TO: Office of Jared Polis, Governor of Colorado
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SUBJECT: Colorado Air and Space Port

Executive Summary

The Colorado Air and Space Port gives the state the opportunity to become involved in the commercial space industry. The coalition that originally supported the development of the port, which consisted of private aerospace companies and Colorado government officials, recognized the potential revenue and jobs that the port could bring to the state. Private companies were successful in gaining governmental support for the space port. Government officials began the developmental process required for obtaining a license and formal status as a space port, which was achieved in August 2018.

After gaining approval, the Colorado Air and Space Port must work towards procuring commercial clients to partner with the port. An inability to obtain commercial partners has led to the failure of state ports in the past. To face these challenges, Colorado must have an authoritative body with the ability to create an environment favorable to the development of private aerospace companies at the state's port. The authority should have the power to address the needs of the Colorado Air and Space Port, which will aid in the port's growth in the evolving space industry.

Introduction

The development of the Colorado Air and Space Port is progressing. Colorado is becoming further involved in the commercial space industry, which brings revenue and jobs into the state. The space port is working towards activation with horizontal launches taking place there in which vehicles would take off like traditional airplanes, travel into suborbital space under the power of rocket boosters, and land back at a port (Colorado Air and Space Port [CASP], 2018a). These suborbital flights would be used for microgravity experiments, satellite material testing, and commercial tourism and would boost Colorado's economy and standing in the space industry.

This memo is a follow-up to the previous one sent to the Governor's Office on the importance of obtaining commercial clients for the space port. This memo focuses on how that can best be accomplished with a state-wide effort to create an authoritative body with the power to take direct action that would aid in the space port's development and growth. The topics covered include background information on what led to the formation of the Colorado Air and Space Port and how the port was formally established. The current status of the port's development along with the problem concerning the lack of authoritative direction faced by the space port and its likely effects are also included. Finally, a recommendation on the best course of action to take to aid in the space port's growth and future success is given.

Developmental Background of the Colorado Air and Space Port

The Colorado Air and Space Port is a result of tremendous support from a coalition that saw an opportunity to benefit from the commercial space industry. According to the Advocacy

Coalition Framework, policy change can be understood in terms of policy subsystems, which are defined by specific topics (Jenkins-Smith, Nohrstedt, Weible, & Ingold, 2018). These subsystems contain coalitions of actors joined together by shared beliefs. Polices are shaped by these coalitions and change as the actors involve learn as the policy is implemented.

A coalition made up of commercial aerospace companies and Colorado government officials paved the way for the formation of the state space port. These actors saw an opportunity for Colorado to get involved in the growing commercial space industry. The United States accumulated $38 billion in revenue from the country's space industry in 2016 (Whealan George, 2018). The commercial sector of the industry is expected to grow at a rate of seven percent annually. The coalition was hoping to capitalize on the emerging aspects of the industry, such as Reusable Launch Vehicles (RLVs), which are designed to be reusable and can be routinely flown in space (Shove, 2005). These vehicles reduce the cost of space travel and increase opportunities for space activities. RLVs are also propelling the commercial space travel industry, which would greatly reduce international flight times. Advocates of the Colorado Air and Space port saw the port as a chance to benefit from this rising industry.

Fortunately, a space port in Colorado is well positioned to succeed. To be successful, a space port must fulfill several requirements including a close proximity to clients, access to a skilled workforce, and the support of an effective transportation infrastructure (Shove, 2005). Colorado is already heavily involved in the space industry (CASP, 2018a). Prominent aerospace companies such as the United Launch Alliance, Northrop Grumman, and Lockheed Martin already have facilities in the state and employ over 50,000 workers in high-wage jobs. Colorado is also home to some of the top engineering schools in the country, including the University of Colorado-Boulder and the School of Mines. This location provides the port with access to potential partners and a skilled labor pool. The port would also benefit from Colorado's established transportation infrastructure consisting of Denver International Airport and major highway systems (CASP, 2018a). This transportation system allows for the efficient transport of materials used by the port's commercial clients.

These indicators were used by the coalition as justifications of the space port's likely future success. The space industry's economic growth and revenue increases were used as symbols of potential economic prosperity for Colorado (Birkland, 2016). The issue of the port was originally taken up due to input from the private space industry (Avery, 2011). Those involved with private companies serve as unofficial actors, who informally participate in policy formation (Birkland, 2016). They saw an opportunity to boost revenue by increasing their participation in the commercial space industry. According to the Metro Denver Economic Development Corporation, the pressure from the private industry came from both in and out of state (Avery, 2011). Out-of-state companies saw the port as an avenue into the rising field of space tourism, while in-state companies were encouraged by the convenient location. Citing the economic potential, representatives of the private industry urged government officials to support the development of a state port.

Members of the Colorado government agreed with the space industry on the benefits a space port could bring to the state. They saw an opportunity to increase revenue and create jobs in Colorado by getting in at the start of a rising industry. Support from these official actors was important as they were granted the formal authority to enact policy (Birkland, 2016). In 2012, former Governor Hickenlooper sent a letter of intent to the Federal Aviation Administration (FAA) stating that Colorado intended to start the process of applying for a site operator license

(David, 2012). This was the first official step towards making the Colorado Air and Space Port a reality.

