



Commercial Space Markets and Public-Private Partnerships

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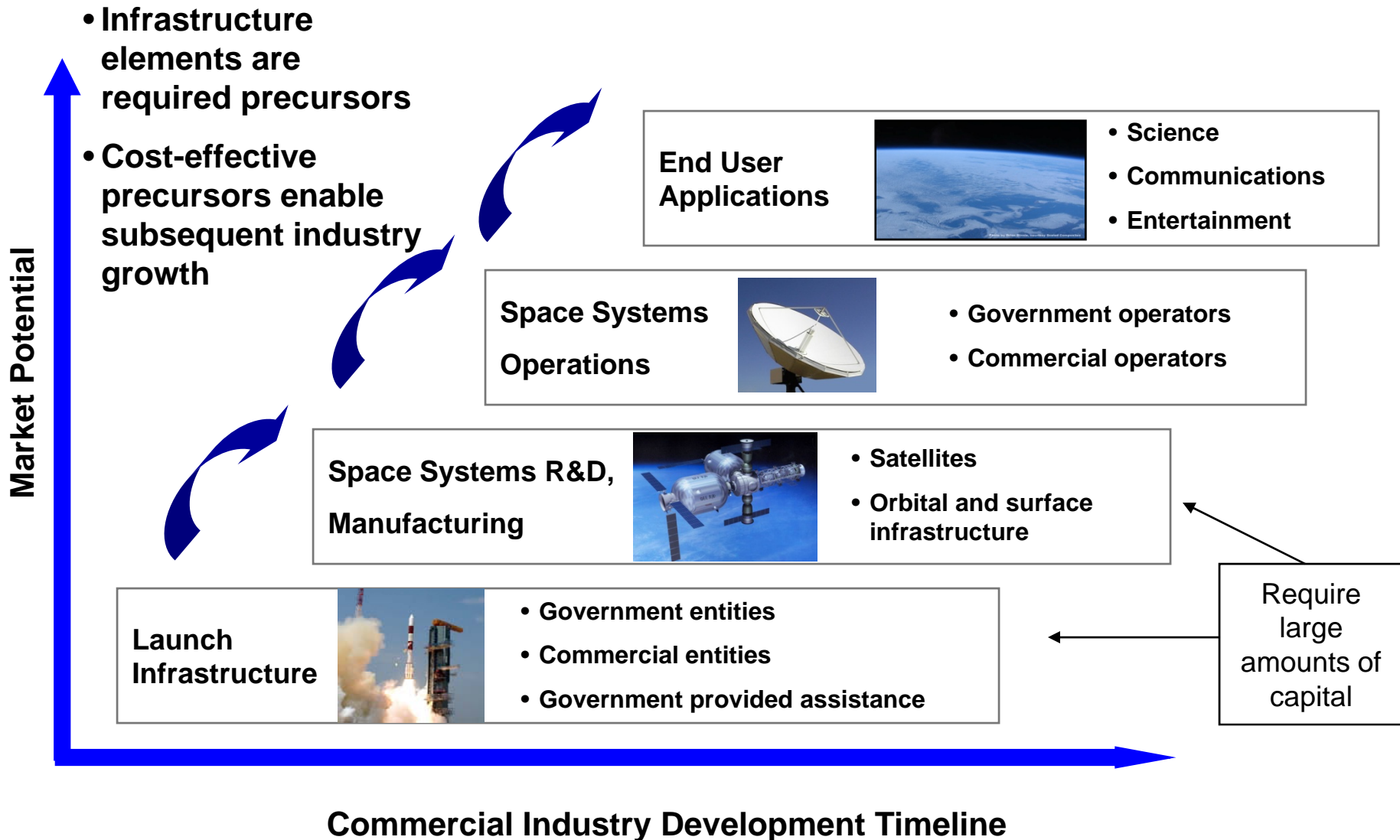
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Themes

- Space is not a destination
- Space is an enabler for a variety of business verticals
- Space accelerates and expands business verticals by providing new, disruptive ways of doing business
 - Faster
 - Cheaper
 - Better
- Public-Private Partnerships can catalyze and accelerate space related businesses
- Infrastructure is a precursor to space-related applications

