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Aerospace States' Incentives To Attract The Industry

An Update

By Rosa Maria Moller, Ph.D.

Prepared at the Request of Senator Roy Ashburn

May 2008

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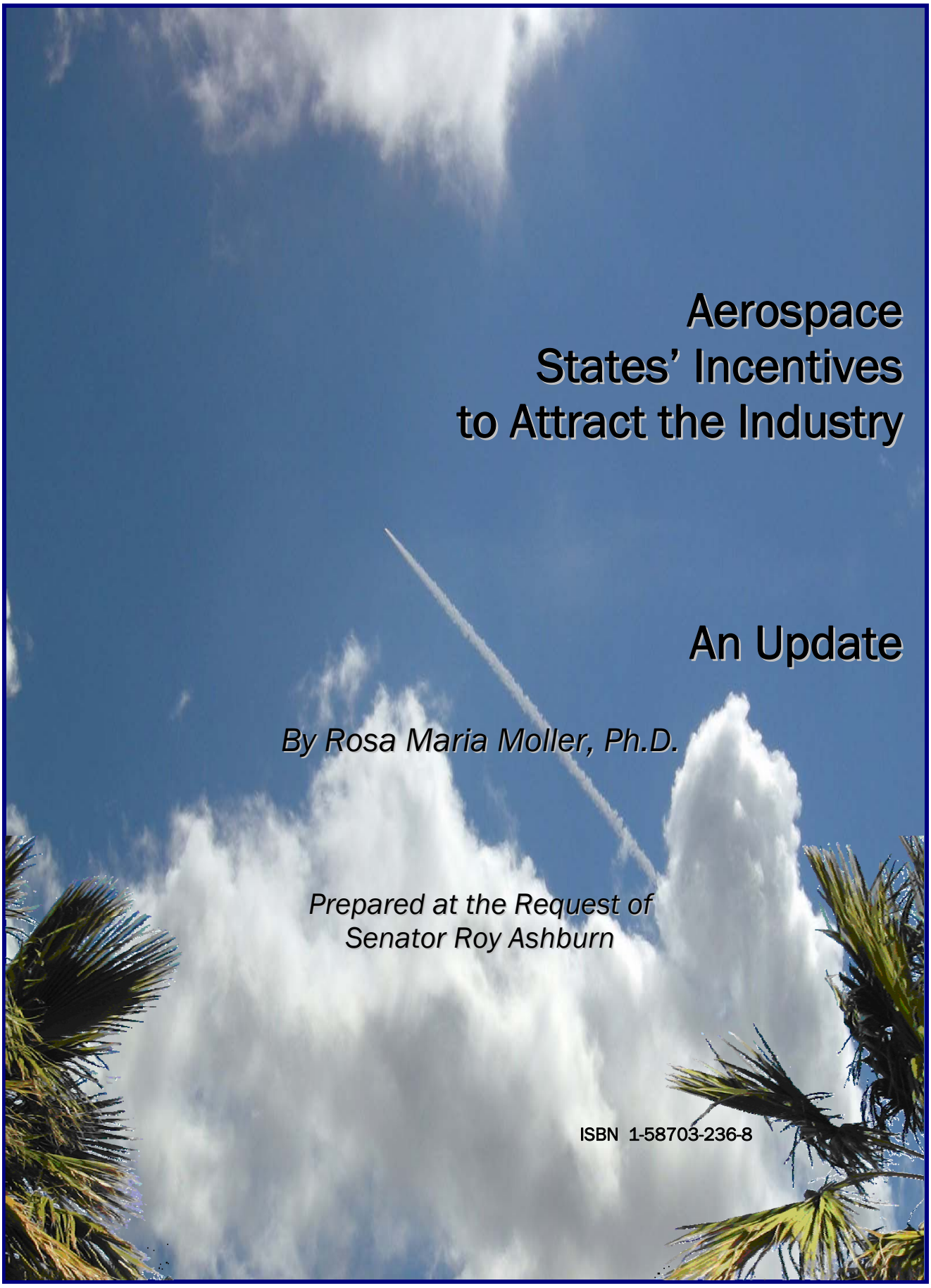

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Space Shuttle Enterprise

Photo Credit: National Air and Space Museum

EXECUTIVE SUMMARY

This paper originated from a request by Senator Roy Ashburn to update the California Research Bureau's report: "Other States' Incentives to Attract or Encourage Aerospace Manufacturing", published in June 1999.

Broadly defined, the aerospace industry includes the manufacturing sectors of: aircraft and related parts; guided missiles, space vehicles and related parts; and, search, detection, and navigation instruments.

Significance of the Aerospace Industry

The aerospace industry attracts the attention of policy makers because it contributes significantly to the economy of the state. The industry provides a number of well-paid jobs and is a spring board of innovation for other sectors. Historically, California has had a significant share of the U.S. American aerospace industry. Although this share has been declining, California still has the largest share of U.S. aerospace employment.

California has been losing aerospace jobs to other states. In the 1990s, the state lost about 166,300 aerospace jobs. By 1999, California employment in the aerospace industry was less than half of what it was in 1986. In 1986 California had almost one third of U.S. aerospace jobs, in 1990 it was 29 percent, reducing to 22 percent by 1998. In 2006 this share was 19 percent, but still above the California's share of U.S. average manufacturing employment (11 percent).

Between 1998 and 2006, the aerospace industry in the rest of the country lost 12 percent of its workforce, but California lost more than twice this amount. Most of the losses took place in aircraft and components manufacturing. During this period, Washington State's share of U.S. aerospace employment also decreased, while the number of U.S. aerospace workers increased for Texas, Arizona, Georgia, Ohio, and Illinois.

This paper includes a section on the history of California aviation and aerospace to emphasize the historical importance of this industry in California. The origin of the aircraft industry in the state dates from 1909, when Glenn Martin started his company which became an early hub of a network of giants of America's aviation.

