NM Spaceport Authority Status Brief

Science, Technology & Telecommunications Committee

Santa Fe

November 15, 2021

Scott McLaughlin, Executive Director

SPACEPORT AMERICA

THE SPACE TO BE...

Outline

- Activity
- Budget
- Outlook

Recent Activity

- **SpinLaunch** first kinetic launch tests
- Two flights to space by **Virgin Galactic**
- Liquid rocket engine testing by **C6 Launch** and **Ursa Major**
- **Intuitive Machines** tested laser assisted landing system to be used for moon
- High Altitude Pseudo-Satellite (HAPS) flights by **Swift Engineering**
- Space flight by **UP Aerospace** with **LANL** as customer
- Start of operations by **AeroVironment Jump 20** and **AeroVironment TUAS**
- Rocket launches by **NM Tech, NMSU Atomic Aggies, U.S. West Point Academy**
- Virtual **Spaceport America Cup** (June 2021) with 70 teams from 16 countries
- Developed lesson plans for virtual **NMSU STEM Outreach**, as well as provided **virtual tours and STEM speakers** in classrooms throughout NM
- Recognized for arts integration in **STEM project with LCPS**; working with Global Spaceport Alliance for **STEM International Space Station research**
- Working with several good aerospace prospects

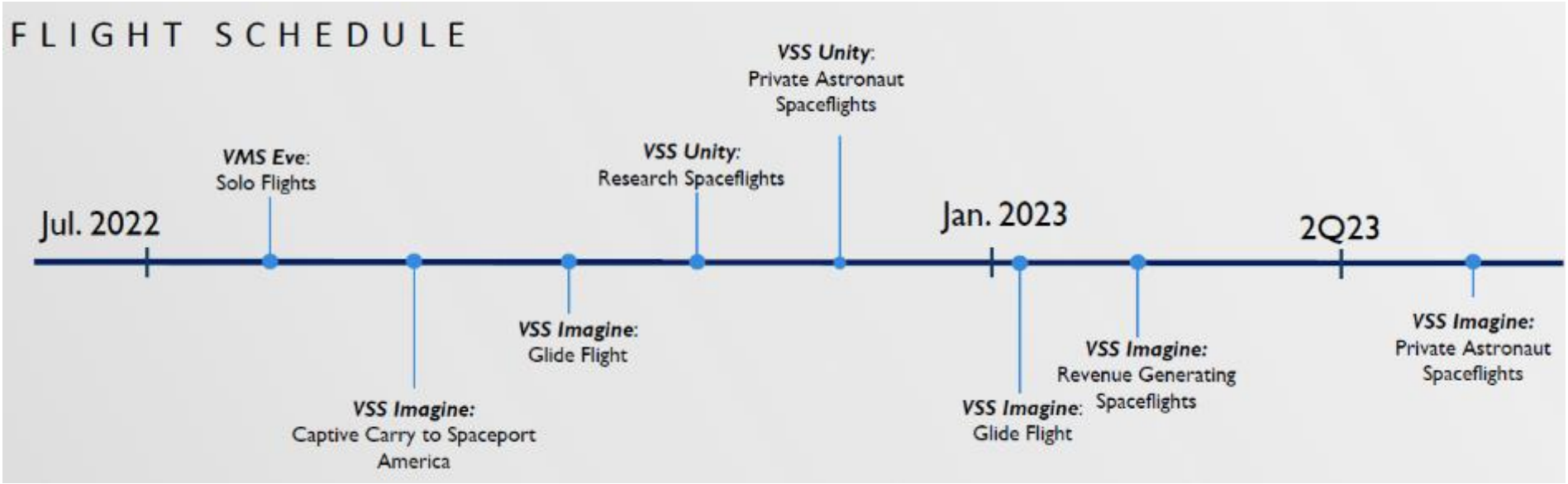
Virgin Galactic

- Completed two flights to space this year (May 22, & July 11).
- Unveiled new spaceship, *VSS Imagine.*
- Currently about 180 employees living and working in NM (will increase next year).
- Entering enhancement period for carrier aircraft

VIRGIN GALACTIC TIMELINE

From 2021 Q3, released Nov. 8 (*https://investors.virgingalactic.com/events-and-presentations)