Policy Background of the Colorado Air and Space Port

Starting the licensing approval process was the beginning of Colorado government officials' efforts to activate the state's space port. The development process needed to obtain the license required funding allocated by regulatory bodies (Birkland, 2016). Financing was legislatively distributed to fund the project. The local government of Adams County, where the port is located, recognized the economic potential for the area. Facilitating economic expansion and industry growth is a primary responsibility of local governments (Hall, 2015). To support the space port, Adams County allocated $300,000 to its development in the county's 2013 annual budget (Adams County Government Center, 2019). Funding also came from the FAA's Office of Commercial Space Transportation, the Colorado Department of Transportation's Division of Aeronautics, Denver International Airport, the city of Aurora, and the town of Bennett (Painter, 2012).

Those efforts were successful and led the space port to apply for its site operator license from the FAA in March 2018 (Aguilar, 2018). This competitive regulatory process called for a 180-day review and an environmental assessment test (Birkland, 2016; CASP, 2018b). Colorado officials from all levels of government sent letters to the FAA urging the agency to issue approval (CASP, 2018c). After successfully passing the assessment, the Colorado Air and Space Port was granted a license on August 20, 2018, and gained formal designation as a space port, becoming only the eleventh launch facility in the country to do so.

Current Status of the Space Port

Although the Colorado Air and Space Port obtained its license, launches are still years away. The space port must bring in commercial clients to build and launch their developments from the facility (CASP, 2018a). These private partners and their vehicles would also have to be evaluated and licensed by the FAA. It is essential that the port builds a diverse client base made up of multiple partners with different methods and goals (David, 2008). The Colorado Air and Space Port can learn from the past policy mistakes of previously unsuccessful space ports and adjust its strategy as needed (Jenkins et al., 2018). Failed ports focused too heavily on only a small number of clients, but having multiple partners provides more stability in an industry that is always evolving (Handburg, 2014). However, due to the global nature of the industry, there is immense competition to procure clients, which comes from other states and from countries around the world.

The Colorado Air and Space Port was successful at obtaining a partnership with PD Aerospace, a Japanese aerospace company that is developing a reusable spacecraft, in April 2019 (Barnett, 2019). The space port issued a letter of intent that signified the port's commitment to serve as the launch site for PD Aerospace. While this is a good start, Colorado must offer additional location incentives to companies to convince them to settle at the state's space port (Handburg, 2002). These incentives, such as a tax credit, reduce the cost of developing research and launch facilities. The state and local governments must work together to develop effective strategies. Currently, no comprehensive, state-wide effort exists to assist in the construction of a base of diverse partnerships necessary for the growth of the space port. This can lead to delays,

funding issues, and difficulty gaining clients and puts Colorado's space port at risk of being confronted with the same problems faced by unsuccessful ports in the past.

Prediction

Without a focused effort guiding the development of the Colorado Air and Space Port, the port could face the same issues that led to the failure of several past state ports. Challenges arise due to the constant changes that occur in the space industry. Global competition, regulation changes beyond state control, and advancements in science and technology make it more difficult to succeed in the field (Shove, 2005). Other state space ports have failed due to their inability to cater to the needs of the space industry at the time (Handburg, 2014). With relatively few commercial partners available, these ports were unable to persuade companies to use their facilities. With a lack of private money coming in, the ports relied too heavily on government funding and could not sustain themselves. Without a clear direction moving forward, the Colorado Air and Space Port could experience the same problems. The space port needs to be able to address these challenges in the ever-evolving space industry.

Recommendation

The Colorado Air and Space Port needs an authoritative body with statewide power to create incentives to entice a wide range of clients to settle at the state's port. This body should have the ability to take government action that allows Colorado to succeed in the competition with other states for commercial partners. Colorado can learn from the methods of other state ports that have been successful, such as in Florida and Oklahoma. The development of a space port in Florida began in the 1980s when the governor approved a feasibility study to assess the viability and options for a port in the state (Shove, 2005). The study recommended the formation of a state-enabled authority with the power to develop launch infrastructure and facilities and promote the economic development of the commercial space industry. The authority was controlled by a board of directors that was appointed by the governor and approved by the state senate. The Florida Space Authority focused on developing a launch pad and helping companies obtain infrastructure financing. The space port was successful and grew to be involved in launches, research, and tourism.

The state of Oklahoma also saw a state port as an opportunity to get involved in the commercial space industry. In response, the Oklahoma Space Industry Development Authority (OSIDA) was signed into law in 1999 (Shove, 2005). It was modeled after the Florida Space Authority, with power given to the authority to regulate real estate, develop and operate infrastructure and facilities, issue revenue bonds, levy taxes, and charge fees. The efforts of OSIDA were successful and encouraged multiple private companies to invest in the space port.

A similar authoritative body is needed to guide the efforts of the Colorado Air and Space Port. The space industry is constantly changing, which makes it impossible to predict which companies will be successful. The space port must bring in a wide array of partners with different missions and objectives to ensure long-term stability over time (David, 2008). A formal authority would be focused on the needs of the space port and should have the ability to create a favorable environment for commercial space companies to develop in. Providing incentives and assistance to these potential partners helps to encourage them to settle at Colorado's space port. Governor Polis is urged to support and promote the creation of an authoritative body that would

guide Colorado's efforts in the space industry. The authority would remain informed on the advancements and changes occurring in the evolving industry and would therefore be better equipped to handle any arising issues. By having the formal ability to address those issues, the authority would play an important role in the growth and success of the port.