

Some Historical Analogies in Space Commercialization

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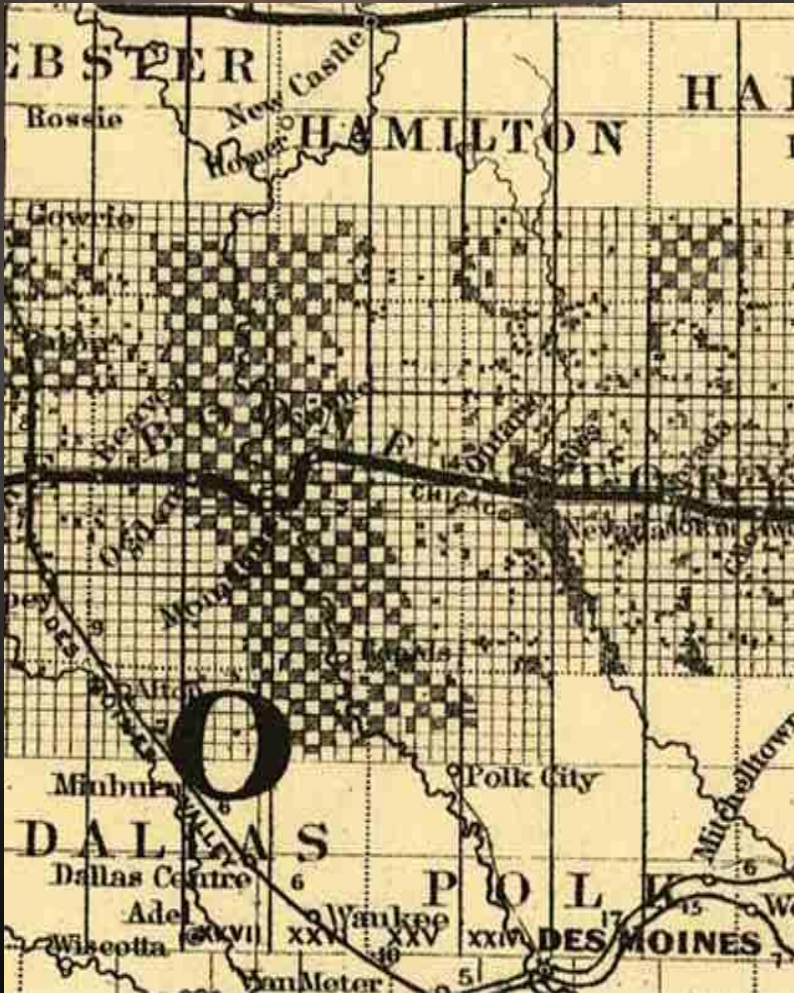
Lunar Transportation Corridor

Analogy #1: Transcontinental Railroad



Congress decided that private entrepreneurs and not federal agencies should build the transcontinental line. Lawmakers resolved to “do enough, and only enough, to induce capitalists to build the Pacific railway.”

Public-Private Partnership



- **Pacific Railroad Act of 1862**
- **Granted 20 sections of land for every mile of completed railway**
- **Railroads used value of land as collateral for private loans**
- **Provided subsidy bonds, essentially a second mortgage, to lend funds to railroad firms**
- **Loans repaid largely by transportation revenues and land sales**
- **Government received non-monetary benefits** (troop transport cost reductions)
- **Increased returns by 2%**

