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THE FINAL REPORT OF THE SENATE STUDY COMMITTEE ON THE CAMDEN COUNTY SPACEPORT

COMMITTEE MEMBERS

Senator Bruce Thompson – Chair
District 14

Senator John Kennedy
District 18

Senator William Ligon
District 3

Senator Valencia Seay
District 34

Mr. Colin Ake
Georgia Institute of Technology

Mr. Chuck Clark
Camden County Commission

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Mr. Jimmy Starline
Camden County Commission

Prepared by the Senate Research Office
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COMMITTEE FOCUS, CREATION, AND DUTIES

The Camden County Spaceport Senate Study Committee (Committee) was created by Senate Resolution 1159 in order to identify if the challenges and opportunities related to a spaceport in Georgia would be beneficial in advancing the potential \$300 billion industry within Georgia.

Senator Bruce Thompson of the 14th chaired the Committee, while other members included Senator John Kennedy of the 18th, Senator William Ligon of the 3rd, Senator Valencia Seay of the 34th, Mr. Colin Ake from the Georgia Institute of Technology, Mr. Chuck Clark from the Camden County Commission, Mr. Aaron Hawkins from ViaSat, Dr. Glenn Lightsey, Ph.D. from the Georgia Institute of Technology, and Mr. Jimmy Starline from the Camden County Commission.

The Committee held a total of three meetings; one at the Camden County Commission Office in Woodbine, Georgia on October 20, 2016 and two others at the Georgia State Capitol on November 28, 2016 and December 15, 2016.

The Committee heard official testimony from the following: Dr. Clay Montague, Chair of the Spaceport Camden Environmental Sub Committee; Mr. Dick Parker, representative of the executive board of the Little Cumberland Island Homeowners Association; Mr. Kevin Lang, board member of the Little Cumberland Island Homeowners Association; Mr. Steve Sainz, co-founder of the Alliance for Spaceport and Coastal Economic Development; Ms. Megan Desrosiers, Chief Executive Officer and co-founder of One Hundred Miles; Mr. Andrew Nelson, Spaceport Camden Consultant; Mr. Steve Howard, Camden County Administrator and Spaceport Camden Lead; Mr. Eric Stallmer, President of the Commercial Spaceflight Federation (CSF); Ms. Amy Hudnall, Director of the Center of Innovation for Aerospace at the Georgia Department of Economic Development; Dr. John Olds, Ph.D., P.E., and Chief Executive Officer of SpaceWorks Enterprises, Inc.; and Mr. Stephen Fleming, Founder of Boostphase.

BACKGROUND

Private Spaceports in the United States

The United States government created and commissioned the first functioning spaceport in the mid 1940's with a launch site at Wallops Island, VA in 1945 and quickly followed by White Sands Missile Range in 1946. It was until a decade later that the federal government created a space complex at Cape Canaveral on the eastern coast of Florida in 1958. Over 30 years after the first manned space shuttle took off from Kennedy Space Center, the first privately funded, human spaceflight took place in 2004 at the Mojave Air and Space Port in California. Over two decades before that, the first ever commercial launch occurred in 1982, when the Conestoga-I was launched to space with a test payload.

Due to the regulatory burden encountered by the Conestoga team across multiple government agencies and concerns about several international space treaties that the United States had signed, legislation was proposed in 1984 called the Commercial Space Launch Act of 1984. The Act streamlined the launch licensing system and clarified the requirements for commercial entities to pursue space activities. The Act was signed into law by President Ronald Reagan on 30 October 1984, and has subsequently been amended several times including major amendments in 1988, 2004 and 2016. This legislation is the foundation of the commercial space industry in the United States.

These breaks into the commercial space industry has spurred the creation of eight non-federal, licensed spaceports in Alaska, California, Florida, New Mexico, Oklahoma, Texas, and Virginia. Figure 1 displays all current federal, non-federal, private, and future proposed spaceports in the United States.

