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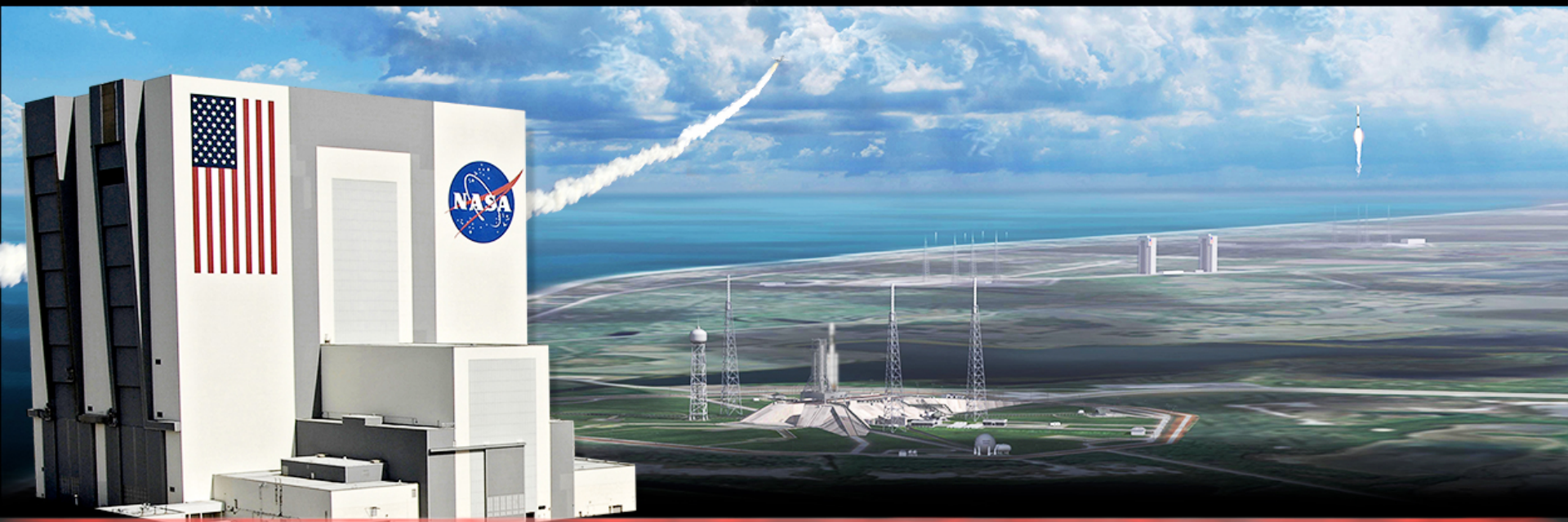
National Aeronautics and Space Administration

KENNEDY SPACE CENTER



Transformation to a Multi-User Spaceport

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Transformation to a Multi-User Spaceport

- In the past, launch pads were used almost exclusively for government missions. To support a growing private sector space economy, NASA's Kennedy Space Center has transformed to a multi-user spaceport capable of handling the needs of a variety of companies from launch processing through recovery. NASA, the FAA, and Air Force Space Command provide diverse launch operations, government and commercial, enabled by the Commercial Space Launch Act. These agencies are working together to simplify the steps to certify commercial launches from Kennedy Space Center's multi-user spaceport.

KSC Multi-User Spaceport Evolution

- **2004 Transition planning began with announcement of Shuttle retirement**
  - 2005 Request for Information (RFI) to determine commercial space uses of KSC
  - 2008 Master Plan identified Area Development Plans

- **Focus intensified approaching Shuttle fly-out**
  - 2010 NASA Authorization Act: Identified KSC as a multi-user launch complex supporting government and commercial operations
  - 2010 Industry Workshops: Seeking input on 21st Century Space Launch Complex (CSLC) investments
  - 2010 RFI: Asking industry for interest in underutilized KSC facilities
  - 2011 Last Shuttle flight
  - 2011 Notice of Availability: Identifying underutilized facilities at KSC
  - 2013 Commercial Space Policy strives to encourage and facilitate growth of the US commercial space sector (National Space Transportation Policy)

- **Post Fly–Out Planning and Execution**
  - 2011 KSC Future Development Concept – Precursor to the KSC Master Plan
    - Supporting the NASA Mission and Programs
    - Evolution to a Multiuser Spaceport
    - Leaner Greener
    - Divest without Diminish