A variety of factors contributed to the expansion of aerospace in the state, including favorable weather, a significant number of technological breakthroughs that took place in the state, and increased federal purchases of aircraft, particularly during the Second World War. Most of the conditions that attracted the industry to California are still in place. The state has a rich infrastructure of educational institutions and research centers. The presence of the aerospace industry in the state is still strong. Although complete airliners are no longer built in Southern California, there is a large subcontracting business. California has a strong electronics industry and a significant

proportion of aerospace electronic components and parts are produced in the state and the state has a leading role in space activities and programs with a variety of projects for unmanned vehicles developing in Southern California.

Policies to Enhance Industry Competitiveness

California can enhance the competitiveness of its aerospace industry by creating a more favorable business climate for the industry. Many states are trying to achieve this goal through a variety of policy incentives and other efforts offered to the industry.

Policies can be part of an integrated economic planning effort or just be independent efforts to increase capital and funding for different types of businesses or regions. Examples of integrated efforts are Enterprise Florida and the California Space Authority effort. These organizations have developed strategic plans for space related activities within their state. More independent efforts include enterprise zones, defense conversion, market development, export financing, strategic technology, and other policies targeted to promote selected activities.

Many programs share knowledge and information to promote growth. Other types of programs encourage the development of new technologies and help to provide financing for start ups in the industry.

States provide a variety of tax incentives to decrease costs of targeted industries and to influence factors that determine site plant location and expansions. The appendix of this paper has a summary of the various tax incentives that are offered by the 25 states with the highest share of U.S. aerospace employment. Tax incentives can be offered to specific industries or targeted to single projects. For example, California designed a variety of incentives to retain the Joint Strike Fighter program, including a hiring wage credit and a property credit for businesses involved in the program. These incentives expired in 2006.

Important factors that determine site plant location include labor costs, property costs, taxation policies, availability of skilled labor, access to research facilities, political support, access to capital, and quality of life (assessed by a variety of factors including infrastructure, weather, transportation facilities for employees, affordable housing, cultural events and amenities, a healthy environment, attractiveness of the community landscape, the quality of the educational system). To improve business conditions, the states typically offer tax incentives for investment, job creation, research and development expenses, property tax breaks, discounted rates for electricity, grants for worker training, sales tax breaks, infrastructure support, and others.

Policy Options

This paper suggests some policy options gathered from various sources including conversations with representatives of organizations that work with the industry. To stimulate investment and research in California, a reinstatement of a manufacturing investment tax incentive and increases in research and development tax credits are among these options. Other suggested policies mentioned in this paper are the creation and support of development programs that enhance the skills of California's workforce and the development of a strategy to recruit suppliers through partnerships with existing aerospace companies. One of the industry's major challenges is that companies will have to replenish their workforce as their current workers age and other high-tech sectors are recruiting the most talented. This happens in a context where the U.S. lags behind both Europe and Asia in producing college graduates with advanced degrees in science, math, technology, and engineering disciplines.

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INTRODUCTION

This report, requested by Senator Roy Ashburn, is a brief overview of the aerospace industry in California and updates information on incentives that other states offer to attract and retain aerospace industries reported in our previous report, "Other States' Incentives to Attract or Encourage Aerospace Manufacturing", published in June 1999.

The aerospace industry attracts the attention of policy makers because its contribution to the economy of the state: 1) aerospace provides a significant amount of well-paid employment; 2) aerospace exports have been an important source of growth for the state economy; and, 3) innovations in this industry have had significant spill-over effects to other industries (examples are the Global Positioning Systems (GPS) and weather satellites).

Broadly defined, the aerospace industry includes the manufacturing sectors of: aircraft and related parts; guided missiles, space vehicles and related parts; and, search, detection, and navigation instruments. In addition, there are related aerospace and aviation services such as air transportation services; air courier services; airport and airport terminal services; satellite communication services; and, space research and technology services. However, this paper focuses on the aerospace manufacturing industry rather than aerospace and aviation services.

The aerospace industry is one of the largest private industry sectors in California, employing more than 157,000 persons. Aerospace is a highly concentrated industry with relatively few firms, a capital-intensive sector that requires large amounts of investment and a high proportion of skilled labor. Compared to other manufacturing activities, the industry has relatively high labor costs and technology requirements.

HISTORICAL BACKGROUND OF THE AEROSPACE INDUSTRY IN CALIFORNIA

Origins of the Industry

The origin of the U.S. aerospace industry began in 1903 when Wilbur and Orville Wright demonstrated an airplane capable of powered, sustained flight. The French government was the first to negotiate with the Wright brothers for a license to their patents. The first sale of a military aircraft was made in 1908 when the Wright brothers provided one Model A flyer to the Signal Corps of the U.S. Army. In 1909, France and Germany, both aware of the military potential of aircraft, began producing aircrafts on a relatively large scale. By 1911, pilots were flying between European cities in competitive races. Between 1914 and 1918, 210,000 aircraft were produced worldwide.[1]

California's enthusiasm for flying began in the early 1900s, shortly after the success of the Wright brothers, and intensified during the 1920s. Favorable weather and

geography attracted pioneer aeroplane builders and pilots as well as military aviation activities to California. Pioneer events in aviation include:

1908: Aero Club of California

The Aero Club of California that was established in 1908 in Los Angeles (one of the first in the U.S.), and the first aviation show in California was organized by the Aero Club that same year. William Schoneberger, author of "California Wings. A History of Aviation in the Golden State", reports that members' exhibits included "gliders of Edgar S. Smith and W.J. Cochrane", "The Gyroplane", "a full-scale model of J.H. Klassen helicopter", and a "gasless" airship designed by A.L. Smith."[2][i] In 1910, the Aero Club of California acquired the Los Angeles Aerodrome, and members began to build flying machines. Also in 1909, San Francisco followed the Los Angeles example and the Pacific Aero Club was founded.[3]

