



ALASKA AEROSPACE CORPORATION



A Diversified, Sustainable Aerospace Industry for Alaska

Strategic Plan 2011 - 2016



Alaska Aerospace Corporation 2011 Strategic Report

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Alaska Aerospace Corporation

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Executive Summary

Alaska Aerospace Corporation (AAC) is seizing new market opportunities to grow the aerospace industry in Alaska through four major short term objectives that will expand the aerospace industrial base in the State, provide numerous technical and engineering family wage careers for Alaskans, and posture Alaska for additional economic growth to meet long term goals. AAC's short term goals are enabled by the strong aerospace service workforce and infrastructure at the Kodiak Launch Complex (KLC), who have performed fifteen highly successful launches through November 2010. These short term goals are:

- Expanding our main business unit, small-lift launches, by energetically pursuing over 60 small-lift launches over the next decade.
- Expanding into the lucrative medium-lift market due to the fielding of two new medium-lift rockets; a once in a generation opportunity.
- Partnering with aerospace giant Lockheed Martin (LM) to bid on performing operations and sustainment of the Ground-based Midcourse Defense missile system at Fort (Ft.) Greely, an Alaskan base that will soon be run by in-state Alaskans.
- Preparing to acquire large unmanned aircraft that will soon be retired by the Air Force. AAC, in partnership with other State and Federal agencies, will use the Global Hawk's ability to stay aloft for over 30 hours to meet many Alaskan needs, such as search and rescue, resource protection, and security.

These short term goals will diversify and expand the aerospace industry in Alaska, making aerospace in Alaska more resilient to the ever changing economic environment.

AAC has numerous secondary goals which will strengthen and increase the economic and educational engines in Alaska. These goals include the establishment of aerospace related support services within the state, the creation of a Kodiak economic development zone, attracting highly skilled personnel, establishing an Alaska Aerospace and Missile Defense Technology Center in conjunction with the University of Alaska system, and maintaining high standards for quality, safety, and environmental stewardship. This holistic approach to State-wide economic development is enabled by the success of the primary AAC business units.

Figure 1: KLC, one of the four major U.S. Launch Ranges, is providing Assured Access to Space.



A robust aerospace industry requires a combination of State and Federal investment before it can become truly self-sufficient. The operating expenses of all spaceports in the world are funded to a large degree by the state or national governments that have a strong desire to promote a high tech industry in their territory. AAC has leveraged modern technology to reduce operating costs to a minimum, especially when compared to other spaceports. AAC projects a requirement for \$10 million annually for basic operating expenses which will allow AAC to offer cost-competitive launch services from Kodiak. AAC will also require approximately \$85 million in capital investments over a period of three years to build the infrastructure required for medium-lift rockets. The McDowell Group projects the economic benefit to Alaska from these programs could reach \$80 million in annual revenue by 2018, with total direct, indirect and induced economic activity approaching \$250 million annually. AAC, as a state-owned corporation, is dedicated to being a good steward of state and federal funding to greatly expand the Alaska aerospace industry, providing a corresponding increase in economic activity and aerospace services which will benefit all Alaskans.

Company History

Alaska Aerospace, a public corporation of the State of Alaska, was established by Alaska statute as the Alaska Aerospace Development Corporation (AADC) in 1991. Enabling legislation envisioned economic development and educational advancement through an affiliation with the University of Alaska and the Poker Flat Research Range. AADC was located, for administrative purposes, within the Alaska Department of Commerce, Community, and Economic Development (DCCED).

AADC transitioned to AAC in 2009 as a reflection of market changes and recognition of the fully operational aspect of KLC. The purpose of AAC is to take a lead role in developing a high technology aerospace industry in the state through the exploration and development of space, to enhance human and economic development and to provide a unifying direction for accelerating space related economic growth.

Effective 1 July 2011, AAC will move departments from DCCED to the Department of Military and Veteran Affairs (DMVA). This move will prove advantageous to the State, DMVA, and AAC. AAC's launch customers have been all Federal, and most of those sponsored by the Department of Defense (DoD) organizations such as the United States Air Force (USAF) or the Missile Defense Agency (MDA). This move will align AAC's military customers with the State National Guard oversight, which will provide more opportunities for direct federal funding, establish additional relationships between the Federal and National Guard agencies, and provide opportunities for National Guard Soldiers and Airmen to participate in DoD launch operations and exercises in support of launch activities. The DMVA and AAC will also provide mutual benefits in AAC's planned business development, such as missile operations at Ft. Greely (where the Alaska National Guard's 49th Missile Battalion operates) and Global Hawk program (a joint military/civil asset). These advantages will be described later in this report.

The corporation has a conventional top down business organization including a Board of Directors, a Chief Executive Officer, a President & Chief Operations Officer, Vice Presidents, and Directors who oversee focus areas. AAC's corporate offices are in Anchorage, Alaska.

Alaska Aerospace History and KLC Development

1991-97 Alaska Aerospace established

- Board of Directors named
- Initial funding provided
- KLC site selection
- KLC permitting & environmental studies performed



Payload Processing Facility

1998-02 AAC constructs the following support facilities at KLC:

- Launch Control Center
- Payload Processing Facility
- Integration & Processing Facility
- Spacecraft Assemblies Transfer Building
- Launch Service Structure
- Range Safety & Telemetry System



Launch Pad Service Area

Alaska Department of Transportation (AK DoT) improves road access to KLC

U.S. Air Force executes AIT-1, AIT-2, QRLV-1, & QRLV-2 missions

Lockheed/NASA executes Kodiak Star mission, the first KLC orbital launch

U.S. Army executes STARS WCRRF mission



Range Safety & Telemetry

2003-08 AAC constructs the following support facilities at KLC:

- Instrumentation Field
- Maintenance Support Facility

Marine Fiber Link goes live - broadband comm. to Kodiak & Kenai

AK DoT fully paves road access to KLC

AAC works with AT&T / Verizon to bring cell phone service to Narrow Cape

AAC signs a five year contract with U.S. Missile Defense Agency (MDA)

MDA executes IFT-13c, IFT-14, FT04-1, FTG-02, FTG-03, FTG-03a, FTX-03, & FTG-05 missions

AAC tracks satellite for MDA launch from VAFB

AAC supports MDA's Trident I (C4) Hybrid pathfinder



Marine Fiber Installation

2008-11 AAC constructs the following support facilities at KLC:

- Rocket Motor Storage Facility (RMSF) Earth Covered Magazine 1
- RMSF Earth Covered Magazine 2 to be complete in 2011

U.S. Air Force Minotaur IV pathfinder occurs

U.S. Air Force executes STP-S26 mission

U.S. Air Force TacSat-4 mission scheduled for 2011



USAF STP-S26 Launch

Alaska Aerospace Revenue History

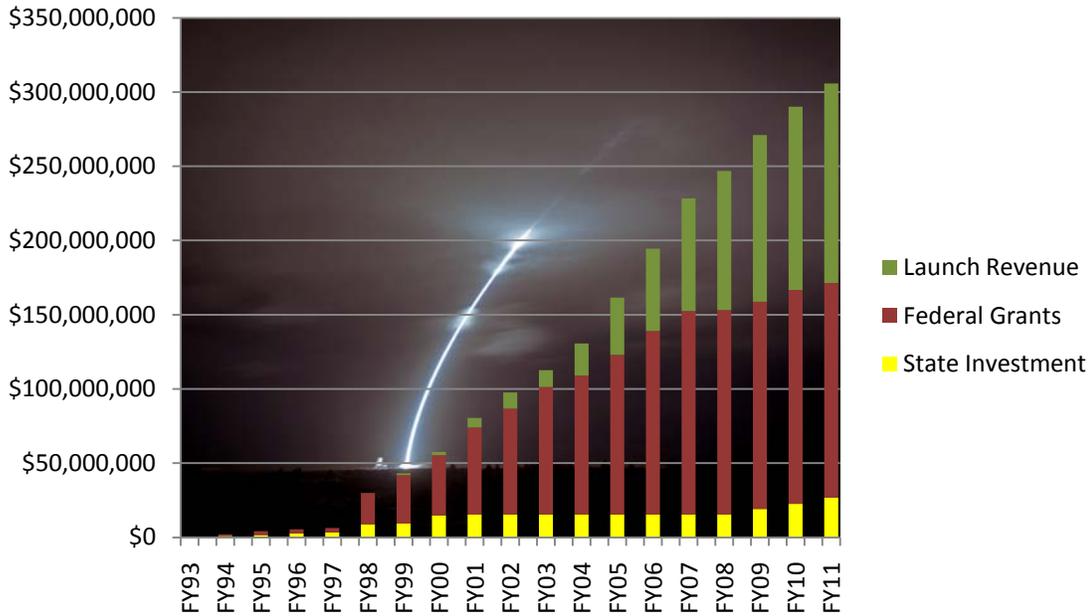


Figure 2: The figure above provides a pictorial representation of how AAC has grown the State of Alaska’s investment.

Table 1: Detailed AAC revenue history by launch revenue, federal grants, and state investment.

Year	Launch Revenue	Federal Grants	State Investment	Totals
1993	\$0	\$0	\$352,000	\$352,000
1994	\$0	\$937,000	\$680,000	\$1,617,000
1995	\$0	\$1,611,000	\$590,000	\$2,201,000
1996	\$0	\$289,000	\$1,011,000	\$1,300,000
1997	\$0	\$50,000	\$820,000	\$870,000
1998	\$65,000	\$17,980,000	\$5,408,000	\$23,453,000
1999	\$1,266,000	\$11,654,000	\$509,000	\$13,429,000
2000	\$878,000	\$8,025,000	\$5,519,000	\$14,422,000
2001	\$4,225,000	\$18,054,000	\$555,000	\$22,834,000
2002	\$4,615,000	\$12,463,000	\$185,000	\$17,263,000
2003	\$379,000	\$14,599,000	\$0	\$14,978,000
2004	\$10,219,000	\$7,615,000	\$0	\$17,834,000
2005	\$16,915,000	\$13,954,000	\$0	\$30,869,000
2006	\$16,892,000	\$16,173,000	\$0	\$33,065,000
2007	\$20,465,000	\$13,467,000	\$0	\$33,932,000
2008	\$17,678,000	\$727,000	\$0	\$18,405,000
2009	\$18,620,000	\$2,018,000	\$3,500,000	\$24,138,000
2010	\$11,337,000	\$4,395,000	\$3,500,000	\$19,232,000
2011*	\$10,794,000	\$800,000	\$4,000,000	\$15,594,000
Totals	\$134,348,000	\$144,811,000	\$26,629,000	\$305,788,000
Percentage	44%	47%	9%	100%

*2011 figures above are estimated values

Kodiak Launch Complex Background

AAC has a history of providing reliable launch services into conventional polar and unique orbits. KLC was the nation's first commercial spaceport not collocated on a federal range. Located about 44 road miles south of the city of Kodiak at Narrow Cape on Kodiak Island, the spaceport is state-of-the-industry. KLC is situated on 3,717 acres of state owned land, and AAC has authority during launch missions to limit public access to an additional 7,000 acres to assure public safety and security.

KLC was built with a combination of state and federal funds. Initial State of Alaska funding resulted in significant federal funding to build and expand a state-of-the-industry launch complex. To present, a total investment of \$305.7 million has been generated by KLC. Alaska funded \$26.6 million (9% of total) with federal capital investments of \$144.8 million (47% of total), and launch services generating \$134.3 million (44% of total).

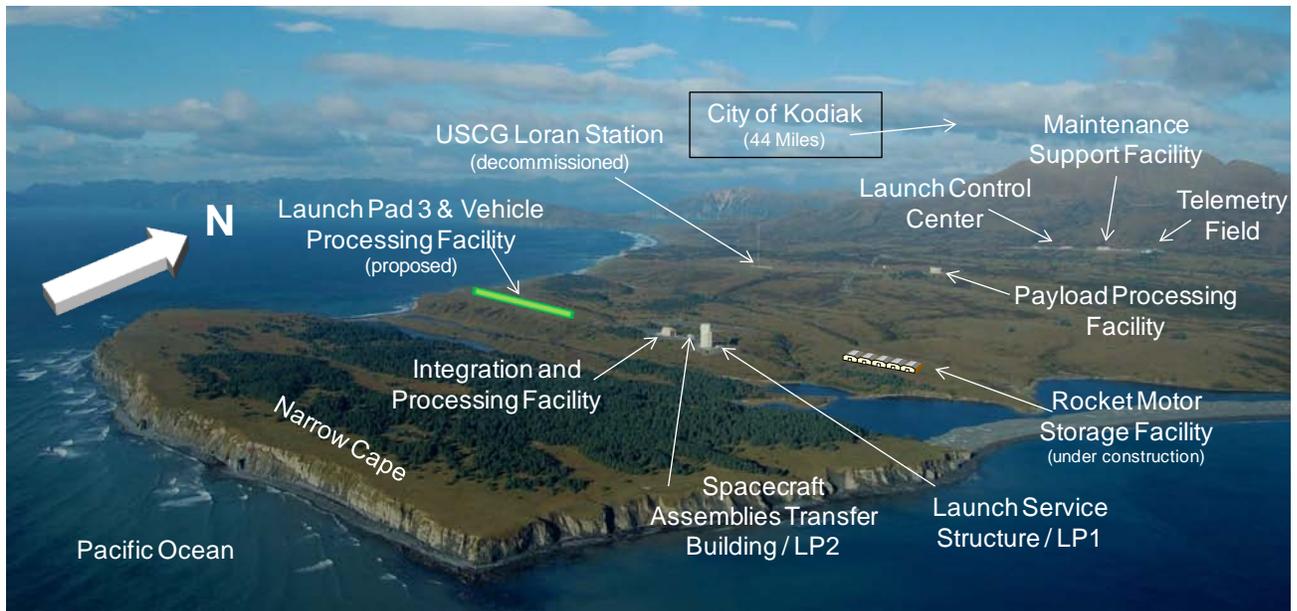
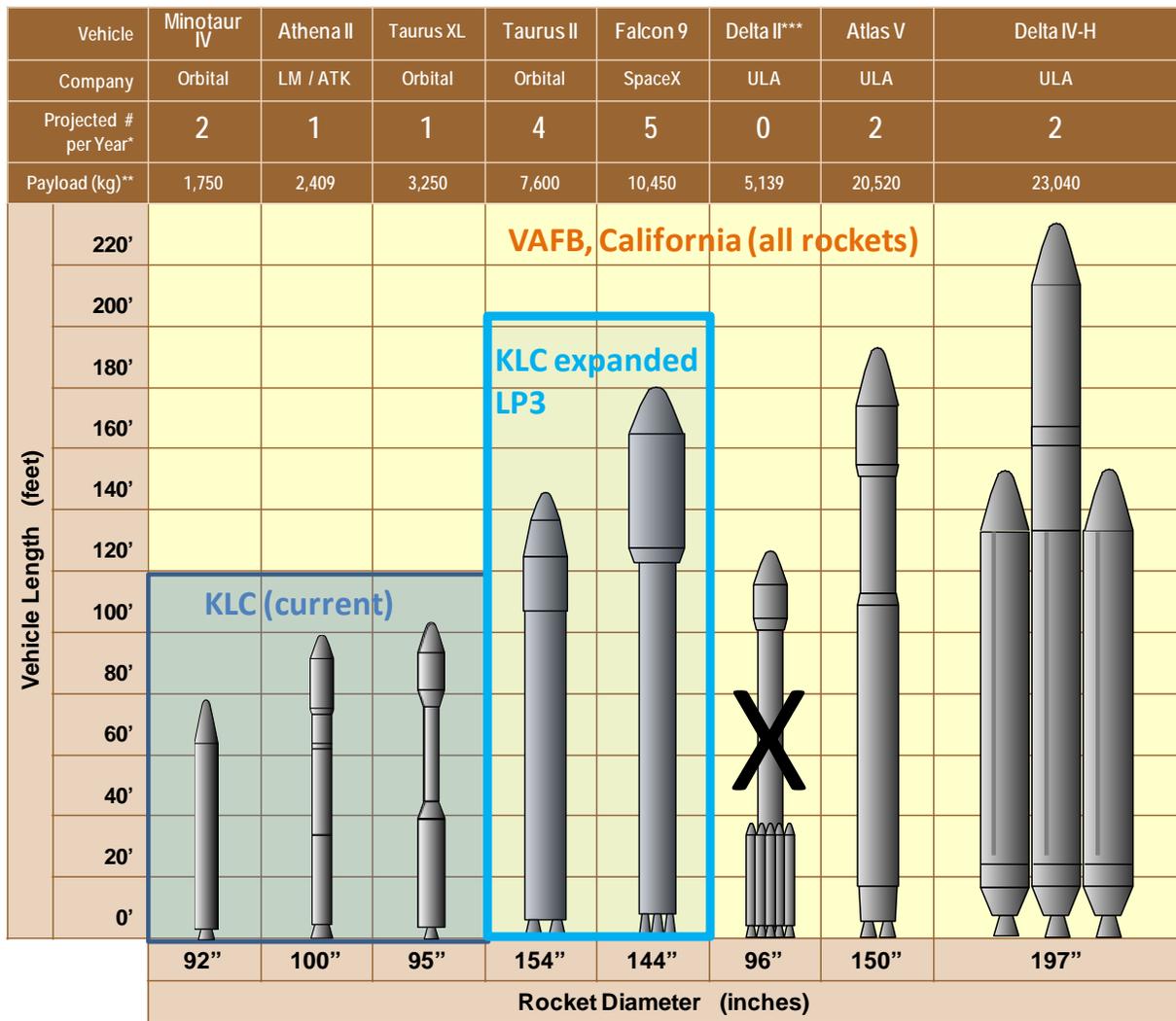