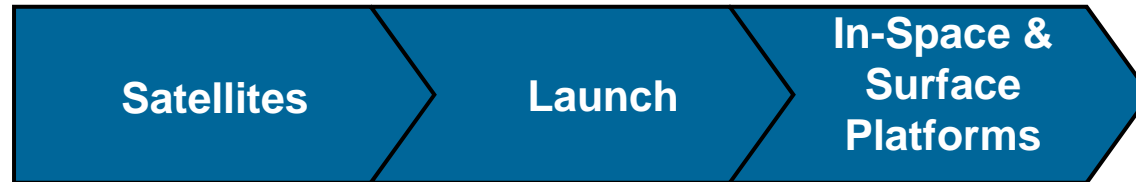
Different segments of the commercial space industry are closely related to each other.



-Commercial Space Market Segments-

Space is an enabler: it enhances existing market verticals.

Infrastructure



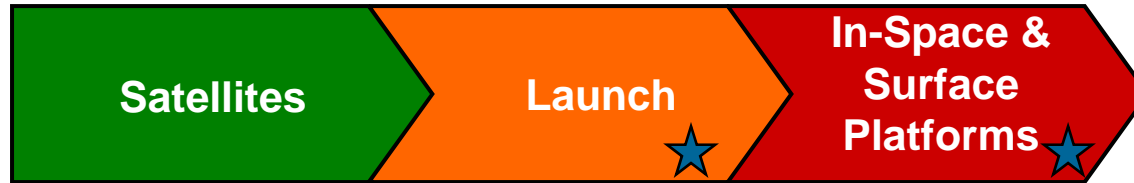
Applications

Healthcare	Earth Observation	Science Research
Media and Entertainment	Navigation and Communications	Governance
Energy and Mining	Defense	Transport Operations

Commercial Space Market Segments

Timeframe Estimates

Infrastructure



Applications



Short-term



Mid-Term



Long-Term



High Entry Costs

Categories of Public Private Partnerships (PPPs)

A PPP is a commercial venture or government service that is developed and/or operated through a partnership of government and commercial companies.

Public Financed Infrastructure

- Private sector relies on Government to provide infrastructure
- This infrastructure is required to provide a service through a private operator
- Government serves as one of many customers of the resulting service
- Examples: Ariane