- Enhancement period for carrier aircraft should result in 100 flights between major maintenance inspections (up from 10)
- Carrier aircraft and new spaceship return to SA around Q3 2022
- Private Astronaut Service scheduled for Q4 2022
- About 3 flights a month by Q2 2023



SMALL LAUNCHES

- New Mexico Tech

- NMSU Atomic Aggies

- U.S. West Point Academy

- Vaya Space Systems

Unmanned Aerial Vehicles (UAV)

- **Swift Engineering**

  Operating at Spaceport since 2020. Returned recently for multi-month long campaign

- **Stratodynamics**

  Balloon-launched UAV. Returns autonomously and collects meteorological and turbulence data

- **AeroVironment**

  Besides **Sunglider** (discussed on next slide), there is an increasing presence on site with additional two additional programs, **Jump 20**, and **TUAS**

AeroVironment / HAPSMobile

- **Sunglider** is a solar-powered high-altitude platform-station (HAPS)
- Over $8M in construction paid by customer for new test site, includes large hangar, offices, mission control, maintenance space
- Airplane has 260’ wingspan, 10 electric motors, and can fly to 80,000’
- Eventually two will be on site; multi-year effort for FAA certification
- Their market is “cell phone tower in the sky” and other

AeroVironment New Test Site

About 35 people on site, with increase when flight operations – up to 100

Other Activity

- **C6 Launch and Ursa Major**

  Customer built new rocket engine test stand (now an SpA asset) and ran rocket engine tests over several weeks

- **Intuitive Machines**

  Tested laser assisted landing system to be used for moon or other celestial body landing

UP Aerospace & Los Alamos National Laboratories

*"Normally, these tests are made over the Pacific Ocean. And to test a new piece of technology on a rocket takes years of planning with the DOD and can cost more than $100 million. But by partnering with private companies, the Lab can conduct these tests much more frequently and at a fraction of the cost within the State of New Mexico. The flight at **New Mexico's Spaceport America**, Aug. 11, cost only $1 million and occurred only 15 months after the initial concept."*

LANL Deputy Director of Weapons Bob Webster

LOS ALAMOS DAILY POST
Official Newspaper of Record in Los Alamos County
Member National Newspaper Association
Member New Mexico Press Association

Spaceport America: LANL And UP Aerospace Partner On Suborbital Flight Experiment

Submitted by Carol A. Clark on September 1, 2021 - 2:03 pm

UP Aerospace SpaceLoft Rocket on its rail at Spaceport America. Courtesy/Spaceport America

SpinLaunch

- Suborbital now substantially complete, expect about 30 employees on site
- Construction was over two years and estimated at over $40M
- Visit www.spinlaunch.com for videos etc.

SpinLaunch

SPACEPORT AMERICA® CUP

- Premier event hosted by Spaceport America since 2017
- 2019 Cup included 122 teams, about 1500 students in attendance (representing 14 different countries), 80 sponsors, 100 judges.
- 2020 cancelled, 2021 successfully held virtually
- *The in-person event delivers an estimated $1.5 million in economic impact (hotels, restaurants, etc.) and realizes large earned media and marketing windfall for the Spaceport, Las Cruces, and New Mexico.*

2019 SA Cup Participants

STEM Outreach & Workforce Development

- Ongoing production of educational videos with aerospace related science
- Podcasts on social media
- Visits to local schools (before and after COVID)
- Working with NM Public Education Department (PED) for additional outreach
- Student visits to SpA and partnership with tenants
- Work to create excitement about STEM and cultivate ongoing workforce pipeline for spaceport customers
- Foster entrepreneurship and keep young New Mexicans in New Mexico

NMSA Budget

NMSA Budget Background

- Operations have increased significantly in the last few years, requiring additional employees and protective services personnel.
- NMSA budget is about $10.9 million per year. Customer revenue provides around $6.8 million; with $4 million needed from GF.
- NMSA had relied on about $2 million per year of GRT Excess Pledged Revenues (EPR) . . . this is no longer an option.
- NMSA operating expenses include fixed costs that cannot be cut, including facilities maintenance and 24/7 site operations
- If the $2 million EPR amount is not replaced, NMSA will be in deficit, and will have to make severe cuts to the operational budget, staff, and onsite services. These cuts will directly affect obligatory contractual services, and negatively impacting tenant operations.