- **2011-2016 Facility partnering agreements (OPF 1,2,3, LC 39A, SLF, Exploration Park, SSPF)**

- **2015-16 KSC IS a Multi-User Spaceport with a diverse customer base**

Requirement for a Business Case

- Before proceeding with any out-grant, a Center shall develop and submit a business case to the Director, FRED, to support their concept for out-granting NASA real property. Some development of the business case may require projections as to how the Center plans to use NASA's authority. The business case is a tool for planning and decision making. It is an analysis that links estimates of costs and benefits with stated requirements and expectations for projected outcomes. The purpose of a business case is to make transparent to the various decision-making and operating groups the objectives to be met by a facilities investment, the underlying assumptions and alternatives, and the attendant costs and potential consequences of alternative actions. For all out-grant agreements with nongovernment entities NASA's intent is to ensure fairness to all parties and best value to the Government.

Reference/Authority

Real Estate Management Program: NPR 8800.15C

NASA Real Property & Facilities Business Case Guide

Outline of Actual KSC Business Case

- The business case shall include:
- a. Overall Center concept for utilizing NASA's out-leasing authority, whether for a single NASA facility, a group of facilities, or land.
- b. Description of the programmatic benefits in both qualitative and quantitative terms that NASA hopes to achieve from the partnership.
- c. Detailed description of the real property to be used, including facility plans and maps and the current use of the property, if any.
- d. Discussion of and copies of all SAAs detailing partnership arrangements.
- e. Points of contact at the Center.
- f. Intended conveyance instrument (i.e., lease, concession agreement, contract).
- g. Legal analysis:
- (1) NASA's authority to enter into the land use agreement, considering all appropriate Federal statutes, regulations, and guidance.
- (2) An explanation of why the property should not be declared excess (in accordance with GSA regulations).

Outline of Actual KSC Business Case Continued

- (3) Identification of any deed restrictions, reversion problems, or any other land use limitation.
- h. An economic analysis that conforms to OMB Circular A-94, "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs" (use of ECONPACK software, is preferred).
- i. An analysis of the following alternatives:
- (1) Status quo as an underutilized asset.
- (2) Upgrade of the facility by modification or repair for NASA use.
- (3) Standby/mothball/abandon the facility.
- (4) Demolition of the asset.
- j. For each of the alternatives, the following shall be listed:
- (1) Cost in personnel resources to develop, enter into, and manage lease.
- (2) Operations and maintenance cost.
- (3) Rents, common service charges, and other revenues received from the tenant, as appropriate.
- (4) Alternatives should be compared on the basis of cost and on the basis of benefit to NASA.

Outline of Actual KSC Business Case Continued

- k. A clearly stated recommendation for the chosen alternative, indicating that it represents the best business decision.
- l. A discussion of the analysis to ensure fair market value (whether by appraisal or other means) to establish and evidence value. This may be through an analysis performed by the GSA or an independent professional appraiser.
- m. An analysis of the cost effectiveness of the proposed PPV, if fair market value is not to be assessed for the out-grant.
- n. A security analysis:
- (1) The legislative jurisdiction of the subject property and the law enforcement responsibilities based on the type of jurisdiction.
- (2) How and what security services will be provided to or by the partners.
- (3) A determination whether the partners will possess any material that may affect security requirements, i.e., national security classified information, weapons or explosive materials, drugs, cash.

