

**Written Testimony of
Joanne Irene Gabrynowicz**

Before the

**Committee on Science, Space and Technology Subcommittee on Space
United States House of Representatives**

Wednesday, September 7, 2016 – 2:00PM 2318 RHOB

Chairman Smith, Ranking Member Johnson, Members of the Committee: Thank you for giving me the opportunity to address the subject of *Commercial Remote Sensing: Facilitating Innovation and Leadership*.

When invited to testify regarding the state of U.S. remote sensing law and regulation governing commercial space-based remote sensing, I was asked to raise what I consider to be some of the key issues for Congress to include in its consideration. They are, the purpose of the Federal government's investments in enabling commercial remote sensing activities; the global commercial remote sensing legal landscape; U.S. leadership in two crucial policies; and the existing onerous licensing process.

**I. The Purpose of the Federal Government's Investments In
Enabling Commercial Remote Sensing Activities**

A key question to be considered is whether federal funds—either as grants, contracts, or subsidies—will be used to facilitate new national remote sensing legislation and the activities it will address. And, if so, what is the policy the funds are intended to execute?

In approximately one decade as government space-imaging requirements—specifically military and intelligence requirements—changed, the commercial remote sensing satellite industry decreased from three companies to

one.¹ The remaining company continues to operate only due to its continuing National Geospatial-Intelligence Agency (NGA) contract.

Is this situation the result of the government harming industry development by attempting to commercialize satellite remote sensing with public funds and exercising control over companies to meet mission needs? Or is the situation the result of the private sector being dependent on government funding rather than risking its own capital and executing bona fide business plans? Or is it both? This is an analysis for an economist and should be pursued. Nonetheless, what is evident is that after years of providing funds, contracts, products, and services, the fact remains that there is no sustained long-term commercial remote sensing satellite industry in the U.S. What does exist—a single entity—exists because of military funding, not because of an independent market.²

New technologies are emerging that can now be applied to commercial satellite remote sensing. These include smallsats and smallsat constellations. Unpiloted aerial vehicles (“drones”) are also in competition with emerging space-

¹ EOSAT began in the 1980s. SpacelMaging began circa 1994. It acquired EOSAT in 1996. WorldView Imaging began in 1992. WorldView Imaging changed its name to Earthwatch in 1995. Earthwatch changed its name to DigitalGlobe in 2001. In the early 2000s, there were three operators: DigitalGlobe, SpacelMaging and Orbimage (former subsidiary of Orbital Imaging). The government (NIMA/NGA) tendered two contracts. SpacelMaging was not awarded one of the contracts and failed. SpacelMaging was acquired by Orbimage in 2005. Orbimage changed its name to GeoEye in 2006. GeoEye and DigitalGlobe merged in 2012 when the government changed its requirements for imaging services. In sum, the industry went from three operators to one in approximately one decade.

² This was also the case with the civil *Landsat* system in the 1980s. The attempt at first privatizing, then commercializing *Landsat* resulted in a single federally funded monopoly which led to returning *Landsat* to the public sector. See Joanne Irene Gabrynowicz, *The Perils of Landsat from Grassroots to Globalization: A Comprehensive Review of U.S. Remote Sensing Law with a Few Thoughts for the Future*, 6 CHI. J. Intl'l. 45 (2005).

based platforms. The NGA has announced a new Commercial GEOINT Strategy that plans to use smallsats and other new emerging technologies.³

The question going forward is, will the previous cycle be repeated but with newer technologies? That is, an infusion of military funds into a few companies whose overwhelming focus must be to make the new technologies meet mission needs; followed by industry reorganization catalyzed by change in mission requirements; followed by a winnowing of companies to a single provider that will likely be rendered technologically less relevant in the face of the next new technology.

The possibility of repeating this cycle requires consideration of two concepts. The first is, what constitutes “commercial”. The second is what remote sensing activities ought to be in the private sector and what remote sensing activities ought to be in the public sector.

“The definition of the term ‘commercial’ has a long and dynamic history in the aerospace industry.”⁴ In Congress’ consideration of the state of U.S. remote sensing law careful attention needs to be paid to the definition of “commercial”. This consideration needs to include the fact that the remote sensing industry has become less an aerospace industry and more of an information industry. Careful attention needs to be paid to the related concepts and definitions of “commercialization” and “privatization”.⁵ Congress has indicated it also strives to

³ Doug Messier, *NGA Announces New Commercial GEOINT Strategy*, Parabolic Arc (Nov. 7, 2015), <http://www.parabolicarc.com/2015/11/07/geoint-strategy/#more-56695>

⁴ See Joanne Irene Gabrynowicz, *One Half Century and Counting: the Evolution of U.S. National Law and Three Long-Term Emerging Issues*, 4 Harv. L. & Pol’y Rev., 405, 423 (2010).