NMSA Budget (thousands)

Item	FY21 (20 FTE)	FY22 (~28 FTE)	FY23 (~ 28 FTE)	Notes
Operating Revenue	5,829	6,245	6,859	From customers (fees, leases, utilities, fuel)
General Fund	1,918	1,825	**4090.9**	**$2M needed from the GF for FY23 & going forward**
Revenue Total	**7,747**	**8,070**	**10,949.9**	
200 Personal Services	2,294	2,707	2,907.3	
300 Contract Services	4,883	5,187	5,638.1	Expenses increase with tenant activities but are charged back.
400 Other Costs	2,119	2,467	2,404.5	
Expense Total	**9,296**	**10,361**	**10,949.9**	
Fund Balance Used		291		
Supplemental	1,750	**2,000**	0	***To replace GRT EPR**
Result	**201**	**0**		
Fund Balance*	**1,201**	**910**	**910**	

- SPA is approximately 60% customer funded but will need a **supplemental for FY22** to balance the budget.
- SPA is continuing to work to increase client revenue, but the **additional $2M from the GF** is needed for future years as base funding to stabilize operations and meet contractual obligations

Note that SPA has variable revenue and expenses and should **keep a minimum 5-10% Fund Balance to stabilize from year-to-year to avoid customer service funding emergencies and to avoid multiple requests to the legislature.*

SPACEPORT IMPACT

- Current private sector tenants provide more than 230 full-time jobs, with *indirect and induced jobs* exceeding 460+ (at 2 times multiplier), with an estimated payroll at over $26M.
- In the last two years, tenant construction amounted to about $60 million, with corresponding GRT generated
- Customer salaries, local spending, and services also added to collected GRT and state collected income taxes
- When Virgin Galactic achieves forecasted steady-state operations, there will be substantial additional employment, with concurrent increase in tourism
- Spaceport customers fill hotel rooms, add per diem, and spend other money in the local area throughout the year
- NMSA is working to attract new long-term tenants and short-term customers, and expects the spaceport's growth to be aligned with the quickly growing commercial space industry
- The spaceport helps sell NM as an entrepreneurial destination for the "new space" economy and helps create a complete aerospace ecosystem

GROWTH – NEXT FIVE YEARS

- Continue to work with Virgin Galactic to maximize economic impact
  - As Virgin Galactic moves toward 2 carrier aircraft and 5 spaceships, the region will see significant and consistent positive economic benefits
- Target appropriate markets and technologies, concentrate on tenants to increase private sector jobs, and help enable NM aerospace ecosystem
  - Continually update business development targets and operational plans as the commercial space marketplace continues to grow
  - Our current markets are test and development, suborbital flights, UAVs, engine testing
- Acquire FAA reentry license and work toward attracting viable partners
  - Suborbital point-to-point and orbital re-entry programs are upcoming markets and will be carefully and objectively considered, dimensioned, and cultivated
- What do we need from the SoNM?
  - Stability in our budget and in political support for the future of the spaceport.
  - Changes in GRT and other factors that seem to drive aerospace companies away
  - Continued capital improvement to keep building the site attractiveness

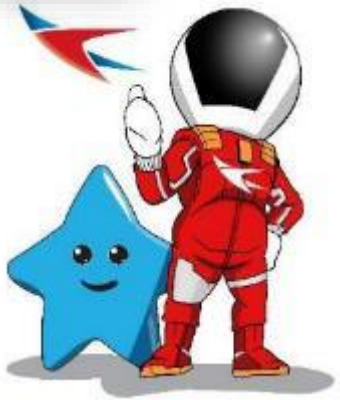
Spaceport America compares well against other spaceports.

Thank You for the Opportunity to Talk About Spaceport America

Questions?

Recent launch by
U.S. Army
West Point

- URL: www.spaceportamerica.com
- Email: scott.mclaughlin@spaceportamerica.com
- Main Phone: (575) 267-8500
- Google Earth Link to Site: https://tinyurl.com/y4grkvca



THE SPACE TO BE...