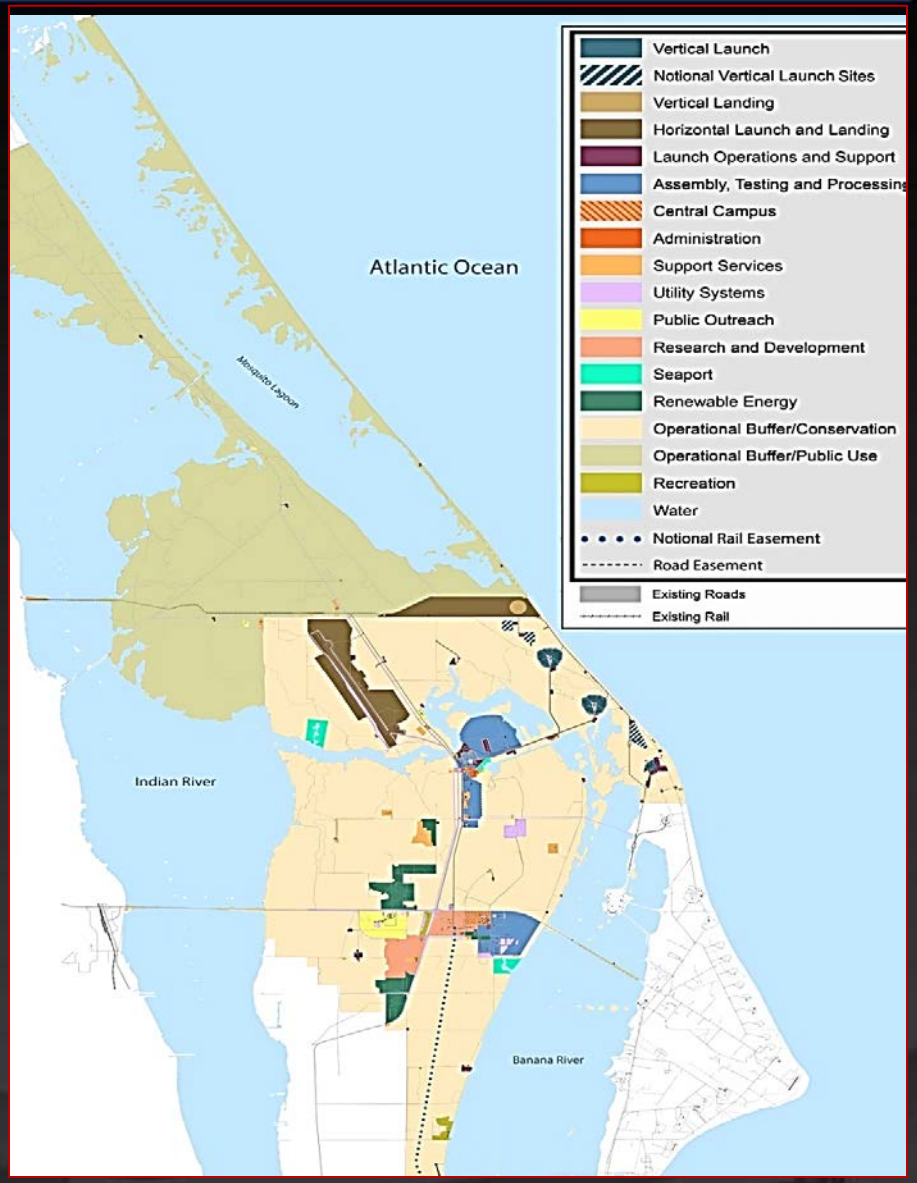
Outline of Actual KSC Business Case Continued

- o. An environmental analysis:
- (1) Documented results of the EBS of the subject property.
- (2) Appropriate NEPA documentation, i.e., categorical exclusion with record of consideration,
- environmental analysis and finding of no significant impact, or environmental impact statement and
- record of decision.

KSC Multi-User Spaceport Master Plan Map

- **KSC Goals:**
  - **Supporting both Government and commercial vehicle and payload processing and launch operations**
  - **Repurposing under-utilized assets**
  - **Strategy has now shifted to supporting land development**
  - **Facilitating Government/commercial common-use processing facilities**

- **What's new for KSC:**
  - **GSA appraisals/market pricing**
  - **Business case analysis**
  - **Announcement For Proposal, Notice Of Availability, property loans**
  - **NPR 9090.1 policy revision 2013**
  - **Enhanced Use Leases**
  - **Commercial Space Launch Act (CSLA)**

