2016 Cape Canaveral Spaceport Master Plan Public Briefing

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CCS Master Plan Briefing Summary

- Purpose and need for the 2016 update
- A new strategic vision for the Spaceport: Vision 2025
- CCS Master Plan:
  - Adapting an aging infrastructure
  - Serving the marketplace of the future
  - Evolving spaceport management and governance
  - Strengthening the development plan
- CCS Master Plan will evolve with the spaceport it serves (more extensive update anticipated in 2017-2018)

“To achieve this vision, we must engage our stakeholders with conviction”

Frank DiBello, Space Florida President & CEO
Introduction
Space Florida’s Planning Charter and Legislative Direction

It is the intent of the Legislature that Space Florida will... preserve the unique national role served by the Cape Canaveral Air Force Station and the John F. Kennedy Space Center by reducing costs and improving the regulatory flexibility for commercial sector launches while pursuing the development of complementary sites for commercial horizontal launches.

Space Florida shall develop a spaceport master plan for expansion and modernization of space transportation facilities within spaceport territories ... the plan shall contain recommended projects to meet current and future commercial, national, and state space transportation requirements. The plan shall identify appropriate funding levels and include recommendations on the appropriate sources of revenue...The territory consisting of areas within the John F. Kennedy Space Center and the Cape Canaveral Air Force Station may be referred to as the “Cape Canaveral Spaceport.”

Space Florida shall carry out its responsibilities for spaceport operations by supporting federal efforts to clarify roles and responsibilities of federal agencies and eliminate duplicative federal rules and policies, in an effort to streamline access for commercial launch users... Seeking federal support and developing partnerships to renew and upgrade the infrastructure and technologies at the Cape Canaveral Air Force Station, the John F. Kennedy Space Center, and the Eastern Range that will enhance space and military programs of the Federal Government, and improve access for commercial launch activities.

--- Florida Statutes 331, Part II
Sections 331.3011, 331.304, 331.360, 331.3051
Cape Canaveral Spaceport Master Plan

Statewide Spaceport System & CCS Territory

Map Legend
- Urbanized Area
- Existing System
  - Spaceport
  - Spaceport Territory
  - Control Center
  - Payload Processing Facility
  - Other Significant Facilities
  - Part of Eglin Air Force Base
- Strategic Intermodal System (SIS)
  - Interstate Highway
  - SIS Roadways
  - Railroad
  - SIS Existing Airport
  - SIS Spaceport

Legend
- Cape Canaveral Spaceport
- Kennedy Space Center
- Cape Canaveral Air Force Station
- Space Florida
purpose and need of the 2016 update

- Provide a “living” roadmap that will evolve with the Spaceport and promote collaboration among its stakeholders.

- Respond to changing roles and responsibilities among federal agencies and in performance of Space Florida’s charter and responsibilities.

- Respond to a dynamic and rapidly evolving commercial space transportation industry and global space commerce marketplace.
Implement the new Strategic Vision 2025

- Modified set of goals, strategies, and objectives
- Build upon recent successes by Space Florida in partnership with FDOT
- Frame an agenda of specific, targeted projects for capacity improvements at CCS that will guide allocation of available capital improvement resources in the planning horizon
Key Elements of NASA and CCAFS Plans

NASA directed by Congress to identify most efficient retention, sizing, and distribution of facilities and infrastructure.

NASA’s 2012 Future Development Concept envisions the transition of KSC to a multi-user spaceport managed in the future by an independent spaceport authority.

