

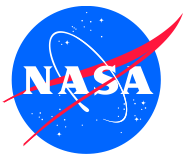
*Kennedy Space Center - CFO Business & Cost Assessment Office*

# **Innovative Business Agreements and Related Cost & Pricing Methods at NASA in Support of New Commercial Programs**

**JIM ROBERTS & TERRY LAMBING**

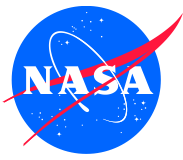
**NASA Kennedy Space Center  
Office of the CFO**

**ICEAA National Conference  
June 2014**



## **Background..**

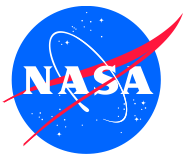
- **Immediately after Shuttle retirement decision in 2004, transition planning for NASA's facilities was begun.**
- **In April 2010 President Obama delivered a speech at Kennedy Space Center in which he outlined his new vision for the U.S. space program. Emphasis was placed on enabling the exploration of Space by Commercial entities instead of by Government.**
- **The Constellation Program - which was to fill the void of the retiring Space Shuttle Program - was cancelled.**
- **Facilities no longer needed for remaining NASA programs were identified, and NASA Centers were charged with leveraging value of underutilized property through initiatives such as out-leasing.**
- **Focus was placed on development of Commercial Business Partnerships to enable commercial space activities using unused or available facilities and launch infrastructure.**



# **Kennedy Space Center - Launch Infrastructure**

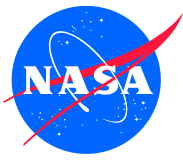


- Vehicle Assembly Building
- 3 Orbiter Processing Facilities
- Launch Pads A&B
- Shuttle Landing Facility
- Operations Support Building
- Operations Support Building II
- Launch Control Center (4 control rooms)
- Logistics Facility
- 8 Acre Footprint, 525' Tall
- 30,000 SF Each
- Fuel/Oxidizer Tank  
Capacity of 1.8 M Gal
- 15,000' Runway, 300' Wide
- 200,000 SF 1378 Office Space
- 189,000 SF 860 Office Space
- 230,000 SF 237 Office Space
- 3-story, 230,000 SF



## **New Roles for Kennedy Space Center:**

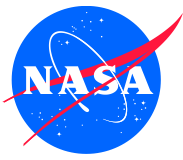
- **NASA is providing a new heavy lift processing and launch capability**
- **NASA is transforming to have Low Earth Orbit (LEO) access (cargo and crew) via commercial providers**
- **Commercial Space policy strives to maximize the commercial use of space**
- **KSC's role as a traditional single user launch complex is transforming to become a true spaceport supporting multiple users (programmatic, commercial, public)**
- **KSC Goals include:**
  - Supporting both government and commercial vehicle and payload processing and launch
  - Enabling commercial partners to locate life-cycle functions at KSC
  - Facilitating government / commercial common-use processing facilities



## **NASA Authority and Guidance**

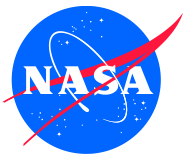
- **The National Aeronautics and Space Act**
- **The Economy Act**
- **The Commercial Space Launch Act**
- **NASA 2011 Strategic Plan**
- **The National Space Policy of the United States of America (2010)**
- **NPR 9090.1A - Reimbursable Agreements**
- **NAII 1050.1 Space Act Agreements Guide**
- **NPD 1050.1I – Authority to enter into Space Act Agreements**
- **NPR 8800.15B - NASA Real Estate Management Program**
- **NPD 8810.2 - Master Planning for Real Property**

***NASA has legal authority to provide facilities, equipment, and services to non Federal entities on a non-interference basis.***



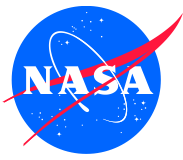
## **Legal Authority To Establish Agreements**

- **Economy Act (1932)**
  - Agreements with Federal Agencies
- **Space Act (1958)**
  - Agreements with Commercial Entities
  - and Agreements with Federal Agencies
- **Commercial Space Launch Act (1984)**
  - Agreements with Private/Commercial Launch Enterprises
- **Commercial Space Competitiveness Act (2000)**
  - for Commercial Space Entities (- not yet used by NASA)