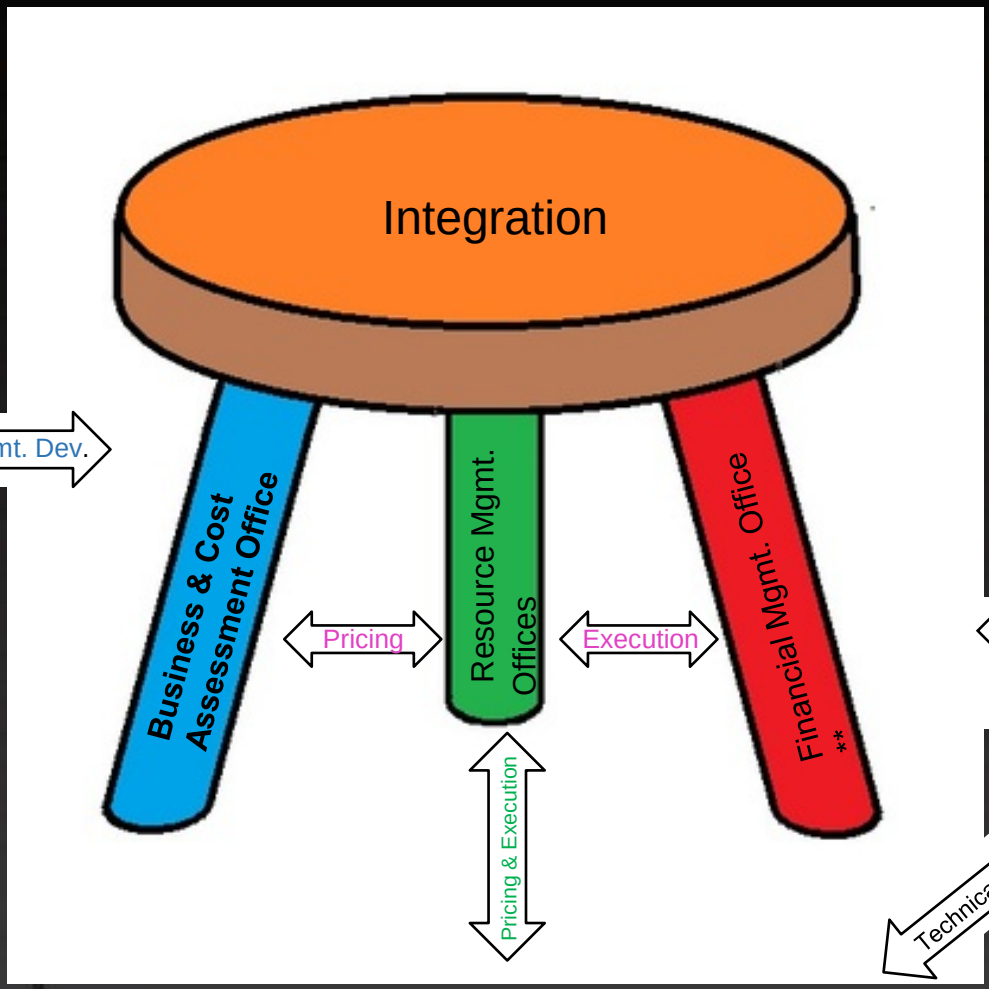


Alignment to KSC Multi-User Spaceport

<u>Partnership Dev. Teams</u>
Center Planning & Development, Org. Technical POCs, Safety, Spaceport Services & Integration, Procurement, Chief Financial Officer, Chief Counsel

Center Planning & Development*

External Customers



Spaceport Services Customer Advocates, Business Office Analysts, Contract Mgrs, Functional Mgrs, Subject Matter Experts (e.g. property officers, radio frequency monitor)

Press Site & Cell Towers - Executed

Overview

- KSC currently has 9 Press Site & 4 Cell Tower agreements:
  - CBS, NBC, Associated Press, Reuters, Nikon AT&T, Florida Today, Orlando Sentinel, Spaceflight Now
  - Verizon, American Tower, AT&T
- Enhanced Use Lease authority
- Pricing based on GSA appraisal / market pricing

OPF 1, 2 and 3 - Executed

- **Overview**
  - **Jan 2011 Issued Notice of Availability (NOA)**
  - **Oct 2011 Signed Use Permit for OPF 3**
  - **July 2013 MOA for OPF 1 & 2 (HQs/MSFC)**

- **Current Status**
  - **Two agreements in place:**
    - OPF 1 & 2 (USAF) – X37 Program
    - OPF 3 (Space Florida) - 15 years
      - Renamed C3PF
      - Subleased to Boeing for CST-100 “Starliner” (Commercial Crew Program)
      - Space Florida obligated to demolish facility at end of the agreement

LC-39A Space X - Executed

- Overview (2013-2014 agreement development)
  - Use of LC-39A and adjacent facilities for processing and launch of Falcon Heavy and Falcon 9 rockets
  - Agreement enables LC-39A modifications, construction and KSC services (20 years)
- Current Status
  - Four agreements executed (CSLA Use Permit, CSLA Services, RSAA Launch Viewing, Telemetry site)
  - Requests for additional processing, storage, and fabrication space/facilities on KSC – in work