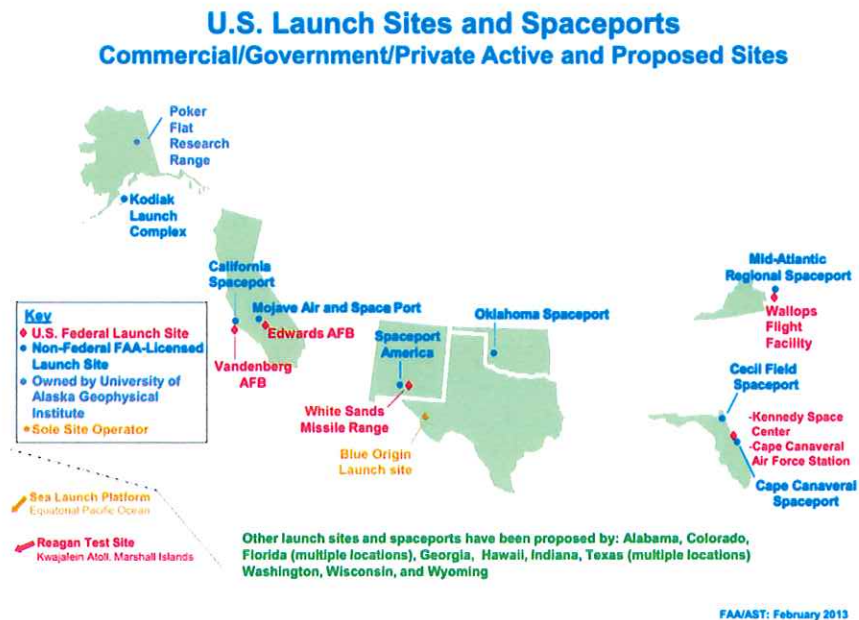


Figure 1: Map of Spaceports in the United States
Source: Federal Aviation Administration

In order to become an operational launch facility in the United States, the operating local government must apply for a Launch Site Operator License from the Federal Aviation Administration's (FAA) Office of Commercial Space Transportation. The FAA, the regulating body of all U.S. commercial space launches and reentries, issues all licenses associated with the launch, reentry, operation of a launch site, operation of a reentry site, and any experimental permits for developmental reusable suborbital rockets.

Once the license application is submitted, the FAA undertakes a process which includes a policy review, a launch site location review, a safety review, and an environmental review.¹ The policy review involves an FAA determination whether the potential exists to affect U.S. national security, foreign policy, or international obligations. The launch site location review demonstrates that, for each facility, at least one type of expendable or reusable launch vehicle can be flown safely. In order to satisfy the safety review, license applicants are responsible for ensuring public safety, demonstrating an understanding of the hazards, and discussing safe operational plans and best practices. The environmental review includes the creation of an Environmental Impact Statement (EIS) to be reviewed under the National Environmental Policy Act (NEPA).²

After all of the criteria have been met, the FAA will issue a license of operation, along with continued communication and visits for compliance monitoring. If the FAA does not find the application suitable to issue a license, the agency may issue alternative actions such as a no action alternative, other alternatives, or the FAA-preferred alternatives in the draft EIS.

¹https://www.faa.gov/about/office_org/headquarters_offices/ast/environmental/nepa_docs/review/documents_progress/camden_spaceport/media/Spaceport_Camden_EIS_ScopingPresentation_v1_508.pdf

² <http://spaceportcamden.us/why.php>

Camden County Spaceport

During the boom of the Space Race in the 1960s, Thiokol Chemical Company used an area of land in coastal, southeastern Georgia where they manufactured and tested the world's most powerful rocket motors ever. While this same site is no longer in use today, Camden County has proposed to repurpose the land to its former historical significance and create a commercial spaceport.