⁵ “Privatization is when industry provides goods and services previously provided by governments. Commercialization is a more difficult task in that industry has to serve private demand in addition to government demand.” Dr. Scott Pace, Hearing of the House Committee on Science, Space, and Technology Subcommittee on Environment

seek clarification of these terms.⁶ Going forward, it ought to be clear whether Congressional intent is to facilitate a true commercial information industry with a vibrant market or a dedicated capability dependent on military funds.

Remote sensing is more than satellites. Congress' consideration of the state of U.S. remote sensing law should also include what remote sensing activities ought to be in the private sector and what activities ought to be in the public sector. This includes considering the need for a publically disseminated remotely sensed data set with characteristics determined by science and industry

"NOAA Utilization of Commercial Remote Sensing Data", May 20, 2015, *available at* <https://elliott.gwu.edu/sites/elliott.gwu.edu/files/downloads/news/pace-noaa-commercial-remote-sensing-data-May20-2015.pdf>.

⁶ An Act To Authorize Appropriations for the National Aeronautics and Space Administration for Fiscal Years 2000, 2001, an 2002, and for Other Purposes, P.L. 106-391, § 309. "DEFINITIONS OF COMMERCIAL SPACE POLICY TERMS. It is the sense of the Congress that...the usage of terminology in [NASA] policies [be]...consistent with the following definitions:

(1) The term "commercialization" means actions or policies which promote or facilitate the private creation or expansion of commercial markets for privately developed and privately provided space goods and services, including privatized space activities.

(2) The term "commercial purchase" means a purchase by the Federal Government of space goods and services at a market price from a private entity which has invested private resources to meet commercial requirements.

(3) The term "commercial use of Federal assets" means the use of Federal assets by a private entity to deliver services to commercial customers, with or without putting private capital at risk.

(4) The term "contract consolidation" means the combining of two or more Government service contracts for related space activities into one larger Government service contract.

(5) The term "privatization" means the process of transferring--

(A) control and ownership of Federal space-related assets, along with the responsibility for operating, maintaining, and upgrading those assets, to the private sector; or

(B) control and responsibility for space-related functions from the Federal Government to the private sector."

needs as a baseline to support value-added activities by both the public and private sector.⁷

II. The Global Commercial Remote Sensing Legal Landscape

U.S. remote sensing law, like most U.S. space law, is the apparent standard for remote sensing law around the world. Some of the legal principles established in U.S. remote sensing law have been adopted by other nations. The best example of this is the principle of nondiscriminatory access to data. Any changes in U.S. national remote sensing law will be closely observed by other remote sensing nations. It should be expected that in some cases changes made in U.S. law will be adapted or adopted by other nations.

Remote sensing has catalyzed more recent national space law, regulations, and policies than any other space activity.⁸ Even nations that had been major spacefaring nations for decades only found it in their national interest to promulgate a national space law with the advent of commercial remote sensing. These nations include Canada, Germany, France, and Japan. In addition to the United States, there are currently approximately 22 nations that have national commercial remote sensing laws, regulations and/or data policies.⁹

⁷ The author would like acknowledge Dr. Gerald C. Nelson Professor Emeritus, University of Illinois at Urbana-Champaign for his assistance in discussing economic aspects of remote sensing. See, Google Scholar, *Gerald C. Nelson*, <https://scholar.google.com/citations?user=g5W2z5EAAAAJ> (last visited, Sept. 5, 2016).

⁸ Here, “national space law” encompasses statutes analogous the 1958 *National Aeronautics and Space Act* in the U.S. That is, a statute specifically dedicated to general national space interests. It does not include bodies of law specifically dedicated to stand-alone activities like telecommunications.

⁹ Gabrynowicz, J.I. *The Land Remote Sensing Laws and Policies of National Governments: A Global Survey*, NCRSASL/DOC-NOAA (2007), available at <http://www.spacelaw.olemiss.edu/resources/pdfs/noaa.pdf>. (There are more policies than law but the trend has been to establish more formal law.).

The proliferation of remote sensing legislation was a specific response to the commercialization of high-resolution data.¹⁰ High-resolution data has a long heritage of intelligence gathering and military applications that prompted nations to protect their national security interests and to meet international treaty obligations by passing national laws.