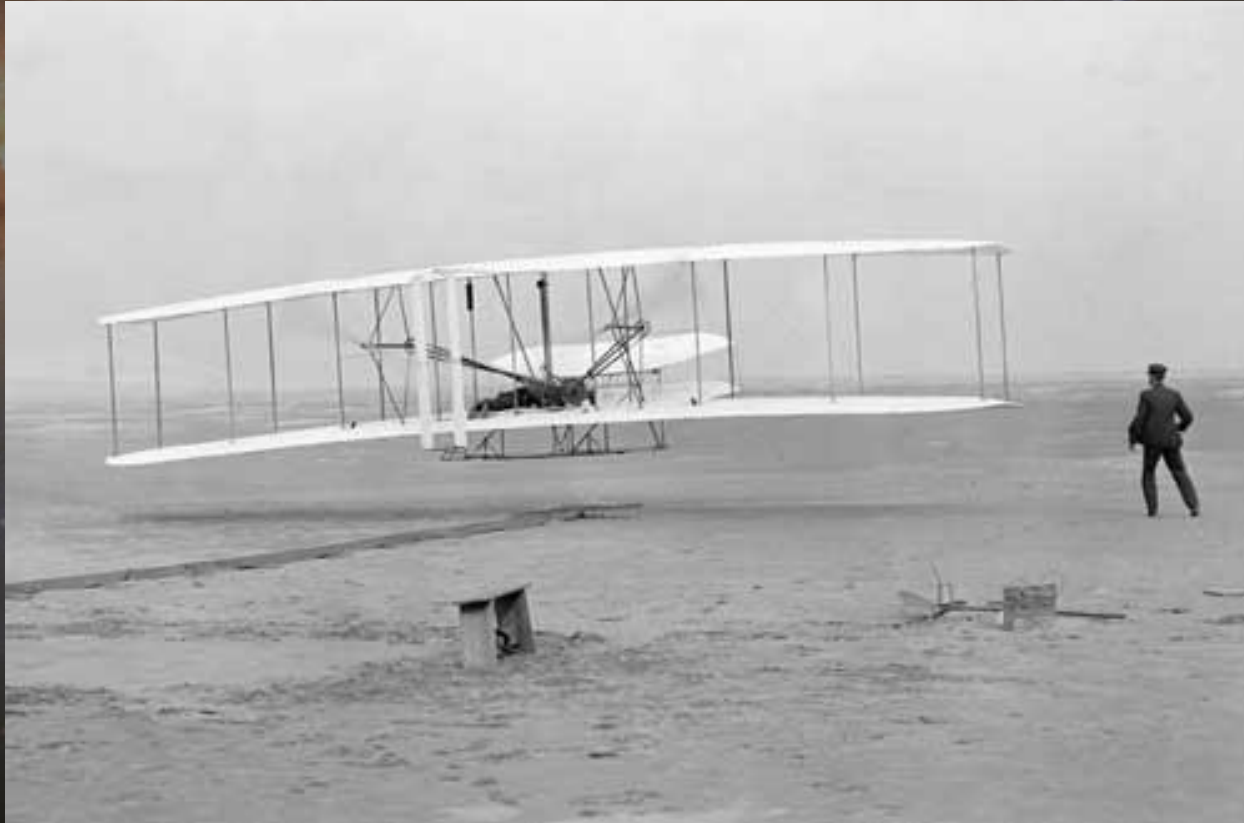
Is a Privately Developed Lunar Transportation Corridor Possible?

- **Relevance of Aspects of Analogies:**
 - Private financing supplemented with government loans
 - Property and patent rights granted to participating firms
 - Guarantee revenues with government contracts and allowance of special transportation fees
- **Challenges to Approach:**
 - Lunar land grants problematic at present but alternatives might include right to use land and extract minerals on Moon
 - Value of future patents may not be sufficient to spur large investments today



