

FAA Commercial Space Transportation Regulations:

A Model for International Consideration

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Panel 5: Government Cooperation with Aerospace Stakeholders

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Office of Commercial Space Transportation

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**Federal Aviation
Administration**



Department of Transportation, Federal Aviation Administration- Statutory Authority

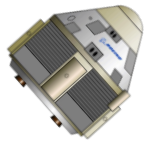
51 U. S. C. Chapter 509 (formerly the Commercial Space Launch Act of 1984, as amended)

- Authorizes the FAA* to license commercial launch and reentry activities and the operation of launch and reentry sites as carried out by U.S. citizens or within the United States.
- Directs the FAA to:
 - Exercise this responsibility consistent with **public** health and **safety**, safety of property, and the national security and foreign policy interests of the United States, and
 - Encourage, facilitate, and promote commercial space launches and reentries by the private sector.

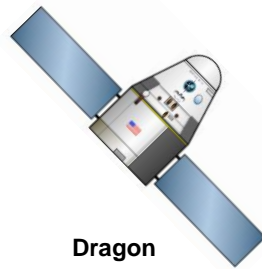
* The Secretary of Transportation's licensing authority has been delegated to the Administrator of the FAA and further assigned to the Associate Administrator for Commercial Space Transportation (AST).

FAA Licensed or Permit Launches History

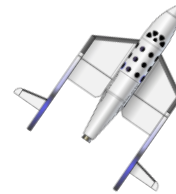
- 240 FAA-licensed commercial launches 1989-2015
 - Includes 132 to Geosynchronous orbit, 85 Non-Geosynchronous orbits, 23 Suborbital
- 40 Permit launches 2006–2015 (all suborbital)