1909: Glenn Martin - Powered Flight in California

In 1909, one of the first powered flights of "a heavier-than-air machine" in California occurred when Glenn Luther Martin flew 100 feet at an elevation of eight feet for 12 seconds.[4] Glenn Martin is credited with establishing the California's aviation industry since his Los Angeles factory (established in 1910) was an early hub of a network of giants of America's aviation that provided a base and training ground to many aviation pioneers, including Donald Wills Douglas, the Lougheads (Allan and Malcom)[ii], Jack Northrop, Gerard Vultee, Claude Ryan, Howard Hughes, and James Kindelberger (Douglas chief engineer and, later on, president of North American Aviation).[5]

1910: Glen Curtis

First Production Engine Designed to Power Aircraft

In 1910, Glen Curtiss (considered the father of American Naval Aviation) started the development of an airplane to operate from water.[6] The same year, E.J. Hall (Hall-Scott Motorcar Company in San Francisco) developed a four-cylinder aircraft engine, the first production engine designed to power aircraft.[7]

1911: First Aeroplane to Land on a Ship

In 1911, Eugene Ely initiated naval aviation history as the first aviator to land his aeroplane aboard a ship, flying from Selfridge Field in San Francisco and landing a Curtiss biplane on a cruiser in San Francisco Bay.[8] In 1915, Congress created the National Advisory Committee for Aeronautics (NACA) to support aeronautical research.

[i] During the early history of aviation, airplanes were generally referred to as airships. Later, airship referred to a gas filled aircraft like dirigibles and hot air balloons.

[ii] The spelling of the Loughead name was changed to Lockheed by 1926.

1916: Loughead Aircraft Manufacturing Company	In 1916, Allan and Malcom Loughead established the Loughead Aircraft Manufacturing Company in Santa Barbara and began work in a garage on the F-1, which first flew in March 1918. This was a ten-passenger flying boat with a 74-foot wingspan.[9] The Loughead Aircraft Manufacturing Company went bankrupt in 1921.[10]
1917: First Wind Tunnel at Caltech **North Island, San Diego**	In 1917, the Throop Polytechnic Institute in Pasadena (Caltech since 1920) built its first wind tunnel,[11] and the same year, North Island, San Diego, was considered the most important training site for U.S. military aviation pilots (The House Armed Services Committee declared it, by resolution, "The Birthplace of Naval Aviation").[12]
1919: Waterman Aircraft Manufacturing Company	In 1919, Waldo Waterman started Waterman Aircraft Manufacturing Company in Venice, California, to develop and produce the Mercury Gosling for the Mercury Aviation Company.[13]

The Expansion in the 1920s

World War I stimulated American aviation leading to a production of nearly 14,000 airplanes from April 1917 to November 1919.[14] In the 1920s, Europeans and Americans competed in aircraft manufacturing, leading to many refinements in design and performance. During this period, the transition of aviation from a craft to a scientific discipline started to take place. California's leadership in aeronautical research and development began during this decade. In 1922, only five American colleges[iii] had programs in aeronautical engineering and California had two of them.[15]

Important developments in aviation that took place during this period include:

1920's: USC	In the 1920s, the University of Southern California began to be involved in aviation.
1920: Davis – Douglas Aircraft Company	In 1920, David R. Davis and Donald Douglas created Davis-Douglas Aircraft Company with the intent of building a biplane for transcontinental nonstop flight, the Cloudster, the first airplane to lift its weight in payload. The Cloudster was built in Santa Monica in 1920. However, it did not accomplish the goal for which it was designed, and after being rebuilt, it was used for sightseeing trips around Santa Monica and Venice and was eventually converted by Claude Ryan (1924) to a passenger airplane.[16] In 1921, David R. Davis sold his interest in the business to the Douglas family.[17]

[iii] These institutions were the Massachusetts Institute of Technology, the California Institute of Technology, the University of Michigan, the University of Washington, and Stanford University.

In 1924, the Douglas World Cruisers made the first around-the-world flight, and Douglas entered the international market after receiving an order for versions of this plane.[18] During the 1920s Douglas Aircraft Company became the largest provider of aircraft to America's military forces."[19]

Mid 1920's: Kinner Airplane and Motor Corporation

By the mid 1920's, Kinner Airplane and Motor Corporation was producing "business, pleasure, and sport" aircraft in Los Angeles, and later, at Glendale Airport.[20]

1922: Ryan Flying Company and the Spirit of St. Louis

In 1922, T. Claude Ryan opened the Ryan Flying Company and later on built the company that produced Charles Lindbergh's Spirit of St. Louis in San Diego.[iv] The Ryan M-1/M-2 (1925-1927) was the first production monoplane in the country. It was used to open the Los Angeles-Seattle airmail service managed by Pacific Air Transport, which later became United Air Lines."[21]

Spirit of St. Louis

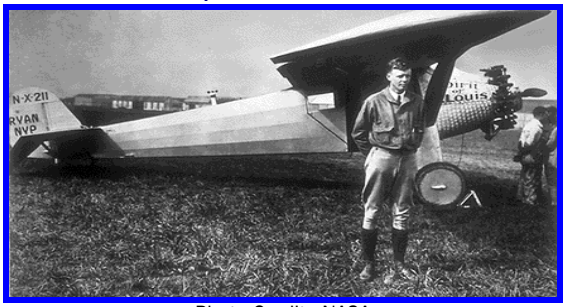

Photo Credit : NASA

1926: Stearman Aircraft Company

In 1926, Stearman Aircraft Company formed in Venice, where many popular light airplanes were designed.[22]