# Types of Real Property Agreements:

- **Enhanced-Use Lease (EUL)**
- **Use Permit**
- **Commercial Space Launch Act (CSLA) Agreement**
  - *Allows favorable pricing (direct cost only) for Companies engaged in Space Launch and Landing activities*
- **Reimbursable Space Act Agreement (RSAA)**
  - *Used for demand services including utilities and commodities*



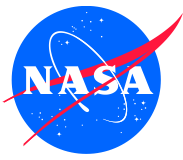
# Primary Guidance for NASA's Agreements

## - NASA Procedural Requirement NPR 9090.1A

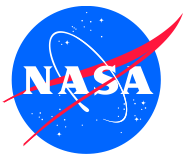
### Covers:

- Administrative Procedures
- Determining Full Cost
- Pricing Reimbursable Agreements
- Enhanced Use Leasing of Real Property





# **AGREEMENT TYPES AND LEGISLATIVE AUTHORITY**



# ECONOMY ACT - 31 USC § 1535 (1932)

*“Act provides authorization for Federal agencies to request and perform interagency reimbursable work. Under the Act, such reimbursable work must be in the best interest of the Government, and goods and services are less expensive or more conveniently provided by Federal agencies than by commercial vendors.”*

- **Application:**

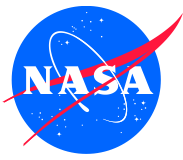
- Applies only to agreements between Federal Agencies

- **Features:**

- Requires pricing at recovery of “actual costs” (full costs)
- Pricing can be rate-based or cost-based..

- **Examples:**

- NOAA Observation Satellites - Interagency Agreement
- Lease of KSC office space by FAA for space launch licensing

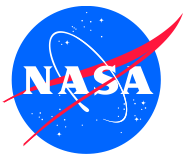


# **NATIONAL AERONAUTICS AND SPACE ACT ("The Space Act") – 51 USC § 20101 (1958)**

*"The Space Act authorizes NASA "to enter into and perform such contracts, leases, cooperative agreements, or other transactions as may be necessary in the conduct of its work and on such terms as it may deem appropriate, with any agency or instrumentality of the United States, or with any State, Territory, or possession, or with any political subdivision thereof, or with any person, firm, association, corporation, or educational institution."*

- **Application:**

- Agreements w/ Commercial Customers & Federal Agencies
- Authorizes NASA to enter into agreements as may be necessary in the conduct of its work..
- Primary Authority for NASA reimbursable business



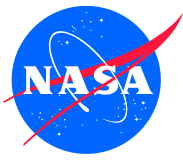
## **The SPACE ACT (continued..)**

- **Features:**

- Allows wide range of Uses and Agreement Topics
- Pricing is “full cost” but may be adjusted in conjunction with direct benefit to NASA - - documentation is required

- **Examples:**

- Use of KSC facilities for Commercial Space enterprise
- Testing of Race Cars on Shuttle Landing Facility (SLF)
- Agreements with Mercedes Benz & Honda for automobile demonstration & testing
- Use of SLF Hangar by Fish & Wildlife Service helicopter



# COMMERCIAL SPACE LAUNCH ACT (CSLA) – 51 USC § 50901 (1984)

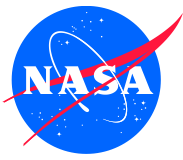
*“Governs the sale, by NASA, of launch and reentry property for fair market value and the sale of launch and reentry services for direct cost only. The charge for launch services or reentry services is an amount equal to the direct costs, including the basic pay of Government civilian and contractor personnel, the Government incurred because of acquisition of the services.”*

- **Application:**

- Agreements with the Commercial Space Launch Industry
- CSLA was established to provide commercial space companies with incentives to grow the U.S. space launch industry

- **Features:**

- Private Sector bears reasonable portion of investment risk & responsibility



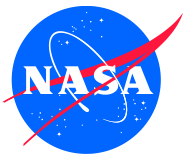
## **CSLA (continued...)**

- **Features (cont.):**

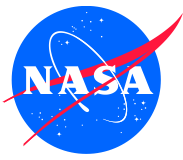
- Calls for Pricing based on 'Direct Cost' (-see next slide)
- Price adjustments under CSLA authority require the concurrence of the cognizant Program Manager and approval of the Center CFO

- **Examples:**

- NASA has Agency-wide CSLA Agreements with Boeing, Lockheed, Space-X and Orbital Sciences for development and testing of new vehicles and space launch systems



- **“Direct Cost”– as defined by CSLA..**
  - Cost must be directly associated with agreement’s commercial launch effort.
  - NASA would not have otherwise incurred these costs.. (except Civil Service labor)
  - Civil service salary and fringe benefits are allowed if directly applicable to effort (Management oversight cost are not allowed)
  - “Pooled” costs are not allowed, however...
  - Contractor G&A costs may be allowed since NASA would not otherwise have incurred these costs..