CST-100 Starliner



Dragon



SpaceShipTwo



Lynx



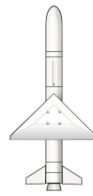
Atlas V



Delta IV



Falcon 9



Pegasus XL



Minotaur C



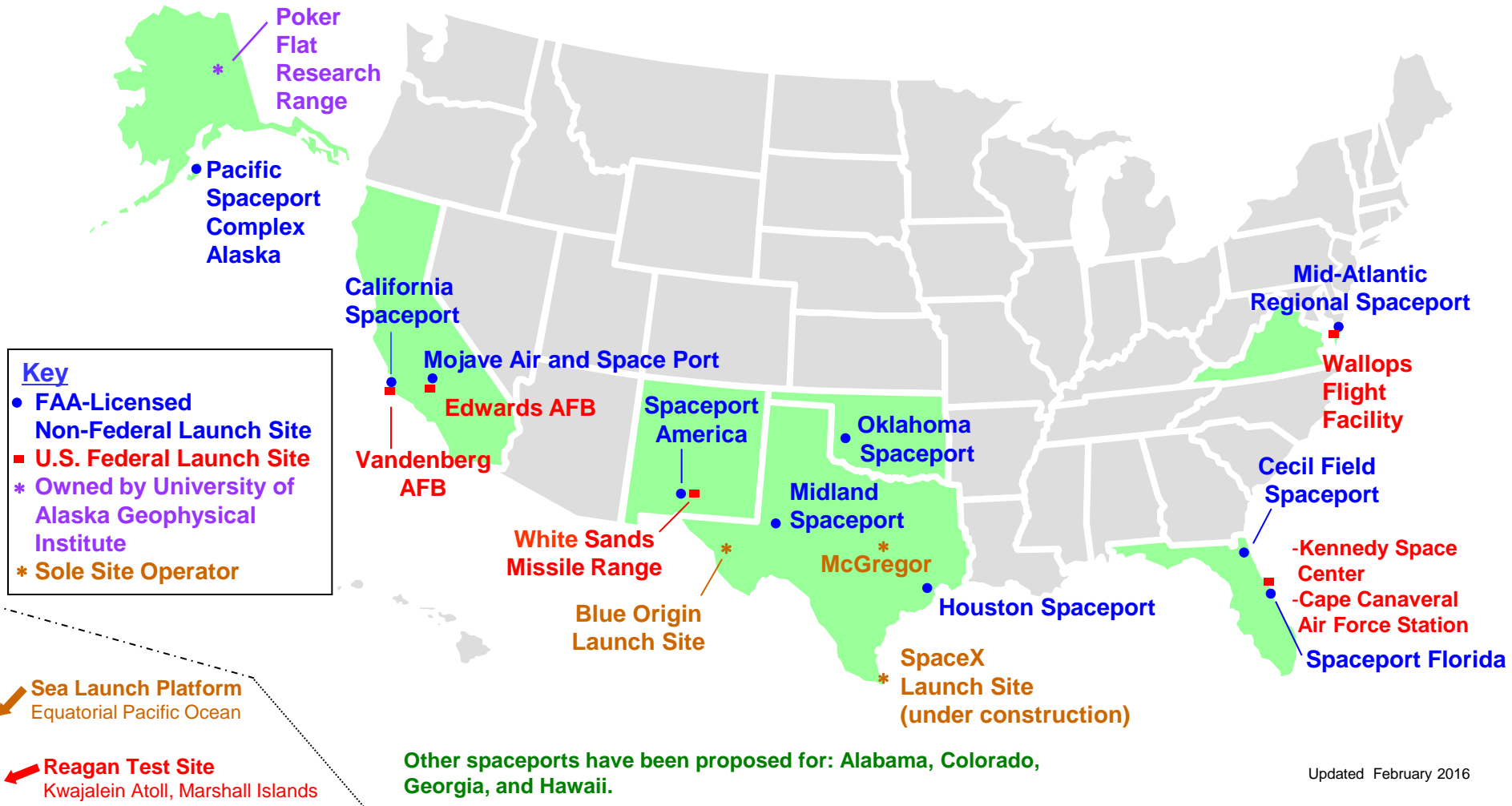
Antares



Zenit 3SL

U.S. Spaceports

Commercial/Government/Private Active and Proposed Launch Sites



Expanding Commercial Capabilities

ELVs, Suborbital RLVs, Orbital Systems, Reentry Systems



Virgin Galactic



Sierra Nevada Corp



Boeing



XCOR Aerospace



Masten Space Systems



Blue Origin



Orbital Sciences



Space X



Stratolaunch

Who Must Obtain A License

- An entity must obtain a license:
 - To **launch** a launch vehicle from the United States;
 - To **operate** a launch site within the United States;
 - To **reenter** a reentry vehicle in the United States; or
 - To **operate a reentry site** within the United States.
- A U.S. citizen or an entity organized under the laws of the United States or any State must obtain a license:
 - To launch a launch vehicle *outside* the United States;
 - To operate a launch site *outside* of the United States;
 - To reenter a reentry vehicle *outside* of the United States; or
 - To operate a reentry site *outside* of the United States.
- FAA does not license launches or reentries “the Government carries out for the Government”
 - NASA and the Department of Defense typically carry out their own launches.