The Spaceport Camden site is proposing a vertical launch facility, a landing zone, and operations support facilities to be located on the I-95 corridor next to the Atlantic Ocean, surrounded by a large undeveloped buffer zone. Figure 2 displays a map of the location of Spaceport Camden, while Figure 3 shows a visual model overview of the launch complex. The vision of the project is to “develop a successful world class spaceport through public-private partnership that establishes Camden County as the Commercial Space Center of the United States.”³ The Camden Spaceport project is currently in the midst of the licensing process having received a Notice of Intent to prepare an EIS from the FAA along with conducting a public scoping period. The spaceport is now waiting on the draft EIS, which will then be open to public comment, and followed by a Notice of Availability of the final EIS. Finally, the FAA will issue a Record of Decision for the spaceport site.

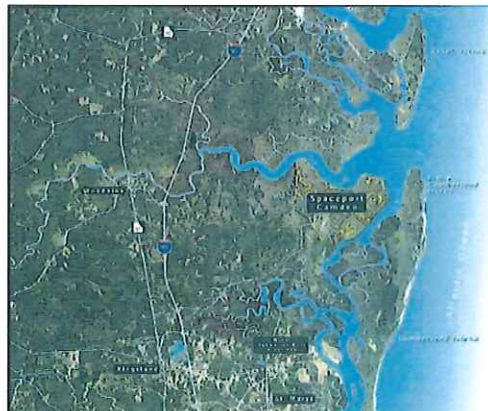


Figure 2: Map of Location of Camden County Spaceport
Source: Spaceport Camden

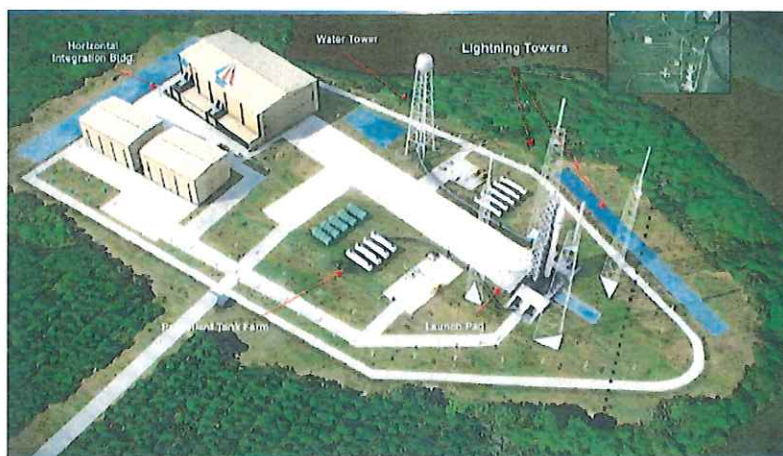


Figure 3: Launch Complex Overview
Source: Spaceport Camden

³ <http://spaceportcamden.us/about.php>

Proposed Georgia Legislation

Georgia Space Flight Act – House Bill 734 (2015-2016)

Under current Georgia law, operators of space flight activities may be held liable to space flight participants for ordinary negligence, if the participant is harmed as a result of the operators not acting in a manner which an ordinarily prudent and cautious person would have acted in their situation.

This bill provides operators of space flight activities immunity from any lawsuits if space flight participants become injured during the space flight, except in the case of gross negligence. However, the participant must have signed a warning and written agreement. This warning and written agreement must meet the following requirements:

- It must be written in a document separate from any other agreement (other than other warnings consent, or assumption of risk statements required under federal or state law), printed in capital letters in no less than 10-point bold type;
- It must be signed by the space flight participant on their own behalf, as well as their heirs, executors, administrators, successors, and assignees;
- It must be signed by a competent witness; and
- It must have been provided to the space flight participant at least 24 hours prior to the space flight.

In addition to signing this warning and written agreement, the space flight participant must also be given any other informed consent required by federal law. This bill does not limit liability for when the space flight entity acts with gross negligence or acts to intentionally cause harm. Any type of lawsuit pertaining to space flight activities will be governed by Georgia law.