SLF - Executed

- **Overview**
  - June 28, 2012 NASA - Mission Support Council made the decision to divest the SLF due to no further program reqt.
  - August 1, 2012 - KSC issued a Request for Information (RFI) for this Real Property Asset

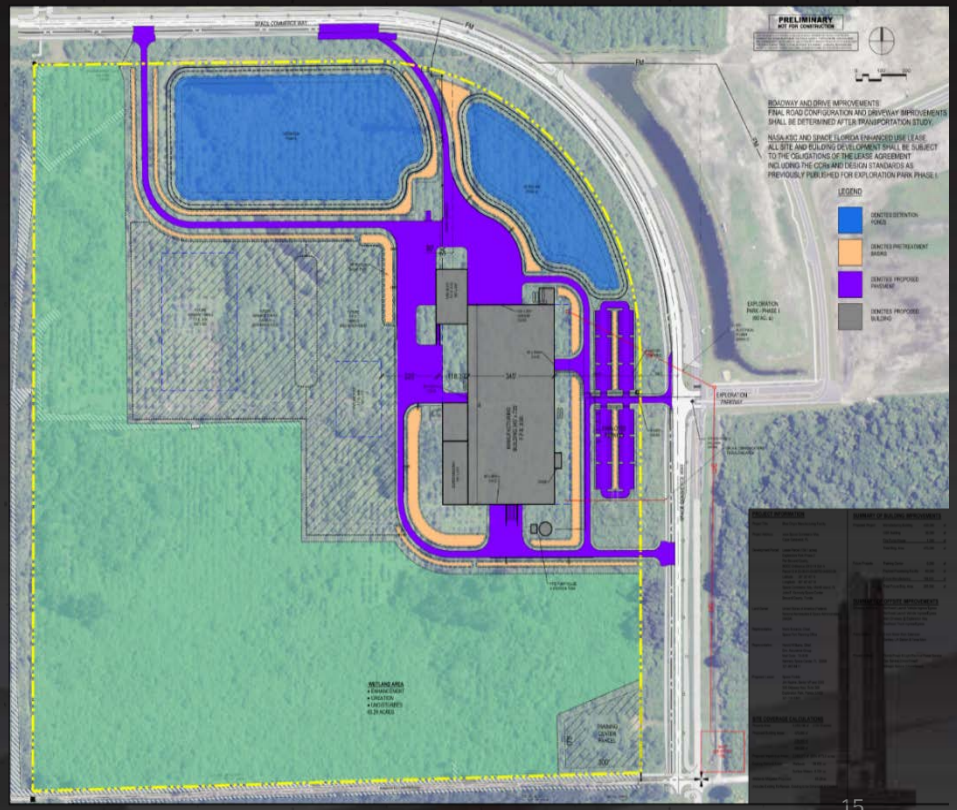
- **Current Status**
  - 30 year Partnership Agreement with Space Florida executed 6/2015
  - NASA receives priority use
  - $45k of unreimbursed landing services
  - Assets operated & maintained at no cost to NASA

Exploration Park Phase 2 - Executed

(Phase 1 executed 2008)

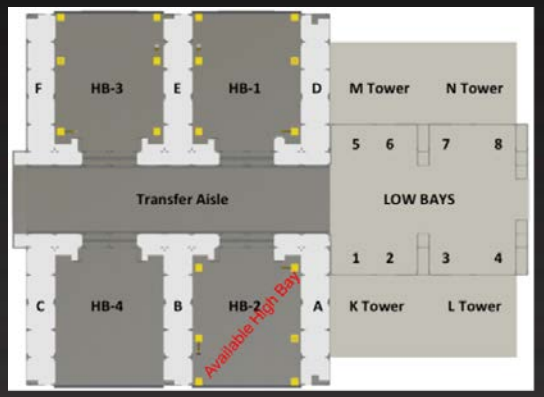
- **Overview (2015-2016 agreement development)**
  - **Partner is Space Florida**
  - **First tenant (Blue Origin) begun construction May 2016**
    - 750,000 SF Manufacturing Facility ~500 jobs
  - **Second tenant (One Web, LLC.) announced April 2016**
    - $80M Satellite Manufacturing Facility ~250 jobs