Space Transportation Industry

Analogy # 2: Commercial Aviation Industry



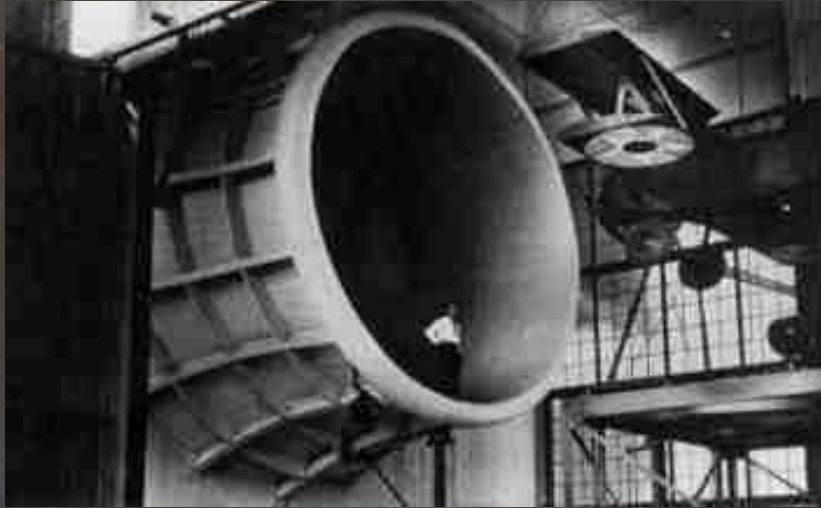
Between 1915 and 1938, government officials in the U.S. undertook a series of initiatives designed to create a commercial airline industry in private hands.

Drivers for Commercial Aviation



- **Washington law-makers saw necessity of fostering new technology**
 - National Security
 - Economic competitiveness
 - Pride and prestige
- **Although Americans had invented the airplane, by 1914 leadership in technology had moved to Europe**

National and Local Government Initiatives



NACA Full-Scale Tunnel



LaGuardia Airport

- **Multidimensional Approach:**
 - National security
 - Research and development
 - Regulatory environment
 - Commercial development
- **Established NACA to conduct research on flight (1915)**
- **New York/New Jersey created port authority with power to issue bonds and collect fees (1921) for airfields**

From Government Operated Flight Systems to Commercial Aviation



- **Air Mail Act (1925) (Kelly Act)** directed Post Office to contract for commercial air carriers
- **Air Commerce Act (1926)**, instructed Commerce Dept. to establish airways and navigation aids, license pilots, certificate aircraft, and investigate accidents
- **Civil Aeronautics Act (1938)** created CAA/FAA with broader powers to regulate commercial air operations
- Congress could have established national airline run by civil servants or under contract, but instead created favorable climate for private investment

Is a Commercial Spaceline Industry Possible?

- Government agencies conduct basic research; operational responsibility by private carriers
- Congress creates authority (modeled on Overseas Private Investment Corporation) to provide loans/insurance to spaceline firms
- Federal government regulates routes; primes investment pump; direct subsidies to carriers in exchange for services
- Challenges to this approach:
 - NASA has a critical path with specific milestone deadlines; the loans/insurance incentives may not produce services in time
 - Liability issues



Lunar Tourism

Analogy #3: The National Park Experience



U.S. Congress created the National Park Service in 1916 to conserve natural and historical resources “by such means as will leave them unimpaired.”

Park managers, recognizing the need for public support to encourage future preservation, allowed private entrepreneurs to commercialize the parks in such a manner as to encourage public visitation.

Park rangers could have decided to preserve the national parks as wilderness areas, but to build public support arranged for development as tourist sites



Glacier Hotel, built by the Great Northern Railroad

- Officials encouraged railroad companies and other concessionaires to build hotels and related facilities at the national parks
- Concessionaires paid fees which the National Park Service used to build roads and trails
- Americans rode and drove to the national parks, vastly expanding tourism and creating a family vacation tradition

Is There a Similar Path for Lunar Tourism?

- Government awards lease contracts for habitation/support services
- Outposts privately owned; baseline development/operational costs funded by government lease
- Companies may add tourism capacity for marginal cost
- Firms do commercial deals with their own suppliers, creating a private-sector space ecology
- Efficiencies of private-sector management may cut NASA cost
- Government also benefits as tourism brings economies of scale



The U.S. has a Long History of Public/Private Partnerships



Will this continue in space?

- 1. Lunar transportation corridor**
- 2. Space transportation industry**
- 3. Lunar tourism**

These analogies are intended to encourage creative thinking