Each national law has been crafted to meet the specific interests of the nation in question. Some are more restrictive than U.S. law. Two examples of this are the remote sensing laws of Canada and Germany.

In Canada, government departments and agencies at all levels, as well as individuals and corporations, are subject to the legislation and require a license.¹¹ This is analogous to requiring NASA or the Defense Department to obtain a remote sensing license for their satellites.

In Germany, satellite operators and data distributors must use a decision-tree supplied by the Federal Government to determine if the entity to whom they want to provide data is an acceptable recipient. Despite the use of the decision-tree, if the recipient later proves to be anathema to Germany's national interests the distributor is subject to criminal sanctions.¹² U.S. law provides only civil, not criminal sanctions.¹³

¹⁰ There is no one uniform definition of "high resolution". For purposes of this testimony, the term "high definition" refers to spatial resolution used in national laws and policies by the major remote sensing nations.

¹¹ See Remote Sensing Space Systems Act, 2005 S.C., ch. 45 (Can.), and Remote Sensing Space Systems Regulations, SOR/2007-66 (Can.).

¹² *Act to give Protection against the Security Risk to the Federal Republic of Germany by the Dissemination of High-Grade Earth Remote Sensing Data (Satellite Data Security Act — SatDSiG)* (2007). Unofficial English translation available at 34 J. Space. Law 115 (2008).

¹³ 15 C.F.R. §§ 960.14 – 15 (2006).

III. U.S. Leadership in Two Crucial Policies

A. The Nondiscriminatory Access Policy

The U.S. was the leader in establishing, defining, and applying the nondiscriminatory access policy. The U.S. instituted the policy to counter the position taken by some nations that the consent of a sensed state was necessary before remotely sensed images could be collected or distributed. The international community accepted the nondiscriminatory policy and the legitimacy of remote sensing was established at international law. At the national level, the U.S. Congress formally adopted the policy and incorporated it into U.S. law twice. The second time Congress enacted the policy, “the Committee refrained from making any changes in the nondiscriminatory access provision as it applies to private systems. Specifically, the Committee is reluctant to take any action which...might revive debate in the United Nations about the legitimacy of remote-sensing without prior consent.”¹⁴

It is in the U.S. national interest to ensure that the nondiscriminatory access policy is continued. Currently, it applies to both public and, to a more limited extent, private systems. In the U.S., satellites paid for entirely by tax funds are required to make data available to all who request it. Satellites paid for entirely by private funds must make data available to a sensed state on commercial terms. A case-by-case determination is to be made regarding satellites paid for partly by tax funds and partly by private funds.¹⁵

B. The National Satellite Land Remote Sensing Data Archive (NSLRSDA)

The scientific value of data grows over time. In the era of big data, it now also grows in economic value over time. It is crucial to both public and private interests that the U.S. has data archiving policies in place for the very long-term.

¹⁴ H.R. Rep. 102-539 at 51-53.

¹⁵ 15 C.F.R. §§ 960.9 and 12 (2006).

Recognizing the growing importance of global change research, Congress transferred responsibility for maintaining and expanding the National Satellite Land Remote Sensing Data Archive from a private sector operator and the Department of Commerce to the Department of the Interior. The result was to align responsibility with what was already being carried out in practice.¹⁶ As part of this realignment, a regulation was promulgated to require licensed commercial remote sensing satellite operators to “(1) [p]rovide data to the National Satellite Land Remote Sensing Data Archive for the basic data set; (2) [m]ake data available to the National Satellite Land Remote Sensing Data Archive that the licensee intends to purge from its holdings...” so that the NSLRSDA has the opportunity to acquire the data at the cost of reproduction and delivery. Annual operational audit and record keeping must include imagery purges and purge alerts provided to NSLRSDA.¹⁷ Operators are not required to purge data. If an operator chooses to conduct a data purge it will use its own internal criteria based upon what it deems best for its business. However, the operator must give the NSLRSDA a right of first refusal if the decision to purge is made. These are important regulations that must be retained.

IV. The License Application Process, as Currently Administered, is Onerous and Dysfunctional

A license certifies to the world the legality of the licensee’s actions. A license is also the mechanism whereby the U.S. meets its obligation¹⁸ to

¹⁶ H.R. Rep. 102-539 at 50.

¹⁷ 15 C.F.R. § 960.0 (2006).