Lockheed Aircraft Company

In 1926, Allan Loughead and Kenneth Jay, a financial organizer formed Lockeed Aircraft Company.[23] Their first product was the Lockheed Vega, the first airplane flown over both polar regions. Vega airplanes were flown by Frank Hawks (who set a transcontinental record flying from Burbank to New York), Charles Lindbergh; Amelia Earhart (the first woman to cross the Atlantic), Wiley Post (who flew for the first time around the world); Sir George Hubert Wilkins (first trans-Arctic flight); Carl Ben Eielson (who made the first flight over Antarctica); and, Roscoe Turner

[iv] On May 21, 1927, Charles A. Lindbergh completed the first solo nonstop transatlantic flight in history, flying his Ryan NYP "Spirit of St. Louis" 5,810 kilometers (3,610 miles) between Roosevelt Field on Long Island, New York, and Paris, France, in 33 hours, 30 minutes. Source: Smithsonian National Air and Space Museum. "Milestones of Flight." At http://64.233.167.104/search?q=cache:8d-oLR67jBEJ:www.nasm.si.edu/exhibitions/GAL100/stlouis.html+The+Spirit+of+St.+Louis%22&hl=en&ct=clnk&cd=4&gl=us.

(who set seven transcontinental speed records).[24] In 1929 a holding company (the Detroit Aircraft Corporation) bought control of Lockheed and other companies, but it went into receivership when the stock market collapsed.[v] A consortium bought the Lockheed Aircraft Corporation, initiating the current company (Lockheed Corporation).[25]

Lockheed Vega

Photo Credit: NASA

1928: Northrop Aircraft Corporation

In 1928, after working with Donald Douglas in Santa Monica and Allan Loughead on the Vega, Jack Northrop left Lockheed to establish, with Ken Jay, the Avion Corporation in Burbank. Avion designed the Northrop Alpha aircraft (a single-engine all-metal passenger and mail plane) that was produced for TWA, the Department of Commerce, and the Army Air Corps.[26] Avion was purchased by United Aircraft and Transport Corporation in 1929 and operated as the Northrop Aircraft Corporation until 1931.[27]

The Decade of the 1930s

Many refer to the period from 1927 through the 1930s as "America's Golden Age of Aviation".[28] The turning point when the aircraft manufacturing center shifted from east to west was in the mid 1930s.[29] In 1929, New York totaled $17.2 million in aircraft production, while California only $4.9 million. By 1937, California was the leading producer of aircraft products, totaling $51.9 million annually, significantly higher than New York (second larger manufacturer) with $15.5 million.[30] This was a period when aircraft became more sophisticated and the aircraft business started to integrate component manufacturing and assembly within one firm.[31] In 1938, Germany began aggressively producing military aircraft, while Britain and France started to compete and increased their orders from the United States. This further stimulated the American industry. In 1939, aircraft manufacturing in the state was a big business. California

[v] A company goes into receivership when a receiver is legally appointed to run the company and administrate its assets.

designed and built about 55 percent of the nation's planes. Only the major players such as Lockheed, Douglas, Vultee, Northrop, North American, Menasco[vi], Consolidated Aircraft, and Security Aircraft[vii] manufactured airframes.[32]

A variety of factors drove the expansion of the California industry, including: 1) a number of significant innovations that took place in the state; 2) increased federal purchases of aircraft, particularly around the Second World War; 3) the expansion of a number of educational institutions that offered specialized training in skills used by the industry (for example, the California Institute of Technology, the University of California at Los Angeles, and the University of Southern California); and, 4) the success of California industry in preventing the unionization of the labor force.[33]

During the 1930s, many interesting events took place. For example:

1932: Northrop Corporation

In 1932, Northrop together with Donald Douglas formed a new Northrop Corporation in El Segundo, as part of Douglas Aircraft. This subsidiary concentrated on military aircraft development, including the BT-1, which evolved into the SBD Dauntless that became crucial for the U.S. Navy during WW II.[34] By 1934, Northrop Corporation had more than 1,000 employees. In 1939 Northrop participated in forming a fourth company, since he wanted to move on from production to development work and design. This was Northrop Aircraft Incorporated in Hawthorne, California.[35]

1932: Hughes Aircraft Company

In 1932, Howard Hughes Jr., the famous and colorful millionaire, combined his passion for movies with his passion for airplanes and formed Hughes Aircraft Company as a division of the Hughes Tool Company. In 1935, Hughes with Glenn Odekirk and Dick Palmer, built the H-1 Racer in a Glendale hangar, which included every concept to gain simplicity and efficiency then known, including a retractable landing gear, a fully enclosed cockpit, and the first use of flush rivets. The H-1 set various speed records

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[vi] In 1926, Albert Menasco established Menasco Manufacturing in Los Angeles. According to information from the site *Kensaviation.com*, "the company's first product was an air-cooled rebuild of a Salmson radial. In 1929, Menasco introduced the 4-A, the first of what was to become its main product line, the inverted, in-line engine." Menasco small engines were popular with racers. After the Second War, the company ended engine development and manufacturing. Later on, Menasco Aerospace was recognized for its landing gear. It became part of Coltec Industries and was acquired by Goodrich Aerospace in 1999. From: Kensaviation.com at: www.shanaberger.com/menasco.htm.