EXTRA SLIDES

NMSA Statutory Mission

The New Mexico Spaceport Authority shall:

A. Encourage and foster development of the state and its cities and counties by **developing spaceport facilities** in New Mexico;
B. Actively promote and assist public and private sector infrastructure development to attract new industries and businesses, thereby **creating new job opportunities** in the state;
C. Create the statutory framework that will enable the state to **design, finance, construct, equip and operate spaceport facilities** necessary to ensure the timely, planned and efficient development of a southwest regional spaceport; and
D. Promote educational involvement in spaceport activities and **education and training of the workforce** to develop the skills needed for spaceport operations.

Stipulated in the New Mexico Spaceport Development Act, 2005

Capital Outlay

- Approximately $38M available
- In progress items include
  - Spaceport Operations Center (SOC) Repairs ($1.2M)
  - Fabric Hangar Improvements (fire alarm, fire suppression, and HVAC) ($800k)
  - Spaceport Technology and Reception Center (STARC) ($10M)
  - Rocket Launch Rail ($1.8M)
  - Vertical Launch Area Improvements ($5M)

    Roads, electricity, water, restrooms, rentable buildings, and concrete pads
  - General Purpose Hangar(s) ($2M)
  - Master Plan ($1M)

NM Statewide Pricing Agreement contractors are being utilized to access project management services to increase development and implementation speed.

ICIP FY23 Request

- $20M – Spaceway Taxiway (2023)
- $7.5M – General Infrastructure (2024/2027)
- $5M – Warehouse/Light Duty Shops (2024)

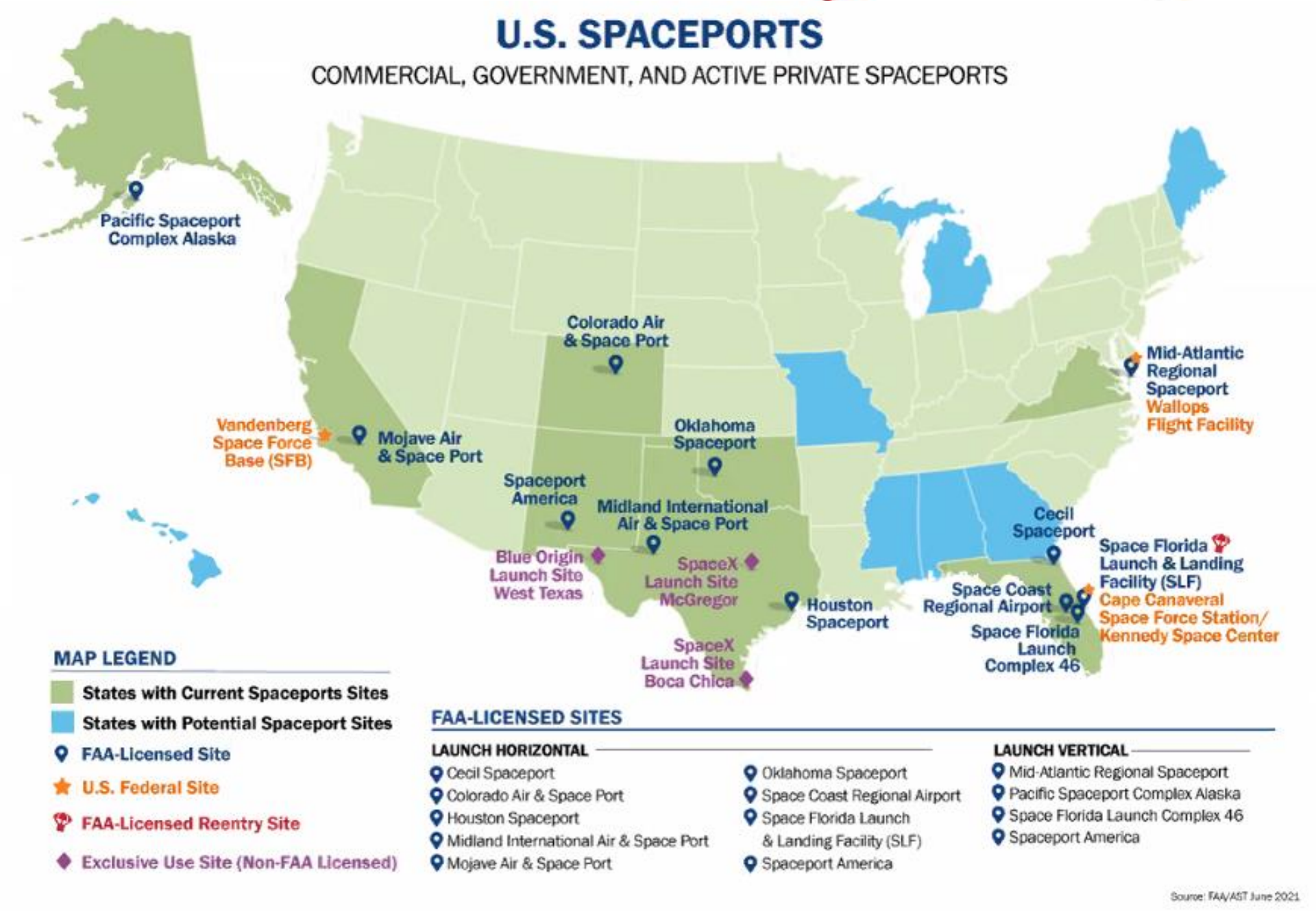
What is Commercial Space?