Figure 3: The Kodiak Launch Complex is America's newest spaceport in 40 years, intelligently designed based on decades of experience at other spaceports and built away from population centers to maintain a safe environment free from encroachment.

KLC primarily supports launches of small-lift to medium range space launch vehicles, ranging in size from the small-lift Castor 120 and Peacekeeper motors (used in the Athena, Minotaur IV, Minotaur V, and Taurus XL systems). KLC has engineering plans and permits in progress to expand to the medium-lift Taurus II and Falcon 9 systems. KLC is also configured to support the launch of Minuteman I-derived Space Launch systems, and to support the launch of long-range ballistic systems, such as the Polaris-derived A-3 STARS and the Minuteman-derived Minotaur II and III.



* Projected launches a year are based on historical performance and future projections
 **Payload mass varies with launch site, inclination, and orbit height
 ***The Delta II is no longer being produced

Figure 4: KLC can currently launch small-lift solid fueled rockets as indicated in the shaded blue box above. AAC intends to expand KLC capabilities to include the medium-lift Taurus II and/or Falcon 9 which will provide significantly more launch opportunities.

Since its first space launch from KLC in 1998, AAC has established a consistent record of reliable, safe, and cost-effective launches, accounting for 15 successful space launches through November 2010. KLC is one of only four U.S. spaceports licensed under the Federal Aviation Administration's (FAA) Commercial Space Transportation (AST) to operate commercial launches.

KLC is also the nation's highest latitude full service spaceport. It features indoor, all weather, processing and a modern GPS metric mobile Range Safety and Telemetry System (RSTS).



Payload Processing Facility (PPF)

- Two 40'x60'x58' processing bays
- Demonstrated Class 7,000 clean room

Integration and Processing Facility (IPF)

- Large 55'x100' bay, expandable to 55'x170'
- Installed raised rail system to interface with Type II transporter or ORS Transporter / Erector.

Spacecraft Assemblies Transfer Building (SCAT)

- Mobile building mounted on rails
- Provides environmentally controlled expansion for IPF or LP1

Launch Service Structure / Launch Pad 1

- Covers suborbital Launch Pad 2 for processing.
- Orbital launch
- Flame trench rated at 1.25 million lbs
- Attach points for Minotaur I TE
- 75 ton bridge crane
- Adjustable platforms accommodate Min I / IV



Figure 5: KLC features modern building that allow all weather indoor processing, which is normally done in the open or temporary facilities for small-lift rockets at other spaceports.

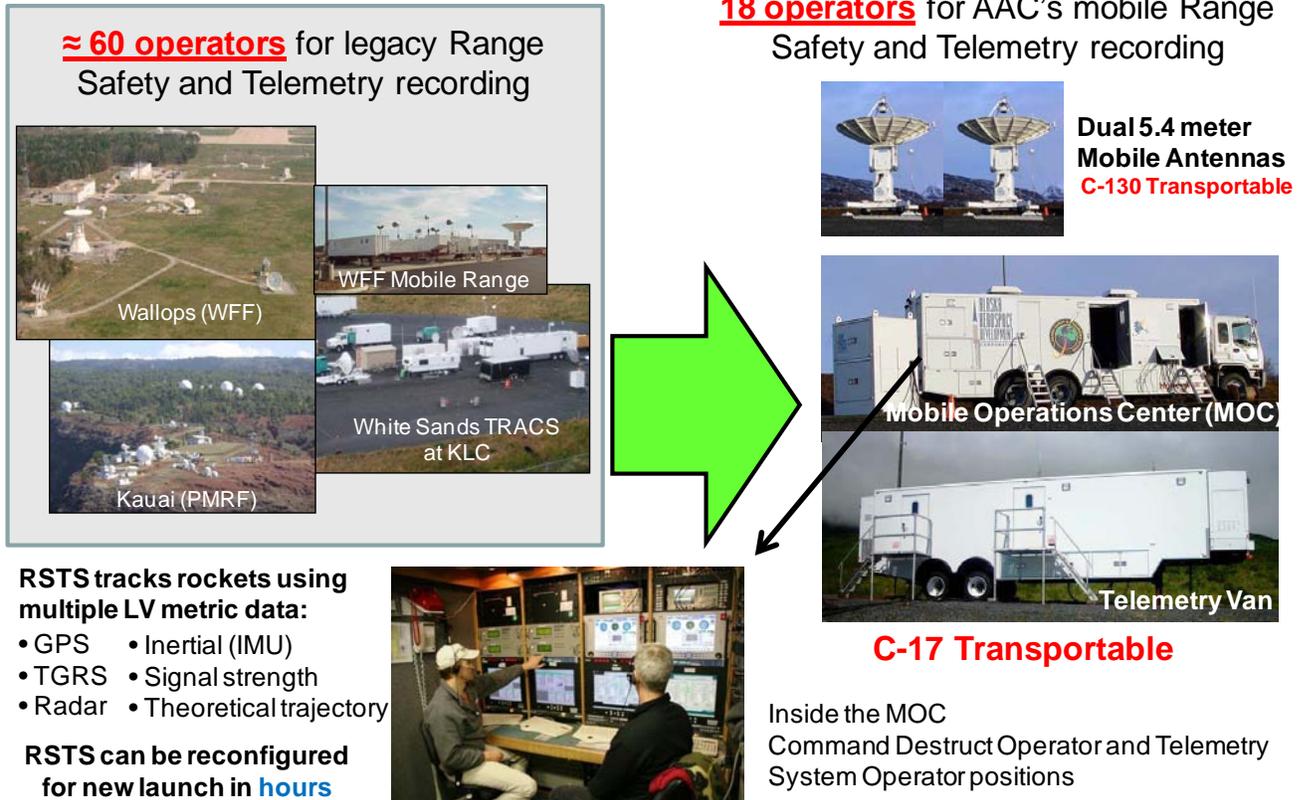


Figure 6: AAC's advanced Range Safety and Telemetry System (RSTS) reduces cost by leveraging GPS technology to reduce the number of telemetry operators. The RSTS also uses networked systems to increase responsiveness and reliability.

KLC was designed specifically to provide optimal support for space launches to polar and high inclination orbits, including circular and highly elliptical Molniya and Tundra orbits. KLC offers unrestricted down range launch azimuths ranging from 110° to 220°. KLC is the only U.S. facility that can launch directly into the high inclination (63.4°) missions without land over-flight and the requirement to resort to energy consuming dog leg flight segments, which can result in a 15% - 19% payload weight advantage out of KLC depending on the type of rocket.

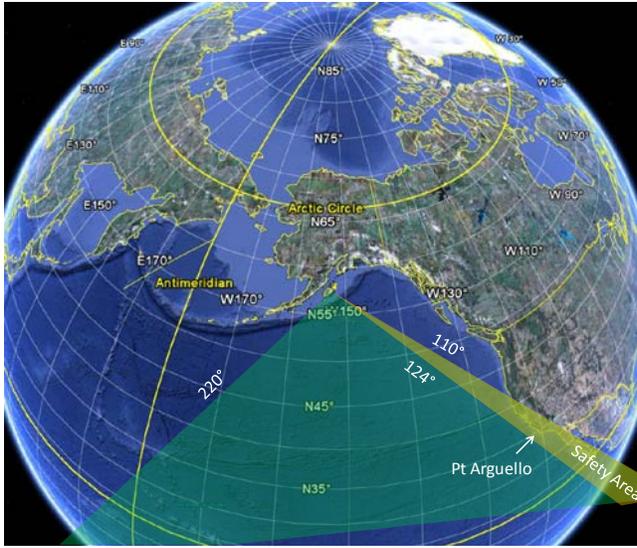


Figure 7: KLC's wide southern launch azimuth over open ocean is ideal for polar low earth orbit, sun synchronous, and highly elliptical orbits.

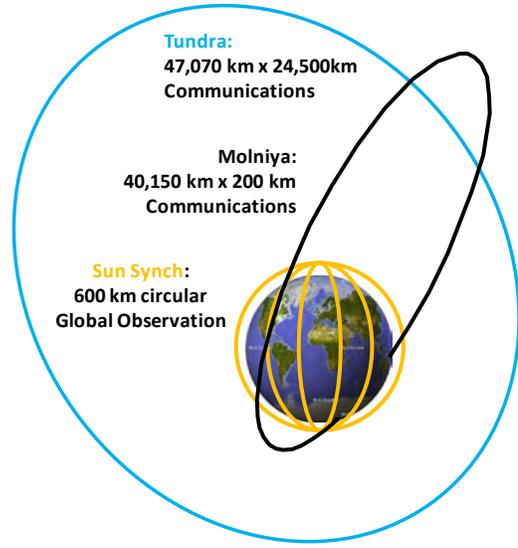


Figure 8: KLC is the only U.S. spaceport that can launch directly into the advantageous Tundra and Molniya orbits, as well as classic orbits like Low Earth and Sun Synchronous.

KLC recently expanded its launch capacity with the construction of a rocket motor storage facility, designed to allow year round storage of rocket motors and the storage of fully assembled rockets for a unique rapid launch capability. The rocket motor storage facility can easily accommodate the larger sized Minotaur IV series rockets and increases AAC's competitiveness and speed in the business of launching satellites into orbit.



Figure 9: The Rocket Motor Storage Facility consists of five earth covered magazines, each with the capacity to hold a fully assembled rocket. The exterior of the first magazine is shown above, along with a Minotaur Stage 3 motor being placed into storage.

Company Mission

AAC remains committed to excellence in space launch operations, focusing on the unique capabilities of polar orbits from KLC. AAC is also expanding into other high technology aerospace related business opportunities for the purpose of establishing a strong aerospace technology industrial base in Alaska and providing job opportunities for Alaskans. AAC will develop the aerospace industry in Alaska through public and private sector cooperation in education, training, research, workforce development, investment, and aerospace centric incentive programs that create a viable, sustaining, in-state aerospace business sector.

Strategic Vision

AAC is a semi-independent, state-owned corporation focused on developing a strong aerospace industry in Alaska. AAC will be most effective in achieving its strategic vision by maintaining an independent alignment with state government, while leveraging the advantages of being a state-owned corporation. In doing so, AAC has the capability to use its state-owned corporation position to be the primary governmental agency for coordinating aerospace development opportunities across the state. As a state-owned entity, AAC can also facilitate policy and budgetary options for the successful implementation of aerospace development in Alaska.

While the initial concept of AAC was to develop a commercial aerospace industry in the state, realities of the past decade have shown that the primary aerospace customer in the near term will remain government/military development. For that reason, AAC's state-owned corporation status will be beneficial in facilitating expansion of aerospace opportunities consistent with Alaska's strong, positive relationships with the Federal government, the United States military, and NASA.

In 2009, Governor Parnell established the Alaska Military Force Advocacy and Structure Team (AMFAST). AMFAST worked to develop long-term priorities and on March 1, 2010 released its Long Term Strategic Plan which contained four long-term strategic priorities. One of these priorities is to *"Promote expansion of the nation's third largest rocket launch site, Kodiak Launch Complex, and identify consistent operational funding sources for the Alaska Aerospace Corporation."*

AAC's strategic direction will focus on expanding rocket launch capabilities at KLC to include medium-lift operations and responsive launch capabilities. In addition, AAC will diversify into new aerospace business ventures for Alaska by pursuing such opportunities as maintenance and operational support to missile defense, developing Unmanned Aircraft Systems (UAS) operations, and more closely integrate relationships between AAC and the Alaska National Guard. AAC will expand business relationships and partnerships to include aggressive business development opportunities which enhance the unique aspects of Alaska in the aerospace industry. AAC will take the lead in creating a viable Alaskan based aerospace industry to secure the economic benefits of future high technology investments in aerospace for the citizens of Alaska.

In order to achieve this vision, AAC will:

1. Pursue contractual relationships and partnerships with national aerospace industry leaders in diversifying Alaskan aerospace development.
2. Expand the facilities at KLC to accommodate new market demands.
3. Diversify aerospace industry opportunities for relocation/establishment of associated/support industries in Alaska.
4. Develop a closer relationship with the Alaska National Guard, identifying mutually beneficial objectives.