[vii] Security National Aircraft Corporation (1932-1936) was owned by Walter "Bert" Kinner. By 1933 Security National Aircraft offered a low wing, single-place monoplane, the Security Airster. Source: The Legacy, Downey California NASA Site Story at:. http://www.aerospacelegacyfoundation.org Also see Schoneberger, William A. "California Wings. A History of Aviation in the Golden State." Indsor Publications, Incorporated Woodland Hills, California. 1984, p. 43.

during the following few years, including a transcontinental speed record in 1937.[36]

1934: Ryan Aeronautical

In 1934, T. Claude Ryan created Ryan Aeronautical in San Diego. Ryan had ownership in several previous companies, one of which was also called Ryan Aeronautical. The first design of the second Ryan Aeronautical was the Ryan-ST, a two-seat, open-cockpit aircraft.[37]

1935: DC-1 Establishes Records

Douglas Aircraft Company developed the DC-1. While only one DC-1 aircraft was produced, the prototype and test model demonstrated its superiority versus the dominant airliners at that time, the Ford Trimotor and Fokker Trimotor. By the middle of 1935, the DC-1 had established 19 world records for speed, payload, and range feats.[38] This prototype was the foundation for the DC-3, which became one of the most successful airplanes in history, credited with revolutionizing the course of World War II. In turn, the DC-3 provided the basis for future Douglas transport aircraft.[39]

Douglas Aircraft Company DC-3

Photo Credit: Library of Congress

Consolidated Aircraft Corporation

Consolidated Aircraft Corporation moved to San Diego Harbor and started operations in 1935. This company was created in 1923 and had moved from Rhode Island to Buffalo, New York. Consolidated was famous for its flying boats of the 1920's and 1930's culminating with the PBY Catalina (the first model flying from San Diego Harbor in 1936) and PB2Y Coronado models.[40] Consolidated Aircraft Corporation became one of the most active aircraft production companies. One of the most famous Consolidated aircraft was the B-24 Liberator that first flew in 1939. The Boeing B-17 and Consolidated B-24 were critical for the U.S. Army Air Force's air campaign during the Second World War.[41]

Consolidated B-24 Liberator

Photo Credit: NASA

North American Aviation Moves to Inglewood, CA

In 1935, James Kindelberger, the president and general manager of North American Aviation, who had worked for Douglas in Santa Monica, moved North American Aviation to California, after receiving an order from the U.S. Army that led to the production of the AT-6 Texan, one of the most durable training aircraft. North American Aviation (later on North American Rockwell Corporation, Rockwell International (1996), and now a subsidiary renamed Boeing North American[42]) had been established in 1928 as a holding company in Delaware, sheltering companies such as Fokker, TWA, and Eastern Air Lines. In 1934, the company switched to aircraft manufacturing. The original aircraft manufacturing company was established in Dundlank, Maryland and moved to Inglewood, California in 1935. The North American Aviation Inglewood plant started with 250 employees. A contract by the Army Air Corps for O-47 production established the company as a producer of advanced tactical military aircraft.[43]

1938: Lockheed Provides Military Aircraft to the British

In 1938, Lockheed received an order from the British Air Ministry for more than 200 Hudson reconnaissance aircrafts, placing Lockheed in the international military market.

1939: Ames Aeronautical Laboratory Established at Moffett Field

In 1939, The National Advisory Committee for Aeronautics (NACA)'s Ames Aeronautical Laboratory was established at Moffett Field, near Sunnyvale, to perform exploratory and developmental flights and testing in wind tunnels. Over the years, Moffett Field became a major center for the development and testing of new aircraft and flight-related technology. In the early years, the center specialized in flight research for the military. The location of the center was chosen for its good weather, moderate temperatures, and low air traffic.[44]

The Second World War Period

After the United States joined the war in 1941, President Franklin D. Roosevelt set production targets, which led to the expansion of new facilities and factories running 24 hours a day, six to seven days a week. World War II began a differentiation among the aircraft producers. American companies such as Boeing, Martin, and Douglas became developers of bombers. Curtiss, Grumman, and Lockheed focused on fighter manufacturing.[45]

During the Second World War, the industry grew rapidly in California, and as it grew, many specialized aircraft parts and supply companies were established in the Southern California-Los Angeles area.[46] This economic prosperity was driven by federal military spending. In the period including the fiscal years from 1940 to 1946, California received about 35 billion out of the 360 billion dollars spent by the federal government and in fiscal year 1945 alone, the federal government spent more than eight and a half billion dollars in California. Aircraft accounted for nearly 60 percent of the federal government spending under prime contracts for goods manufactured in California.[47] According to Walton Bean, "in 1933, all the airframe factories in Southern California together employed only about 1,000 people" while "in November 1943 they employed 280,300".[48] Data on the aircraft assembly industry in Los Angeles alone indicates that employment increased almost 12 times between 1939 and 1943.[49]

Important developments for California aviation that took place during the 1940s include:

WWII Production in California: **Douglas Begins Construction of Long Beach Facility**	In 1940, Douglas began construction of the Long Beach facility where a variety of aircraft were produced (A-20B, C-47A, and A-26B). Douglas also established plants in Oklahoma (Midwest City) and Illinois (Chicago).[50] At peak wartime production, Douglas had 160,000 employees, including more than 5,000 engineers, and produced more than 300 aircraft per month.[51]
Northrop	Northrop Corporation's first aircraft order came from a foreign government (Norway) in the early 1940s. In 1941, the Army Air Corps contracted for two airplanes that resulted in the XP-61 Black Widow, a night fighter and radar-equipped interceptor. In 1942, Northrop Aircraft had a significant base of subcontracting and licensed manufacturing and became America's 13th largest airframe producer.[52] In 1946, Northrop entered the missile business with the development of the first intercontinental missile, the SM-62 Snark.[viii]
Lockheed	Lockheed's employment peaked at 93,000 during the period July 1940 to September 1945, when the company produced about

[viii] A missile is a self propelled explosive projectile used as a weapon to destroy a target.