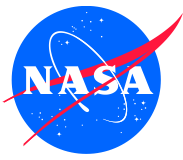


# COMMERCIAL SPACE COMPETITIVENESS ACT - (CSCA) – 51 USC § 50504 (2000)

*Authorizes NASA to allow commercial entities to use its facilities on a reimbursable basis – if used to support space-related effort, and equivalent commercial services are not reasonably available. Provides broad authority.*

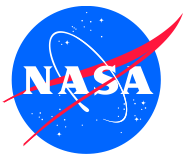
- **Application:**
  - Space-related agreements with non-Federal entities
- **Features:**
  - Direct cost only may be charged – full cost is allowed
- **Examples:**
  - No agreements under CSCA authority have yet been written by NASA. (Special permission needed.)





## Summary of Legal Authorities:

REIMBURSABLE CUSTOMER	AGREEMENT	PRICING
Federal Government	Economy Act	Actual Full Cost
Federal Government Non-federal Government Private entities	Space Act	<ul style="list-style-type: none"><li>• Cost-Based</li><li>• Market-Based</li><li>• Fair and Reasonable (at less than full cost)</li></ul>
Private Sector	Commercial Space Launch Act (CSLA)	Direct Cost
Non-Federal	Commercial Space Competitiveness Act (CSCA)	Direct or Full Cost



## **OTHER AGREEMENT TYPES:**

- **Enhanced Use Leases**

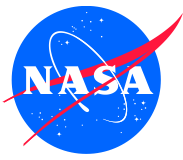
- Examples: Land for Solar Farm, Cell Towers, and Press Sites for CBS, NBC, etc., possible office space leases, Exploration Park, Hanger N, Hypergol Module Processing Facility, and Parachute Refurbishment Facility
- Allows NASA to retain profits

- **Use Permits**

- Can be used with any Real Property:
- Examples: Orbital Processing Facility No. 3, (OPF-3)  
Shuttle Landing Facility (SLF)

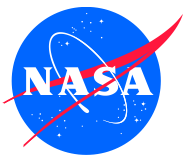
- **Memorandum of Agreement (MOA) & Memorandum of Understanding (MOU)**

- Mostly with other Agencies – usually no cost



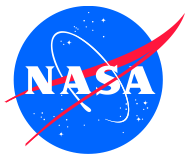
## Current / Emerging Partnership Highlights

- **Currently 60+ Partnerships existing or in works.**
- **Agreements for Facility Usage (completed or in-work):**  
*Including:*
  - Launch Pad 39A
  - Shuttle Landing Facility (SLF)
  - Vehicle Assembly Building (VAB)
  - Orbiter Processing Facilities (OPF's)
  - Hypergol Maintenance Facility (HMF)
  - Thermal Protection System Facility (TPSF/Tile Shop)
- **Commercial launch/space services industry**
  - COTS, CRS and Commercial Crew including CCiCAP
    - SpaceX, Orbital, Boeing, Sierra Nevada
  - Bigelow Aerospace, Andrews (Space Services), ProXopS Inc.