Strategic Background

AAC has followed a comprehensive development plan over nearly twenty years. In 2008, AAC developed a new Strategic Plan which outlined an aggressive growth plan. AAC recognizes that the changing operational environment, based primarily on MDA's decision to not renew and extend the contract at KLC for missile defense test launches announced after adoption of the 2008 Strategic Plan, created a demand to update the plan and to expand business opportunities.

On July 8, 2010, the AAC Board of Directors met to conduct a special meeting addressing strategic direction. Through an extensive and exhaustive evaluation of opportunities, the Board of Directors agreed on four basic business efforts.

The **AAC 2010 Strategic Plan Observations Report** was published on August 23, 2010 and listed the four market direction as follows:

1. Kodiak Small-Lift Vehicle launch operations
2. Kodiak Medium-Lift launch operations
3. Launch Services at other locations outside of Kodiak, and
4. UAS operations and maintenance.

This planning session and subsequent report was used as the baseline for development of this strategic plan.

External Environment

Economic Factors – Despite a global recession during the past two years, there continues to be a demand for satellites and space based operations for government and military purposes, as well as a continued interest in commercial use of space. The industry has remained relatively flat the past two years, which is a positive indicator in a world that has seen a significant reduction in many markets, i.e housing, investments, currencies, etc. With the current global recession easing, projections indicate that both government and commercial use of space will continue at a relatively stable rate over the next decade. In the United States, investments in space operations, while shifting from wholly government owned and operated systems to more commercial space operations, has resulted in a smaller federal investment, but the shift has provided opportunities for more cost effective government/commercial operations to gain market position.

KLC falls into this category. It is a cost effective, responsive spaceport, which is state owned and can operate as both a national launch range and a commercial spaceport.

Political Factors – Recent decisions by the Obama Administration to curtail manned space flight, reduce the missile defense program in Europe, reduce defense spending, and relook at the federal approach to space exploration and research have created confusion in the aerospace



Figure 10: The Canadian built Radar Satellite 2 is an example of a satellite system that can be launched from KLC to identify national security threats.

industry over future commitments to space. However, the Obama

Administration's National Space Policy specifically calls for the United States to advance a bold new approach to space exploration, as well as to seek partnerships with the private sector to enable commercial spaceflight opportunities. One of the key elements of the policy beneficial to AAC is the explicit direction that *"The United States*

will invest in space situational awareness capabilities and launch vehicle technologies;

develop the means to assure mission essential functions enabled by space, enhance our ability to identify and characterize threats; and deter, defend, and if necessary defeat efforts to interfere with or attack the United States or allied space systems."

Furthermore, the aerospace industry has components in all fifty states and political interest to retain a strong aerospace industry is high in Congress. National interest in continuing a robust space program in the United States remains solid. Likewise, there is consistent support for space operations within the military. In fact, the Federal FY2012 budget submission from the DoD includes an increase in missile defense spending for the revised European plan. The budget also includes specific program funding for the NASA budget, which shows a propensity to retain a viable national space program.

The 2010 federal elections created a Congress that is divided over raising taxes to fund existing programs versus cutting programs to meet budget limitations. The national deficit will be a major political factor in the next two to five years, with significant political maneuvering to resolve

the problem. This has the potential for negative impacts on the DoD and other government sponsored manned space and space exploration programs. However, indicators show that there remains concern at the national level that the United States not lose our advantage in space. The budget priorities for NASA continue to reflect support for technology development aimed at improving NASA, other government, and commercial space capabilities.

The Alaska Congressional delegation has consistently demonstrated leadership in supporting the development and operations at KLC. Alaska's two senators represent each of the two main political parties. Alaska is fortunate that one senator is a member of the Senate Armed Services Committee, while the other is a member of the Senate Appropriations Committee. This provides Alaska with a distinct advantage in advancing military and government programs beneficial to the nation and Alaska through the budgetary process. In the House of Representative, Alaska has but one seat. Despite the numerical disadvantage, the Alaska representative is the second most senior Republican in the House of Representatives and maintains a senior ranking among both parties. This seniority provides Alaska some advantage in addressing issues specific to AAC in the Congress. While the current federal budget situation will be challenging over the next five years, Alaska is well positioned to protect the investments in aerospace at both the executive and legislative levels of government.

While the activities of AAC receive strong support from both the executive and legislative branches of the federal government, the ability to translate that support into increased government funding for AAC is not corollary. It is anticipated that federal funding for aerospace operations will continue to be constrained and the challenge facing AAC is the number of competing state sponsored space organizations being established. As states continue to expand into aerospace operations, pressure will increase over the distribution of federal funds available in any given year. Therefore, the political ability to leverage funds will be an important aspect of gaining sufficient federal funding and support. Strong state support in funding capital improvements, operations and sustainment will be a key to obtaining matching federal funds.

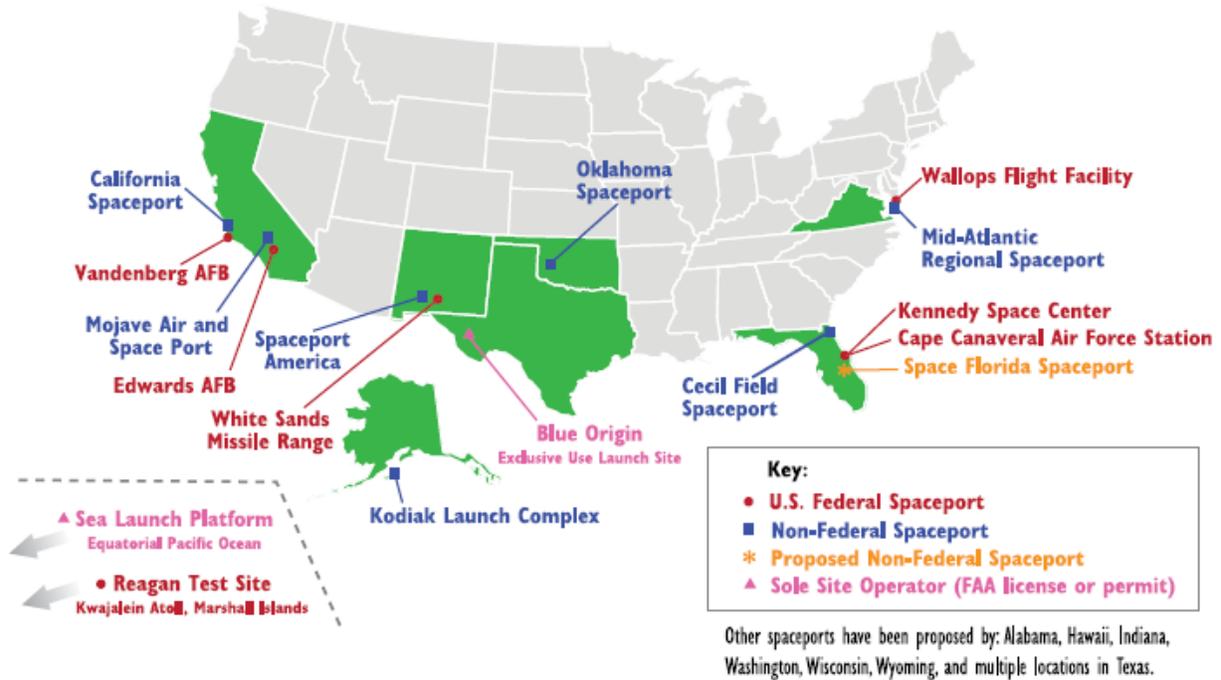


Figure 11¹: There are seven states with active space launch programs, with five more proposed. Of these numerous sites, only the California Spaceport (operated by Spaceport Systems International) at Vandenberg AFB is in direct competition with Alaska for satellite launches based on launch azimuth.

At the state level, while the State of Alaska has savings in excess of \$50 billion in the Permanent Fund, Constitutional Budget Reserve, and interest savings; the state continues to have one of the highest government spending rates per capita in the nation. The rapidly increasing entitlement costs of health care, state pension programs, education, and escalating cost of living continues to put significant pressure on the ability to expect increased expenditures on discretionary programs. Despite this, the Executive branch has demonstrated strong support for aerospace development in Alaska. State financial support has increased over the past two years and recent actions by the executive branch to realign AAC within the executive branch reflect positive support for continuing development of the aerospace industry in Alaska.

The Alaska state legislature support has been vital to the success of AAC. Over the past four years the legislature has worked with the executive branch to ensure adequate state funding was provided to meet federal match funding. Capital investments at KLC have been essential to the continued success of AAC. The state legislature has been unwavering in providing the necessary

¹ Federal Aviation Administration. "2010 U.S. Commercial Space Transportation Developments and Concepts: Vehicles, Technologies, and Spaceports", January 2010, page 61.

state funds to ensure the state-of-the-industry facilities at KLC are developed and maintained at the highest level. In fact, from 2009 to 2010, state financial support to AAC increased, in relationship to federal funding, from 9% to 11% of total funds received. State funding has been managed efficiently to meet current market demands, such as the rocket motor storage facility which was used by the Air Force just days after completion in August 2010. In addition, the state legislature in 2010 supported state funding to meet operational needs of AAC in a bi-partisan fashion. The 2010 state elections resulted in very few changes in the state legislature. It is expected that state legislative support will continue.

Table 2: Summary of State Funding to AAC by state fiscal year.

Fiscal Year	1991-2000	2009	2010	2011
State Funding to AAC	\$ 15.6 million	\$ 3.5 million	\$ 3.5 million	\$ 4.0 million
Purpose of Funds	Initial Seed Funding & Construction	Rocket Motor Storage Facility	Rocket Motor Storage Facility	Operations & Sustainment

Technological Factors – The continuing uncertainty of the reliability of missile defense is of concern to AAC. The failure of 7 of 15 missile defense test launches, including the failure of the two most recent tests, has continued to present skeptics examples that the system is not reliable.

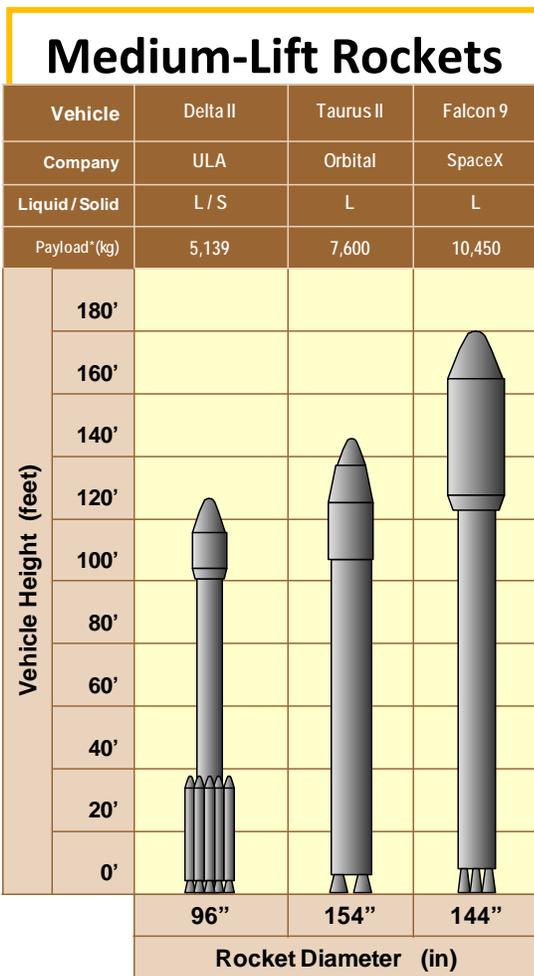


Figure 12: KLC has launched eight target rockets as part of MDA's GMD testing program.

Recent announcements from the Department of Defense indicate that support for missile defense will remain strong and that the issues which have caused the recent test failures are being addressed and will be corrected. As technology changes, it is anticipated that the missile defense program in Alaska will be modernized. This is a positive indicator for Ft. Greely. However, the current direction of MDA in addressing technology advancements and continued testing of the missile defense system does not appear to include KLC. AAC will need to be more aggressive in working with MDA (and the prime contractor- Lockheed or Boeing)

to meet the mission objectives of MDA in order to regain a market share of MDA test launches. With the maturing of the missile defense industry, there will be a need to provide sustainment testing of the system to ensure that the mission readiness of the interceptors does not degrade. Test launches of interceptors from KLC can accomplish such testing without taking the missile defense system off-line. This sustaining aspect of missile defense is possible at KLC and AAC may have an opportunity to regain missile defense operations at KLC.

Medium-Lift: Commercial Orbital Transportation System- The change from government conducted to government sponsored commercial space operations has created a new paradigm for



investment considerations. According to NASA Administrator, *“as we continue to maintain our world leadership in human spaceflight, we are working to help build the space transportation systems of tomorrow, incentivizing commercial companies to compete in the space marketplace and reducing our costs.”*² The market is shifting towards commercial companies that are developing the space systems government will use. In that vein, efforts also need to shift towards working more closely with commercial systems developers, such as Space X, Orbital, Lockheed Martin, Boeing, ATK, and others to secure business opportunities. New technological systems for aerospace operations will be developed in the commercial sector for use/contract by both commercial and government entities. Therefore, closer relationships between the commercial suppliers of technology will be essential for business development.

Figure 13: As the Delta II retires after 22 years of service, the Taurus II and Falcon 9 will perform many of the missions that the Delta II performed, to include scientific mission and GPS replacement.

² Bolden, Charles. “Thoughts on the President’s State of the Union Address” Online. Posted 25 Jan 2011. Accessed 26 Jan 2011. http://blogs.nasa.gov/cm/blog/bolden/posts/post_1295970274498.html

There is currently an aggressive pursuit of modernizing the medium and heavy-lift capability for space exploration as the Delta II, America’s medium-lift “workhorse” rocket with 147 launches, retires next year. The next generation medium-lift rockets being developed by SpaceX and Orbital Sciences will require a west-coast launch facility to launch weather and scientific satellites. Alaska and California are the only states with a west-coast launch facility, and whichever state is able to secure this new medium-lift Commercial Orbital Transportation System (COTS) launch business will win the launch business for the next 20-30 years. Currently, SpaceX has partnered with Florida, and Orbital with Virginia to launch from the east-coast. A similar, mutually beneficial, partnership between Alaska and one of these medium-lift service providers can bring 25 years of reliable launch business to KLC, along with stable economic growth at the local and state level. The emergence of these new, lower-cost, medium-lift COTS launch vehicles may greatly increase their demand.

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Figure 14: The Orbital Taurus II and the SpaceX Falcon 9 already have forty manifested missions, with ten of those requiring a west-coast spaceport; either KLC or Vandenberg AFB, will be the west-coast launch location.

The development of horizontal lift spacecraft, such as the use of reusable vehicles in the space tourism business, may increase as the commercialization of that aspect of the industry matures. While Virgin Galactic, and others will enter the commercial suborbital market from spaceports in the Lower 48, the technological change allowing for cost-effective horizontal lift is not expected to significantly impact the need for vertical lift launches in the foreseeable future.

These systems will complement each other, providing a specific lift capability unique to the desired mission objectives. Specifically, the current horizontal lift development at Spaceport America in New Mexico is focused on suborbital manned operations, or unmanned launches with very limited payload capability, which is only a very narrow aspect of space launch requirements.