19,000 airplanes (5,600 patrol bombers, 2,750 B-17s, and nearly 10,000 P-38 lightning bombers). Production took place mostly in Burbank facilities (which were carefully camouflaged) and ten feeder plants across the state.[ix] [53] Significant Lockheed airplanes in the 1940s include the Constellation, which first appeared as a C-69 military transport, "the piston-powered Neptune, which initiated Lockheed's supremacy in naval antisubmarine warfare", and the P-80, the first U.S. production jet fighter.[54]

Consolidated-Vultee – Convair

Consolidated-Vultee Aircraft was formed in 1942 when Consolidated Aircraft was acquired by Vultee.[x] The new company name became Convair. Convair's main products include delta-wing aircraft (F-102, F-106, and B-58) and the massive B-36 bomber, commonly referred to as the "Peacemaker" because of its capacity to transport nuclear weapons.[55]

Convair B-36 Peacemaker

Photo Credit: United States Air Force

North American Aviation

Between January 1939 and September 1945 North American Aviation produced 42,683 military aircraft (14 percent of all aircraft produced by U.S. manufacturers during the war, and 10,000 more than Convair, its closest competitor).[56] Among the achievements of this company are: 1) the North American F-86 Sabre (also referred to as Sabrejet), the first "high-performance, swept-wing, turbojet-powered tactical aircraft" that in 1948 set a new world speed record of 670.981 miles per hour;[57] and, 2) the North American P-51 Mustang, initially designed for the British as a medium-altitude fighter and later powered by a Rolls-Royce Merlin, became the superior American fighter of the war.[58]

[ix] Feeder plants were established in Bakersfield, Fresno, East Los Angeles, Santa Barbara, Taft and Pomona, and a service depot at Van Nuys airport.

[x] Centennial and KenAviation sites indicate that Convair was formed in 1943. However, San Diego Air and Space Museum indicates in its site the same date reported by Shoneberger (1942).

The North American F-86 Sabre
The plane shown here was fitted with special instrumentation for transonic flight research conducted by the Ames Laboratory.

Photo Credit: NASA

Hughes Company

During the Second World War, the Hughes Company designed and developed several prototype aircraft. The most famous was Hughes H-4 Hercules, referred to as the "Spruce Goose". At the start of the war, Hughes Aircraft had only four employees, by the end it had 80,000.[59] During World War II, the Hughes Aircraft Company built numerous subassemblies for other aircraft companies, including wings and rear fuselage sections for Vultee BT-13 trainers.[60] Hughes' companies also led the American production of aircraft ammunition belts at that time. A well known project was the XF-11 (later XR-11), a fast, long-range reconnaissance aircraft for the U.S. Army. Hughes almost lost his life during the maiden flight of this plane in 1946.[61]

Hughes H-4 Hercules over Long Beach Harbor

Photo Credit: United States Army

Aerojet

Aerojet Engineering Corporation was founded in 1942 by a group of scientists led by Dr. Theodore von Karman (Caltech professor). The company's first product, the Jet Assist Take Off (JATO) rocket motor, provided power for U.S. military planes during the war.[62]

Rohr Aircraft Company

Frederick Hilmer Rohr, who grew up in San Francisco and created the fuel tanks for Charles Lindbergh's Spirit of St. Louis, founded Rohr Aircraft Company in 1940. Rohr, referred as the "artist with metals", had a vision that fit perfectly with the massive military plane production driven by World War II.[63] During the aircraft industry transition from mostly experimental to large scale production, Rohr saw the necessity for a manufacturing subcontractor that could provide structural assemblies to prime aircraft producers. Currently, Rohr Corporation is known as Rohr Incorporated, a subsidiary of the B.F. Goodrich Corporation and is headquartered in Chula Vista. Rohr Incorporated produces sub-assemblies for numerous companies, such as Boeing and Airbus. Rohr also manufactures a variety of other formed metal products, including parts for rocket motors.[64]

Advanced Aircraft Development at Edwards AFB

In October 1942, the first flight of the first jet-propelled airplane in the United States, Bell XP-59A Airacomet, took place at Muroc Field (today Edwards Air Force Base). During the same time, tests began on Northrop's Flying Wing. On October 14, 1947, Second Lieutenant Chuck Yeager broke the sound barrier for the first time in level flight in an experimental Bell X-1 at an altitude of 45,000 feet. The Mojave desert has been a center of aeronautical accomplishment since then.[65]

Bell X-1

Photo Credit: NASA

The Post World War II Period

Industrial Activity After the War

After WW II, the high level of activity triggered by the war was no longer required. The aircraft industry went into an abrupt decline in both the United States and Britain. By 1948, aircraft employment in Los Angeles alone decreased by 77 percent from the war peak. Still, Southern California continued being the most important center of aircraft production in the country at that time.[66]

The aircraft industry expanded again during the Korean War in the early 1950s and the Vietnam War in the late 1960s.[67] Among the military aircraft used in the Korean War were the Lockheed P-80 (later the F-80), the Lockheed F-94B, the North American Aviation F-86, and, the Douglas B-26. By the mid-1950s, the "Century" series of fighters (fighters from various companies having an "F" designation of 100 or higher) with supersonic performance in level flight were introduced. The North American Aviation F-100 was the first production aircraft capable of flying supersonically.[68] By 1955, 52 percent of all aircraft operated by airlines throughout the world were built by Douglas. In the commercial airliner market, the Douglas DC-8, a four-engine jet airliner manufactured from 1958 to 1972, competed with the Boeing 707. Both revolutionized aviation and the world's travel patterns.[69]

In the early to mid 1970s, there was a recession and a new reduction of military spending. During this period, aerospace industry's employment dropped 25 percent, and Lockheed, one of the Los Angeles area's most important employers, was able to avoid bankruptcy only with loan guarantees from the federal government.[70] After recovering, the industry also experienced a downturn in the early 1990s as defense spending fell sharply with the end of the Cold War and the demand for commercial aircraft reduced significantly when the world entered a recession.

Structural Changes in the U.S. Aerospace Industry After the Second World War

By the end of World War II, airplane production in the United States centered on design, major assembly, and integration of systems in the aircraft companies rather than manufacturing all components of an aircraft.[71] A decline in defense funding and a contraction of commercial markets led aerospace companies to look for ways to integrate individual strengths, talents, and other resources.

The industry became more complex as, in addition to aircraft manufacturing, the aerospace industry included the development of electronic products and missiles. With the beginning of the Cold War, the development and production of guided missiles and the space age started as the U.S. had to compete with the Soviet Union's technical leadership in this new field.