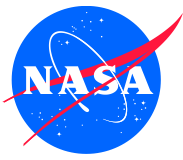
## **Business Case Analysis - Hypergolic Module Processing Facility**





## **Business Case - Table of Contents**

<b>1.0 Purpose and Scope</b>	<b>1</b>
<b>2.0 Description of Proposed Activities and NASA Programmatic Benefits</b>	<b>2</b>
<b>3.0 Summary of Proposed Enhanced Use Lease Agreement</b>	<b>2</b>
<b>3.1 Summary of EUL Terms and Conditions</b>	<b>2</b>
3.2 Description of Associated Space Act Agreement for KSC Provided Services	3
3.3 Approach to Handling Personal Property Associated with the Facilities	3
3.4 KSC Points of Contact	3
<b>4.0 Description of KSC Real Property to be Included in UPC EUL</b>	<b>3</b>
4.1 Identification and Description of Facilities/Land Included	3
4.2 Relationship of the Proposal to the KSC Master Plan	4
<b>5.0 Legal Analysis</b>	<b>4</b>
5.1 NASA's Authority to Enter into the Land Use Agreement – NPR 8800.15B, Section 7.5.2 (g)(1) Status of Property as Excess – NPR 8800.15B, Section 7.5.2 (g)(2) and Restrictions or Limitations – NPR 8800.15B, Section 7.5.2 (g)(3)	4
5.2 Status of Property as Excess – NPR 8800.15B, Section 7.5.2 (g)(2)	5
5.3 Restrictions or Limitations – NPR 8800.15B, Section 7.5.2 (g)(3)	5
<b>6.0 Economic Analysis</b>	<b>6</b>
6.1 Fair Market Value (FMV) Determination	6
6.2 Consideration	6
6.3 Intangible Benefits	8
6.4 Comparison of Options	8
<b>7.0 Risk Analysis</b>	<b>9</b>
7.1 Financial Risks	9
7.2 Safety and Mission Impact Risks	10
7.3 Security Risks and Analysis	10
<b>8.0 Environmental Analysis</b>	<b>11</b>
8.1 Summary of the Environmental Baseline Survey (EBS)	11
8.2 Summary of National Environmental Policy Act Requirements and How Addressed	11
8.3 Sustainability Objectives Met by the Proposal	11
<b>9.0 Conclusions and Recommended NASA Actions</b>	<b>12</b>
Attachment A – Documentation of KSC Office/Directorate Concurrences	A-1
Attachment B – Description and Drawings of the HMPF, M7-1212	B-1
Attachment C – GSA Findings and Observations	C-1
Attachment D – Cost Evaluation from the Office of KSC Chief Financial Officer	D-1
Attachment E – Record of Environmental Consideration (REC)	E-1



## **Business Case for Commercial Use of Hypergol Module Processing Facility**

### **Fair Market Value Determination:**

**Fee Simple value** ( - from Appraisal) **\$230,000**

(Includes: Statement that facilities & services are unique - no competition with local suppliers.)

### **Consideration:**

(NASA Guide for Enhanced Use Leasing of Real Property - NPR 8800.15B)

**Annual Lease Value** ( - from Appraisal) **\$33,000**

CM&O Tax (16.0%) **5,280**

**TOTAL:** **\$38,280**

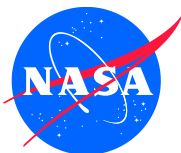
**TOTAL over 15 YR. TERM** (w/2.5% escalation): **\$686,000**

### **Intangible Benefits:**

1. Supports NASA goal to encourage, enable and support 'Commercial Use of Space'.
2. Sustain availability of skilled workers in KSC local area & help offset losses from end of SSP.

### **Comparison of Options:**

1. **Leave facilities in current condition**
2. **Sell property through GSA Excess process**
3. **Provide use of property under an EUL for Commercial space operations and support**



## Business Case Document for UPC use of HMP

### Review of Appraisal

For the Hypergol Module Processing Building (South)  
And the Hypergol Support Building  
National Aeronautics and Space Administration  
John F. Kennedy Space Center, Florida 32899

It is my opinion that the completeness, accuracy, adequacy, relevance and reasonableness of the appraisal report under review substantially meet the requirements stated in Standards 1 and 2 of the current edition of the *Uniform Standards of Professional Appraisal Practice* (USPAP), contractual requirements and client needs. Therefore, I approve this report and the use of the following values as of July 19, 2012:

### FAIR MARKET VALUE

HYPERGOL MODULE PROCESSING BUILDING -- \$230,000

HYPERGOL SUPPORT BUILDING -- \$570,000

### FAIR ANNUAL RENT

HYPERGOL MODULE PROCESSING BUILDING -- \$33,000

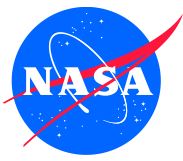
HYPERGOL SUPPORT BUILDING -- \$91,000

  
**JACK FANNIN**  
Certified General Real Property Appraiser  
Georgia #348844

**REGIONAL APPRAISER  
REAL PROPERTY DISPOSAL (4PZ)**

  
**DATE OF REVIEW**

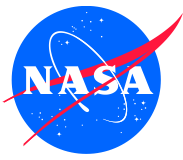




## **Business Case Analysis - PaR Systems use of Hangar N**







## Business Case for Commercial Use of Hangar N (including Personal Property)

### Fair Market Value Determination:

Via GSA Appraisal in accordance with NPR 8800.15B - for Real Property Management

### Consideration:

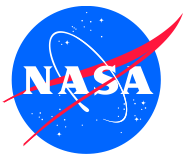
<b>Annual Lease Value</b> ( - from Appraisal)	\$144,628
Facility Service Charge (1.9%)	2,748
<b>TOTAL:</b>	<b>\$147,376</b>
<b>Personal Property Annual Rental Reimbursement</b>	\$109,391 *
Facility Service Charge (1.9%)	2,078
<b>TOTAL:</b>	<b>\$111,469</b>
<b>Essential Direct Support Services</b> – Annual Estimate	\$109,445
Center Management & Operations (CM&O)	2,432
<b>TOTAL:</b>	<b><u>\$111,877</u></b>
<b>ANNUAL TOTAL (1<sup>st</sup> YEAR):</b>	<b>\$370,722</b>

### Intangible Benefits:

1. Supports NPR 8800.15B requirement for maximizing value of underutilized real property.
2. Sustains availability of skilled workers in KSC local area & helps offset losses from end of SSP.

### Comparison of Options:

1. Leave facilities in current condition
2. Sell property through GSA Excess process
3. Demolish Facility and sell NDE Equipment
4. Provide use of property under an EUL for Commercial space support



## Business Case for Hangar N - Personal Property Lease Rate Calculation:

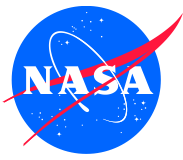
FAR 52.245-9 - Use and Charges

Paragraph (e)(2) - Other Government Property

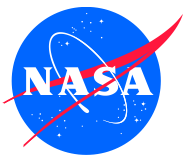
*"The rental charge is calculated by multiplying 2 percent of the acquisition cost by the hours or rental time, and dividing by 720."*

**Example: Robot/Controls - Use Charge = Acquisition Value = (\$3,603,191 \* 2.0% /720) = \$100.09 \* 20 hrs. = \$2,002**

18 NDE Capabilities	Gov't Acq Cost	Projection (Hours of Use)	Lease Rate (Hourly)	12 Month Revenue
X = X-ray	\$ 1,538,337	1684	\$ 42.73	\$71,960
XS = X-ray Safety	\$ 6,460	1684	\$ 0.18	\$302
U = Ultrasound	\$ 875,304	750	\$ 24.31	\$18,236
M = Mechanical Test	\$ 1,190,618	10	\$ 33.07	\$331
I = Infrared	\$ 933,433	200	\$ 25.93	\$5,186
T= Thermography	\$ 508,350	10	\$ 14.12	\$141
E = Eddy Current	\$ 347,217	450	\$ 9.64	\$4,340
L = Liquid Penetrant/Magnetic Particle	\$ 45,305	200	\$ 1.26	\$252
S= Shearography	\$ 337,490	40	\$ 9.37	\$375
R = Related Support Equipment Critical for NDE Operations	\$ 325,206	183	\$ 9.03	\$1,653
C = Highly Specialized Computer, NDE Data Systems, Digital Systems	\$ 444,506	240	\$ 12.35	\$2,963
CS=Calibration Standard	\$ 174,681	183	\$ 4.85	\$888
SCS = Specialized Calibration Standards	\$ 564,562	10	\$ 15.68	\$157
<b>RC=Robot &amp; Controls</b>	<b>\$ 3,603,191</b>	<b>20</b>	<b>\$ 100.09</b>	<b>\$2,002</b>
P = Photography	\$ 74,338	110	\$ 2.06	\$227
SP = Specialized Photography	\$ 220,000	10	\$ 6.11	\$61
D = Data Acquisition	\$ 300,370	20	\$ 8.34	\$167
IE = Infrastructure Equipment	\$ 29,527	183	\$ 0.82	\$150
<b>Total Acquisition Value</b>	<b>\$ 11,518,895</b>	<b>5,987</b>		<b>\$109,391</b>