Market - The future for launch operations at KLC appears strong. According to Futron's Space Competitiveness Index published in June 2009, between 1999 and 2008 35% of all successful orbital launches worldwide were conducted by the United States. That equates to 218 launches. It is estimated that nearly 40% of future U.S. launch needs will be into orbits requiring a west-coast spaceport. Using the statistics of the previous decade, that would equate to about 100 polar launches by 2020, accounting for nearly a 10 per year launch rate. Specifically, a review through 2017 shows 65 potential launches for KLC; however, about half will require facility upgrades at KLC to permit medium-lift and responsive launch capabilities.

Most projected launches are Federal government and military launches from a variety of different agencies, designed to meet a variety of different operational objectives. Since virtually all of these launches are designated for polar orbit, most of these specific launches will occur from either Vandenberg AFB or KLC. Unless Alaska invests in a medium-lift capability at KLC, it is expected that the majority of these launches will occur from Vandenberg AFB.

Market opportunities for space go far beyond military and wholly government programs. Today, space is used for navigation, telecommunication, imagery, emergency response, situational awareness, education, environmental and climate monitoring, internet information sharing, satellite radio, television, and many other uses. The future potential market for polar orbit space launches and aerospace activities has tremendous growth potential.

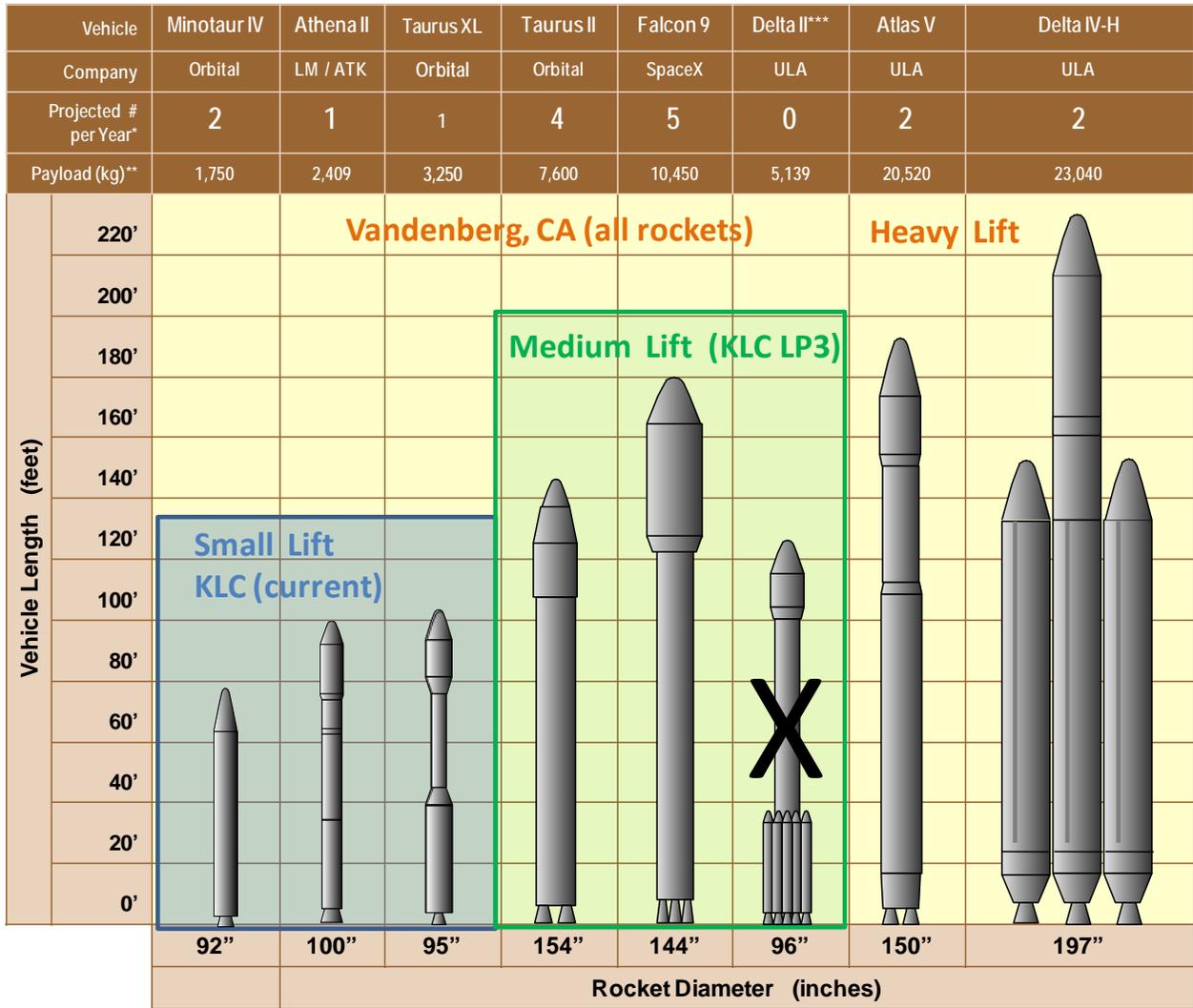
Product Differentiation – Small-Lift (Minotaur IV, Athena, Taurus I launch vehicles) can launch from four U.S. locations; KLC, Wallops Island, VA, Cape Canaveral, FL, and Vandenberg, CA. Each site will be described in the following sections.

Medium-Lift (Delta II, Taurus II, and Falcon 9 launch vehicles) are currently launched out of Cape Canaveral and Vandenberg AFB. Wallops Island, VA will have medium-lift capability upon the completion of the Taurus II launch facilities, which are projected to be operationally ready in 2011.

KLC will be an attractive west-coast location for medium-lift for polar orbits. The McDowell Group concluded in their Kodiak Rapid Launch/Medium-lift Project, January 2010, that *“The future medium-lift launch requirements will be on the west-coast, either at Vandenberg or KLC.”* If it is presumed that Vandenberg AFB is the primary KLC competitor for west-coast, polar launches, the product differentiation becomes paramount, which will be discussed further in the next section.

Heavy-lift (Delta IV and Atlas V EELV rockets, as well as the Space Shuttle) and resupply of the International Space Station (ISS), are predominately launched from Cape Canaveral, Florida, and polar launches from Vandenberg AFB, California. There are no plans at this time to launch heavy-lift missions from Kodiak because the current generation of heavy-lift rockets are mature programs with established infrastructure and supply chains at Vandenberg and Cape Canaveral.

As previously discussed, vertical launch and horizontal launch have different customer bases targeting different markets. KLC is a vertical launch facility with no current plans to enter the horizontal launch market. Therefore KLC 's market will be focused on vertical launch in the small and medium-lift category that require polar orbits.



* Average launches a year are based on historical performance and future projections
 **Payload mass varies with launch site, inclination, and orbit height
 ***The Delta II is no longer being produced

Figure 15: Common Launch Vehicles shown by category. Note that all medium-lift vehicles are liquid fueled (expanded KLC capability), and most small-lift vehicles are solid fueled (KLC current capability). The Minotaur IV is the rocket that was launched from KLC on 19 November 2010, for the STP-S26 mission.

Competitive Position – Internationally, there are a relatively small number of launch facilities actively operating. Cape Canaveral in Florida and Vandenberg AFB in California are the two primary U.S. launch facilities, providing a variety of lift options. Russia’s premier launch facility is located in Kazakhstan. The Biakonur Cosmodrome has been the primary Russian launch complex since 1957, although Russia has also developed smaller scale spaceports; such as Plesetsk Cosmodrome, Svobodny Cosmodrome, and Yasnny Cosmodrome. Japan and France operate

launch complexes, while China and India have become greater players in space operations, with a number of satellite launch centers across their countries. The following sections cover the main spaceports within the United States and profile them for later comparison. The information presented in these sections is taken from the World Space System Briefing produced by the Teal Group Corporation (www.tealgroup.com). The Teal Group Corporation is a team of experienced analysts and service professionals founded in 1988 to research and publish timely, accurate information on the aerospace and defense industry.

Cape Canaveral, FL³. The United States is actively developing space launch capabilities in a number of locations. Cape Canaveral is the premier spaceport in the United States and conducts the largest number of launches. The Cape consists of three organizations; the Cape Canaveral Air Force Station, NASA Kennedy Space Center, and the State owned Space Florida. They are all co-located at Cape Canaveral, and their relationship is similar to that of Joint Base Elmendorf/ Richardson in Alaska, where all three organizations share land, assets, and resources. Cape Canaveral launches serve equatorial orbits and missions to the International Space Station, which are not optimal from Alaska.

This realistically results in Florida not being a prime competitor to KLC. In fact, Alaska Aerospace has a signed Memorandum Of Understanding with Space Florida to foster commercial and small space initiatives.

Space Florida, FL	
<ul style="list-style-type: none"> • Operating expenses paid by State of Florida • Significant financial investment (~\$500 Million) from State • \$31 Million operating budget in 2010 • Significant financial and infrastructure support to SpaceX 	<ul style="list-style-type: none"> • Three commercial orbital launch complexes • Remote control center • One suborbital launch complex • Off-site solid rocket motor storage facility • 50,000-square-foot hangar • 100,000-square-foot Space Life Sciences Lab
	

³ Investment amount taken from “Space Florida Spaceport Master Plan 2010”, RS&H Engineering, Merritt Island, FL, 2010. Operating budget taken from “Space Coast Quandary”, Space News, 10 January 2011, pg 22.

Wallops Island, VA⁴. NASA's Wallops Flight Facility in Virginia is one of the nation's oldest launch facilities. Wallops Flight Facility is where the Mid-Atlantic Regional Spaceport (MARS) facility is being expanded. MARS is a tri-state corporation that has financial contributions from Virginia, Maryland, and Delaware. MARS has access to two launch pads at Wallops Flight Facility, as well as supporting facilities. As with Cape Canaveral, Wallops and MARS do not compete with KLC because they are geographically not optimally oriented to launch polar orbits. AAC has a good working relationship with MARS and NASA Wallops, sharing technical and business data on a regular basis. The state of Virginia has been successful in winning the Taurus II medium-lift business for MARS by building a processing facility and launch pad for the new rocket. This may serve as a model for Alaska to emulate to win a medium-lift rocket for West-coast launches.

Vandenberg, CA⁵. KLC's principle competition for polar launches is Spaceport Systems International (SSI), located on Vandenberg Air Force Base. (McDowell Report, p7) This facility is a FAA licensed spaceport specializing in low-polar-orbit launches at Vandenberg AFB, California.

Mid Atlantic Regional Spaceport (MARS), VA

- Operating expenses paid by State of Virginia and Maryland
- Significant financial investment (~\$85-100 Million) from State for Taurus II.
- Two orbital launch pads
- Multiple suborbital launching rails
- Payload processing and integration
- Vehicle storage and assembly buildings,
- Liquid fueling capability
- Telemetry and tracking



Spaceport Systems International (SSI), CA

- Joint venture between California Space Authority and ITT.
- ITT invested \$35 Million
- Payload Processing Facility worth \$400 Million leased to SSI
- \$25 Million contract to process payloads.
- One orbital launch pad
- Payload Processing Facility (main business)



⁴ Taurus II investment from Wroble, William, "Wallops Flight Facility", presented at the AIAA Space 2010 Conference, 1 Sep 2010.

⁵ SSI investment from Caceres, Marco "California (USA)", World Space System Briefings, Teal Group Corp, January 2010.

Vandenberg AFB conducts the majority of polar launches in the United States, but not all launches from that facility are cost effective. Due to narrow launch azimuth restrictions, the Vandenberg launch range is more limited than at KLC. Some high inclination launches from Vandenberg AFB require a mid-course adjustment to reach the desired orbit. This mid-course adjustment requires additional energy consumption, which reduces the weight available for payloads such as satellites delivered to orbit. Launches from KLC do not require the mid-course adjustment, allowing for up to 19% greater mission payload weight to orbit, making the KLC launches more cost-effective for inclinations less than 72 degrees to the equator. Vandenberg AFB is also burdened with extreme development and environmental challenges; prone to catastrophic natural disasters, such as earthquakes; located in one of the highest cost-of-living areas in the country with high tax rates and operational costs; and commercial launches from SSI are subject to military operational restrictions, regulations, and are second priority to military missions.

Kwajalein, Marshal Islands. Kwajalein Atoll is the location for the Reagan Test Site (RTS), which is run by the U.S. Army. RTS mainly conducts experimental launches for the United States, both by government and commercial operators. Recently, Space X became a primary commercial launch customer at Kwajalein under contract service to the U.S. government, and successfully launched a single, small rocket to orbit in 2008. But logistical austerity and the 5,000 miles between Kwajalein and California make RTS an unlikely candidate as a SpaceX primary launch site. With

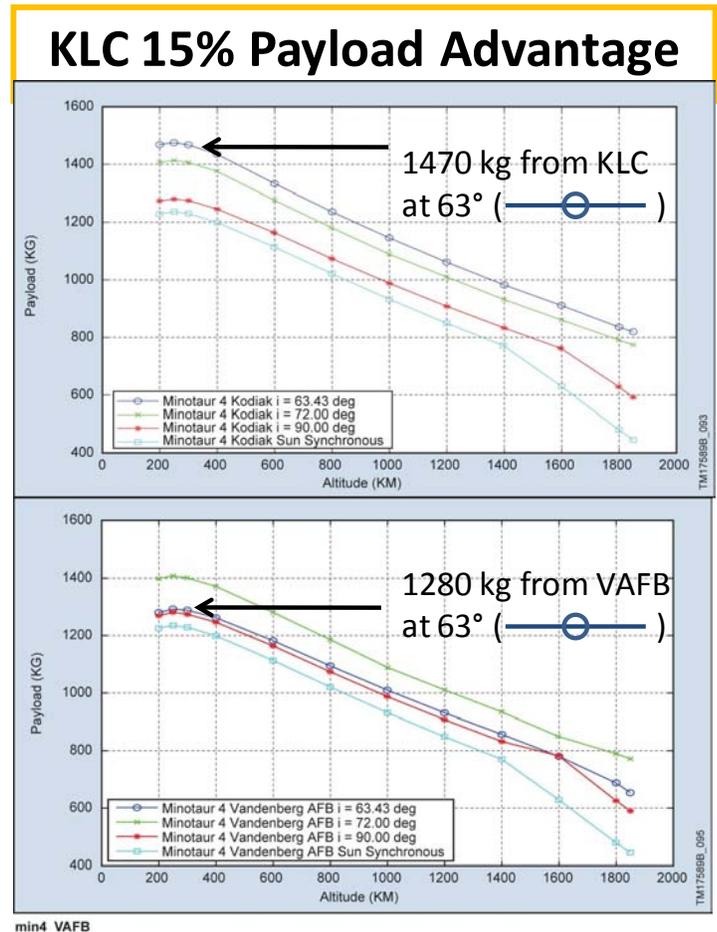


Figure 16: Dark blue performance line (for 63° inclination) is 15% greater at KLC than Vandenberg for the Minotaur IV rocket. Similar performance at both sites once inclination increases to 72° (charts provided by Orbital Science Corporation).