Along with House Bill 734 in the 2015-2016 Legislative Session, House Bill 1, also named the “Georgia Space Flight Act,” has been pre-filed for the 2017 Legislative Session. With some slight language additions, House Bill 1 proposed the same legislative changes as House Bill 734.

COMMITTEE TESTIMONY AND FINDINGS

Meeting 1: October 20, 2016

The first meeting, held at the Camden County Commission Office in Woodbine, Georgia focused on several issues regarding the proposed Camden County Spaceport. The following individuals provided testimony to the Committee:

- **Dr. Clay Montague**, Chair of the Spaceport Camden Environmental Sub Committee;
- **Mr. Dick Parker**, representative of the board of the Little Cumberland Island Homeowners Association;
- **Mr. Kevin Lang**, board member of the Little Cumberland Island Homeowners Association;
- **Mr. Steven Sainz**, co-founder of the Alliance for Spaceport and Coastal Economic Development;
- **Ms. Megan Desrosiers**, Chief Executive Officer and co-founder of One Hundred Miles;
- **Mr. Andrew Nelson**, Spaceport Camden Consultant; and
- **Mr. Steve Howard**, Camden County Administrator and Spaceport Camden Lead.

Dr. Clay Montague first spoke to the Committee on the background, composition, purpose, and current status of the Environmental Subcommittee (Subcommittee). The Subcommittee was formed in October of 2015 by the Camden County Board of Commissioners as a subset of the Spaceport Camden Steering Committee, which consists of 10 environmental and active Camden County community leaders.

The purpose of the Subcommittee is to help the citizens and leaders of Camden County participate effectively in the environmental aspects of the FAA's spaceport licensing process, specifically regarding the EIS. The Subcommittee allowed for a Public Scoping Period, which is required by NEPA and allows for the public to be informed about activities that involve a federal action along with collecting public comment regarding the proposed action, from November 6, 2015 to January 18, 2016. After, they compiled, examined, and interpreted local environmental concerns regarding the spaceport in the form of lengthy questionnaire, **402 Questions**, which were then transmitted to the FAA from the Environmental Issues Subcommittee. The questions were organized into 29 topic areas:

- Air Quality;
- Biological Resources;
- Climate (anticipated sea level rise);
- Coastal and Natural Resources under Coastal Zone Management;
- Use of publicly owned parks, wildlife refuges, recreations areas, and historic sites;
- Farmlands;
- Hazardous materials, waste, and pollution prevention;
- Historical, architectural, archeological, and cultural resources;
- Land use;
- Natural resources and energy supply;
- Noise and noise-compatible land use;
- Socioeconomics, environmental justices, and children's environmental health and safety risks;
- Visual effects;
- Water resources;
- Cumulative impacts;
- Irreversible and irretrievable commitment of resources;
- General questions about the licensing process;
- Evacuation inconvenience and business suspension during launches and landings;
- Launch safety and liability;
- Private Property values;
- Coastal engineering;
- General development impacts;
- Recreation, tourism, and quality of life;
- Traffic and transportation;
- Commerce;
- Design life of spaceport and its impacts;
- Balance between economic gain and environmental loss;
- Opportunity costs (of the no-action alternative); and
- Business Model.

Dick Parker and Kevin Lang presented testimony regarding the views of the Little Cumberland Island Homeowners Association. Both speakers addressed the concerns of eminent domain, along with the safety and environmental concerns of homeowners affected by the potential launch trajectory from the proposed Camden County Spaceport site.

Mr. Parker urged the need to have safety testing and testimony from aerospace engineers and engineering companies. Mr. Lang, who is also a practicing attorney in Athens, Georgia, stated the need for a new legal mechanism to enforce the clearing of an exclusion zone, which would currently include private residences. Both presenters urged the Committee to delay any legislation relating to the Camden County Spaceport until the FAA has made a final licensing decision.