The computer was one important technological breakthrough for aerospace. Its introduction changed the development process by introducing digital modeling and

simulation; computer-aided design (CAD) with computer-aided manufacturing (CAM). A significant proportion of aerospace related electronic components have been produced in California, with many of these operations located in the Silicon Valley Area.

The increased share of guided missiles in defense procurements, space activities, and labor-saving technological and organizational changes resulted in more complex aircraft and an increased demand for skilled labor.[72] In the 1980s the demand for skilled nonproduction workers increased significantly while the demand for production workers declined.

Efforts to reduce costs by eliminating redundancies in administrative functions, personnel, and physical facilities led to decades of mergers and consolidations, a worldwide phenomenon. After consolidation, the three main world defense contractors became Lockheed Martin Company, Boeing, and Northrop Grumman. Raytheon is the number one missile manufacturer.[73] Boeing is the largest combined manufacturer of commercial jetliners and military aircraft, the largest aircraft manufacturer in the United States, and the world's largest aerospace company. The company also manufactures electronic and defense systems, missiles, rocket engines, satellite launch vehicles, and advanced information and communication systems. Boeing operates in 145 countries. The headquarters are in Chicago, Illinois, and employs about 159,000 people.[74]

Rockets, Missiles, and Launch Vehicles

"A *rocket* is a type of power plant that is used to propel something (called a payload) by the high-velocity ejection of matter, usually exhaust gases)".

A *missile* is an air vehicle "that carries a weapon or warhead as the payload, which may be a nuclear weapon or a simple explosive charge".

"A *ballistic missile* is one that assumes a free-falling trajectory (or path) after an internally guided, self-powered ascent".

A *launch vehicle* is a rocket that carries a satellite or spacecraft.

"Some rockets begin as missiles and later become launch vehicles. For example, the Titan II rocket was originally designed to carry a nuclear warhead and was then called the Titan II missile". Later, The National Aeronautics and Space Administration (NASA) used the Titan II to launch spacecraft. The Titan II was then referred as the Titan II booster or the Titan II launch vehicle".

There are *expendable launch vehicles* (ELVs), that are used only once, and *reusable launch vehicles*. Examples of ELVs include the Scout, Saturn, Titan, Atlas, and Delta. An example of a reusable launch vehicle is the Space Shuttle.

Source: Quoted from U.S. Centennial of Flight Commission. At: http://www.centennialofflight.gov/essay/Dictionary/rockets/DI93.htm.

Important Developments in the California Aerospace Industry After WW II

In 1957, the Soviets launched the world's first man-made satellite, Sputnik, and in 1958, the National Advisory Committee for Aeronautics was succeeded by the National

Aeronautics and Space Administration (NASA) and the Mercury manned spaceflight program was initiated. In 1958, Vandenberg Air Force Base (northwest of Los Angeles) launched the first Thor ballistic missile Combat Training Launch (CTL). In 1959, Vandenberg boosted the world's first "polar-orbiting satellite, Discoverer 1, aboard a Thor Agena booster combination."[75]

In the race for conquering space, NASA conducted many research and development projects at its numerous space centers. Much of the space activity took place in California. By the early 1960s, 70 percent of the Air Force's space program budget was spent in Southern California and nearly half of Los Angeles' total manufacturing base was related to defense or space technology.[76]

Following is a brief overview of some of the most important developments that took place in some of the California leading and well known aerospace companies after the Second World War period:

Douglas Company

In 1951, Douglas introduced the F3D Skynight, a military jet which in 1952 became the first Allied jet airplane that shot down an enemy fighter following a night intercept.[77]

McDonnell Douglas Corporation

The McDonnell Douglas Corporation began operations in 1967, when Douglas Aircraft Company merged with the McDonnell Company. The merger was basically a takeover by McDonnell of Douglas, a company with financial problems. The merged company produced military and commercial aircraft, spacecraft and rockets, missiles, electronics products and data processing services. At the time of the merger, the company employed more than 140,000 people. It had two main operations, the Douglas Aircraft Company in California (including the Aircraft and the Missiles and Space groups) and the McDonnell Company based in St. Louis, Missouri. McDonnell Douglas became the fourth largest U.S. aircraft manufacturer, after Boeing, North American, and Lockheed. The company was acquired by Boeing in 1996.[78]

The first important project of the merged company was the DC-10 airliner that was produced in 1970. This plane competed with Lockheed's L-1011 TriStar. Although the plane outsold the TriStar, the company lost money. In 1984, McDonnell Douglas bought Hughes Helicopters from the estate of Howard Hughes.[79] McDonnell Douglas's final commercial aircraft, the DC-10, was produced until 1988.[80]

McDonnell Douglas DC-10

Photo Credit: NASA

Through the years, McDonnell Douglas also produced many successful military aircraft, including the F-15 Eagle (1974) and the F/A-18 Hornet (1975) as well as the Harpoon and Tomahawk missiles. The F/A-18 Hornet was extensively used by the U.S. Navy and Marine Corps and several foreign countries. In 1981, the company started production of Harriers, a jet that could take off and land vertically and fly horizontally as a regular plane.[81] The company's space group built Delta expendable launch vehicles that have launched satellites since 1960. Douglas converted one of its surplus Saturn V third-stage (S-IVB) sections into Skylab, America's first space station, which was placed into orbit on May 14, 1973.[82] In 1974, a Delta rocket positioned into orbit the first U.S. domestic communications satellite (Westar-I, built by Hughes Aircraft Company) and, in 1989, the first Delta II rocket launched the first U.S. Air Force Navstar global positioning system satellite (built by Rockwell International).[83]