Kwajalein, Marshall Islands

- Home of the U.S. Army’s Reagan Test Site (RTS)
- Primary mission is test support for Air Force and NASA
- Launched all four Falcon 1 rockets to date
- Several small launch pads
- Many radar and tracking assets
- Difficult logistics



regards to missile defense testing, Kwajalein has become a strong competitor to KLC. In 2010, MDA did not extend its operational agreement with KLC in favor of targets launched from Kwajalein Atoll. Rational for the change in test launches was based on the need to test longer range, head-on intercept operations than are currently capable from KLC. According to MDA, KLC test launches were successful and demonstrated the capability to intercept at ranges up to around 2,000 miles. Longer range intercepts, such as at the range of 4,000 to 5,000 miles, required greater distance between the target and kill vehicles. Therefore, Vandenberg AFB and Kwajalein Atoll were determined to be the optimum launch sites.

Spaceport America, NM⁶. The primary focus for Spaceport America is suborbital Reusable Launch Vehicles (RLV) operations. The most notable business accomplishment has been the 20 year lease with Virgin Galactic to lease the spaceport and develop on-site facilities for commercial space operations. Due to the business focus on RLV’s for suborbital operations, Spaceport America is not considered a direct competitor to KLC.

For both U.S. commercial and government launches, AAC is in a strong competitive position to capture new business for west-coast and other aerospace operations, especially for launches that relate to national security and the need for a polar or high inclination orbit.

Spaceport America, NM

- Operating expenses paid by State of New Mexico.
- New Mexico has committed \$133 Million to build Spaceport America
- County residents approved a county tax increase to raise \$6.8 Million a year for operating expenses
- Primary service is space tourism
- Suborbital flights may be performed



⁶ Spaceport America investment from Caceres, Marco “Spaceport America”, World Space System Briefings, Teal Group Corp, July 2010.

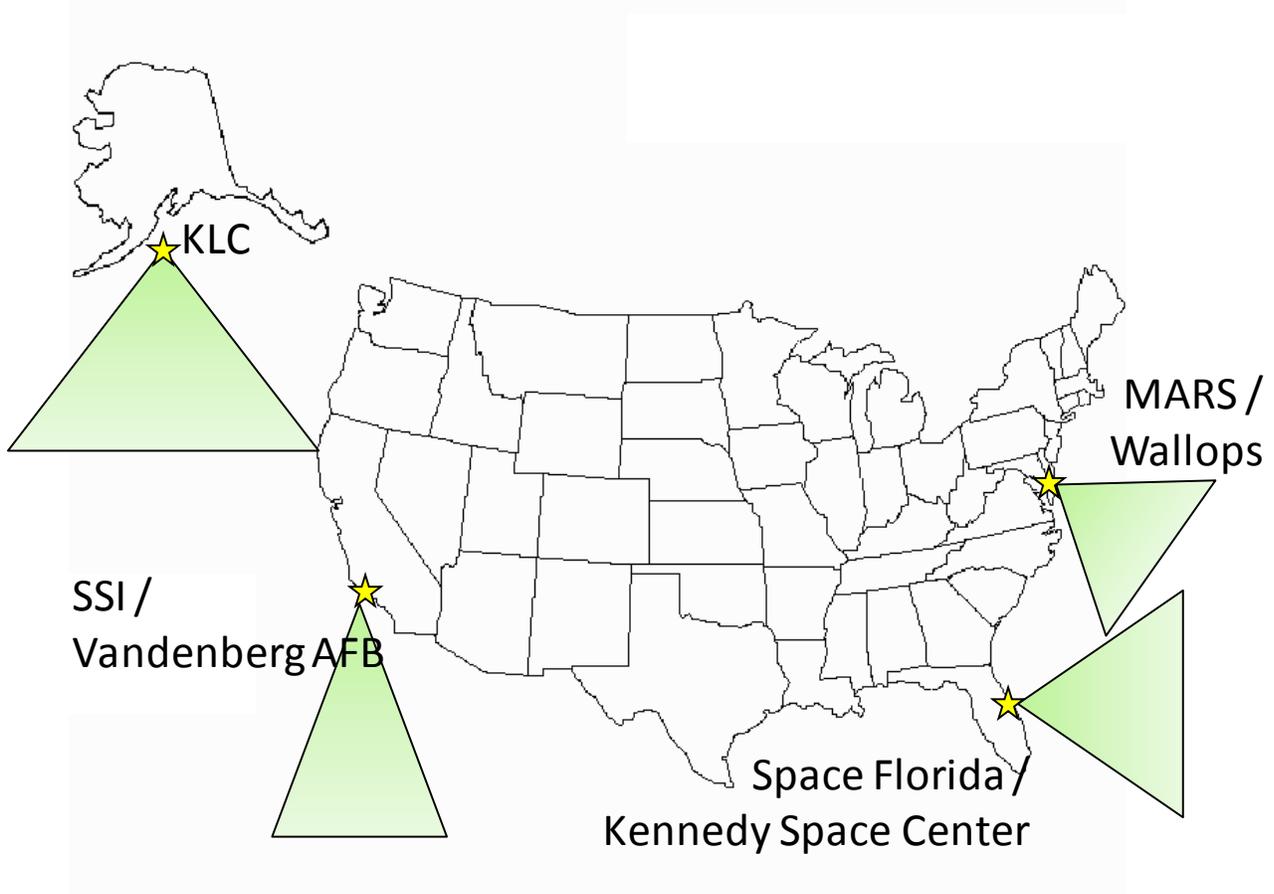


Figure 17: There are only four operational spaceports in the U.S. that can launch satellites into orbit, and a potential 5th U.S. launch range located in the Marshal Islands in the Pacific Ocean.

Orbital Sciences Corporation (Orbital) develops and manufactures small and medium-lift rockets and space systems for commercial, military and civil government customers. The company's primary products are satellites and launch vehicles, including low-earth orbit, geosynchronous-earth orbit and planetary exploration spacecraft for communications, remote sensing, scientific and defense missions; human-rated space systems for earth-orbit, lunar and other missions; ground- and air-launched rockets that deliver satellites into orbit; and missile defense systems that are used as interceptor and target vehicles. Orbital also provides satellite subsystems and space-related technical services to U.S. Government agencies and laboratories. Orbital is in the final stages of pre-flight testing of the new Taurus II medium-lift rocket, which is expected to make its maiden flight from Wallops, Virginia in December 2011.

Space Exploration Technologies Corporation (SpaceX) also is developing small and medium-lift platforms for use by both commercial and government customers. SpaceX using private and NASA funds to develop the Falcon family of rockets and the Dragon crew/cargo capsule from the ground up, including main and upper stage engines, the cryogenic tank structure, avionics, guidance & control software and ground support equipment. With the Falcon 1, Falcon 9 and Falcon 9 Heavy launch vehicles, SpaceX will offer a full spectrum of light, medium and heavy-lift launch capabilities. The Falcon 9 and Falcon 9 Heavy are the only US launch vehicles with true engine out reliability (meaning that the rocket can still achieve the proper orbit even if one engine fails during launch). The Falcon series are also designed with reusable first stages, making them the world's first fully reusable launch vehicles. SpaceX has demonstrated two successful flights of the medium-lift Falcon 9 rocket from Florida. SpaceX plans to launch three additional Falcon 9 missions in 2011. Their first west-coast launch is scheduled for 2013 out of Vandenberg AFB, California, but they have not broken ground on any new facilities which will be required to launch from California.

Strengths/Weakness/Opportunities/Threats (SWOT) Analysis

Strengths –

- AAC is a state-owned corporation.
- AAC has the statutory and corporate ability to develop an aerospace industry in Alaska.
- The launch site at Kodiak is wholly state-owned, on state land.
- The infrastructure at KLC is state-of-the-industry.
- The size of the KLC workforce is small and much more cost effective than other larger launch facilities.
- KLC is optimally located for polar and high inclination orbit launches.
- KLC provides a safe environment for launches, with no flight occurring over populated areas.
- KLC has never had a failed mission launch.
- The isolated location of KLC and the distance from heavily populated areas is a strength, for both security and safety.
- KLC has constructed one of the nation's only Rocket Motor Storage Facilities (RMSF) available for both government and commercial use.
- Alaska has a first class engineering university and a highly diversified state workforce development program that provides exceptional vocation and technically trained personnel to the labor force.
- Alaska salaries rank near the top of the national average.
- No statewide personal income tax.
- State corporate taxes are highly concentrated in the oil industry.
- Alaska is financially sound, with budget reserves and a balanced budget (often with surpluses).
- Alaska is ranked #2 by the Tax Institute on their Best State Business Tax Climate
- The current global recession and corresponding fiscal problems have created significant constraints on state budgets, other than Alaska. Past state expenditures in other spacefaring states may very well be reduced or eliminated, providing opportunities for Alaska to increase our share of launch business.

Weakness –

- Alaska's geographic location is both a strength and a weakness. Being located a significant distance from potential customers and rocket manufacturers creates problems of cost and logistics support.
- KLC is located about 40 miles from the Kodiak Airport, along a single, paved, two lane road with limited alternative routes.
- KLC needs additional infrastructure to meet the increased lift requirements of potential customers, such as a third launch pad to facilitate medium-lift or rapid launch capability.
- Currently, the labor force does not have sufficient numbers of highly skilled aerospace laborers. Many skilled employees must come from out of state. But this is improving with the AAC college intern program and military recruitment initiatives.
- The Alaska market is very concentrated, with most economic power held by out-of-state corporations.
- In recent financial assessment reports, Alaska is ranked last or near the bottom of all states for doing business. The State of Alaska provides very little financial investment or initiatives for aerospace business development, compared with other states. In a business that is highly tied to government business and investment, the minimal state investment by Alaska is viewed as a negative indicator.

Opportunities –

- The competitive environment in the government and commercial space launch industry allows KLC to favorably compete for launches from industry leaders, such as Orbital, LM, SpaceX, Sandia, and ATK.
- AAC's positive reputation provides an opportunity to partner in other aerospace centric businesses wanting to do business in Alaska, such as Lockheed Martin GMD competition at Ft. Greely.
- The DoD direction to contract for cost-effective launches that meet mission objectives with minimal risk benefits AAC's position.
- The change to NASA Commercial Orbital Transportation Services (COTS) provides KLC with an opportunity to seek commercial space opportunities.
- The change in direction by the Obama Administration concerning manned space activities and space exploration has created unique opportunities for Alaska. With a significant drawdown in manpower and operations in Florida, Alaska has a large, skilled manpower market available in other states who may be willing to relocate. AAC will exploit these opportunities by targeting new launch customers and aerospace markets.
- The Department of Defense has seen consistent budget growth over the past ten years. While some programs associated with aerospace opportunities in Alaska have been reduced, cancellation of future test missile launches from KLC by the Missile Defense Agency (MDA), other government/military options remain strong. Providing a unique facility to conduct launches for growing niche markets makes KLC a strong contender for both additional small-lift/rapid launch and medium-lift launches which require polar orbits.
- The Department of Defense is rebidding the contract for operations of the Ground Based Midcourse Defense interceptor program at Ft Greely, Alaska. There is interest in two leading aerospace companies to bid on this contract, which is expected to be awarded in mid-2011. AAC has decided to team with Lockheed Martin as a partner to provide operations and maintenance support, should Lockheed Martin be successful in the competitive process.
- The transition from manned flight operations to unmanned flight is rapidly accelerating. The use of UAS, by both military and non-military agencies is increasing. Alaska has a strong potential to attract UAS business by both military and non-military customers.
- States are aggressively pursuing spaceport operations following passage of the Commercial Space Act in 1998. Alaska has a clear lead to build on with the fully functioning spaceport at KLC.
- The economic slowdown and world recession has placed tremendous financial burdens on other states competing in the aerospace business. California, Alaska's main competitor for space launch, is not in a good position to offer financial incentives to attract new launch customers.

- The retirement of the Delta II medium-lift rocket and the fielding of two new medium-lift rockets present an opportunity to become the new launch facility for either or both rockets for the next decades.
- Iridium Satellite Communications is building 70 satellites to replace their current constellation that is in polar orbits. Iridium has contracted SpaceX to provide six to ten medium-lift launches in 2015-2017 that can be launched from Kodiak.

Threats –

- US government contracts are subject to Congressional appropriations and may be changed, delayed, or terminated if future funding is not provided by Congress. Therefore, long term security that funding will always be available is a risk in any government dominated program.
- The amount of US debt is a national concern and indicators are that future actions to reduce the nation's debt may negatively impact the Department of Defense budget, reducing the size and cost of government programs.
- Changes in United States aerospace priorities are beyond the control of the State of Alaska. For example, current missile defense operations at Ft Greely could be curtailed or eliminated depending on federal actions.
- While operations at Ft Greely are expected to continue, ratification of the new Strategic Arms Reduction Treaty (START) creates a potential threat to long term operations in missile defense. These uncertainties create a risk to Ft Greely.
- In 2009, Congress terminated the Multiple Kill Vehicle (MKV) program and cancelled the Transformational Satellite (TSAT) program.
- The commercial rocket launch projections of the past have not been significant, as satellite communications systems have not progressed as rapidly as cell phone and fiber optics communications systems.
- Environmental issues pertaining to renewing its five-year federal permit, issued in 2006 under the federal Marine Mammal Protection Act, which the U.S. Commerce Department administers through the National Marine Fisheries Service and the National Oceanic and Atmospheric Administration, to allow launches over Stellar sea lion and harbor seal habitat could impact future operational capabilities if not renewed.
- Vandenberg AFB, California, is considered the "default" west-coast launch facility due to its legacy and their close proximity to rocket manufacturers in California, Arizona, and Utah. The new medium-lift rockets will go to Vandenberg unless Alaska makes a compelling argument to bring these programs to KLC.

Long Term Objective

AAC has leveraged past State and Federal funding to build the Corporation for future success. The long term objective of AAC will remain concentrated on the strategic priority of expanding rocket launch opportunities at KLC while diversifying the Alaska aerospace industry. In accomplishing this, AAC seeks significant revenue growth through increasing current operations, expanding into other related launch and aerospace opportunities, and seeking new business ventures which directly support the aerospace industry in Alaska. The combination of new launch opportunities and diversified aerospace growth will create a solid, sustainable foundation for the Alaskan aerospace industry. AAC will continue to leverage successful business development to capitalize on new opportunities as they arise, and continue to expand business that benefits the State and the people of Alaska.