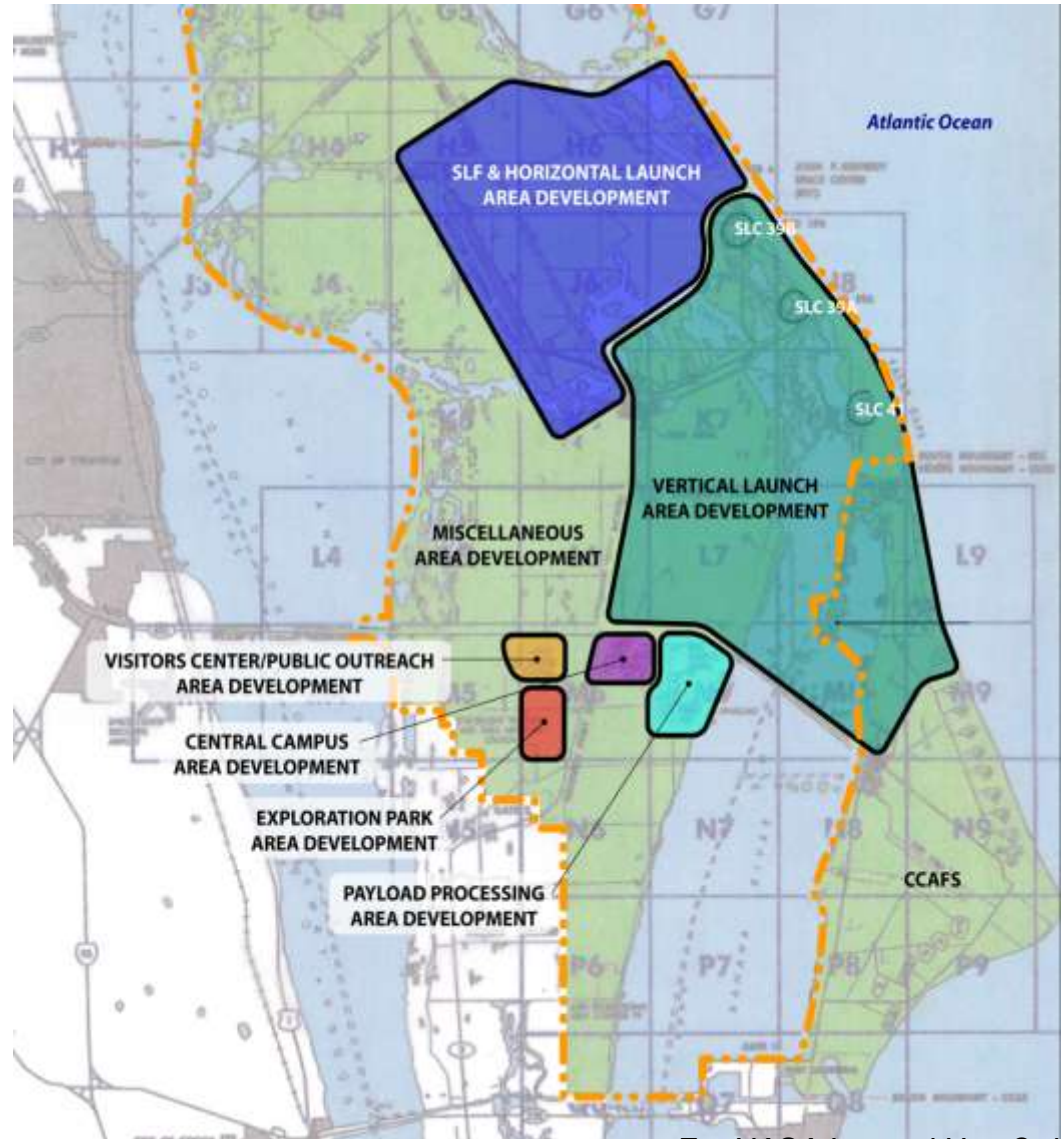


# **Examples of KSC Commercial Leasing**



# KSC Master Planning Area Development

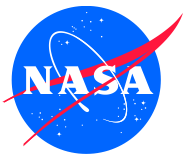
- **Development Areas**
  - SLF & Horizontal Launch/Recovery
  - Vertical Launch/Recovery
  - Payload Processing
  - Industrial Area (Central Campus)
  - Public Outreach
  - Exploration Park
  - Misc. Resources (e.g. disturbed agricultural land)