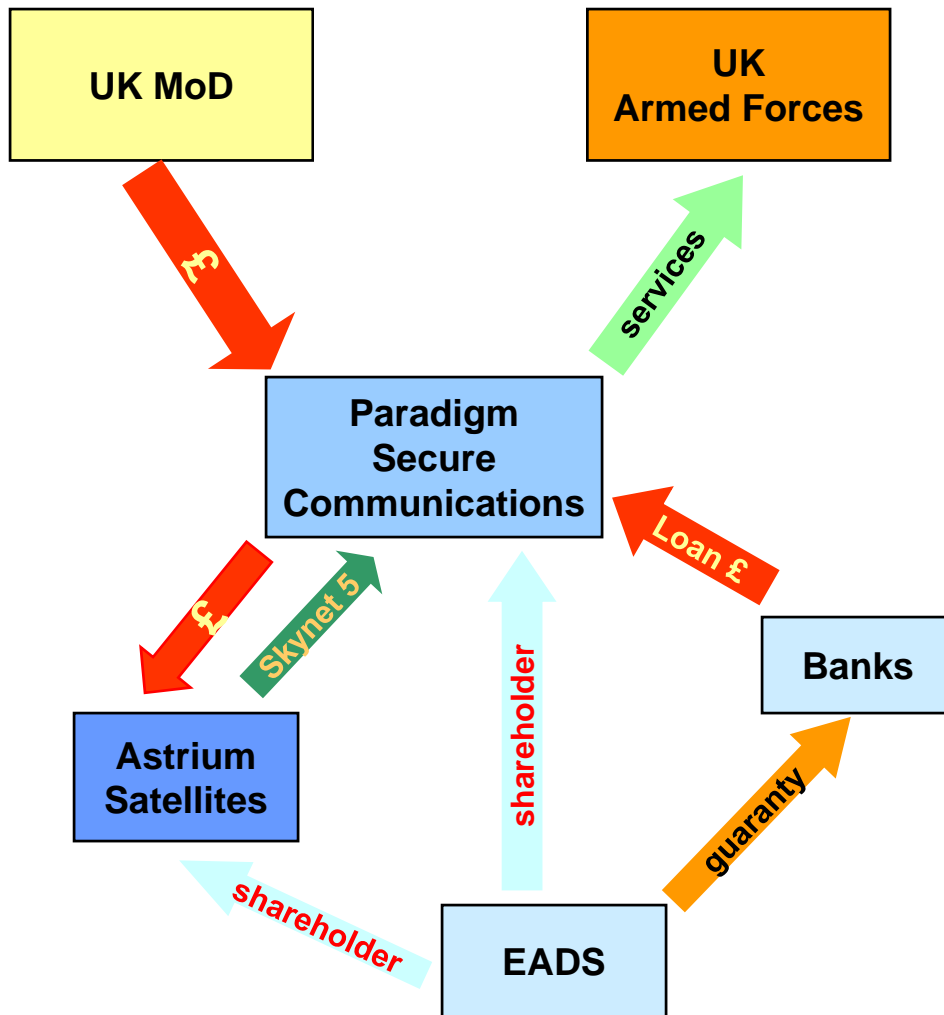
Private Financed Infrastructure

- Private sector finances and provides required infrastructure
- Government serves as one of many customers of the resulting service
- Examples: Digital Globe, GeoEye, Paradigm

Joint Financing of Infrastructure

- Both Government and Private entities finance and provide the required infrastructure
- Government serves as one of many customers of the resulting service
- Example: COTS, Terra SAR

Paradigm : A Win-Win Partnership



MoD Commitments

- Exclusive concession over 20y
- Allow 3rd party sales
- Commitment to a take or pay level

Paradigm Solution

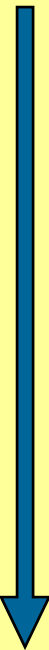
- Very strong project support from shareholder (EADS)
- Minimised interfaces, completion guarantee, life cycle cost optimisation
- Transfer of implementation, service delivery and usage risk
- 3rd party market is the incentive for financial performance

The Galileo Concession failure

Galileo Facts

- **Galileo** : - constellation of 30 satellites
- four navigation services
- jointly funded by European Commission (EC) and ESA

- **The tentative PFI Concession :**



Oct 2003	EC and ESA issue a call for tenders for Galileo concession, with a PFI scheme
Apr 2004	Two consortia are selected for competition phase and deliver their bids
Jan 2005	Pushed by the EC/ESA the two consortia deliver a joined proposal
June 2005	Formal negotiation between EC/ESA and concession consortium
Jan 2006	
May 2007	
Sept 2007	EC takes note of the lack of progress for the concession negotiation, and decides to come back to full public funding for the development

Failure reasons

- **Political issues :**

- Contradictory interests from main EU countries (services priorities, industrial return)
- Need to have a good geographical balance for the selected consortia

- **Financial issues :**

- The large business is in the very downstream services (already existing with GPS)
- Fees and cash return mechanisms to the Galileo operator were not secured by European Commission
- Resulting risks from this business uncertainty could not be supported by the private sector alone

Commercial Orbital Transportation Services (COTS)

- **Overview :**

- Created in 2006 to facilitate commercial delivery of cargo and crew to the International Space Station
- Orbital Sciences and SpaceX

- **Partial Infrastructure Funding:**

- Demonstration of orbital transportation services:
 - Space X: \$278M
 - Orbital Sciences: \$170M

- **Service Contracts:**

- Cargo resupply flights to the ISS (CRS)
 - SpaceX: 12 Flights, \$1.6B
 - Orbital Sciences: 8 Flights, \$1.9B



Key factors for a successful PPP

- **Large and profitable end market to justify the investment**
- **Sustainable business case for private investors : business backed by the government as a guaranteed customer**
- **Substantial industrial and/or government experience with the technologies involved**
- **Fair share of risks between public and private partners: (e.g. concerning the success of the project (insurances), and concerning potential exclusivity on behalf of the private entity)**

Concluding Themes

- **Infrastructure for commercial space requires large amounts of capital**
- **PPPs can assist in infrastructure development and market creation activities**
- **Government guaranteed contracts can enable and stimulate growing space markets**
- **The success of some commercial space ventures may depend on their direct or indirect involvement with PPPs in the short to mid-term**