Short-Term Objectives

To achieve the long-term objectives of this plan, AAC will seek to expand KLC to allow for additional small-lift, as well as medium-lift launches on the Orbital Taurus II or SpaceX Falcon 9, and enhance responsive launch capabilities. Furthermore, AAC will initiate programs in missile defense, UAS operations, integrated operations with the Alaska National Guard, and pursue development of a small, in-state aerospace support industry. AAC organized the short term objectives into sixteen categories, which will be discussed below:

1. Increase Small-Lift Launch Business
2. Further Develop Rapid Launch Capabilities
3. Develop Medium-lift and Rapid Launch Capabilities
4. Develop KLC as the alternate U.S. West Coast Launch Facility for National Security Objectives
5. Initiate Unmanned Aircraft Systems (UAS) Operations
6. Initiate Ft. Greely Missile Field Operations and Maintenance Support
7. Establish Aerospace Related Support Services in Alaska
8. Stimulate Aerospace Industry Investment in Alaska
9. Create Kodiak Economic Development Zone
10. Establish Alaska Aerospace and Missile Defense Technology Center
11. Attract and Retain a Highly Skilled, Professional Aerospace Workforce
12. Form Strong Alliances in Alaska
13. Maintain high Product Reliability and Space Flight Safety
14. Sustain a Safe and Healthy Workplace
15. Maintain an Environmentally Sound Operation
16. Generate and Sustain Annual Corporate Revenues

Objective 1: Increase Small-Lift Launch Business

AAC remains committed to small-lift launch services as a core competency of the business model. Since the first launch in 1998 by the U.S. Air Force, KLC has demonstrated a sterling reputation as a reliable and cost-effective launch facility. Beginning in 2007, AAC began an aggressive business development program designed to market the capabilities of KLC to other government and commercial customers. These efforts have proven successful with the U.S. Air Force decision to launch two Minotaur IV missions from KLC. On 19 November 2010, the first mission, STP-S26, was an outstanding success. The second mission, TacSat-4, is scheduled to occur in the second half of 2011.

AAC has identified 34 potential small-lift launches over the next nine years that could come out of KLC. These missions, which range from fully funded to conceptual missions, include customers from the Air Force, Operationally Responsive Space, NASA, and the scientific community. All potential customers are excited about the capabilities and responsiveness offered at KLC, which was clearly demonstrated during the Minotaur IV launch in Nov 2010. The U.S. Air Force, through Air Force Space Command, has also indicated a strong desire to conduct routine launches from KLC in future operational schedules. Small-lift launch capabilities can provide the baseline for sustainment of all operations at KLC. The objective of this plan is to develop a market

Table 2: KLC Mission History. KLC has successfully launched 15 rockets since 1998. The launches highlighted in yellow indicate winter launches.

YEAR	MONTH	SPONSOR	MISSION
1998	NOV	USAF	AIT-1
1999	SEP	USAF	AIT-2
2001	MAR	USAF	QRLV-1
	SEP	NASA/USAF	Kodiak Star
	NOV	USASMDC	STARS WCRRF
2002	APR	USAF	QRLV-2
2004	DEC	MDA	IFT-13C
2005	FEB	MDA	IFT-14
2006	FEB	MDA	FT04-1
	SEP	MDA	FTG-02
2007	MAY	MDA	FTG-03
	SEP	MDA	FTG-03a
2008	JUL	MDA	FTX-03
	DEC	MDA	FTG-05
2010	NOV	USAF	STP S26

for three launches per year of small-lift operations from KLC. These may be either government or commercial operations, or a combination under the new commercialization of space vision. As

stated by the President in his 2010 National Space Policy, *“The United States is committed to encouraging and facilitating the growth of a U.S. commercial space sector that supports U.S. needs, is globally competitive, and advances U.S. leadership in the generation of new markets and innovation-driven entrepreneurship.”*⁷

One aspect of this business sector is the ability for KLC to become the primary launch location for missile defense continued reliability testing (also called “aging and surveillance”) for the current system at Fort Greely. The U.S. Air Force has had a long history of rocket operations from silos across the United States using Intercontinental Ballistic Missiles (ICBMs). The U.S. Air Force conducts routine evaluations of missiles and crews through live launch operations at Vandenberg AFB. In doing so, they test the reliability and sustainability of the missile and provide crews the opportunity to conduct a live fire exercise. The primary purpose of aging and surveillance testing is to ensure the rockets maintained in the silos are functional, while also conducting numerous tests of the system to evaluate for potential future system improvements. As the missile defense system ages at Ft. Greely and the systems are modernized with technological improvements, sustainment and reliability evaluation launches from KLC are potentially feasible.

The Federal Government purchases the most small lift launches, yet there is still the potential for commercial small-lift operations at KLC. The Government, usually the Department of Defense or NASA, use small-lift to launch scientific and small communication satellites. Most commercial satellite programs are trying to launch multiple satellites on medium and heavy-lift rockets because the per-pound cost is lower (ie: for about three times the cost of a small-lift rocket, they can launch about 6 times the weight on a medium-lift rocket). While the commercial launch program is often tied with government launches, there still will be an opportunity for commercial satellite launches in the future whether they be for communications systems, imagery, or navigation. Therefore the potential for commercial KLC launches remains viable through civil mission and purely commercial enterprises. AAC will invest in pursuing commercial launch opportunities, as they present themselves in the changing technological environment.

⁷ Office of the President of the United States, “NATIONAL SPACE POLICY of the UNITED STATES of AMERICA”, page 3.

Objective 2: Further Develop Rapid Launch Capabilities

Rapid Launch is the ability to launch rockets on short notice to address national and international emergencies/contingencies. The primary payloads are communications, imagery, and GPS based systems. Rapid launch is an emerging market that holds significant interest for the Department of Defense (DoD). DoD



Figure 18: Earth Covered Magazine 1 (ECM1), shown above, is one of five planned bunkers that can hold a fully assembled solid rocket motor that is configured for rapid launch.

has an Operationally Responsive Space (ORS) office that is dedicated to developing rapid launch capabilities for the United States. According to General Robert C. Kehler, commander of US Strategic Command and former commander of Air Force Space Command, *“the country needs an ability to reconstitute, to replenish, to adjust to changing needs [to space systems]”* and Assistant Secretary of Defense William Lynn said *“by building systems on smaller satellites using modular components, ORS gives us the ability to rapidly augment our space systems.”* The June 2010 McDowell Group study said the following about the Kodiak Rapid Launch Project: *“Development of rapid (responsive) launch capability at KLC would position Alaska to play a key role in the Department of Defense’s new ORS initiative.”*



Figure 19: A Minotaur Stage 3 rocket motor stored in ECM1 at KLC. The Rocket Motor Storage Facility was put into use several days after ECM1 was completed.

KLC’s modern systems and the new Rocket Motor Storage Facility (RMSF) enables KLC to perform rapid launch missions, which cannot be done anywhere else in the U.S. Normal launch campaigns last 60-90 days, whereas rapid launch is a revolutionary capability that will reduce this

time period to a few days, or even hours. This will allow the U.S. to quickly launch satellites in response to any emergency. Senior DoD leadership is becoming increasingly aware that KLC, as a Rapid Launch Spaceport, provides a critical service to maintain national security in space. Rapid launch has civil applications as well, by allowing pre-built communication or observation satellites to be launched on short notice in the event of a major natural disaster to help coordinate the response of first responders and humanitarian relief efforts. Rapid launch is a prime business opportunity for AAC at KLC.

Objective 3: Develop Medium-lift and Rapid Launch Capabilities

Medium-Lift is an expanding market that AAC is well poised to capture due to AAC's existing workforce and infrastructure.

Medium-lift Launch Capabilities - There is a significant shift underway to utilize the new, low cost, medium-lift class launch vehicles. This market shift is due to four factors:

- Retirement of the Delta II rocket, the workhorse of the U.S. space industry with over 147 launches, 40 of which came from the west-coast.
- Development of two new rockets, the Orbital Taurus II and the SpaceX Falcon 9.
- NASA's Commercial Orbital Transportation Services (COTS) partnership agreements with U.S. industry totaling \$3 billion for commercial cargo transportation demonstrations.
- Significant increase of cost in the heavy-lift market, which may potentially drive more business to the medium-lift market with the new generation of low cost medium-lift rockets. The cost of heavy-lift rockets are projected to rise by more than 50% over the next few years to a cost of almost \$10 billion dollars⁸.

The shift to medium-lift capability represents a potentially significant market for AAC. Orbital and Space X are the two primary potential customers for medium-lift operations at KLC (described on pages 29-30). Both companies are aggressively developing medium-lift operational capabilities to meet demands for the next decade. Both companies will have to establish west-coast launch facilities which meet their future mission projections. They already have dozens of

⁸ Brinton, Turner "U.S. Air Force EELV Budget Expected to Skyrocket," *Space News*, 14 January 2011. Accessed online 23 Feb 2011 at <http://www.spacenews.com/military/110114-eelv-program-costs-skyrocket.html>

missions manifested for their new rockets (thirty for the Falcon 9 and nine for the Taurus II through 2017 so far). SpaceX successfully launched the first Falcon 9 mission in June 2010 and currently has manifested a list of 30 missions through 2017, with the majority being launched from Cape Canaveral, Florida for NASA resupply missions for the International Space Station (ISS). However, Space X has used Kwajalein Island for their small-lift demonstration rockets, and they are indicating that they will use Vandenberg AFB for the medium-lift Falcon 9. Space X is only in the planning and permitting process to launch from Vandenberg AFB, and the State of California has a tremendous state budget deficit which may preclude its ability to adequately fund its spaceport for the new rockets. This could have a negative impact on Space X future capabilities from Vandenberg AFB. Until SpaceX actually breaks ground on a new launch pad at Vandenberg, they can move their operations to another west-coast facility. However, this decision is very time critical, and it is likely that SpaceX will make a final commitment this year.



Figure 20: Orbital and SpaceX each have new medium-lift rockets under development, which are funded in part by the NASA Commercial Orbital Transportation Services (COTS) contract.

Orbital has not yet selected a west-coast operating location. Due the high costs of operations, the stringent environmental restrictions, scheduling constraints and security concerns related to operating from Vandenberg AFB, Orbital may be highly motivated to consider KLC as their preferred launch site for the Taurus II. Furthermore, the problems associated with developing a full spaceport operation at Vandenberg AFB may also present Alaska an opportunity to attract some or all of SpaceX and/or Orbital missions to KLC. This has the potential of establishing a significant, and reliable, launch revenue source for AAC. The medium-lift launch market has been very reliable over the last 20 years, and should continue to be strong for many decades.



Figure 21: Concept drawing of Launch Pad 3 at KLC with a medium-lift rocket on the pad. Launch Pad 3 will be the most modern launch pad in the country, utilizing decades of liquid fuel experience to make and intelligently designed facility with streamlined operations and low operating costs, which will attract additional business to KLC.

Medium-lift presents a possibility to secure Federal matching funds with emphasis on commercial space. According to the Commercial Space Act, *“the participation of State governments in encouraging and facilitating private sector involvement in space-related activity, particularly through the establishment of a space transportation-related infrastructure, including*

launch sites...and support facilities, is in the national interest and is of significant public benefit.” (49 USC, Chapter 701) Although Federal participation is not guaranteed, the current bipartisan support for commercial space as assured access to space will be fertile grounds for such a request, especially with strong state support.

The capital investment required to capture business in the medium-lift and responsive launch markets is based on proven designs and procedures in place at Wallops Island, VA (Orbital) and Cape Canaveral (SpaceX), making it a low risk investment.

Upgrades required include:

- Dedicated medium/rapid launch pad (Launch Pad 3).
- Vehicle Processing Facility (VPF) for medium-lift.
- Liquid fuel infrastructure.
- Rocket transporter/erector.
- Telemetry data package development.
- Pathfinder operation for system test.

These improvements represent an approximate \$85 million investment over three years. The required permits are in place, or in progress. Plans for the upgrades are prepared, with ground work design complete and initial facility designs at the 65% complete stage (and a lesser degree with SpaceX). The plans are currently being engineered with Orbital to ensure design compatibility with planned operations. A medium-lift launch industry in Alaska will create more business opportunities for other Alaskan businesses as well. Transportation, hospitality, and numerous other businesses will see significant increases related to the launch industry. A full discussion of these benefits is discussed in Objective 6.

Objective 4: Develop KLC as the alternate U.S. West Coast Launch Facility for National Security Objectives

Vandenberg AFB in California is the only Federal U.S. launch range that can launch spacecraft into polar and sun-synchronous orbits, which are used extensively for National Security and scientific payloads such as Earth observing satellites and low earth orbit (LEO) communications. Therefore, a disaster at Vandenberg could eliminate America's ability to launch critical satellites for months or even years. This limitation is obvious to many potential space-faring adversaries. Vandenberg is also located 60 miles from the active San Andres Fault and six smaller faults, which pose a risk to their launch facilities. These vulnerabilities, in addition to launch pad accidents such as the 1993 explosion of a Titan IV rocket, suggest that it is in the best interest of the U.S. to have a back up West Coast launch facility for National Security purposes. Such an arrangement exists today for East Coast launch facilities between Cape Canaveral and Wallops Flight Facility.

KLC complements Vandenberg's launch capability by providing additional launch capacity for critical payloads launched on small and medium-lift rockets. KLC has a proven track record of successful small-lift rockets, and medium-lift specific facilities that are planned for KLC will do the same for medium-lift rockets. KLC is designed for rapid launch capability in the event that a scheduled Vandenberg launch must be quickly remanifested for KLC. KLC is not designed to replace Vandenberg's abilities, but is a complementary spaceport and can provide strategic depth to launch National Security missions.

When a government customer arrives to perform a launch from Vandenberg, they expect to find a spaceport that is ready to support the launch campaign. This is reasonable because the government spends about \$300 million a year to sustain Vandenberg. Federal customers expect the same from KLC, yet the Federal government does not currently contribute to the annual sustainment of KLC, around \$10 million (3% of Vandenberg's sustainment budget). AAC's goal is to have the Federal government partner with the State of Alaska to support sustainment because KLC is a critical component of the U.S. space launch infrastructure without having onerous legacy infrastructure costs.

Objective 5: Initiate Unmanned Aircraft Systems (UAS) Operations

AAC is conducting the ground work to establish a viable UAS program in Alaska. Initially working with NOAA on a trade study for utilizing UAS's in Alaska, AAC believes that the opportunities for UAS operations in Alaska far exceeds the initial NOAA concept. However, the current NOAA effort has significant potential for the state.

- As NOAA seeks to better understand the impacts of climate change, their ability to gain real-time data over an extended period of time can be a significant source of information for developing future theories on climate change and the impacts created thereby.
- Use of civil application UAS also can provide many opportunities for emergency response and providing real-time dynamic imagery of forest fires, flooding, coastal erosion, and volcanic activity. Information derived for UAS operations in Alaska will be accurate and cost-effective.
- There is also an interest in using UAS's for Search and Rescue. The current system of manual/visual surveillance to track missing aircraft, snowmobiles, and people would be more cost-effective and significantly more accurate in the search phase, potentially saving more lives than using current systems. The Global Hawk synthetic aperture radar (SAR) can detect metallic objects through adverse weather conditions, helping rescue workers to focus on snowmachines, downed aircraft, and stranded vehicles.
- Fisheries enforcement and environmental monitoring are two aspects of UAS operations that could significantly benefit the State of Alaska. Using UAS's is a cost-effective means, with rapid and reliable information, to determine compliance.

