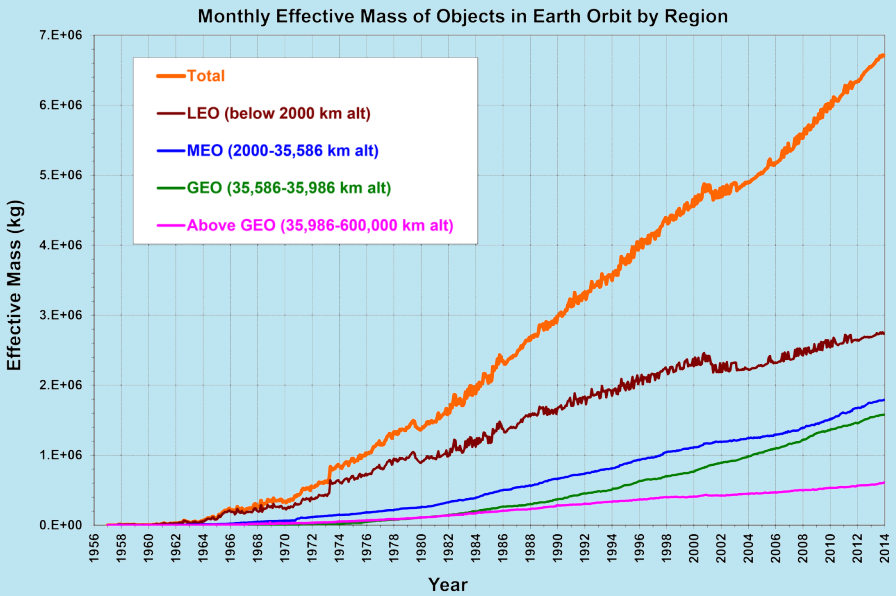
Space Activity & Remote Sensing Data Law

Japan has taken an important step forward in enabling private sector engagement and investment in remote sensing. Japan should build on this progress by enhancing its Space Activity & Remote Sensing Data Laws with practical-level detail and specificity regarding implementation and incentives. In this context, in order to promote technological innovation and global market expansion, Japan should design the implementing regulations so that the remote sensing law will promote new business, not prevent it. Similarly, the United States has an opportunity to update and streamline its own regulatory and licensing regime, based on a forward-looking assessment

of the globally competitive remote sensing marketplace. Both governments should facilitate industrial cooperation through the creation of a Japanese comprehensive data policy addressing dual-use technologies and capabilities. An effective fast-track arrangement for licensing overseas commercial remote sensing business, focusing first on cooperative initiatives in areas such as disaster mitigation and MDA, could contribute to the global competitiveness of Japanese and American remote sensing firms. The fact that many new remote sensing related businesses are emerging in the US implies that the current remote sensing regulations in US are well designed to promote commercial activities. Harmonizing with US regulation would be a good starting point for Japan to design their new remote sensing regulation.

Private Sector Partnership for Space Debris Removal

To address a potentially serious threat to the security of both nations' space assets, the United States and Japan should work to establish an international norm to minimize the creation of new orbital debris and to reduce existing debris. The allies should cooperate on a civil space orbital debris removal mission, recognizing that this issue has both national security and commercial implications. Such a mission would enhance the robustness of civil space cooperation between the United States and Japan.



Increase in orbital debris over time, as cataloged by the U.S. Space Surveillance Network

Chart courtesy of Orbital Debris Program Office, NASA/Johnson Space Center, Houston, Texas, USA

Japan-U.S. Friendship Commission

The Japan-U.S. Friendship Commission was established as an independent federal government agency by the United States Congress in 1975 (P.L. 94-118) to strengthen the U.S.-Japan relationship through educational, cultural, and intellectual exchange. The Commission is a grant making agency that supports research, education, public affairs and exchange with Japan. Its mission is to support reciprocal people-to-people understanding, and promote partnerships that advance common interests between Japan and the United States.

The Maureen and Mike Mansfield Foundation

The Maureen and Mike Mansfield Foundation is a 501(c)3 organization that promotes understanding and cooperation in U.S.-Asia relations. The Foundation was established in 1983 to honor Mike Mansfield (1903-2001), a revered public servant, statesman and diplomat who played a pivotal role in many of the key domestic and international issues of the 20th century as U.S. congressman from Montana, Senate majority leader and finally as U.S. ambassador to Japan. Maureen and Mike Mansfield's values, ideals and vision for U.S.-Asia relations continue through the Foundation's exchanges, dialogues, research and educational programs, which create networks among U.S. and Asian leaders, explore the underlying issues influencing public policies, and increase awareness about the nations and peoples of Asia.

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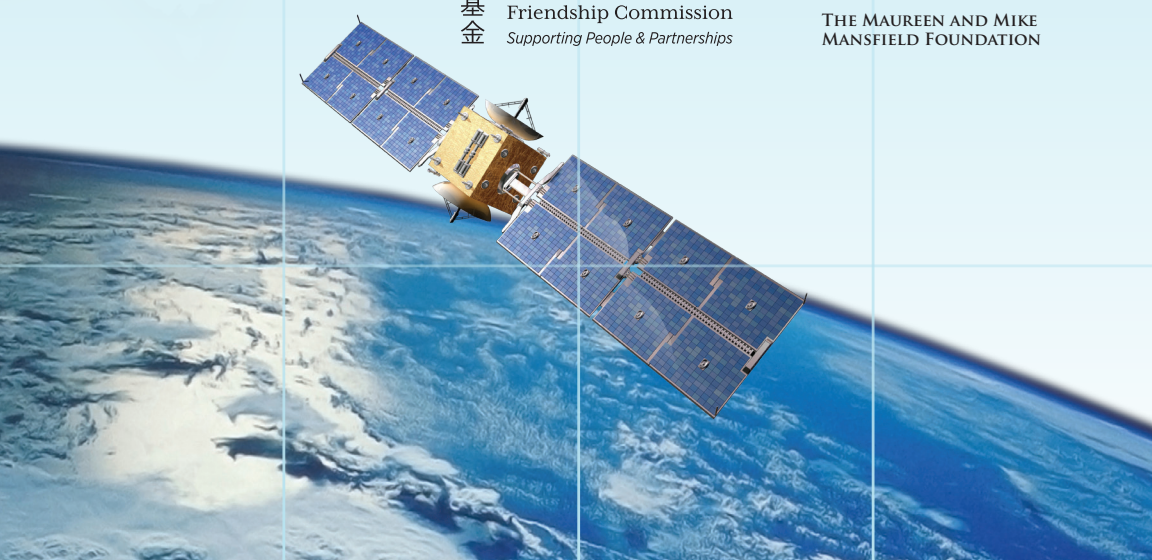

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