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IS SPACE EXPLORATION BEST SERVED BY NASA HOLDING PROPERTY ASSETS AS A LANDLORD?

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ABSTRACT

In an era of tightening federal budgets, is NASA's mission focus on exploration beyond earth orbit impeded by its ownership and "landlord" responsibilities for an extensive real estate footprint? Would space explorers and American taxpayers alike be better served if NASA cast off some of its terrestrial liabilities? Is NASA willing to rely on state and private sector partners to assume a greater role in managing, operating, and eventually recapitalizing the nation's launch sites? If so, could we accelerate our return to the Moon, our quest to send humans to Mars, or a discovery that life exists elsewhere in our universe? Would we prefer a NASA opportunity announcement of "space availability" be in reference to a deep space mission, rather than a solicitation seeking renters for an unneeded facility?

These questions are explored in the context of on-going challenges to transforming NASA's Kennedy Space Center, and through examination of federal property divestment alternatives that have demonstrated effectiveness in other applications. These include Base Realignment and Closure (BRAC) property transfers, Public Benefit Conveyances of former federal airports and seaports; and creation of state-chartered authorities to develop and manage transportation infrastructure, including spaceports.

NASA is the ninth largest real property holder among all federal agencies, accountable for over 124,000 acres of land and more than 4,900 buildings and structures with a replacement value exceeding $30 billion. Kennedy Space Center (KSC) constitutes 67% of the agency's land ownership and nearly 20% of NASA's facilities asset value. Current property management initiatives, such as those dealing with former Space Shuttle facilities like the Shuttle's runway and orbiter processing hangars, illustrate different approaches to and interpretations of government policy and down-sizing directives. The authors present competing approaches and assess relative merits for a sustainable business model that supports long term space exploration and economic development.

FEDERAL DISCRETIONARY SPENDING: THE THREAT TO NASA HUMAN EXPLORATION PROGRAMS

Is Space Exploration best served by NASA holding property assets as a landlord? The answer to this question must first be considered in the context of today's ever tightening budget, and the implications of that to the necessary mission focus and resource allocation decisions the agency must make.

Like it or not, funding for NASA falls into the declining portion of the U.S. budget labeled "Discretionary." That is the portion of the budget that lawmakers control through annual Congressional appropriations, as opposed to the much larger share of the budget that is mandatory spending on entitlement programs and the national debt payments. The trend in discretionary spending does not bode well for NASA's human exploration programs.

In a 2013 report, the non-partisan Congressional Budget Office highlighted the downward projection of federal funding expected to be available for Congress to appropriate against discretionary spending priorities through 2023. Based on assumptions related to existing budget controls, the CBO projected that availability of funding for defense and non-defense discretionary spending would be at the lowest level (relative to GDP) in more than half a century (Table 1). The CBO report examined a set of 28 options that federal lawmakers could consider in order to further reduce the U.S. budget deficit or redistribute the available funds among "higher priority purposes" while keeping total discretionary appropriations at or very close to current statutory caps on spending. **Option 11: Eliminate NASA's human space exploration programs**.[1]

Today's ever-present challenge is to balance federal spending with budgetary resources amid growing concern for the threat to our nation's economic health from an expanding U.S. debt. In this environment of budget competition for declining resources, NASA and its stakeholders have no choice but to seek and implement the most cost efficient measures for programs and activities that will undergo intense scrutiny within both the Administration and Congress.

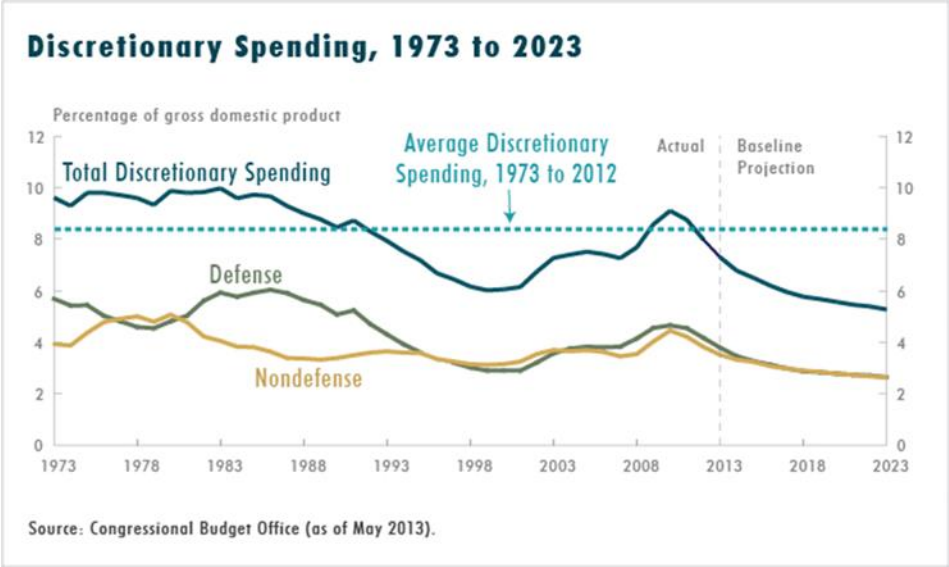

Exhibit 1: A View of U.S. Discretionary Spending, 1973 to 2033

Given this reality, it is tempting for NASA to search for ways to "supplement" its federal appropriations as a means of retaining particular capabilities or assets. Leasing of assets is one such possibility. However, those activities are being scrutinized by Congress as to whether they are being pursued as authorized and appropriate to the purposes and mission of the agency. Agencies may not augment their appropriated funds without the express authority of Congress, which has a well-known history for granting such authority with great caution and

heightened oversight. To be sure, any activity which appears to have little or no relation to the mission and purpose that Congress has established for an agency, or has the potential to divert NASA mission focus and resources, is likely to be a lightning rod for Congressional inquiry and reaction.