## CCiCAP





## **XCOR**

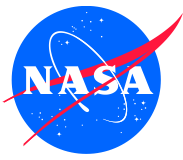


**Example:**

**- Operations @ SLF**

**(Approximately  
150 employees)**

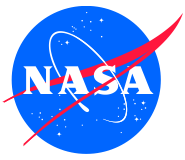




## **Launch Complex 39A & 39B**



- **LC 39A – Commercial Customer (SpaceX)**
- **CSLA Agreement**
- **Approx. 300 employees**
- **Customer performs all O&M and pays all utilities & commodities**
- **LC 39B – NASA SLS and Commercial**



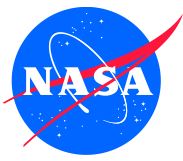
## **OPF 1 & 2**



- **Use Permit**

**(Approximately  
75 employees)**

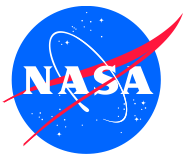




## **OPF 3 (&PCC)**



- **Use Permit with Space Florida (SF)**
- **OPF#3**
- **Processing Control Center (PCC)**
- **15 year permit**
- **Approx. 300 employees**
- **SF pays all Ops./Maint. Costs and utilities**
- **Annual Contribution of \$100K to Center Mgmt. & Operations Budget**



## **Vehicle Assembly Building (VAB)**



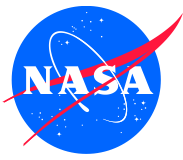
- **Vehicle Processing**
- **4 High Bays**
- **456 ft. doors**
- **Transfer Aisle**
- **Processing Platforms**
- **5 Cranes**
- **343,500 s.f.**



- a) Media/press sites**
- b) Cell tower locations**
- c) FPL solar arrays**
- d) Future Launch sites**  
**(e.g. Pad 39-C)**



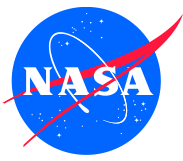




## **KSC Photovoltaic Facility**



- **In-kind EUL**
- **Florida Power & Light**
- **60 acres of land**
- **10 megawatt system**
- **KSC received a 1 megawatt system**
- **Valued @ \$6.36m and annual O & M for 30 years**
- **Produces 1% of KSC electricity**



## **Cell Towers**

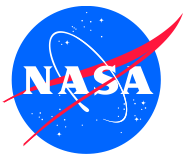


- **AT&T**
- **Verizon**
- **American Tower**
- **Bell South**
  
- **Aprox. \$15k annually  
for each tower**



Development has begun on **Exploration Park**, a 'research/business park' adjacent to Kennedy Space Center, with laboratory and office space available for lease to commercial companies interested in having a business presence and/or other operations near KSC.





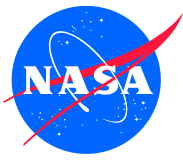
## **Providing Personal Property**

**NASA has personal property that space industry companies can use for their commercial operations, both government and private customers, examples below:**

- 220 items in OPF3
- 1600 items in the NSLD

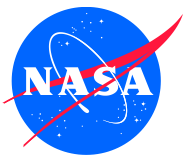
### **Background:**

- **NASA has no current need for the property, but may need it in the future**
- **NASA has no funds to maintain this property**
- **KSC proposes to provide such property to space industry companies if the company agrees to maintain the property at its expense and return it to NASA on request**
- **The alternative is to permanently dispose of the property as excess/surplus losing the property and the skilled workforce that uses the property**

