

Perspectives / History How far we have come

- Russians: unmanned Sputnik (1957)
- Americans: Founded NASA (1958)
- Russians: 1st astronaut to orbit earth (1961)
- Americans: 1st astronaut on the moon (1969)
- USSR/USA: multiple manned space missions
- International: 1st permanent human presence (2000)
- Russians: 1st "space tourist" to ISS (2001)
- Spaceport America: 1st private, commercial spaceport (~2008)

SPACEPORTS

- Types of ownership
 - Private (fixed or mobile)
 - Public-shared facilities
 - State-federal financing
 - Federal-contract operations
 - Independent public authority



SPACEPORTS

- Infrastructure:
 - Receiving & processing facilities
 - Labs & clean rooms for testing & assembly
 - Fuel storage sites
 - Specialized transportation equipment
 - Launch pads
 - Crew & passenger facilities
 - Specialized facilities nearby (weather, air traffic, etc)
 - Landing runways & support structures



SPACEPORTS

- Laws & regulations
 - @ the federal level
 - US DOT licenses spaceports
 - Occupational Safety
 - Health Act
 - @ the state level
 - Operation and funding is legislated by the individual state where the port resides
 - Regional governing possible



Other considerations if you want to build one of your own...

- Level of public interest
- Current space market / political climate
- Location Location Location!!!
- Competition: 6 U.S. 30 worldwide



SPACEPORTS

•Project cost estimates:

- Runway - \$43 million
- Facilities - \$61 million (terminal and hangar)
- Infrastructure - \$82 million (roads, water, wastewater, power, comm, systems)
- Rent - 27.5 million over 20 years
- Plus taxes & contingencies... total \$190-\$200 million
- Maintenance - 10% per year



SPACEPORTS

? How can private ports see the fastest return on their investment ?

- Advanced sales
- Advertise / PR
- Regional discounts
- Multiple flights
- Other Ideas?

Virgin Galactic + Scaled Composites = Spaceport America

- Richard Branson - Virgin group
- Burt Rutan – Scaled Composites
 - Together they formed The Spaceship Company
 - New Mexico HQ
 - Dubbed “Spaceport America”



Spaceport America

- SpaceShipOne - suborbital
 - Late '09 - early '10
 - Possible setback
 - 1 flight/week & later, 2 flights/day
- Orbital craft, ISS docking capabilities
 - Depends on success of the former



Spaceport America

- Cost -- \$200,000 USD
- Flight – 2.5 hours
 - 50,000ft with mother ship (1st phase)
 - 360,000ft to apex (2nd phase) 330 “space”
 - 3-4G on takeoff / 2500mph
 - 7-8G on descent
 - ~3 min @ 0G



Neil, Homer, Buzz

Implications

How will NASA be affected if this new “enterprise” turns out to be lucrative?

- Lunar missions
- planetary missions
- Interplanetary missions
- Sun observing missions
- Satellites
- Space telescopes

Implications

- How will this change our attitudes about space exploration?
- Will we begin to think in exponential terms rather than linear?