Further, any NASA success in generating "supplemental" revenue, even if done with Congressional blessing, will more than likely be rewarded with corresponding reduction of appropriated funds so that the freed up discretionary budget can be reallocated to other purposes outside of NASA. NASA must be careful not to antagonize federal lawmakers who may already have human space exploration programs on their short list of budget reduction candidates.

NASA's earthly possessions: Becoming the government's ninth largest property owner

Today, NASA is the ninth largest real property holder among all federal agencies, accountable for over 124,000 acres of land and more than 4,900 buildings and structures with a replacement value exceeding $30 billion.[2] Kennedy Space Center (KSC) constitutes 67% of the agency's land ownership and nearly 20% of NASA's facilities asset value.[3]

Most of the agency's land and facilities were acquired in the early 1960s in support of the nation's Apollo lunar landing program. At KSC, then known as NASA's Merritt Island Launch Area, plans for the infrastructure and support facilities needed for the Saturn V and much larger Nova launch vehicles led to acquisition of nearly 85,000 acres of property by outright purchase or condemnation proceedings, and the open-ended use dedication by the State of Florida for another 56,000 acres of state-owned submerged lands and other properties for the government's purpose of conducting space program activities.[4]

There was little existing infrastructure on the newly acquired NASA property, and the planned industrial area and launch complexes for the moon base were miles away from the small, mostly rural communities on the mainland nearby.

Construction began in early 1963 at what was expected to be nearly a billion dollars' worth of facilities. In 1968 at the peak of the effort to conduct the Apollo lunar landing program, a total of 26,500 NASA civil service and contractor employees worked at what had become the Kennedy Space Center.[5]

A limited number of additional facilities, including the Shuttle Landing Facility (SLF), were later added to the facilities footprint of KSC in the 1970s for the Space Shuttle Program. Today, KSC's constructed assets are mostly over 40 years and in a deteriorating condition due to the magnitude of deferred maintenance and the lack of agency funds for facilities recapitalization. The budget-challenged Space Launch System Program is in no position to assume the KSC institutional liability that was once borne by the Apollo and Shuttle programs.[6]

Agency-wide, nearly 80 percent of NASA's facilities are 40 or more years old, there is a backlog of $2.19 billion in deferred maintenance, and there may be as many as 865 unneeded facilities with maintenance costs of over $24 million.[7]

Reality sets in: "Flat is the new Up" and a flat budget is not enough to sustain and rebuild NASA's facilities

At gatherings of NASA's facilities and asset management community, a sobering message has been delivered by agency leaders. Budget reductions, and even flat budgets, are making an already dismal facilities renewal rate that much worse.

NASA's Chief Financial Officer bluntly told one such gathering that they should anticipate that "flat is the new up" and that given the realities of the federal budget in the years ahead, there is no guarantee that flat budgets will be sustained. In that environment, asset managers evaluated a painfully different future for program and institutional facilities, one which would not sustain an already stretched out facilities renewal rate.

Limited funding for renewal of aging facilities means only a percentage of those assets can be replaced in the future to meet NASA mission needs. It has been assumed that NASA's horizontal infrastructure – roads, bridges, utility systems – would have limited opportunities for reduction, and must for the most part be sustained. Technical facilities would be the highest priority asset category, but projected funding could not sustain a majority of the 1100 assets in the current portfolio. NASA-owned non-technical assets, like office buildings, would be difficult to justify replacing given the pressure on technical capabilities, and might suggest options such as renting facilities for NASA civil service and contractor personnel where practical.[8]

NASA experiments as a landlord: "It's good to be king" but will enhanced leasing save NASA's assets?

While NASA had developed a considerable portfolio of other federal tenants at field installations like the Stennis Space Center in Mississippi – often referred to as a "federal city" – and at Wallops Flight Facility in Virginia, it did not begin to experiment with more commercial-styled leasing of underutilized property until 2003.

NASA had requested that Congress grant it the same form of leasing authority held by the Veterans Administration and the Department of Defense, a type of federal leasing to private and other non-federal entities that would allow NASA to lease out property at fair market value and retain the proceeds for use by the agency. Already concerned about whether such authority was the best approach for dealing with underutilized property, Congress granted NASA a pilot program for just two field centers – KSC and the Ames Research Center in California. For the pilot program, NASA could accept in-kind consideration as well as cash payments.[9]

Both field centers welcomed the new tool, known in government as Enhanced Use Lease (EUL). They began to structure deals that would put underutilized land and assets to more productive use, generating cash or new infrastructure that would otherwise have not been available. KSC used the authority to gain State-funded infrastructure for a new research park, and to transform fallow citrus land into a private solar power generation facility that provided KSC its own separate solar plant in the deal. Ames used the authority to leverage its high value Silicon Valley property to gain tenants for the NASA Research Park, and users for the Moffett Field facilities that NASA had taken over from the Navy.

"It's good to be king," observed one of the Ames architects of commercial-styled lease terms and conditions for EUL tenants. Ames celebrated its multi-million dollar annual lease deal with a Google-related company needing the benefits of hangar space and the relatively uncrowded Ames airfield. But early success stories and high hopes for the benefits of EUL authority soon gave way to critical assessments of accounting controls, differing opinions over uses of the proceeds, and the lack of Congressional oversight that was a concern from the beginning. When NASA sought to expand the EUL authority to all centers, Congress tasked the GAO to perform a study of the NASA pilot lease program. In its report to Congress, GAO found that NASA did not have adequate controls in place to ensure accountability and transparency, or to protect the government. The agency also lacked measures of effectiveness or criteria for determining whether EUL represents the best economic value to the government. GAO further pointed out that NASA's implementation of EUL could reduce budget transparency. In-kind consideration in the form of services and construction was not reflected in the agency's budget, and cash revenue was not readily apparent within the agency's reimbursable budget line.[10]

NASA got its expanded EUL authority in 2008 for all centers, but with significant changes and limitations, extensive reporting and oversight controls, constraints on how funds could be used and how they must be identified to Congress, and a sunset expiration date on the authority of 2017. It became clear that the tool was not nearly as attractive as had been envisioned, and indeed required a lot of administrative burden to employ. Moreover, of the cash earnings, 35% was to go to a NASA Headquarters account for use throughout the agency as it deemed most appropriate, a sort of income-redistribution feature to ensure those centers with assets less valued by the market might none-the-less benefit from the cash.[11]

It also seemed more than likely that the end game would be Congressional reductions of agency budget to offset the income earned from leasing activities. And at least for a center like KSC, it was equally clear, from the start, that EUL benefits would not offset more than a tiny fraction of the institutional liability for facility maintenance and renewal.