- Also known as "**New Space**" & "**Space 2.0**"
- DoD and NASA are becoming a customers, and investments are made by private companies and using venture capital
- The May 2020 SpaceX *Dragon* capsule was the first U.S. launched human spaceflight since 2011.
- The SpaceX *Dragon* flew again just a few days ago on September 16. The Inspiration 4 mission successfully completed a three-day flight that carried four citizen astronauts for the first time ever into Earth orbit.
- We now have Blue Origin's *New Shepard*, Virgin Galactic's *VSS Unity*, and SpaceX with the first non-NASA civilians in orbit
- In 2010, Apollo astronauts heavily criticized the move to commercial launch providers for astronauts, stressing the need for Federal involvement. It is amazing how quickly SpaceX and others have moved since then.
- With vertical and horizontal launch capability, remote wide-open spaces, and restricted airspace, **Spaceport America** is competitively well positioned, and becoming a premiere site for commercial aerospace operations

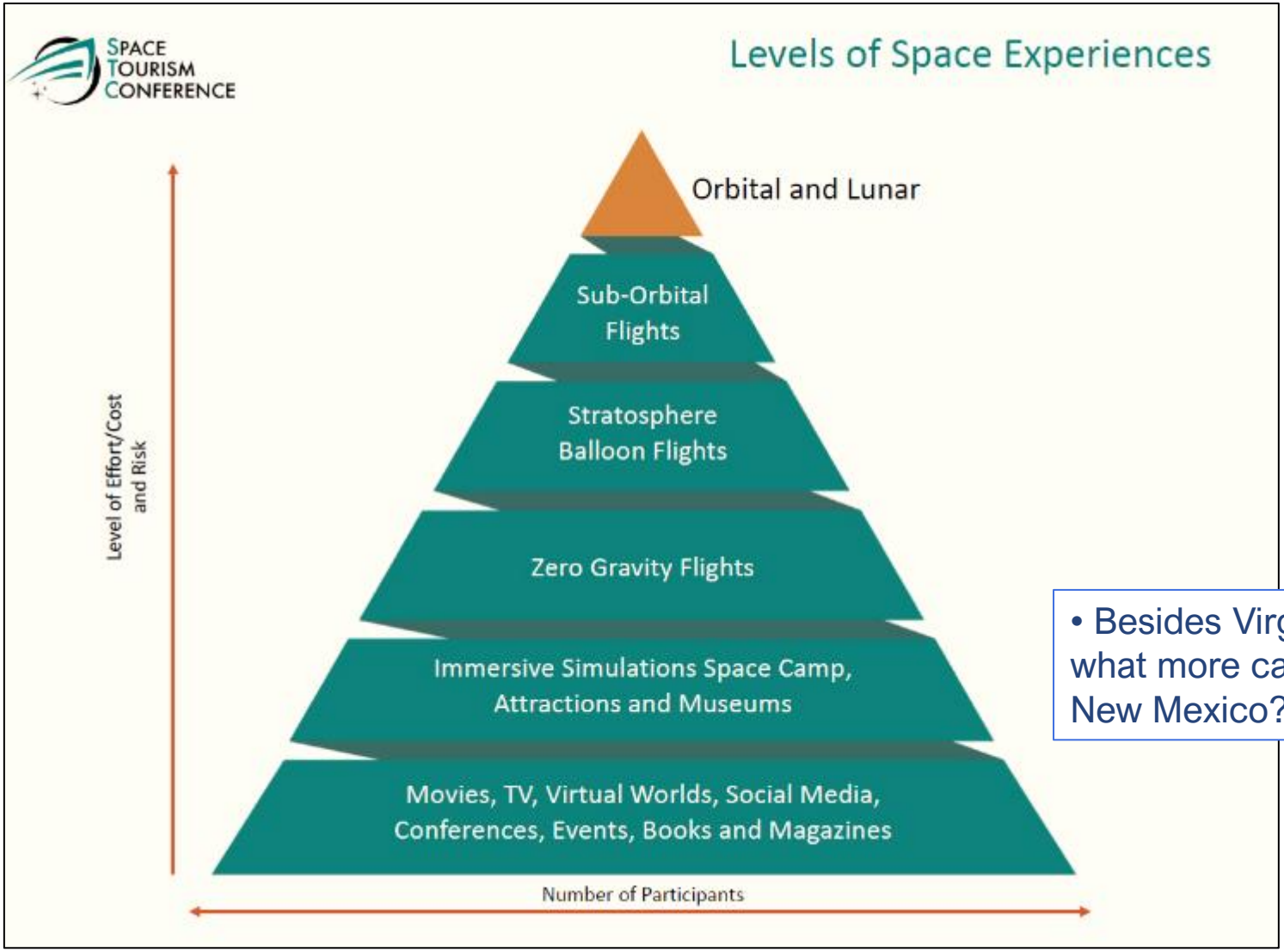
Space Economy

- **Morgan Stanley**: Space economy will be 1.7 trillion by 2040, https://tinyurl.com/yh8dfnu2 (2019)
- **CNBC**: Space economy is ~$420B and growing, https://tinyurl.com/y2m3oh93 (July 2020)
- **Financial News Now**: References to continued and strong growth of the space industry; https://tinyurl.com/yfjp5rop (April 2021)
- **AP Article**: *60 years since 1st American in space: Tourists lining up*, https://tinyurl.com/yjq9k8bf (May 2021)