CCAFS currently updating its General Plan but has already adapted to new partnering opportunities with commercial enterprises such as SpaceX and Blue Origin.
World's most powerful rockets, with increasing launch tempo

Today's Major Spaceports of the World
Based on metric ton lift capacity, destinations supported

Legend:
- Orange: Orbital Spaceports with annual lift capacity greater than 400 metric tons
- Yellow: Orbital Spaceports with annual lift capacity of approximately 200 metric tons or more
- Green: Orbital Spaceports with annual lift capacity of approximately 50-150 metric tons
- Purple: Orbital Spaceports primarily supporting polar orbit missions (low with targeted annual lift capacity)
Cape Canaveral Spaceport Master Plan

The global leader in enabling Space Commerce
The global leader in enabling **Space Commerce**

**High Value Destinations in Space**
- Sustained Operations in Space Environment
- Spaceport Site Capacity for Cargo Lift & Throughput
- Commercial Provider Production & Delivery Capacity
- End User Need
- Global Market Demand
- Public/Private Investment
- Private Capital Markets

**Predictable Operating Revenue & Environment**
- Enabling Access to Private Sector Capital to Fund Needed Infrastructure

**Return on Expectation**

**Return on Investment**

**Space-Related Services/Products**
- Exploration
- National Security
- Manufacturing
- Science
- Resource Extraction
- Landers
- Rovers
- Transport Systems
- Propellant Depots
- Habitats
- Satellites
- Adventure Tourism
- Hypersonic Point-to-Point

**Space-Based Commerce**

**Space Florida**
Cape Canaveral Spaceport Master Plan

A Multi-sector Space Transportation Complex

Cape Canaveral Spaceport
Typical Range of Supported Launch Trajectories

Space Commerce Zones
Commercial Services & Infrastructure
Transitional Spaceport Council
Independent Cape Canaveral Spaceport

2016
2025

Common Needs
Department of Defense
U.S. Civilian Science Agencies
Commercial Operators & Markets
Cape Canaveral Spaceport Master Plan

Integrated with Statewide and Regional Assets Beyond its Borders
GLOBAL SPACE COMMERCE

MODERN, EFFICIENT, & ADAPTABLE FACILITIES AND INFRASTRUCTURE

IDENTITY AND QUALITY OF LIFE

INTER-CONNECTED COMMERCE AND MISSION ZONES
Global Space Commerce

**What?** Facilitate global space commerce by enabling continuous multi-functional horizontal, vertical and integration activities and missions.

**How?**
- Create uniform and reliable operating conditions through regulatory predictability and transparent business practices.
- Develop balanced and flexible land use processes adaptable to market needs.
- Enable effective governance through establishment of independent Spaceport Authority.
Modern, Efficient, & Adaptable Facilities

What?
Encourage development of buildings, facilities, infrastructure, and gathering areas that are adaptable and allow for a variety of uses and functions over time. Consolidate compatible uses.

How?
- Establish unified development codes and processes to minimize jurisdictional conflicts
- Incorporate flexible design standards and construct adaptable facilities for varying functionalities
- Establish consistent, authorized funding mechanisms to enable increased federal, state, and private investment at CCS
Inter-connected Commerce and Mission Zones

What?
Provide safe, convenient, and comfortable transportation networks promoting clear wayfinding that leverages the multi-modal transportation opportunities at CCS: land, sea, air, and space.

How?
- Create connected and organized commerce zones using appropriately located and sized public roadways, trails, and greenways.
- Optimize commercial accessibility and movement by tiered structure of physical controls.
- Enhance building relationships to minimize operating costs and promote an integrated community.
Identity and Quality of Life

What?
Invest in amenities, services, and facilities while maximizing resources through creation of commerce opportunities to enhance the Spaceport community. Establish and promote CCS as a unified entity, multi-sector Spaceport.