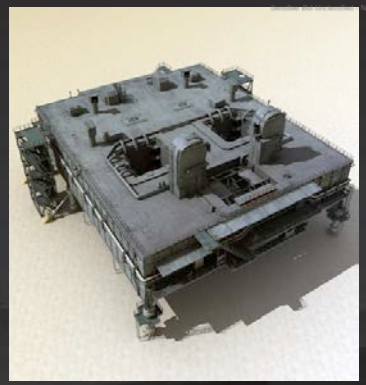
- **Current Status**
  - **Subleases are the responsibility of Space Florida**



VAB HB2 and MLP's 1/2/3 – In Work

- **Overview**
  - VAB is a shared use facility (SLS, commercial)
  - Competitively offered VAB High Bay 2 (HB2) via AFP
  - Offer three MLPs as secondary assets in AFP
  - HB2 Model Agreement and MLP Loan Terms and Conditions provided
  - Following HB2 selection, remaining MLPs to be dispositioned
- **Current Status**
  - Tenant (Orbital ATK) selected
  - Final agreement negotiations & pricing in work
  - Target execution last quarter of 2017





LC-39B Shared Use Pricing – In Work

- **Overview**
  - Anticipated commercial need with VAB HB2 AFP offer
  - Shared with SLS program – NASA priority scheduling

- **Current Status**
  - Under construction through 2018
  - ROM estimate (based on PPBE 17 budget)
    $22K use fee per day – 30 day launch flow
  - Revised estimate in development

LC-39C Small Class Launch Capability – In Work

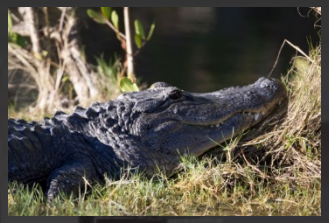
- **Overview**
  - **Multiple companies interested in launching from LC-39C**
    - Venture Class Launch Services (LSP)
      - Firefly Space Systems
      - Rocket Lab USA
      - Virgin Galactic
  - **Potential use of Universal Propellant Servicing System (UPSS)**

- **Current Status**
  - **Supplied technical response and price ROM for LC-39C, UPSS, processing facilities, etc. to potential users**
  - **Developing user constraints for LC-39C**
  - **Expect to offer payload processing services upon request**

Land Use Notice of Availability (NOA) – In Work

- **Overview**
  - **KSC is making available land to expand its Multi-User Spaceport capability**
  - **First NOA was open for one year**
    - Received three respondents who met the criteria (Space X, Ensco, AT&T)
      - Agreements are early in development stage
  - **Second NOA was released June 1, 2016 (open for two years)**
    - Launch Operations and Support
    - Assembly, Test and Processing
    - Renewable Energy
    - Research and Development
    - Vertical Launch
    - Vertical Landing

- **Current Status**
  - **Evaluating responses**



SLF

OPF 3

MPPF

LC 39B

Hangar N

PCC

OPF 1&2

CIF

LC 39A

Hangar AF

PRF

MLP

MILA

VAB-LCC

Recovery Ships

HMF

CT

ARF-BFF

O&C

SSPF

KSC Challenges

- No two agreements are exactly alike! (Full Cost, CSLA, EUL, NRSAA, Partnership)
- Responding to customer needs for rapid agreement development and execution of services
- Understanding Center risk posture and partner insurance requirements
- Creating shared understanding of KSC, Federal Aviation Administration and Air Force Space Command roles for commercial launch activities (e.g. range requirements, requirements duplication etc.)

Questions ?

- 45th Space Wing
- Air Liquide
- Air Force
- American Tower
- AMF
- Associated Press
- AT&T
- Blue Origin
- Boeing
- Brevard EDC
- Canaveral Port Auth.
- Caterpillar
- CBS
- Craig Technologies
- DARPA
- Energy Florida
- Florida City Gas
- Florida Today
- FPL
- JSC (Orion)
- KT Engineering
- LVX Systems
- MSFC
- MAS
- MIT Lincoln Lab
- Moon Express
- Navy
- NBC
- Nikon
- NRO
- Orbital ATK
- Orlando Sentinel
- PISCES
- Reuters
- Rollins College
- Sierra Nevada
- Space Florida
- Spaceflight Now
- SpaceX
- ULA
- Univ. of North Dakota
- Verizon