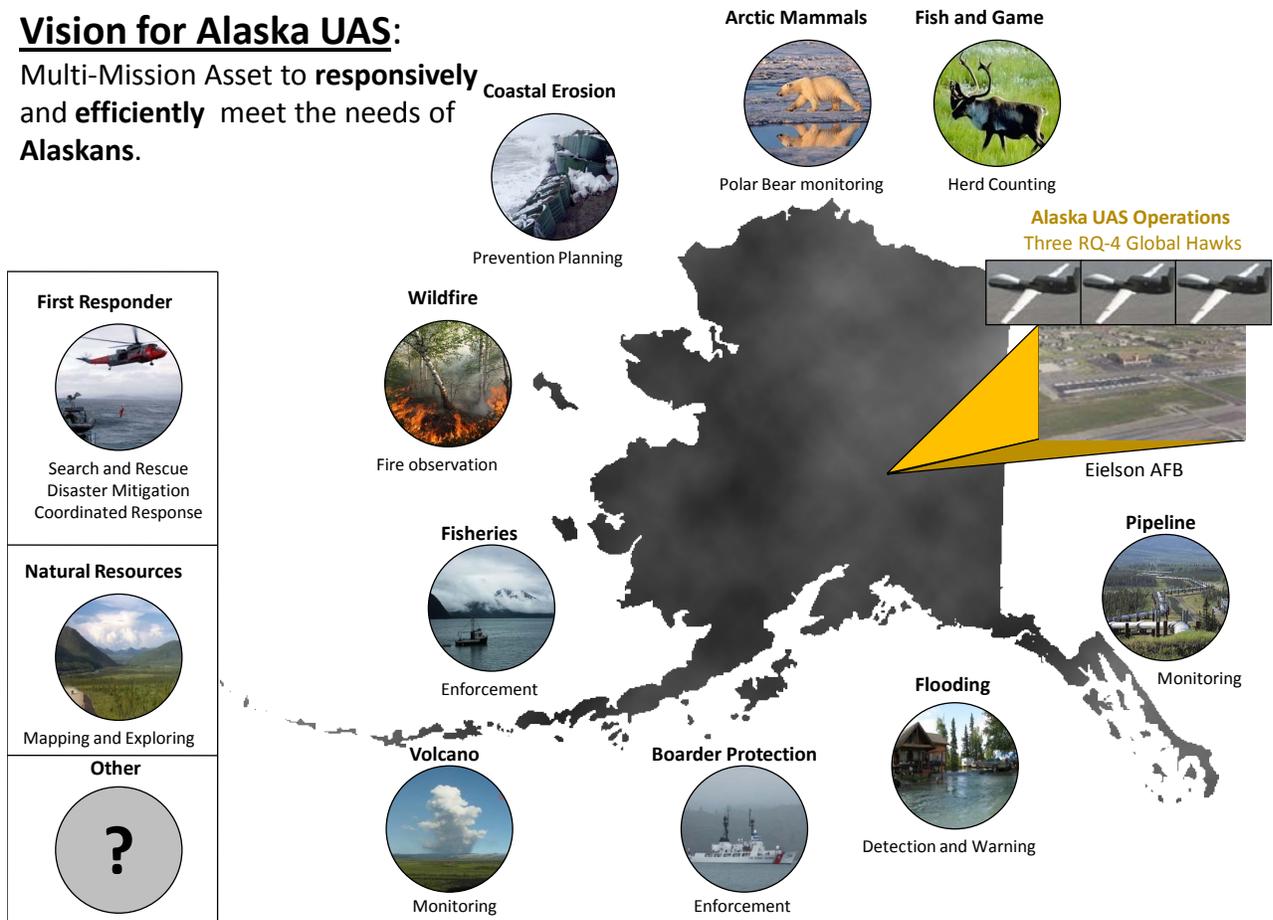


Figure 22: The Global Hawk UAS can fly over all of Alaska, even the outermost Aleutian Islands, in one flight from Eielson AFB.

- Natural resource development, such as oil and gas exploration, could benefit by having organic UAS capabilities that exist in Alaska.

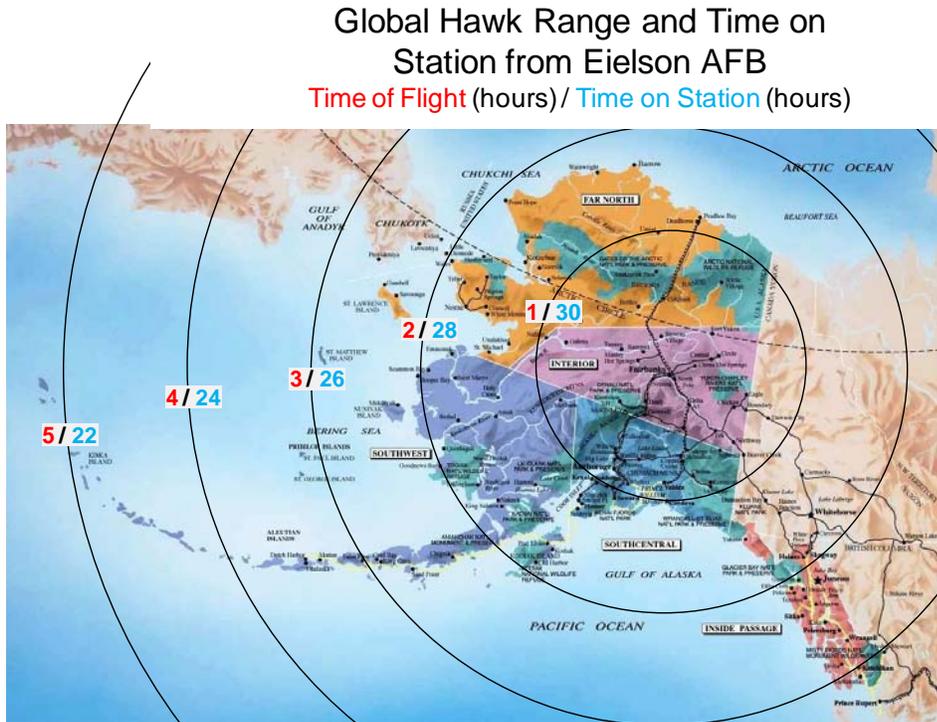
Vision for Alaska UAS:

Multi-Mission Asset to **responsively** and **efficiently** meet the needs of **Alaskans.**



The Federal Aviation Administration is currently developing rules and regulations for the use of UAS in the National Airspace System (NAS). AAC is working to develop the UAS program in Alaska and has been pursuing the potential operation of Global Hawks. A single Global Hawk UAS can remain airborne for 30 hours and cover the entire State of Alaska in one flight. The U.S. Air Force is tentatively planning on retiring some early version Global Hawk Block 10s in 2013 from active duty. AAC is working with the Alaska National Guard and Alaska Homeland Security to ascertain the viability of receiving some of these UAS for operation from Eielson AFB. The proposed concept of operations would include accepting the Global Hawk UAS by the Alaska National Guard and AAC for use as a military resource, integrated both active duty and reserve UAS operations worldwide. The state role would serve as a homeland security and surveillance of state resources. Ideally, the

Global Hawks could be used by state and Federal agencies for border protection, surveillance of the seas, reconnaissance of flood impacted areas or other natural disasters, surveillance of the Trans Alaska Pipeline, or other aspects important to non-military state and federal agencies.



More study is needed to ascertain infrastructure requirements and costs for operations at Eielson AFB, determination of the viability of operating Global Hawks in the cold climate conditions of interior Alaska, and the viability to access airspace for launch and recovery operations. Global Hawk operations

out of Eielson AFB also strengthen the base against future closure considerations. North Dakota was able to successfully retain Grand Forks AFB as an operational base in the Base Realignment and Closure (BRAC) actions of 2005 by converting the base to a National Guard UAS operation.

Objective 6: Initiate Ft. Greely Missile Field Operations and Maintenance Support

AAC is currently partnered with Lockheed Martin to compete for the Ground Based Mid-course Defense (GMD) contract, which provides ballistic missile defense for Alaska and the Continental United States. Contract submission was January 2011 with subsequent award tentatively scheduled for summer 2011. AAC is included in the proposal as a key Alaska partner on the Lockheed Martin team. A proposal win will likely add significantly to the revenues and size of AAC, which will see an expansion of operations in the Delta Junction area for Alaskan employment.

Under the contract AAC will:

- Establish a resident workforce and operations business unit in Delta Junction.
- AAC, with Lockheed Martin, will make reasonable efforts to hire Alaskans for the engineering and technical positions at the GMD Operations Office.
- AAC, with Lockheed Martin, will work with the University of Alaska to develop an Aerospace and Missile Defense Technology Center (AMDTC) in the Delta Junction and Fairbanks areas. The AMDTC would be the overarching mechanism for developing a sustainable missile defense industrial base in Alaska.
- As part of the AMDTC, AAC, in conjunction with Lockheed Martin will create workspace at Ft. Greely to provide for research and development, training and education, and office space for support to the aerospace industry and missile defense in Alaska.
- AAC will also work with the University of Alaska to expand the current student internship program to provide University of Alaska students with practical experience in aerospace and missile defense technologies, to generate a high rate of student absorption into missile defense in Alaska, and to increase the initial productivity level of new college hires in support to GMD.



Figure 23: Emplacement of Ground Based Interceptors (GBI) will be a major portion of the AAC work at Fort Greely.



Figure 24: Secretary of Defense Robert Gates visits Fort Greely with Senator Mark Begich in 2009. The GMD system is the primary component of the U.S. anti-ballistic missile system.

- AAC will work with the State of Alaska on workforce and facility development in support of sustained GMD operations in Alaska. This would entail being the primary state agency for coordinating activities in support of GMD operations in Delta Junction.

These dynamic program proposals have a direct benefit to Alaska. While the direction of missile defense has changed, indicators from within DoD validate that the administration fully supports the need for a comprehensive and effective missile defense program in the United States. Alaska's strategic global positioning for military operations has always played a significant role in Alaska's economic and community development. AAC's pursuit of an agreement with Lockheed Martin to support the GMD operation at Ft. Greely is designed to expand Alaska's recognized capabilities and workforce skills in the aerospace manufacturing and operating sectors of the state's economy and to develop a diversified sustainable model that expands high paying job opportunities for Alaskans and accommodates a growing body of engineering and technical professionals within the state, while broadening AAC's core business capabilities.



Figure 25: Lockheed Martin Team advertisement for the GMD contract.

Objective 7: Establish Aerospace Related Support Services in Alaska

Aerospace operations in the United States is an intricate network of government, both military and civilian, and commercial businesses involved in the operation and sustainment of our aerospace interests worldwide. There are a variety of services that reach beyond launch capabilities to support the aerospace industry, especially the future in unmanned space operations.



Figure 26: The PAVE PAWS radar at Clear AFS plays a critical roll in detecting threats to the United States. PAVE is the program name, PAWS stands for Phased Array Warning System.

The Obama Administration has determined that pursuit of increased commercial operations, in lieu of government owned and operated systems, is the most cost-effective means for delivering services as demonstrated by the Administrations strong support for the NASA Commercial Orbital Transportation Services (COTS) program. In that light, the U.S. military is looking at a more competitive environment for aerospace operations, which includes

more commercial contractors in the operation and sustainment of major systems.

While AAC is currently pursuing maintenance and operations support for the missile defense site at Ft. Greely as a partner on the Lockheed Martin team, there are other opportunities in Alaska which support aerospace missions. The U.S. Air Force, in support of Air Force Space Command operates the long range radar site at Clear Air Force Station (AFS), in Anderson, Alaska. The operational aspects of the mission are jointly conducted by U.S. Air Force and Alaska Air National Guard personnel, with a small contingency of Canadian personnel in support of the North American Aerospace Defense Command (NORAD) role at Clear AFS.

In 2001, Clear AFS was upgraded to the PAVE PAWS Solid-State Phased Array Radar System, but this remains separate from the missile defense warning system. Under current Department of Defense direction in support of missile defense, plans are underway to perform further upgrades at Clear AFS to integrate the station's radar system into the missile defense system operated at Ft. Greely. In doing this, the operations at Clear AFS would remain under the Air Force Space Command with data information being part of the surveillance information used in determining missile threats and providing targeting discrimination for the missile interceptors at Ft. Greely.

All logistics and support work at Clear AFS is the responsibility of the U.S. Air Force, with most work being conducted by contract services. Contract functions include most base support, and radar technical and maintenance functions. Contracted services also include base maintenance and support, logistics, transportation, food service, civil engineering, and medical care. There are currently approximately 50 Department of Defense personnel and over 200 contract personnel working at Clear AFS. Like the decision to expand into logistics, operations and maintenance support services at Ft. Greely, AAC considers contract logistics and support services at Clear AFS as a viable business development growth opportunity.

In the past decade the U.S. Air Force asked the Alaska National Guard to consider support operations at Eareckson Air Station (AS), Shemya Island, Alaska. The U.S. government uses Eareckson AS for two primary purposes. The first is to provide a secure airfield, with a paved, instrumented runway exceeding 10,000 feet in length in the North Pacific for trans-Pacific operations and/or emergencies. The other primary mission at Eareckson AS is support to the COBRA DANE radar operation. The current COBRA DANE radar is a phased array radar constructed in the mid-1970's. It is used to monitor space and missile activities in the western Pacific. In 1995 operations at Eareckson AS were converted to contractor services. As AAC expands operations in the support area beyond KLC, to potentially include Ft. Greeley and Clear AFS, Eareckson AS becomes a viable logistics and support opportunity within the state. With the interest of the U.S. government to continue operating Eareckson AS on a contract basis, AAC will have the opportunity to pursue contract opportunities there when the contract is reopened for bid. The combined Kodiak, Ft. Greely, Clear AFS, and Eareckson AS support operations, maintenance, and logistics support are a key strategic objective of AAC.

Objective 8: Stimulate Aerospace Industry Investment in Alaska

AAC will expand operations beyond small-lift launches at KLC to medium-lift and responsive launch capability operations. With this, it is envisioned that associated aerospace business opportunities will be presented for KLC. Working with the supply chains for space launch of small, medium, and responsive lift capabilities, AAC will focus on attracting associated businesses to KLC

in support of the launch operations. These businesses may be in areas such as satellite assembly, fuel/oxidizer supply, component fabrication, and engineering services.

Expanded operations at AAC will also increase the induced economic activity in the state. Northern Economics, an independent economic analysis group, has consistently demonstrated that AAC revenue induces a significant amount of economic activity in Kodiak, Anchorage, Cordova, and other parts of Alaska. As AAC expands into the medium-lift launch market and other aerospace operations across Alaska, this trend will continue. Major beneficiaries of AAC business are in the business of hospitality, transportation, telecommunications, and fuels. Construction will also receive a big boost for two years as the new launch pad and related infrastructure are built. Once medium-lift rockets begin launching from Kodiak, there is a high probability that other high tech aerospace jobs will move to Alaska to support these operations.