¹⁸ “In particular, it is important to note that ***the license requirement*** imposed on the licensee that it maintain ‘operational control,’ as the term is defined in Section 960.3, ***is an implementation of U.S. obligations under the United Nations Outer Space Treaty of 1967.*** That treaty provides that the U.S. Government, as a State party, will be held strictly liable for any U.S. private or governmental entity’s actions in outer-space. Consequently, NOAA requires that licensees under this part to maintain ultimate control of their systems, in order to minimize the risk of such liability and assure that the national security concerns, foreign policy and international obligations of the United States are protected.” 15 C.F.R. § 960 at 24477 (2006). Emphasis added.

“authorize[e] and continua[lly] supervis[e]” the space activities of nongovernmental organizations.¹⁹

An effective and efficient licensing process is in the best interests of both the Nation and industry. However, an effective and efficient licensing process is not the current reality. On paper, the interagency licensing process is a maximum 120-day process in which “the Secretary of Commerce shall review...and make a determination.”²⁰ In reality, license applications are mired in interagency turf battles, ideological differences, disparity of political strength among agencies, as well as genuine differences in worldview and what is in the national interest.

The private satellite remote sensing licensing regulations embody a worldview that reflects the closing days of the Cold War more than Globalization Era technology development. This is most clear in the method of dispute resolution in the event of an interagency disagreement at the staff level during a license review. “Consultations shall be constructed so that, in the event an agreement cannot be reached at the staff level, sufficient time will remain to allow the Secretary of Commerce to consult *personally* with the Secretary of State or the Secretary of Defense, as appropriate, prior to the issuance of a determination by the Secretary of State or the Secretary of Defense [...] That function **shall not be delegated** below the acting Secretary [...failing to reach consensus, the Principals will] refer the matter to the President for decision.”²¹ (See Appendix 1) This dispute resolution structure gives substance to an often-voiced criticism of the licensing process namely, that the Government is overly protective of remote sensing capabilities and technologies.

¹⁹ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205, art. VI.

²⁰ 15 C.F.R. Part 960, Appendix 2, Fact Sheet Regarding the Memorandum of Understanding Concerning the Licensing of Private Remote Sensing Satellite Systems Dated February 2, 2000.

²¹ 15 C.F.R. 960, Fact Sheet Regarding the Memorandum of Understanding Concerning The Licensing of Private Remote Sensing Satellite Systems, Feb. 2, 2000. Emphasis added.

The regulations for licensing private land remote sensing systems were first promulgated in 2000, and revised in 2006.²² The revision was prompted by the “experience gained since August 2000 with respect to the licensing of commercial remote sensing space systems, and include improvements that take into account public comments received on the regulations.”²³ The interagency process was not reconsidered at that time.²⁴ It is unnecessary to change the Land Remote Sensing Policy Act of 1992.²⁵ However, after a full 16 years of experience, revisiting the interagency process would be appropriate. Among the potential changes that ought to be considered are mechanisms to determine if and when: an individual agency policy is bringing more influence to bear than a national policy; the failure to reach a decision is based on disparity of political power more than anything else; and, the establishment of an authoritative dispute resolution mechanism that can be accessed below the Cabinet level.

Finally, when considering the interagency process the use of durable general principles ought to be encouraged as guidelines for the process. General principles can be applied to a myriad of situations that require decisions to be made. If the guidelines are articulated primarily in technological specifics, the guidelines can change with each inevitable technological change, creating an unpredictable regulatory process.

I thank the committee for giving me this opportunity and thank you for your work to develop the law of space.:

²² 15 C.F.R. Part 960 (2006).

²³ *Id.* at 24474.

²⁴ *Id.* Subpart B, at 24476. “NOAA, in consultation with the other signatory agencies to the MOU, has determined not to amend the MOU at this time.”

²⁵ 51 U.S.C. § 60101 et seq.