- **SpaceNews**: *Space industry in midst of transformation following record private and public investments*, https://tinyurl.com/yejbxa5h (April 2021)

- Commercial space is where the internet was in the 1990's. New Mexico needs to be part of this technology sector. Other states are competing for the same business.


U.S. SPACEPORTS
COMMERCIAL, GOVERNMENT, AND ACTIVE PRIVATE SPACEPORTS
Pacific Spaceport Complex Alaska
Colorado Air & Space Port
Mid-Atlantic Regional Spaceport
Wallops Flight Facility
Vandenberg Space Force Base (SFB)
Mojave Air & Space Port
Oklahoma Spaceport
Spaceport America
Midland International Air & Space Port
Cecil Spaceport
Space Florida Launch & Landing Facility (SLF)
Cape Canaveral Space Force Station/ Kennedy Space Center
Blue Origin Launch Site West Texas
SpaceX Launch Site McGregor
Houston Spaceport
Space Coast Regional Airport
Space Florida Launch Complex 46
SpaceX Launch Site Boca Chica
MAP LEGEND
States with Current Spaceports Sites
States with Potential Spaceport Sites
FAA-Licensed Site
U.S. Federal Site
FAA-Licensed Reentry Site
Exclusive Use Site (Non-FAA Licensed)
FAA-LICENSED SITES
LAUNCH HORIZONTAL
Cecil Spaceport
Colorado Air & Space Port
Houston Spaceport
Midland International Air & Space Port
Mojave Air & Space Port
Oklahoma Spaceport
Space Coast Regional Airport
Space Florida Launch & Landing Facility (SLF)
Spaceport America
LAUNCH VERTICAL
Mid-Atlantic Regional Spaceport
Pacific Spaceport Complex Alaska
Space Florida Launch Complex 46
Spaceport America
Source: FAA/AST June 2021

Space Tourism



- Besides Virgin Galactic, what more can occur in New Mexico?

Courtesy of John Spencer

Space Consumer Tourism