Another potential benefit from leasing, or out-granting as it is known in all of its forms, has come to be of broad interest to NASA's field centers. That benefit is keeping center assets maintained, improved, and preserved for possible future NASA use when and if there is a need that emerges. At the same time, the tenants that sustain these government buildings purchase center capabilities and services on a reimbursable basis, with an added percentage charged for general overhead. This type of institutional cost spreading has long been a way of life at centers like Stennis Space Center and Wallops Flight Facility, with some capabilities and personnel being sustained on the contributions of those non-NASA federal and non-federal tenants.

Some NASA Headquarters asset managers have been concerned with the budget liabilities resulting from the accumulation of federal tenants at some centers. There are limited expenses that can be passed onto those federal users, while NASA retains overall ownership liabilities for the rented facility. On the other hand, commercial customers can be charged the full costs, and often accept full facility maintenance and operations costs, including facility capital repairs and improvements during the term of the tenant's use.[12]

NASA Inspector General: Leasing cuts against efforts to reduce footprint and diverts resources from core mission

The practice of out-granting "underutilized but non-excess" facilities and land has caught the attention of asset management professionals both inside and outside the agency as being at cross purposes with goals to reduce facilities infrastructure – measured by reduction of Current Replacement Value (CRV) – by goals of 10% reduction by 2020, and 15% reduction by 2050. Using agency CRV values, that's the elimination of roughly $3 billion of current assets by 2020, and $4.5 billion by 2050. Leasing does not remove an asset from agency ownership or its property inventory, and when it returns to the agency at the end of the term, its CRV will have increased by the amount of annual inflationary escalation of construction costs, plus the value of any capital improvements added during the term. In other words, leasing takes CRV reduction efforts in the wrong direction.

In its 2012 audit report on NASA leasing practices, NASA's Inspector General (IG) highlighted some of the mission risks to the agency of substituting leasing as an alternative to true divestment of infrastructure.

The IG reported that leasing NASA assets can generate revenue to offset facilities operations and maintenance costs. However, the IG concluded that entering into lease agreements for properties that have no identified mission use "cuts against the Agency's efforts to reduce its real property footprint and diverts attention and resources away from its core space, aeronautics, and science missions." Further, the IG noted that leasing is not a long-established NASA function, and therefore the experience of its personnel is "still evolving."

The IG's audit report was critical that NASA did not have clear guidance to ensure that property identified for leasing was not actually excess to the Agency's needs. "NASA has an obligation to ensure that leasing does not become a substitute for disposing of excess property," the IG reported. The audit concluded that NASA Centers have few incentives to declare underutilized property excess to their needs so that it may be removed from NASA's property holdings. Further, the IG was critical of NASA's lack of clear guidance to assist agency personnel in determining whether property is necessary to meet current or future mission needs.[13]

Why NASA as a landlord is inefficient, economically infeasible and a long-term liability to the agency

Try as it might, NASA does not and cannot function like a commercial property landlord. NASA is not equipped or chartered to operate as a commercial real estate management firm, nor does it have the resident expertise and skill sets to engage in commercial real estate transactions and enterprise. Its skill set and mission focus is on deep

space exploration, not empty space management. Whether NASA should even have those skill sets is an open question for Congress and others with oversight responsibility for the agency.

In addition to the inefficiency of operating in an environment foreign to its core skills and capabilities, NASA is burdened with the immensely complex stewardship of federal real property and associated equipment property. NASA, after all, does not really "own" the property it manages, the U.S. Government does. It must follow many regulations and processes to allow others to use the property, or to initiate the sale or transfer of the property as excess to the government's need.

Private sector tenants on a NASA installation are subject to a collection of government-wide mandates imposed on the construction or operation of facilities upon federal property. There are on-going responsibilities that require considerable effort, expense, and focus by NASA personnel. These include, but by no means are limited to, environmental program management and site surveillance, property asset accounting and records maintenance for both the land and buildings, and the government equipment which may have been loaned as part of the deal. There are construction project administrative approvals, specific improvement or modification reviews and approvals, inspections, financial reporting and account monitoring to ensure any servicing obligations accepted by NASA are pre-paid in advance and paid to meet the actual costs and not just the estimated costs furnished to the tenant. All of this takes a lot of NASA and tenant manpower hours for a facility or land the agency presumably did not have a need for.

What makes it even more of an economic impracticality for NASA to lease out its assets are the following: it cannot commit to a tenant the availability of a service or capability, as that is subject to the annual appropriations of Congress; it cannot quote a fixed price for a service; its overhead rate can change on an annual basis; it can terminate the tenant's lease for a variety of reasons specified in the deal, at no cost to the government. A tenant can be terminated if NASA is unable to meet its obligations for services, or NASA determines there is an agency need for the leased facility. There are multiple controls on a tenant's use and operations, including provisions that a tenant's activities shall not interference with government-determined priorities or activities. At the end of the term, the tenant must remove any improvements, and restore the property to its original condition or as otherwise specified, e.g. demolish the facility and clear the site.