Steve Sainz then spoke to the Committee as a Camden County resident, co-founder of the Alliance for Spaceport and Coastal Economic Development, and Executive Director of Camden Family Connection. Mr. Sainz promoted the spaceport as a large economic opportunity for Camden County, which through its job creation, would better the lives of local families and children. He also compared the proposed spaceport to the successful Kings Bay Naval Base, which employs more than 8,000 people and provides more than \$700 million in economic impact to the region.

Mr. Sainz discussed the current market share held by Georgia in the \$323 billion global space industry (currently only one-tenth of one percent), despite having the second ranked aerospace engineering

program in the nation at the Georgia Institute of Technology. The spaceport would impact more than just those directly employed, but also Camden County's large hospitality and retail industries, with aerospace jobs offering higher salaries and disposable income. Along with that economic impact, there also comes an increase in space tourism; people who make pilgrimages to spaceports and watch rocket launches.

Megan Desrosiers discussed the environmental concerns that her and One Hundred Miles, a nonprofit environmental organization dedicated to protecting and preserving Georgia's coast, have regarding the proposed spaceport. Ms. Desrosiers stated that the spaceport is a risky endeavor that would negatively compete with and impact current industries and is unnecessary to boost the space economy in Camden County. She recommends investing in other space sectors, such as satellite services and ground equipment manufacturing.

Ms. Desrosiers pointed out several issues against the spaceport, including that the current proposed site is heavily contaminated, posing the questions of how much of it will be cleaned and for areas not cleaned, how it will affect operations. She also noted the large amount of money spent and planning to be spent on the spaceport; the limit to shipping access to the ocean; and concerns for multiple launch trajectories with wide range of impact.

Andrew Nelson testified to the current commercial space regulations and FAA licensing and permitting process. Mr. Nelson discussed the safety of spaceport launches, with a current success rate of 99 percent, and the specific launch safety information related to the proposed spaceport. He compared the proposed Camden County Spaceport to the already functional launch site in Wallops, Virginia. With a background in engineering, Mr. Nelson briefly discussed the science behind a rocket launch, applying it to the evacuation and safety areas and how long they would be affected during a launch.

Steve Howard lastly provided testimony to the advantages of building a spaceport in Camden County. These include the historical connection with past aerospace rocket testing; a growing global space market, estimated between \$300 billion to \$400 billion; Camden County's location (southern latitude by the coast, port/barge access close to site, proximity to existing space industries in Florida and Virginia, and workforce pipeline of aerospace and engineering talent from the Georgia Institute of Technology); and space tourism opportunities.

Mr. Howard also presented a conceptual outlay of the proposed site with views of the launch complex, landing zone, launch control center/payload processing center, and the welcome center/backup launch control center. He also went into detail on the FAA licensing process and the current status of the spaceport.

Meeting 2: November 28, 2016

The Committee held its second meeting at the Georgia State Capitol in Atlanta, Georgia, where they discussed a number of topics including the space industry as a whole, its current and possible future impact on Georgia, and final public comment on the advantages and disadvantages to Spaceport Camden. The following individuals presented to the Committee:

- **Mr. Eric Stallmer**, President of the Commercial Spaceflight Federation (CSF);
- **Ms. Amy Hudnall**, Director of the Center of Innovation for Aerospace at the Georgia Department of Economic Development;
- **Dr. John Olds**, Ph.D., P.E., and Chief Executive Officer of SpaceWorks Enterprises, Inc.;
- **Mr. Stephen Fleming**, founder of Boostphase;

- **Mr. Dick Parker**, representative of the board of the Little Cumberland Island Homeowners Association;
- **Mr. Kevin Lang**, board member of the Little Cumberland Island Homeowners Association;
- **Mr. Steve Howard**, Camden County Administrator and Spaceport Camden Lead; and
- **Mr. Andrew Nelson**, Spaceport Camden Consultant.