How?
- Facilitate commerce opportunities for CCS community support functions
- Create a one-of-a-kind professional workplace culture
- Enhance amenities and recreation systems
- Leverage regional and statewide assets
The Plan
CCS Master Plan Content Overview

Sections include:

- Roles and Responsibilities
- Inventory and Discovery
- Space Transportation Market Assessment
- CCS Development Plan
Roles + Responsibilities
Role of Space Florida

Spaceport Management & Operations:
- Exploration Park
- SLF
- Space Launch complexes 36 and 46
- Area 57

Spaceport Planning and Coordination:
- Overall planning for all of Florida’s spaceports
- Coordinate with federal agencies on development of CCS
## The “Players”

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Cape Canaveral Spaceport Master Plan

Inventory + Discovery

- Establish baseline of existing conditions
- Key destinations
- Multi-modal connections
- Environmental features
- Existing facilities and infrastructure
  - Control centers and airspace
  - Launch and launch vehicle processing
  - Payload processing
  - R&D
Key Destinations

- Primary Operational Areas existing and/or future users want to access
  - Launch Complexes
  - SLF
  - Multi-function support areas

Development should expand capabilities of these areas and promote integration
Multi-Modal Connections

β CCS is one of only facilities in world that supports a quinti-modal transportation network

β Adequate connections between them enables, enhances, and promotes commercial activity

β FDOT’s Strategic Intermodal System (SIS) provides prioritized funding mechanism for transportation facilities considered high-priority

β CCS is an SIS facility with multiple funded SIS projects at various locations totaling $85M
Environmental Features

- All partners at CCS are proactive in protecting the environment.

- 95% of KSC property managed for environmental conservation including MINWR and CNS.

- Protecting and promoting the natural environment in balance with space transportation is a key component to successful implementation of the CCS Vision.

- The environmental impact of each proposed project will be assessed before implementation.
Regional Assets

- Commodities
  - Resources
  - Workforce
- Port Canaveral
- Natural Systems
- Tourism
Cape Canaveral Spaceport Master Plan

Strengths + Opportunities

**Strengths:**
- Ability to accommodate growth
- Airspace
- Transportation Network
- “Catalytic” carriers

**Opportunities:**
- Regulatory coordination
- Modernized infrastructure
- Private capital and revenue sources
Market Assessment
Space Transportation Markets

- Dynamic, commercial user/commercial provider driven; new technology
- More forms and variants of launch vehicles in all classes exist worldwide today than ever before
- 86 orbital launches in 2015 in 7 countries; U.S. providers conducted 8 of the 22 commercial launches (36%) at value of $617M
- Increasing U.S. market share at CCS and growth in demand will result in higher flight rates
- CCS challenge is to sustain an adaptive capacity to grow with global marketplace it serves
Competing World Spaceports

- Increasing number of spaceports focusing on civil and commercial space exploration in addition to defense sector

- CCS remains well positioned to lead in enabling space commerce with its existing and potential capacity for transporting cargo and people

- But faces competition: new orbital spaceports in Russia and China became active in 2016; new orbital spaceports in development in TX & GA

- Two new suborbital spaceports in Texas join Cecil Spaceport and three others
An Evolving Space Commerce Marketplace

Traditional

- Space-Based assets delivering services and products to global markets (e.g. telecom, internet, GPS)
- Global spending $330 billion in 2015 could reach $600 billion by 2024

Emerging and Future

- New commercial activities beyond earth orbit
- Adventure tourism, hypersonic point-to-point
U.S. companies seek to expand commercial capabilities & markets
Development Plan
Key Trends Influencing Development Planning

- Industry-driven site selection criteria
- Industry technology advances
- New Legislation and regulatory policies (CSLCA of 2015)
- Competitive challenges
GOAL 1: GLOBAL SPACE COMMERCE
Enable global space commerce by facilitating continuous multi-functional horizontal, vertical, and integration activities and missions.

GOAL 2: MODERN, EFFICIENT, & ADAPTABLE FACILITIES AND INFRASTRUCTURE
Encourage development of buildings, facilities, infrastructure, and gathering areas that are adaptable and allow for a variety of uses and functions over time.

GOAL 3: INTERCONNECTED COMMERCE & MISSION ZONES
Provide safe, convenient, and comfortable transportation networks promoting clear wayfinding that leverages the multi-modal transportation opportunities at CCS.