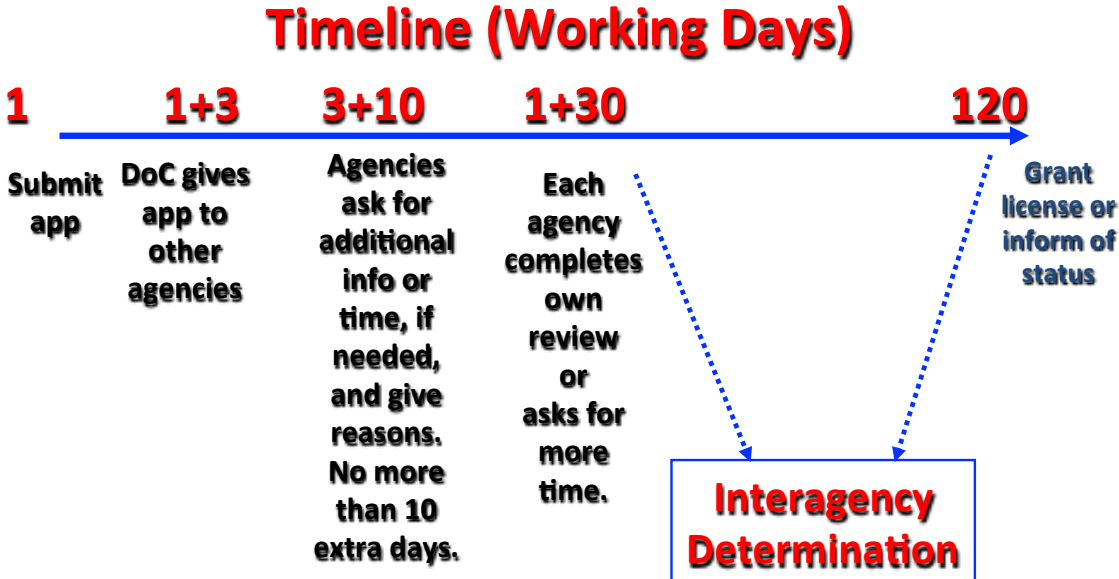
* The author wants acknowledge Mr. Ian Burke Perry for his assistance in editing.

Memorandum of
Understanding Concerning the
Licensing of Private Remote Sensing
Satellite Systems Dated February 2, 2000

Written Testimony of
Joanne Irene Gabrynowicz
Before the
Subcommittee on Space of the Committee on Science,
Space and Technology United States House of
Representatives

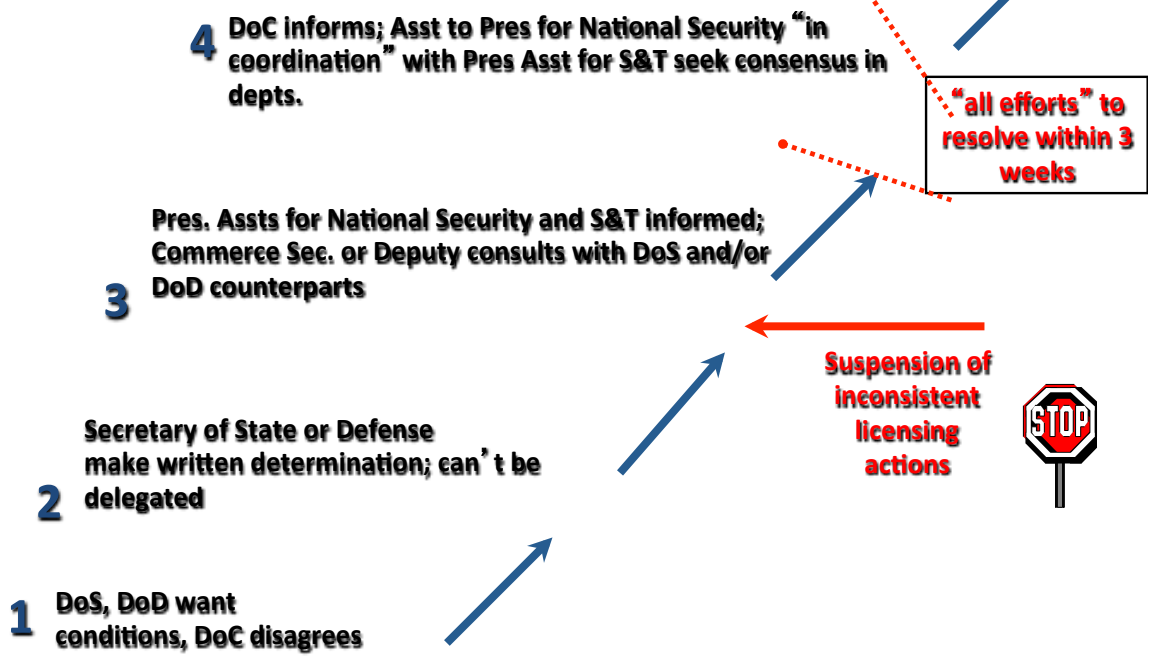
APPENDIX 1

Commercial High-Resolution Systems Consultation During Review of Licensing Actions



© Gabrynowicz 2016

Consultation During Review of Licensing Actions



© Gabrynowicz 2016