The long-term liability for NASA in leasing unneeded assets is the diversion of resources from a mission-focused facilities management which balances holdings with actual program needs and sustainment resources. In addition, by attempting to hold onto asset ownership under government oversight and controls, the opportunity to transfer assets into a more commercially viable environment denies the agency potential partnerships that NASA could use to leverage its limited exploration budgets to achieve greater space mission results.

CONGRESS TO NASA: DOWNSIZE TO FIT MISSIONS AND EXPECTED FUNDING LEVELS

The 111th Congress passed in 2010 a sweeping new NASA authorization bill that set a course for exploration beyond earth orbit as NASA prepared for the final mission of the 30-year Space Shuttle Program. With explicit direction to NASA on its next generation launch vehicle – the Space Launch System – the NASA Authorization Act of 2010 contained a three-year funding plan reflective of the tightening federal budget, and a pointed directive to NASA to reduce its footprint and down size to fit missions and expected funding levels. The Congress incorporated a finding that "NASA needs to re-scope…in a number of areas NASA finds itself 'holding onto' facilities and capabilities scaled to another era."

The law instructed NASA to examine its structure, organization, and institutional assets, providing a report back to Congress with a strategy to evolve toward the most efficient retention of facilities and other infrastructure consistent with NASA's missions and mandates.[14]

To emphasize the urgency for action deemed necessary by Congress, Florida Senator Marco Rubio introduced and received unanimous Senate agreement to "Sense of the Senate" language attached to a budgetary resolution passed by the Senate in March 2013 for fiscal years 2015-2023.

That language highlighted the fiscal burden of NASA's real estate holdings, pointed to the magnitude of annual operation and maintenance costs, and further pressed NASA to move forward with plans to reduce its infrastructure and expedite conveyance or transfer of property to entities such as a State or political subdivision thereof, or to an FAA-licensed launch site operator "for the promotion of commercial or scientific space activity and for developing and operating space launch facilities."[15]

NASA to Congress: We have a plan

NASA responded to this Congressional directive with a report that described a strategy to integrate and improve its governance over the agency's total facilities footprint, implement an agency-wide facilities strategy and associated Agency Master Plan, and processes to assess and manage the agency's technical capabilities "efficiently and effectively." The plan contained in the report described NASA's creation of a Mission Support Council, the establishment of a Corporate Portfolio Management Program for its assets, and highlighted a NASA goal to reduce the renewal liability of its assets by reductions of 10% by 2020 and 15% by 2050.[16]

In prepared testimony to the House Space Subcommittee, Richard Keegan, NASA's Associate Administrator for Mission Support Directorate, reported on the agency's progress and asserted that NASA is committed to its process for assessing technical capabilities in "an objective, comprehensive manner, in order to retain and support only those assets necessary to fulfill current and future mission needs."

"As NASA works to implement its strategic infrastructure goals, the Agency will continue to construct and operate only those assets required to conduct its programs, maintain core capabilities, and meet national responsibilities," Keegan testified. He reported to the subcommittee the activities of the Technical Capabilities Assessment Team in evaluating Center capabilities against the current and future needs of the agency.[17]

NASA Headquarters directs KSC to divest the Shuttle Landing Facility: A case study in progress

As part of this Technical Capabilities Assessment effort and process, NASA's Mission Support Council (MSC) met on June 28, 2012 and decided there is no NASA requirement for the KSC Shuttle Landing Facility (SLF) and that NASA would proceed with divestment of the SLF as part of its technical capabilities portfolio management.

KSC was directed to proceed with SLF divestment via demolition, transfer of ownership, or abandonment in place. MSC identified the preferred divestment option, if viable, as the SLF transfer to a government/commercial entity to maintain and operate at no cost to NASA. NASA could purchase services from this entity if required.[18]

As a result of the divestment direction, KSC issued a solicitation for proposals from entities interested in managing and operating the SLF. This was formally designated a Request for Information (RFI). The RFI identified offered property and listed facilities to be available for transfer and advised potential responders that NASA contemplated a long term agreement "to allow the new operator sufficient time to implement their business plan, including any capital improvement projects considered necessary to make the SLF self-sustaining."

Space Florida responded on behalf of the State of Florida, proposing to accept transfer of the SLF under a defined set of business and operational concepts and principles. Florida proposed:

- Commercial operation, under FAA licensing and regulatory authority, of a unique, shared-use facility to meet the diverse needs of government and commercial customers
- Cooperative partnering and coordinated operations with the U.S. Air Force and FAA, to enable reliable access to a controlled airspace environment ideally suited to evolve space/aerospace transportation

- Supporting commercial and government space launch and reentry operations as the predominant influence on future SLF development and operational architecture
- "High value, low volume" uses most compatible with the KSC operating and natural environment
- Offering an operational laboratory and test-bed capability for concept development and validation to integrate both commercial space transportation and advanced aerospace platforms into the National Airspace System
- "Direct cost" basis pricing for government services, if required, pursuant to CSLA commercial space development focus, option to use non-government services
- Rights-of-commerce granted to support requirement for self-sustainability and long-term needs to improve and re-capitalize SLF infrastructure and facilities[19]

Space Florida was notified June 28, 2013 of NASA KSC's Selection Decision for the purpose of negotiating a partnership agreement to implement the divestment decision. KSC selected Space Florida's proposal as the most compatible with NASA's mission and "the best value for the agency" noting Space Florida's significant experience investing in and operating facilities at KSC and Cape Canaveral Air Force Station, evidencing "a commitment to operating the Cape Canaveral Spaceport"[20]

Negotiations with NASA over just how to transfer the SLF to Space Florida for the asset's future development and operation for government and commercial users is on-going at the time of this writing. The process and potential transfer of the SLF asset to a state-chartered authority to operate and manage under FAA commercial spaceport rules, if successfully implemented, may provide a strong example of how NASA can divest such an asset from the agency's books and still gain the benefit of its functionality for both government and commercial space transportation, as well as for expanded utility to support advanced aerospace systems development.