GOAL 4: IDENTITY AND QUALITY OF LIFE
Invest in amenities, services, and facilities while maximizing resources through creation of commerce opportunities to enhance the spaceport community.
Goals and Objectives to Guide Investments

GOAL 1: GLOBAL SPACE COMMERCE

Enable global space commerce by facilitating continuous multi-functional horizontal, vertical, and integration activities and missions.

Objective 1.1 Enable growth in commercial medium-lift and heavy-lift launch infrastructure and operations supporting identified markets of domestic or global demand.

Objective 1.2 Support commercial crew and cargo delivery to and return from Cis-Lunar destinations.

Objective 1.3 Attract new emerging space transportation and space development systems.

Objective 1.4 Expand horizontal launch and landing capacity and support capabilities.

Objective 1.5 Incentivize and facilitate co-location at CCS of manufacturing, assembly, integration, mission operations, and refurbishment activities.

Objective 1.6 Attract and support collaborative advanced aerospace technology research and development projects from all three CCS-supported sectors involving inter-sector and international partnerships.

GOAL 3: INTERCONNECTED COMMERCE & MISSION ZONES

Provide safe, convenient, and comfortable transportation networks promoting clear way-finding that leverages the multi-modal transportation opportunities at CCS.

Objective 3.1 Work with federal partners at KSC and CCAFS to define and establish Space Commerce Zones with appropriate flexibility of uses and application of concurrent jurisdiction.

Objective 3.2 Support modernization and necessary capacity improvements to existing roadway, bridge, rail, and marine transportation networks.

Objective 3.3 Identify and support reconfiguration of existing access control points on major spaceport arterial networks to improve commercial access to established space commerce zones without compromising necessary security and general public access controls.

Objective 3.4 Enable and support safe, reliable, and concurrent multi-sector integration and mission activities including launches, reusable element returns, and reentries.
GOAL 2: MODERN, EFFICIENT, & ADAPTABLE FACILITIES AND INFRASTRUCTURE

Encourage development of buildings, facilities, infrastructure, and gathering areas that are adaptable and allow for a variety of uses and functions over time.

Objective 2.1 Adopt design guidelines and development standards to guide project planners and developers.

Objective 2.2 Maintain up-to-date needs inventory of required infrastructure enhancements and facility capabilities which can be incorporated into or considered in project development for future repurposing.

Objective 2.3 Establish collaborative planning among the CCS land owners, managers, developers, and regulators through establishment of a Spaceport Planning Council to seek balanced and flexible land use policies and practices throughout the CCS.

GOAL 4: IDENTITY AND QUALITY OF LIFE

Invest in amenities, services, and facilities while maximizing resources through creation of commerce opportunities to enhance the spaceport community.

Objective 4.1 Leverage opportunities for commerce to attract private capital investment in amenities, services, and facilities supporting the spaceport community.

Objective 4.2 Identify and implement opportunities to physically establish Cape Canaveral Spaceport’s brand and multi-sector user areas through entry features and way-finding signage.

Objective 4.3 Identify and actively recruit commercial partners for development of professional, academic, and for during and after-work gathering places tailored to the needs of the spaceport community providers, customers, and visitors.
Key Elements of the Development Plan

- Establishment of Space Commerce Zones to serve as designated areas for commercial development and enable CCS as the hub of global space commerce
- Launch Complexes
- Development of SLF
- Development of Exploration Park
- Annual update of Recommended projects based on review of FDOT’s annual call for projects
Notional Evolution of Space Commerce Zones

β Designated areas zoned to encourage, support commerce
β Overlay districts that remain federally-owned
β Activities function as they would on any commercial site not situated on federal land
β State and local laws, commercial standards apply
β Commercial services will grow and extend
β Areas allowed to grow in boundary over time and interconnect
β Areas still subject to appropriate development standards for land use
Infrastructure Development

- Continue on-going and planned initiatives for infrastructure design and development in parallel with space commerce zones

