Perspectives / History
How far we have come
• Russians: unmanned Sputnik (1957)
• Americans: Founded NASA (1958)
• Russians: 1st astronaut 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 tourists” 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
  (won Ansari X-prize ’04)
  – 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

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?