TRANSFORMING NASA'S LAUNCH SITES: VISIONS OF A SPACEPORT THAT OPERATES LIKE AN AIRPORT

Since the dawn of the space age, there has been recurring question asked with regard to the extensive ground infrastructure required to support NASA's launch operations: Is it necessary that NASA, or even the government, own and operate these facilities? Now being posed with increasing frequency, there is almost universal agreement that the old way of doing business is not a workable model for the future.

Visions of a spaceport that operates like an airport, with multiple users and uses, common infrastructure, dedicated and shared user facilities, and a self-sustaining business model, are widely embraced as the right way forward. Beyond that, any consensus becomes challenged. Who owns and controls the land, the common infrastructure? How is the spaceport governed, and by what type of entity? How are use priorities reconciled? Who is responsible for safety, for security? And if you are a NASA mission manager, how can you be sure your mission needs will be met?

Privately-owned launch services operating at a commercial spaceport: An industry leader's 1961 vision

In 1961, the year NASA launched its very first manned mission from Cape Canaveral, the General Electric Company Chairman of the Board, Ralph Cordiner, penned a chapter for a book about the peacetime uses of outer space. He titled his contribution *Competitive Private Enterprise in Space*. His themes focused on the relationships between government and private enterprise, exploration and economic development. As he peered into the future of the United States space program, he envisioned a day when privately-owned launch services would operate at a commercial spaceport.[21]

"Even in the exploratory phase, must we necessarily assume that all the major facilities should be government owned?" he questioned. As the years pass by…many of the necessary operating facilities could be put on a self-

liquidating, private industry basis." Cordiner foresaw a day when a privately owned launching service would place payloads into orbit at an agreed upon price per pound. "The base itself, from which the commercial launching service would operate, might be modeled after a port authority," he suggested.

Chosen as "Businessman of the Year" by the Saturday Review in 1960, this leader of American industry had a clear opinion as to the appropriate roles of government and private enterprise for areas with commercial potential: "government should avoid the temptation to build operating facilities (under the guise of demonstration units) that will tend to pre-empt the field for tax-subsidized government enterprise and prevent the establishment of private facilities."

As an example, he cited the successful emergence of multiple privately-owned airlines competing for transoceanic air travel as a public benefit that would not have been realized if, in the 1930s, the government had established a nationalized airline instead of helping Pan American to lay the groundwork for international air travel.

A federally-chartered spaceport: Could NASA become a tenant instead of its own landlord?

The concept of a separate, federally-chartered spaceport also emerged in recent years. A common thread to this alternative is that NASA, and possibly both NASA and the DoD, become tenants on a federal spaceport owned and operated by a Congressionally-created authority, operating in a fashion similar to an airport or seaport.

In 1999, an Interagency Working Group was formed to review the future management and use of the primary U.S. space launch bases and ranges. This review was undertaken in response to issues arising from the successful growth of U.S. commercial space launch activity and increasing government reliance on commercially provided launch services.

The *Report of the Interagency Working Group on Future Management and Use of the U.S. Space Launch Bases and Ranges* examined the roles and responsibilities of federal government agencies and the U.S. commercial space sector and the major policy and management issues resulting from the shift in launch base use from its historic government-dominated basis toward more commercial, market-driven activities.[22]

While concluding that the time had not yet come for transferring management responsibilities to a national, state, or regional spaceport authority, the review evaluated a scenario where they might occur in the future. The spaceport authority would have sole responsibility for base ownership, supporting infrastructure, range facilities and systems, and safety systems and operations. The review noted this alternative "would be somewhat analogous to civil, commercial, and military aircraft using runways, facilities, and services at state or regional airports or civil, commercial, and military ships using state or regional seaports."

"A national spaceport authority could serve as an honest broker in managing the U.S. space launch bases and ranges in a manner that balances the best interests of the national security, civil, and commercial users. The spaceport's interest is in satisfying its customers, sustaining jobs, and stimulating economic growth. Assuming spaceport authorities would have the authority to raise adequate funds through bonds, there could be some advantages in terms of cost and flexibility in financing and conducting improvement and modernization projects."

Among the policy questions and potential issues such an approach might pose: How would the government preserve ability to meet critical national security and civil sector mission requirements if the U.S. space launch bases and ranges were under the control of a spaceport authority driven primarily by commercial factors?

In the development of KSC's 2002 master plan, the Center partnered with the USAF 45th Space Wing and the Florida Space Authority (Space Florida's predecessor organization) to prepare a vision for land use management and spaceport planning encompassing the entirety of the federal launch property.

The conceptual framework -- titled the *Cape Canaveral Spaceport Master Plan* -- envisioned an integrated spaceport serving both government and commercial customers. The future form of governance and management model of this integrated spaceport was not defined.[23]

In 2006, a NASA-led commercialization task team evaluated the concept of converting KSC into a federally-chartered Spaceport Authority as part of a *Systems Engineering & Institutional Transitions Study* performed by NASA Headquarters. The assessment, which considered the potential benefits and risks associated with such a concept, assumed that the "KSC Spaceport" would serve both government and commercial users, and that NASA's role would change to that of being a customer of the spaceport. According to those who participated in the un-published study, there could be significant benefits to NASA from such a conversion if coupled with a sustainable commercial launch market. The spaceport authority would be market based, have access to alternate financing sources unavailable to NASA, and would spread operating costs across all customers. Among the risks considered were potential impacts to NASA use and mission requirements for sites on the spaceport. It was understood that the transfer of NASA-owned infrastructure assets and the establishment of a federally-chartered spaceport would require Congressional legislation as well as coordination with other agencies such as the DoD and FAA.[24]