FAA Approaches and Philosophies for Regulating Commercial Space Transportation

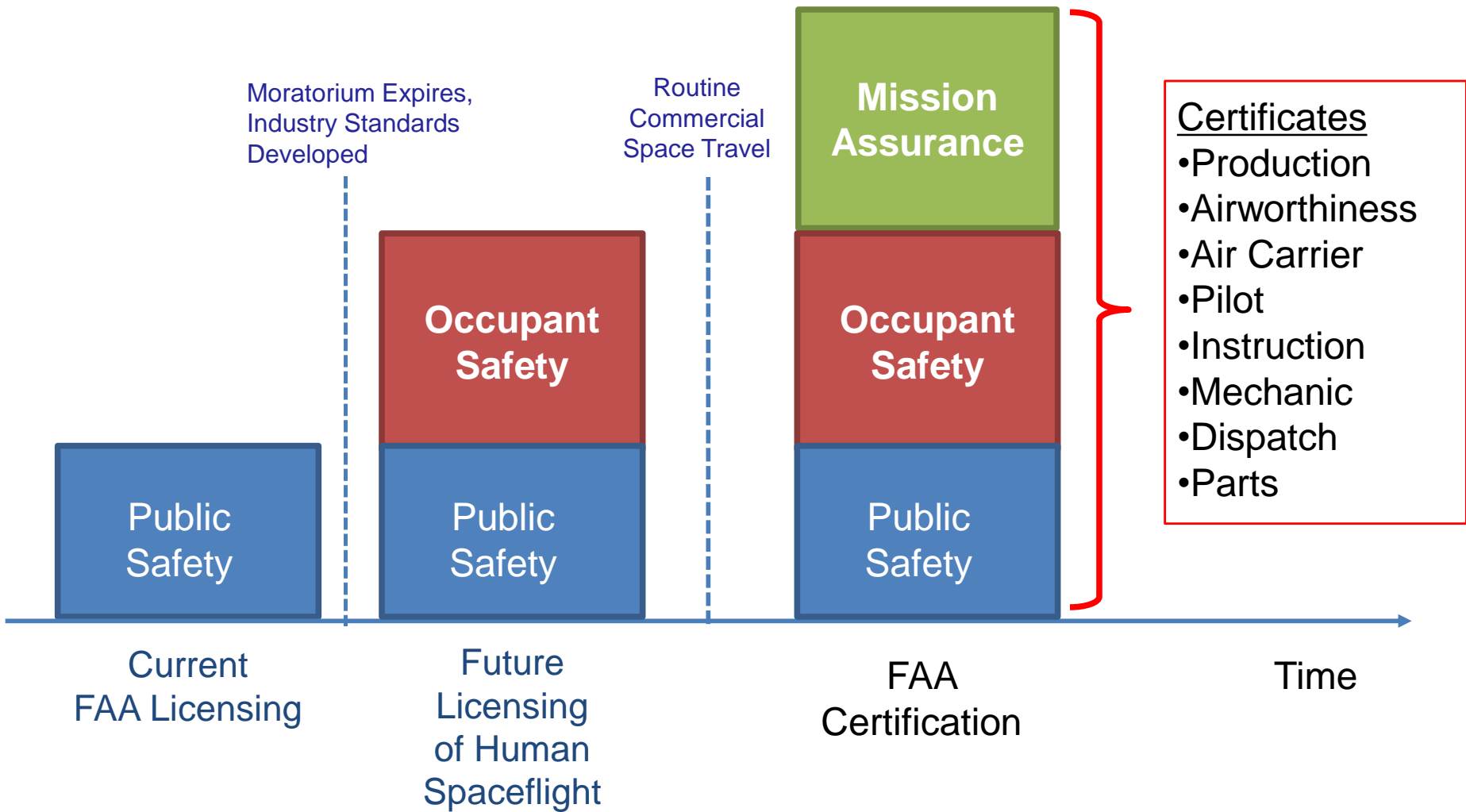
- Focus on public safety
- Performance-based requirements instead of prescriptive-based
 - Allows for technology innovation and rapid development to give industry the flexibility to meet safety objectives without specifying how safety must be achieved.
- License the launch operation instead of the certification of the vehicle or design
- License the spaceport operation instead of the spaceport design
- Regulations evolve as the industry grows and matures without stifling technology innovation
- One single agency to obtain a launch license
- Facilitation and promotion of U.S. industry

FAA Approaches and Philosophies for Regulating Commercial Space Transportation (continued)

- Rules that accommodate a wide variety of industry vehicle designs, capabilities, missions
- Informed Consent regime instead of protection of people onboard
- Safety responsibility on the launch or reentry operator and less on the spaceport
- Flexibility for industry to propose equivalent measures of safety
- Space transportation is different than aviation: faster, air to vacuum environments, more expensive per flight, low volume of flights, not routine, passenger training, customization instead of mass production
- Space transportation is under space law (different than aviation law)



Potential Regulatory Path



FAA/AST International Goals

- The FAA is promoting its commercial space transportation regulations for adoption by other countries
- The goals of AST's outreach are to:
 - 1) Assist U.S. industry activity outside the United States;
 - 2) Provide U.S. international leadership;
 - 3) Establish international relationships; and
 - 4) Prepare for future interoperability between countries.



Contact

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AST international website
http://www.faa.gov/about/office_org/headquarters_offices/ast/programs/international_affairs/

Regulations for Commercial Space Transportation
http://www.faa.gov/about/office_org/headquarters_offices/ast/regulations/

“Recommended Practices for Human Space Flight Occupant Safety” (August 2014)
http://www.faa.gov/about/office_org/headquarters_offices/ast/media/Recommended_Practices_for_HSF_Occupant_Safety-Version_1-TC14-0037.pdf