Vertical Launch Complexes

- LC39A (SpaceX)
- SLC 36 (Blue Origin)
- SLC 46
- Proposed Shiloh Complex
- Notional LC 49 and 48
Shuttle Landing Facility

SLF Legend:
- Phase 1: Southfield and North Field Development; HTOL facilities/Use; Airside and Landside related infrastructure; Utility Corridor Southfield to Northfield; Hangar Road
- Phase 2: Midfield Development; HTOL facilities/Use; Airside related infrastructure
- Phase 3: Midfield Development: Manufacturing, processing and administrative use facilities; Landside related infrastructure; entry feature infrastructure
- Phase 4: Large Vehicle Processing and Launch Operations facilities/Use
- Phase 4A: ATCT, Operations & Media Support Facilities; launch observation area
- Phase 5: Future Airside HTOL Development use (20+ years)
- Phase 6: Future Landside/Arise HTOL Development use (20+ years)

SLF Summary:
- ATCT, Operations & Media Areas: 41 acres
- Existing Southfield Area: 22 acres
- Phase 1: 179 acres
- Phase 2: 209 acres
- Phase 3: 137 acres
- Phase 4: 153 acres
- Phase 4A: 41 acres
- Phase 5: 307 acres
- Phase 6: 306 acres
- Runway and Taxiway Areas: 306.6 acres
- Shankay Road Right-of-Way: 10 acres
Cape Canaveral Spaceport Master Plan

Exploration Park

Phase 1

Building Area Summary:
- Building A: 669,026 SF (3-story)
- Building B: 43,000 SF (3-story)
- Building C: 30,000 SF (2-story)
- Building D: 100,000 SF (2-story)
- Building E: 100,000 SF (2-story)
- Building F: 97,000 SF (2-story)
- Building G: 1,000,000 SF (1story/3-story)
- Building H: 40,000 SF (1story/3-story)
- Building I: 25,000 SF (1-story)

Development Area: 34 acres
Other Area: 26 acres
Total Area: 60 acres

Phase 2

Building Area Summary:
- Manufacturing Building A: 669,026 SF
- Future Plant Annex: 25,715 SF
- Future Plant/ Hermet Storage: 14,400 SF

Development Area: 54.33 acres
Total Area: 139.1 acres

KSC Visitor Complex

KSC Secure Area

Space Commerce Way

Odyssey Way
Cape Canaveral Spaceport Master Plan

Process to Solicit, Evaluate, Recommend, and Fund Master Plan Projects

**COLLECT PROJECTS**
(February – March)
- Call for projects
- Hold public/applicant workshop
- Receive applications

**QUANTIFY**
(April)
- Review project applications
- Categorize
- Determine benefits to the state
- Return on investment

**PRIORITIZE**
(May)
- Perform initial prioritization
- Assess alignment with Space Florida goals/ objectives
- Classify projects based on capital investment and job growth

**ALLOCATE**
(May – June)
- Identify projects and allocations for approved projects
- Compare to available funding sources
- Strategically invest in Florida
- Approval by Board
Future Studies

Forward work essential to development of CCS but beyond scope of the Master Plan Update

Promotes this update as a “living” document which can be updated as these studies are completed and new information/progress identified
Next Steps

- Comments and input are welcome by December 23rd
- Space Florida Board review and approval
- Email comments to: brian.witaconis@aecom.com
Questions + Answers
Cape Canaveral Spaceport Master Plan

CCS Master Plan Content Overview

The 2016 update is organized to:

- Describe CCS as a unified part of Florida’s space-connected geography
- Build on previous and concurrent planning activities
- Provide a Vision for the Spaceport of the future
- Define roles and responsibilities of land owners, managers, regulators
- Update physical inventory and capabilities/support infrastructure
- Highlight market conditions and trends driving industry needs
- Present an annually-updated Development Program aligned with Goals and Objectives