Eric Stallmer began the meeting by testifying on the history and purpose of the Commercial Spaceflight Federation (CSF), an industry association of more than 70 space-related organizations. Mr. Stallmer spoke to the burgeoning small satellite⁴ and “CubeSat”⁵ industry, which has high demand for launch vehicles translating into need for places to launch.

Under the current restrictions of federally owned spaceports, satellite companies are bound by endless government deadlines and are in need of faster and more flexible turnaround times. This, along with the set infrastructure of academic resources from Columbus State, the Georgia Institute of Technology, and the University of Georgia, Mr. Stallmer believes the Camden County Spaceport could produce an economic boom in South Georgia and statewide. Mr. Stallmer stated that he strongly endorses the plans for a spaceport in Camden County and also supports pro-space industry growth legislation.

Amy Hudnall next provided testimony regarding the current state and impact of the aerospace industry in Georgia. In 2013, the total economic impact of the aerospace sector was \$50.8 billion and is growing each year. According to Ms. Hudnall and the Center of Innovation for Aerospace, aerospace products were the number one international export of the State, in 2014, estimated at \$8.25 billion.⁶ Along with top-ranked higher educational aerospace resources in the State, Georgia is host to one of the National Aeronautics and Space Administration’s Regional Educator Resource Centers at the Museum of Aviation in Warner Robbins, which provides educational material and workshops for K-12 teachers with a focus on Science, Technology, Engineering, and Mathematics curriculum.

Dr. John Olds presented to the Committee on the history, purpose, and achievements of his private space entity, SpaceWorks Enterprises, Inc. (SEI), which is also comprised of three subsidiaries: Generation Orbit Launch Services, Inc. (GO); Terminal Velocity Aerospace, LLC (TVA); and Blink Astro, LLC. Dr. Olds mentioned a key project or focus from each division of SEI: SpaceWorks is currently focused on researching torpor inducing transfer habitat for human stasis to Mars; GO is aiming to have its GOLauncher, a horizontal launch vehicle, flying by early 2018; TVA has produced RED-Data Flight Recorders and plans to have the RED-Data 2 launching in 2017; and Blink Astro is working on a small satellite network for connecting the Internet of Things. Along with their advancements in the space industry, SEI offers several education opportunities for students ranging from a high school outreach program during the summer to a college internship program that has been active for 15 years.

When asked the current state of the space industry and the future opportunities for Georgia, Dr. Olds stated that the industry is in a period of transition with a federal government research shift from low earth orbit trajectories to the deep space, leaving a gap for the private space industry to fill. With strengths in the areas of location and educational resources, Dr. Olds says that Georgia’s non-history with space and large space-related military bases gives the State the opportunity to create something new, without existing barriers.

⁴ Small satellites are usually classified as weighing under 180 kilograms or approximately 400 lbs.

⁵ CubeSats are a subset of small satellites that use a “one unit” or “1U” measuring 10x10x10 centimeters and can be extended to larger sizes; 1.5U, 2U, 3U, 6U, and 12U.

⁶ <http://www.georgia.org/industries/aerospace/>

Stephen Fleming presented testimony regarding the history of the space industry in the United States. Mr. Fleming noted, that unlike trains, automobiles, and airplanes, the space industry was introduced and co-opted by the federal government, which at the time was for purely political reasons. When asked what companies look at concerning launch sites, Mr. Fleming stated that FAA accreditation, location, and infrastructure were the primary indicators when choosing a location. While Spaceport Camden does not yet have FAA approval, it does have an ideal location on the east coast and infrastructure already established in the state which can easily be applied to Woodbine, Georgia.

Chairman Thompson then opened up the meeting to public comment, with Dick Parker and Kevin Lang of the Little Cumberland Island Homeowners Association being the only to present testimony. Mirroring his first testimony, Mr. Parker spoke against the proposed Camden Spaceport reiterating his safety and logistical concerns for the homeowners of Cumberland Island and Little Cumberland Island being located in the launch and evacuation zones. Mr. Lang then presented concern for homeowners' rights and the possible violation of the Landowner's Bill of Rights and Private Property Protection Act in needing to evacuate affected areas, including houses, during launches.