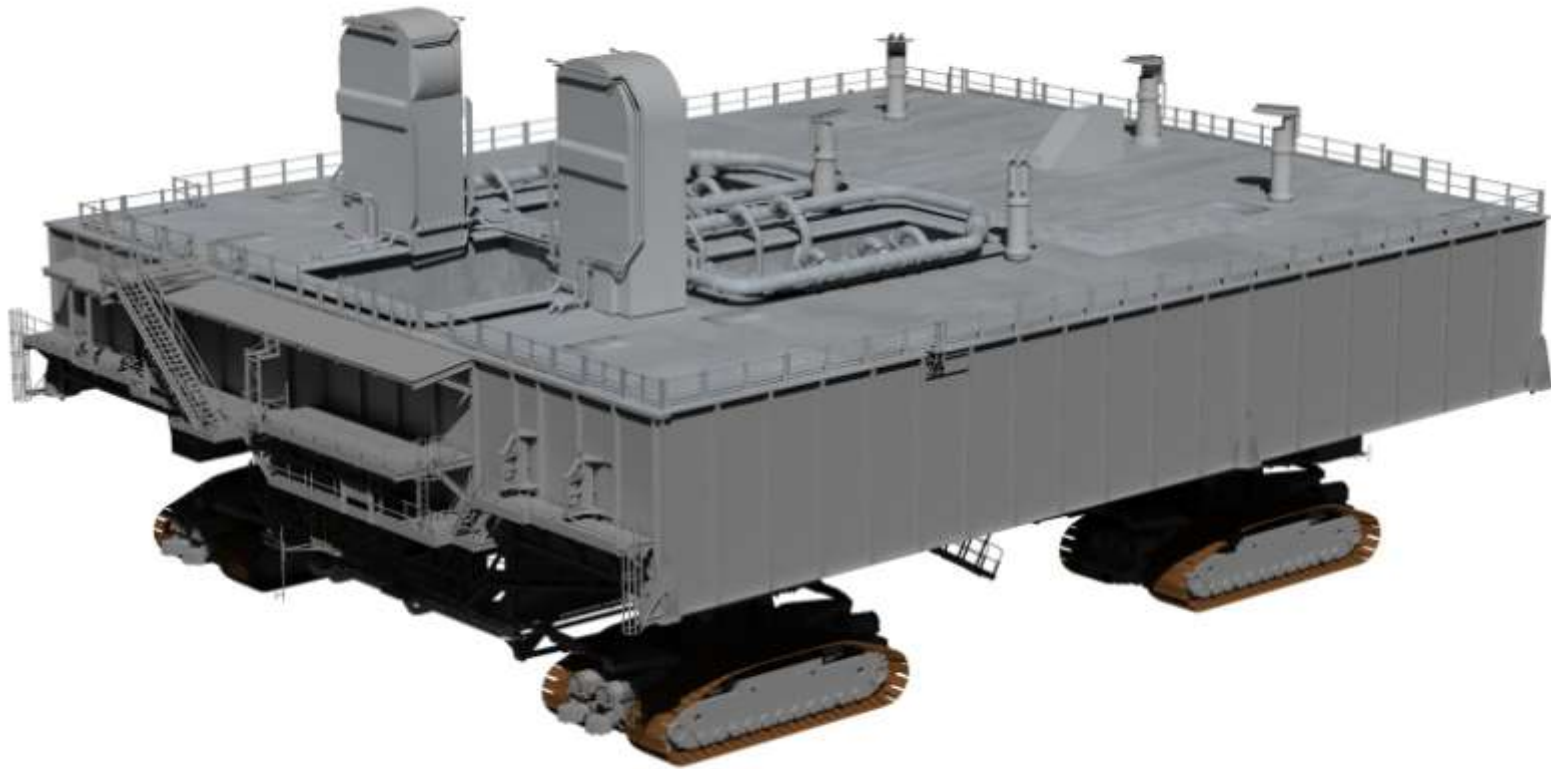


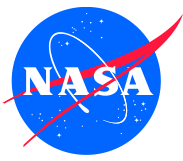
# **Examples of KSC Personal Property**





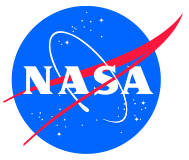
# Crawler-Transporter



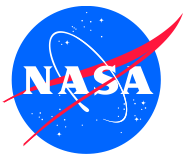


## **MLPs**





# Questions ?



## CONTACTS:

### Terry Lambing:

Phone: 321-867-3755

Email: [Torrance.J.Lambing@nasa.gov](mailto:Torrance.J.Lambing@nasa.gov)

### Jim Roberts:

Phone: 321-867-3018

Email: [James.E.Roberts@nasa.gov](mailto:James.E.Roberts@nasa.gov)