Most recently, the post-Shuttle era *Future Development Concept* prepared by KSC, formally established the concept of KSC as a multi-user spaceport serving both NASA program needs and enabling commercial missions. While not attempting to define the future governance structure in any detail or specifying a timeline, the document presented the need for transitioning to an independent spaceport authority. "To succeed in balancing the needs of all spaceport users, and create an operating environment that responds to both government and commercial needs for affordable and responsive access to space, KSC must ultimately evolve from Agency field center to self-governing spaceport."[25]

State-chartered spaceports: An opportunity for NASA to leverage the partnership of states

The states were the original providers of this nation's infrastructure needs for most of its history. Only in the 1930's, in an intentional effort to pull America from the depths of the Great Depression, did the federal government begin to exercise its power and resources to invest in the basic foundations of transportation. The Interstate Highway System was also a federal response to a critical national imperative of the Cold War. However, that time of passed into history with the election of Ronald Reagan, and with the federal debt destined to continually shadow this and the next generation, the inclination or capacity to repeat those feats, absent a grave national emergency, does not appear likely to return in the foreseeable future.

The challenges of an ever more intense global competition in the space industry will require the U.S. to summon all of its assets, its talent and its capacity to innovate. It will certainly take more than just the federal government. States, major cities, and regional entities have long demonstrated their value as partners in economic development, together with their unique and special powers of agility, adaptability and experimentation.

State and local transportation authorities represent a concept that governments and the private sector recognize as stable and predictable entities, with broad but specialized qualities to enable business. Those strengths impart the confidence necessary in financial markets to secure the appropriate funding commitments to secure sustainable growth.

Examples of the successful application of this governance approach abound, with one the most compelling examples demonstrated by the transfer of the Dulles & National (now Reagan) Airports to the Metropolitan Washington Airports Authority (MWAA) in the 1987.

Although originally established by the FAA to service our national capitol, these federal airports were unable to respond to growing demand and accelerating technology. Ineffective management and operations adversely impacted both the traveling public and operations of the federal government itself. National Airport desperately needed modernization but political and budgetary volatility crippled any effort to properly address major infrastructure upgrades. Similarly, Dulles was woefully incapable of responding to rising international traffic demand.[26]

Against significant institutional and Congressional resistance, the FAA recognized an 'authority' that would include participation by the District of Columbia and the Commonwealth of Virginia would offer the best governing structure to address the technical, administrative and financing needs required of a modern airport. MWAA still has its share of problems, but they are primarily the challenges associated with growth and progress, not an ineffective, outdated business management and operations model.

With a federal government and a NASA increasingly challenged to adapt to a dynamic space industry, are not the federal space transportation assets inevitably on the same trajectory as those former national airports? Could not the innovation of a new federalism in the model of spaceport authorities offer a key step in the restoration of U.S. leadership in commercial space?

If NASA management of a multi-user spaceport is not a requirement for the agency to advance its exploration mission, then a spaceport authority independent of NASA and federal government management could well offer the best opportunity to more efficiently and effectively foster both NASA and private exploration activities in space.

Florida and other states have embraced a role in developing U.S. space transportation infrastructure

In 1989, the Florida Legislature established the nation's first space transportation authority under Chapter 331, Part II, Florida Statutes, and Florida initiated the first steps in what has become its leadership position in state-facilitated support for the improvement and growth of both federal and commercial spaceport capabilities. Florida was soon joined by Virginia, California, and Alaska which established state spaceport authorities promoting orbital launch facilities, and by New Mexico, Ohio, and other states and local special districts engaged in the emerging horizontal launch sites for suborbital reusable launch vehicles. Altogether, these states have directly invested in or facilitated the commercial financing for space transportation assets with a value nearing $1 billion.

About half of that amount has been achieved by Florida, concentrated in launch facility improvements at KSC and neighboring Cape Canaveral Air Force Station serving both government programs and commercial providers of services to federal customers in NASA and the DoD.[27]

In 2006, Florida amended its statutes to create Space Florida as an independent special district, body politic and corporate, and subdivision of the State of Florida. The new organization's charter is to foster the growth and development of a sustainable and world-leading aerospace industry in the state, and to be the single point of contact for state aerospace-related activities with federal agencies, the military, state agencies, businesses, and the private sector. Space Florida leads and integrates Florida's aerospace-related activities in four critical functions – infrastructure development, operational capabilities, funding resources, and policy advocacy.

The broad authorities and powers contained in Space Florida's enabling statute offer a menu of operating and financing tools to support its development of capabilities that can be leveraged to the benefit of NASA's and other federal agencies missions. Other states have enacted enabling statutes for their authorities having similar purposes and powers.

Space Florida has the authority to acquire property, real, personal, intangible, or mixed, within or without its territorial limits, in fee simple or any lesser interest or estate, by purchase, gift, devise, or lease, on such terms and conditions as the Board may deem necessary. It is authorized by Florida to own, acquire, construct, develop, create, reconstruct, equip, operate, maintain, extend, and improve launch pads, landing areas, ranges, and other spaceport facilities and aerospace-related systems.[28]

It further has the authority to examine, develop, and use new concepts; and to own, acquire, construct, reconstruct, equip, operate, maintain, extend, and improve experimental spaceport facilities, in order to promote the development and utilization of new concepts, designs, and ideas in the fields of space exploration, commercialization of the space industry, and spaceport facilities.

Space Florida is directed to carry out its responsibilities for spaceport operations by seeking federal support and developing partnerships to renew and upgrade the infrastructure and technologies at the John F. Kennedy Space Center; improve access for commercial launch activities; support federal efforts to clarify roles and responsibilities of federal agencies; and pursue the development of commercial spaceports in Florida.