The State of Alaska, NASA, and AAC signed a Memorandum of Agreement in November 2010 which establishes a framework for cooperation in a variety of activities of mutual interest involving small satellite development, advanced aviation, space exploration, education, and science. This new agreement with NASA Ames Research Center, allows AAC to evaluate new aerospace business opportunities. The first task being pursued by AAC is an evaluation of existing ground tracking capability at KLC for potential use in support of

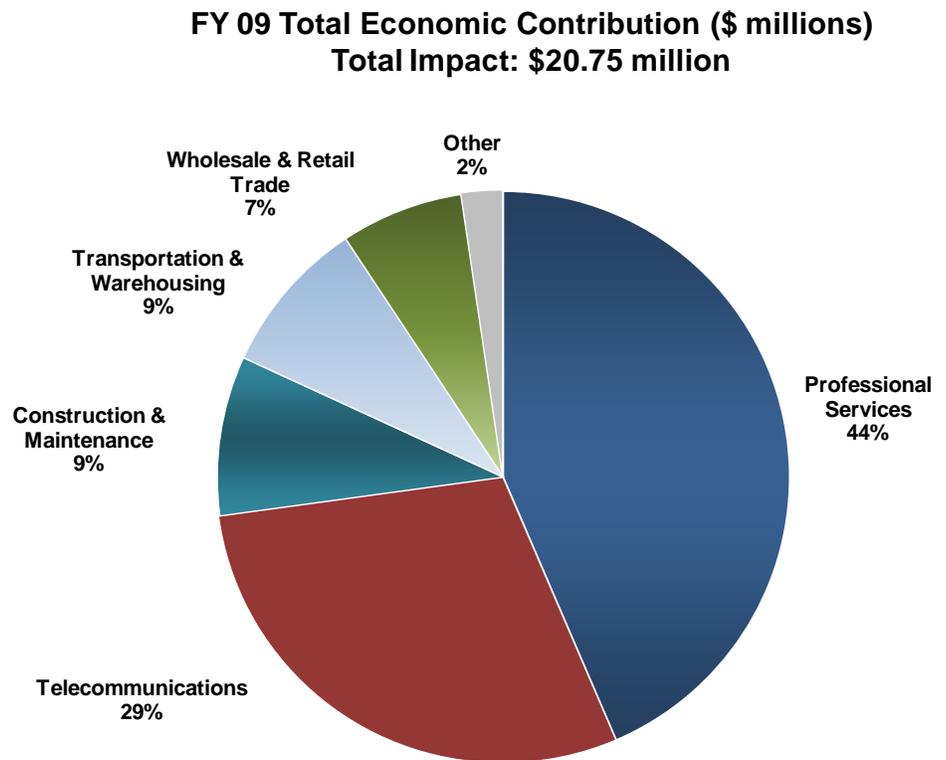


Figure 27: FY2009 AAC economic contributions to different industries as calculated by Northern Economics.

NASA's small satellite operations. It is foreseen that ground tracking capabilities could have additional uses that benefit AAC and provide a catalyst for further tracking, such as with NASA spacecraft.

Using vertical and/or horizontal integration, AAC will seek opportunities to invest in aerospace development. Expanding the core business of launches at KLC into a broad based aerospace corporation across Alaska means that investment and diversification into other compatible business opportunities will be pursued.

AAC will consider Joint Venture investment opportunities for aerospace support industry development. In this way, AAC will offer to participate with small businesses committed to relocating to Alaska or starting additional operations in Alaska. Using both the assets of the corporation and leverage of state-ownership, AAC will focus on establishing aerospace industry complementary businesses in Alaska. In the short term, development at KLC has tremendous potential, while future opportunities may exist in Delta Junction and Fairbanks should the Lockheed Martin proposal for missile defense at Ft. Greely be successful.

Objective 9: Create Kodiak Economic Development Zone

AAC will use land at KLC for investment opportunities. As part of this effort, AAC will market the advantages of KLC to national and international aerospace companies for operations and support industry development in Alaska. Action will be initiated by an Economic Development Zone on state-owned land at KLC for use in developing new aerospace industry investments.

The Kodiak Launch Complex is located on wholly state-owned land. In 1998 the Kodiak Island Borough was granted Free Trade Zone (FTZ) certification. As stated by the Kodiak Island Borough, the FTZ is primarily designed to support activities of AAC at the KLC. In conjunction with development of the FTZ, establishing an Economic Development Zone (EDZ) at Narrow Cape in Kodiak to support AAC operations would provide AAC with both legal and financial incentive opportunities to diversify the domestic and international aerospace presence in Kodiak. If KLC were designated an EDZ, under the authority of AAC, creative programs could be developed to incentivize economic development complementary to the aerospace industry.

Within the new Kodiak EDZ, AAC will seek statutory approvals to establish Economic Development Tax Credits, allowing the ability to establish tax incentive packages to attract new aerospace businesses to the EDZ. It is envisioned that tax credits will be earned through capital investment for property or equipment, creation of new, full-time jobs, or developing and providing specific aerospace training for existing or new employees in full-time positions. Legislation for establishing the Kodiak EDZ and providing the Economic Development Tax Credits will need to be approved by the Alaska legislature prior to establishment of the program

Objective 10: Establish Alaska Aerospace and Missile Defense Technology Center

If the Lockheed Martin proposal is successful, Lockheed Martin, AAC, and the University of Alaska will establish an Aerospace and Missile Defense Technology Center to train engineers and a technical Alaskan workforce. Regardless of the success of the Lockheed Martin Ft. Greely effort, AAC will work with the University of Alaska to develop the nucleus for an Aerospace Technology Center in Alaska. The University of Alaska currently has the Alaska Space Grant Program (ASGP) under a grant from NASA's National Space Grant College and Fellowship Program. ASGP is a consortium of universities and non-profit organizations that sponsor a range of programs to enhance teaching, research, and educational outreach within aerospace, earth science, and other related NASA research and Science, Technology, Engineering, and Mathematics (STEM) disciplines in Alaska. The ability to leverage this program with an increased emphasis by AAC and the University towards relevant space programs that benefit Alaska's current and future operations by AAC would strengthen the workforce and provide increased opportunities for space oriented business development.

If the Ft. Greely proposal is not successful, AAC will seek to develop an agreement with the University of Alaska to expand engineering and vocational training in Alaska to support aerospace industry expansion statewide, using the KLC as both a training and operational base.

By creating an Alaska Aerospace Technology Center, Alaska can provide an increased number of aerospace engineers each year, supporting a work force base that is better prepared to meet future aerospace operational needs in Alaska. Under this proposal, the Alaska Aerospace Technology Center would also include the Alaska Department of Labor's Alaska Vocational

Technical Center (AVTEC) and the Alaska Institute of Technology. AVTEC provides a plethora of vocational and technical training across the state, and under the Alaska Aerospace Technology Center concept, AVTEC would be a key provider of vocational training for the aerospace industry in Alaska. Initial training programs would be concentrated on the sustainment of KLC and associated jobs at Ft. Greely.

Objective 11: Attract and Retain a Highly Skilled, Professional Aerospace Workforce

The aerospace industry in the United States requires a highly skilled workforce. The State of Alaska created AAC for the purpose of attracting aerospace operations to Alaska, training Alaskan to fill aerospace related jobs, and creating commercial business ventures ensuring the continued growth of the aerospace industry within Alaska.



Figure 28: AAC workforce development since 2005.

As AAC expands and other businesses start operating in Alaska, the demand for both college graduates, with a high percentage being engineers, along with the need to ensure an adequate skilled technical/vocational labor force is available, will be paramount. The aerospace industry employs a higher percentage of college graduates than many other industries. It also employs a very high percentage of technically skilled laborers, as the work requirements in aerospace demand precision for success. The compensation and benefits packages offered by AAC must be competitive with other areas of the country. To ensure the long term viability of the industry in Alaska, AAC will continue to match personnel skill requirements against national average compensation packages to remain competitive.

Objective 12: Form Strong Alliances in Alaska

In working to implement the strategic goals and objective of this plan, AAC recognizes that strong alliances need to be formed with other Alaskan government, non-profit, and for-profit business organizations. Strong alliances will provide AAC the ability to educate Alaskans on the viability of an aerospace industry in Alaska, as well as develop a broad base of support within the business, academia, and government sectors for the aerospace industry in Alaska.

If alliances are not developed, the focus on achieving the strategic objectives may be diminished, as organizations pursue different objectives for aerospace development other than those identified by AAC. This fragmented approach can create an uncertainty in the confidence that the strategic goals are achievable, thereby reducing the chance for success. AAC will be out-reaching to strengthen existing alliances and develop new partners for the overall success of AAC.

As part of forming strong alliances, AAC will expand the layout and use of the public internet web site with more information and links. The AAC web site is an effective tool for communicating information and keeping alliances current on AAC operations and developments.

Objective 13: Maintain High Product Reliability and Space Flight Safety

AAC's goal is to deliver reliability, quality, and safety in launch systems and flight hardware. Processing and launching rockets is highly technical work which requires thousands of components to work together in order to achieve a successful launch. These components include mechanical, electrical, communications, pyrotechnics, computers, and structural systems. In order to deliver reliability, quality, and safety, AAC has instituted written procedures, mandatory safety training, and hands on management to make KLC a professional, standards-based organization. AAC also establishes rigorous configuration control over mission critical systems, such as the flight safety system, to ensure that any proposed changes to the system are fully understood and agreed to by a configuration change board before the changes are made. By establishing industry-standard best practices throughout the organization, AAC has established a solid reputation for reliability, quality, and safety.

Objective 14: Sustain a Safe and Healthy Workplace

AAC has maintained an impeccable workplace safety record in the nearly 20 years of operation. ACC provides direct employment for 44 individuals. As AAC expands, it is expected that the workforce will increase significantly. Workforce safety and employee health are important aspects of the organization and with the projected expansion in employee numbers, sustaining a safe and healthy workplace will be a key element to the corporation's success. The safety and health of the organization will be measured by the number of worker's compensation claims,

insurance claims, employee days absent from work, and safety reports conducted at the various work locations.

As a premier aerospace company, AAC strives to maintain safe operational standards. The complexity, integrity, and high costs of aerospace systems demands that customers trust in the ability to ensure safe operations when contracting services. AAC has a history of safe compliance in launch operations at KLC. This historically demonstrated ability to provide system operations to customers with minimal safety issues will be paramount as AAC expands operations and programs.

Objective 15: Maintain an Environmentally Sound Operation

The natural environment in which AAC operates is an important aspect of future development. Alaska is a pristine location and Narrow Cape, Kodiak is a designated under an Interagency Land Management Agreement (ILMA) as a multiple use area for recreation, livestock grazing, and rocket launches. AAC will develop an economically strong corporate presence which recognizes Alaskans appreciation of the environment. AAC will target Leadership in Energy and Environmental Design (LEED®) as the goal for all future construction projects.

To ensure that operations at KLC are conducted under strict environmental controls and in full compliance with state and federal law, AAC is seeking renewal from the National Marine Fisheries Service (NMFS) for authorization to take small numbers of marine mammals incidental to launch activities at KLC through 2016. Although no marine mammals have been injured or disturbed by any launch activity to date, this permit is required to continue operations. This application is a five year renewal request of an existing permit with minimal changes being requested. AAC will strive to ensure that the environmental impacts of operations are negligible.

Objective 16: Generate and Sustain Annual Corporate Revenues

AAC has operated at a ratio of 1:10 state investment dollars against federal investment dollars. As AAC matures from a development company to a sustaining operational company, that ratio will continue to have a positive economic benefit locally and across the state.

AAC, as a state owned independent enterprise, has a goal to become self-sustaining. However, over the next five years, state funding is anticipated to meet the operational and expansion requirements. The aerospace industry in Alaska is in the infancy stage. Other states

have far greater capabilities and have been operating in the aerospace business far longer than has Alaska. Also, other states have been historically providing state funding for the development and sustainment of the aerospace industry. However, the unique aspects of Alaska, both geopolitically and operationally, ensures that Alaska has a viable position for developing a competitive aerospace industry with other states and decreasing state funding requirements in the future.

AAC has transitioned from a development corporation to an operational corporation. The objectives in this strategic plan show a vision of future growth which expands business opportunities in the state and provides the foundation for solid growth in the aerospace industry over the next twenty years beyond small-lift launches from KLC. The continued expansion of AAC into other aerospace operations is essential for this plan to be successful. As AAC expands into other business lines, it is expected that the financial base for the corporation will be diversified, with higher levels of federal funds and/or commercial revenues being generated. This should result in a lower state financial burden.

Conclusion

The strategic direction charted in this plan by AAC creates the basis for establishing a diversified aerospace industry for Alaska, providing jobs for Alaskans, and bringing new opportunities to our state for business expansion. AAC has a proud history of developing the KLC facilities and has demonstrated resounding success of 15 launches through November 2010. We appreciate the significant investment made by the federal government to build the state-of-the-industry launch complex at Kodiak. The State of Alaska has also provided significant funding to develop KLC, recently investing \$7.0 million towards construction of the Rocket Motor Storage Facility (RMSF), which provides a unique opportunity for AAC to market Operationally Responsive Space (ORS) operations from KLC.

Our past has created a solid base for our future growth. As a state-owned-enterprise, AAC is committed to using our state assets to develop an industry that benefits our state by attracting new aerospace businesses to Alaska. Both the executive and legislative branches of state government have supported this direction. Due to this support, this strategic plan outlines an aggressive path towards expanding the aerospace industry state-wide. From our partnership with Lockheed Martin in support of Ground-based Midcourse Defense at Ft. Greely, to potentially operating Unmanned Aircraft Systems in Alaska, AAC will be pursuing new aerospace business ventures. By instituting economic development tax credits for the aerospace investment, to training our workforce for the technical skills required to operate in the aerospace industry, to establishing an Alaska Aerospace and Missile Defense Technology Center in conjunction with the University of Alaska, AAC will strive to stimulate aerospace industry investment in Alaska and retain a highly skilled, professional aerospace workforce for Alaska.

In the short-term, the future for AAC envisions expanding the facilities at KLC and attracting more small-lift launch contracts, while successfully entering the medium-lift market and successfully attracting a major space operations commitment to use KLC for west coast, polar launches. Timing is excellent, as the 2011 National Security Space Strategy specifically highlights the intention of diversifying the space industry in the commercial sector. To accomplish this, AAC will seek state capital investment support and sustainment funding for the next five years. AAC's

success means Alaska will secure a significant market share of the developing aerospace business for the next generation. Our chances are good and our competitive position is strong.

In closing, we want to thank the Alaska Aerospace Board of Directors for their time and commitment. Board members have been instrumental in guiding the corporation toward diversifying our business. They have endorsed this plan. We are more confident than ever that the best years for aerospace investment in Alaska lie before us. We will build upon our past to establish a strong aerospace industry for Alaska, creating a significant number of new, highly skilled, well paid jobs in Alaska, and making Alaska an aerospace leader for the twenty-first century.