When asked his opinion on past and likely future, proposed legislation regarding insurance liability of space companies, Mr. Parker stated that the legislation has no relevance to the spaceport; however, he would ultimately oppose any such legislation as it would create an idea of legitimacy. Regarding horizontal launches⁷, Mr. Parker stated no opposition.

Steve Howard and Andrew Nelson lastly presented information to clarify any lingering questions presented at past and present meetings. In regards to Mr. Parker's previous statements of concern for homeowners being forced to evacuate their homes during a launch, Mr. Nelson stated that the evacuation area is required to be cleared of all non-essential individuals, which excludes homeowners. Mr. Howard publicly stated that Camden County will accept the FAA ruling, whatever the outcome. When asked the time frame of a FAA ruling, Mr. Howard did not provide an exact timeline, but noted that he did not believe it would be completed any time soon.

Meeting 3: December 15, 2016

The Committee met for a third, and final time, at the Georgia State Capitol to discuss its findings and recommendations based on the testimony heard at the previous meetings.

⁷ A horizontal space launch differs from that of a vertical launch because the payload is sent from a hypersonic airplane in flight as opposed to a space rocket or capsule from a launch pad.

COMMITTEE RECOMMENDATIONS

Based on the testimony and findings previously provided, the Committee makes the following recommendations:

1. The Committee urges the Georgia General Assembly to propose and pass legislation that sends a clear signal to the Commercial Space community that Georgia is open for business and understands the risks associated with commercial spaceflight.
2. Specifically, the Committee recommends that the General Assembly consider legislation providing for spaceflight participant informed consent that mirrors federal law and extends protections to the spaceflight value chain from lawsuits brought by the spaceflight participant, his or her heirs, estate and other related parties, except in the case of gross negligence. The Committee would like the General Assembly to consider this issue while also protecting and maintaining the integrity of property owner's rights in Georgia. Passage of such legislation is not a direct approval or disapproval and does not lessen the standards that the Camden County Spaceport project must adhere to in order to gain its necessary federal approvals including human safety, noise and traffic abatement, and related considerations. However, passage of such legislation is likely required for the Camden County Spaceport project to successfully compete with commercial spaceport initiatives in Florida and Texas, where similar state laws have already been passed.
3. The Committee encourages the Georgia Department of Economic Development to develop, with input from industry and spaceport developers, programs to attract and retain commercial space companies and related companies and entities in the extended value chain. The existence of a profitable Camden County Spaceport and the associated high value jobs and revenue would be beneficial for the local population and economy of Camden County, the neighboring region, and the state of Georgia.
4. The Committee encourages the Georgia Department of Education to ensure that commercial space developments are acceptable content for State curriculum standards and that innovative educators are likewise encouraged to pursue advanced Science, Technology, Engineering, Art, and Mathematics (STEAM) programs including and up to educational rocket launches, small cube-satellite development & launch, and high altitude investigations via balloon or amateur rocket flights.
5. The Committee encourages an investigation into the future opportunity for the Georgia Department of Transportation, in association with their other modal responsibilities in road, rail, maritime and aviation, to develop a competency in space industry infrastructure development to support state-wide space commerce expansion and local spaceport developers.
6. The Committee encourages an investigation into the proper role, and best practices of other states, for Georgia state-, county- and local-government involvement in commercial space development activities, while not duplicating or interfering with local, state, and federal law, regulations, policies, and/or practices.

Respectfully Submitted,

THE SENATE CAMDEN COUNTY SPACEPORT STUDY COMMITTEE

A handwritten signature in black ink, appearing to be 'B. Thompson', written over a horizontal line.

**Senator Bruce Thompson – Chairman
District 14**