In order to meet the needs of a dynamic commercial launch industry seeking to grow and sustain U.S. competitiveness for non-federal user markets, Space Florida has proposed to NASA and the FAA the establishment of state-managed, state-controlled vertical and horizontal launch facilities on current KSC property, utilizing the former SLF and a 200-acre parcel of land near the northern boundary of the NASA property in a former citrus community known as Shiloh. These capabilities would be developed as part of Florida's Cape Canaveral Spaceport, and operated under FAA license and regulatory oversight. It has been Space Florida's assertion that the transfer of these portions of KSC to state management and control would enhance, not diminish, the overall capabilities of KSC while facilitating a reduction in NASA's long-term facilities footprint and liabilities.

Space Florida and the Florida Department of Transportation completed in 2013 a study on the specific governance models available and potential phases of a transition plan for the broader Cape Canaveral Spaceport.[29]

Title 51 of the United States Code (U.S.C.) codifies the finding of the United States Congress that the participation of State governments in encouraging and facilitating private sector involvement in space-related activity, particularly through the establishment of a space transportation-related infrastructure, including launch sites, reentry sites, complementary facilities; and launch site and reentry site support facilities, is in the national interest and is of significant public benefit.

In addition, the U.S. Secretary of Transportation is authorized and directed by Title 51 to take actions to promote public-private partnerships involving the United States Government, State governments, and the private sector to build, expand, modernize, or operate a space launch and reentry infrastructure.

Further strengthening the government's policy position on expanding partnership with the states to enhance U.S. space transportation infrastructure is found in the President's November 2013 update of the National Space Transportation Policy, which states that the Secretary of Defense and Administrator of NASA shall operate federal launch bases and ranges in a manner to "encourage private sector and state and local government investment and participation in the development, improvement, and sustainment of space infrastructure, including both federal launch and reentry sites as well as those operated and maintained by private, state, and local entities."[30]

Is KSC's current vision of a multi-user spaceport under NASA consistent with established agency governance?

It would appear that KSC's current vision and plan for a multi-user spaceport is to retain all of its land under its current NASA control and stewardship, and to adapt the existing center organization to the role of managing the institutional assets for multiple government and commercial customers. In other words, the current planning and initiatives point to a federal spaceport not independent of NASA, but run by NASA.

This approach seems evident in the testimony Center Management offered at a February 10, 2014 field hearing of the House Subcommittee on Government Reform, who met at KSC to explore NASA's management of unneeded and underutilized assets. In response to questions during the hearing by Chairman John Mica, KSC Director Bob Cabana testified that NASA would retain all land title it currently holds, and would enter into leases or other forms of out-grants for facilities for which it did not have an identified need.[31]

As previously pointed out, that retention of facilities held in government ownership does not truly divest the asset, it transfers the responsibility for maintenance and the cost of any modification or capital repairs to a tenant, with the asset remaining on the center's real property inventory and eventually returning to NASA for re-leasing to another tenant, or for resuming the agency's use. Perhaps this is consistent with the finding by the NASA Inspector General that a NASA field center is more inclined and motivated to keep an asset than divest it.

If KSC is still to operate as a NASA field center under agency governance models and subject to NASA Headquarters fiscal and property controls, how will it align the requirements for a commercial operating environment that so many of the potential tenants will demand?

There has not as yet been a clear definition of how such a transition from field center to multi-user spaceport will be implemented; no proposed legislative request to Congress that has been made public. About to be made public is a new KSC Master Plan, required by the agency's new corporate portfolio planning to be consistent with NASA Headquarters-led infrastructure and footprint reduction promises to Congress. Definition of that plan will initiate a center-wide Environmental Impact Statement to analyze the impacts of various alternatives for the future proposed development of the Kennedy Space Center.

If the approach fails to adequately align to the repeated direction provided by Washington to NASA to reduce the agency's real property footprint and long term liabilities, it will undoubtedly face significant public and Congressional scrutiny.

Equally troublesome would be failure to signal to industry a truly new way of doing business, one unencumbered, or at least substantially less encumbered, by the status quo. For those industry operators servicing the government customer – such as NASA commercial crew and cargo to the space station, or the payload requirements of the Department of Defense, the current environment is annoying but acceptable in large measure because the customer, the government, will ultimately pay the costs of its own controls, mandates, interruptions, schedule slippages, and oversight. But for those providers who seek to serve a non-federal marketplace of users, the outcome will be the all too predictable. Florida's competitive position compared to other launch sites, existing and proposed for development, will be further eroded, and perhaps permanently eclipsed.

It remains to be seen what advantage the commercial marketplace may see in a spaceport burdened with NASA's additional cost, regulation and schedule impacts to their business, when more attractive locations not so burdened will soon be available. This development fails to meet the more aspirational goals of that direction provided to NASA by the Administration and Congress for a more sustainable commercial space infrastructure network and industrial base.

True transfer of property assets to a non-federal partner may be counter to NASA's culture (an observation made more than once by the NASA Inspector General), but they have occurred with great success in other venues of our federal government.

Federal property transfers aren't rocket science: What NASA can learn from previous successful models?

Some of the best success, and best practices, in the disposal of unneeded federal property can be found in the Base Realignment and Closure process and other transfers of former defense facilities such as airfields and seaports.

GSA has delegated transfer authority in some of these through a Public Benefit Conveyance process to place important transportation assets in the hands of a state or local entity. Some great examples may be found in California's Mojave Spaceport and Civilian Aerospace Test Center, Cecil Spaceport in Jacksonville, and the Ellington Field Airport in Houston. All have been success stories economically.

The time seems right for this type of federal land disposition approach to be examined for launch and launch-related property no longer needed for a NASA program but still of importance to the nation's space industrial base.

One template for possible success already exists. The federal government has learned how to best disposition its installations, facilities and assets to others through the lessons learned through the DoD's Base Closure and Realignment Commission (BRAC). Although a profoundly onerous process for all involved it was initiated only after it was clear the existing processes for the divestiture of military installations and bases could not effectively be executed without bold action.[32]

In 2012 Dorothy Robyn, as the deputy undersecretary of defense for installations and environment, told a Senate panel: "BRAC is the single most effective thing the department has ever done in terms of producing greater efficiency and savings."[33]

Apart from the savings, another benefit has been the clear evidence that a clean transfer of title of real property is the most assured way to remove assets and their accountability from the liability side of the federal ledger.

BRAC has been quantified to some effective degree in previous rounds with savings accrued over time through the transfer of title and thus permanently eliminated obligations of the federal government. The long term savings were identified as a function of cost avoidance in future years, both in general operating costs as well as future recapitalization costs.[34]

Much has been learned in the five rounds of BRAC this nation has undergone since 1989. It is prudent and appropriate we build on that knowledge to construct a more efficient and resilient federal government in the service of its citizens.

Another effective mechanism from which NASA may seek further insight is the General Service Administration (GSA) and their Public Benefit Conveyance (PBC) capability.

When a property has been deemed qualified for Public Benefit Conveyance the process allows for the transfer of property at a substantially reduced price (up to 100% of Fair Market Value). Among the qualified public uses as appropriate for PBC are transportation related facilities for either port or airport (49 U.S.C. 1101).

Specifically identified under the airport designation is the most insightful provision allowing the following flexibility: "This can include property needed to develop sources of revenue from non-aviation businesses at a public airport."[35]

At the Mojave Air & Space Port, the creative use of that 'non-aviation' economic activity has provided the sustainable foundation for the most exciting hotbed of aerospace innovation on the planet. Absent the ability to generate essential cash flow and consistent revenue, no enterprise, and certainly not one as nascent as commercial space, can hope to survive as a going concern. Through blind luck or extraordinary insight this provision has made all the difference in the viability of Mojave, and most assuredly for other commercial spaceports well into the next decade.

Through the vision, imagination and tenacity of Stu Witt, CEO and General Manager, Mojave has established a basic template of success for future commercial spaceports. It was a fundamental understanding that the business of commercial space, as a full and robust market, will take many years to mature to the point where it alone will generate the revenue to sustain its own spaceport. By harnessing other economic activity to cover the costs, Mojave is providing the environment where that day will arrive that much sooner.

Indeed, it had been the case that all commercial airports throughout the U.S. were owned by states, cities or regional government entities, but a few are now fully privatized.[36]

Curiously, within the global marketplace of airports the U.S. is still lagging in the concept of privatization. In Europe, Latin America, New Zealand and Canada, most of the major airports went private some time ago, with consensus being that the endeavor has been a success.

With much of the rest of the world privatizing their airports, why should the U.S. go in the other direction by institutionalizing a federally-managed spaceport run by NASA?

WHY THE MOST EFFECTIVE SOLUTION IS IMPERATIVE TO SPACE EXPLORATION AND SPACE LEADERSHIP

Is NASA's human space exploration program best served by the agency holding onto to its property assets as a landlord to itself and others? Perhaps the question should be asked a different way. Is sustainability of a human space exploration and U.S. leadership in the economic frontier of space enhanced or diminished if the agency holds onto its extensive land and aging facilities infrastructure?

Is there a better way to attract and leverage non-federal resources and skill sets to own, manage, and operate capabilities that support both NASA and private space transportation needs?

Beyond a consideration limited to NASA itself, should we not also consider the implications of NASA property management decisions to the broader goals for the nation's leadership in space? What about the objectives of national space policy related to advancing U.S. competitiveness and economic growth through a robust commercial space industry?

Decades ago the global commercial launch market had only KSC and the Cape Canaveral Air Force Station from which to access space. Before 1980 almost 100% of the free world's commercial payloads to equatorial orbit launched from those federally managed facilities. There was no alternative. However, it was not an environment which readily accommodated the interests and concerns of those in business to launch non-federal payloads for profit. The Europeans saw that market opportunity and established the world's first commercial launch site in French Guiana. It was created specifically to cater to that uniquely commercial sector. With its inception a new way of doing business came to life and other nations also came to offer similar capabilities. As soon as a commercial alternative opened its doors the U.S. market share began to plummet, reaching near zero only a few years ago.

Today, a new breed of commercial launch providers is preparing to take the stage in this global competition and that market is beginning to return to U.S. shores. KSC is publicly promising industry a more commercially friendly spaceport operating environment. However, as a field center of NASA and part of the federal government, KSC will remain heavily burdened with the inherent constraints of its primary mission and responsibilities. Can they deliver on the promise? How long will it take to change the rules, to change the governance, to change the culture?

Industry and the commercial market will not wait, nor should it. The interests of this country and its competitive standing in an ever more aggressive global marketplace will not allow them to wait. Already that industry is again, as it did in the early 1980's, voting with its feet.

It may well be that Brownsville, Texas will capture America's first uniquely commercial launch site for SpaceX. Georgia hopes to soon offer a similar capability near Cumberland Island to new launch entrepreneurs. Other non-federal sites are sure to follow. Florida is working to establish its own state-managed commercial vertical launch site, known as Shiloh, on land the federal government took to support the space program back in the 1960's.

Florida's spaceport planners and their counterparts in Virginia both wish to be leaders in this new age of space transportation, and not hostage to a space heritage where NASA dominated what happened on the ground as much as it did in space.

Few would argue that the focus of NASA should be on the bodies of our solar system and the stars beyond. Few should argue that NASA's mission focus is distracted, and its resources diverted, if it attempts to hold onto and control the land and facilities footprint it acquired back in the 1960s.

NASA has more important things to do than to worry about leasing its empty space. This is especially so when there are non-federal partners that will join with the agency and with the private sector to renew, refocus, and sustain some this nation's best space transportation assets for a future where the U.S. can regain and keep its leadership in the exploration and development of the space frontier.

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