Northrop Corporation

In 1952, Northrop acquired Radioplane Company, a manufacturer of target drone systems, which by the 1980s became Northrop Ventura Division, a leading producer of pilotless aero vehicles (drones). In 1959, the company changed its name to Northrop Corporation. In the 1960s, the company developed a series of advanced jet trainers, including the T-38 that was used to train more than 68,000 U.S. Air Force pilots and thousands of overseas pilots. In 1960, the SM-62 Snark (the first operational intercontinental cruise missile) came into service. During the 1960s, the company also became a subassembly vendor to Boeing in the 747 production. Other interesting developments included: 1) the F/A-18 Hornet in 1978; 2) the B-2 stealth bomber (developed based on Jack Northrop's flying wing design) in 1989; and, 3) the YF-23 (another aircraft with stealth characteristics that is commonly known as Black Widow II) in 1990.[84]

B-2 Stealth Bomber

Photo Credit: United States Department of Defense

Lockheed

In the 1950s, the production of the F-80 Shooting Star (a descendent from the P-80) established Lockheed as one of America's outstanding jet aircraft manufacturers.[85] In 1954, Lockheed created the F 104 Starfighter, which became the world's first Mach 2 (twice the speed of sound) fighter.[86] During the Korean War, Lockheed opened a new facility at Palmdale Airport, and expanded outside California when the Air Force asked the company to reopen a government plant at Marietta, Georgia (now Lockheed-Georgia company). In the new facility in Palmdale, the T-33 was produced in the early 1950s (the T-33 trainer was the final version of Shooting Star and remained in production until August 1959).[87]

Other well known products are the L 1011 TriStar program (a three-engine design) in the 1970s that competed with the Douglas DC -10 and Boeing 747. Lockheed also developed, in partnership with Boeing, the F-22, an advanced tactical surveillance and fighter aircraft. Lockheed has also been significantly involved in space activities, building around 1,000 spacecraft for the military, NASA, and the commercial sector. After a merger in 1995 of Lockheed with the Martin Marietta Corporation, it became Lockheed Martin, the largest defense company in the world.[88]

Convair

In 1943, Consolidated had merged with Vultee Aircraft to form Consolidated-Vultee Aircraft or Convair, with headquarters in San Diego. General Dynamics bought a majority interest in Convair in 1953. The Convair division operated over many years as an independent company under the General Dynamics corporate

umbrella. Convair developed space launch vehicles (the Atlas and the Centaur) as well as new fighter jets and bombers.[89] In 1994, Convair was sold to McDonnell Douglas. However, after two years of operation, the Division was closed.

North American Aviation

After War World II, North American Aviation was faced with the same challenges that confronted all U.S. aircraft manufacturers. In 1946, company's employment fell from a wartime peak of 91,000 persons to 5,000. However, the company recovered more rapidly than some other manufacturers with the development of various jet fighters. North American's aircraft division developed the F-86 Sabre, the first American swept-wing jet fighter, and the F-100 Super Sabre, the first American production fighter to fly at supersonic speeds in level flight.[90]

In 1948, North American Aviation began to diversify, engaging in the development of rockets, guidance systems, and atomic energy. North American Aviation was the prime contractor for the Navaho intercontinental cruise missile program. Although this program was eventually cancelled, it yielded a variety of technical discoveries. Later on, North American Aviation won the U.S. Air Force's Hound Dog Air-to-Ground Missile program and the Little Joe Launch Vehicle, which was instrumental in the development of the launch escape system of the Mercury program.[xi] [91]

Northrop X-15

Photo Credit: NASA

[xi] Wikipedia defines a Launch Escape System (LES) as "a top-mounted rocket connected to the crew module of a crewed spacecraft and used to quickly separate the crew module from the rest of the rocket in case of emergency."

The very important X-15 program was developed by North American Aviation, following a contract in 1955 to build this rocket-powered research aircraft for the U.S. military and NASA. It was used to gather information on flight conditions beyond the atmosphere and first flown in 1959. The X-15 set altitude and speed records for aircraft during the 1960s.[92]

In 1955, North American Aviation spun off its Rocketdyne division, which became the leading U.S. producer of liquid-fueled rockets. Other important divisions were the Space and Information Systems Division and Autonetics, which focused on guidance systems.[93] In 1967, North American Aviation merged with Rockwell Standard Corporation, a producer of automotive parts and later of aircraft, to form North American Rockwell Corporation, which was renamed Rockwell International Corporation in 1973.[94]

In the 1960's and 1970's, the company developed key aspects of the Apollo program, including the Saturn V rocket's second stage and final assembly of the entire launcher. The company also designed and built the Apollo command and service modules. In 1972, it started development of the space shuttle for NASA. The company built five operational orbiters for this project.[95]

The Second Stage Saturn V Rocket Motor and Command Module for the Apollo 11 Mission (First Landing on the Moon)

Photo Credits: NASA

Space Shuttle Endeavor Landing at Edwards AFB

Photo Credit: NASA

Rockwell International's last airplane was the B-1B Lancer bomber (a U.S. Air Force supersonic, long-range strategic bomber), but it remained a major subcontractor to the commercial aerospace industry.[96] Rockwell International sold its aerospace and defense units (including Rocketdyne and aircraft divisions) to Boeing in 1996 to focus on industrial automation, avionics and communications, and electronic commerce.[97]

Hughes Aircraft

In the early 1950s, Hughes Aircraft (headquartered in Culver City) became very successful after the creation of its Hughes Electronics division, which became a major supplier of weapons systems to the U.S. Air Force and Navy. During this time, Hughes built the F-98 Falcon (later designated GAR [Guided Air Rocket]), an unpiloted interceptor missile, and the AIM-4F Super Falcon.[98]

In 1953, Hughes created the Howard Hughes Medical Institute as a charitable foundation for medical research and formed a new Hughes Aircraft Company, completely owned by the foundation.

In 1955, Hughes Aircraft formed the Toolco Aircraft Division that began developing light military helicopters. In 1976, this helicopter division became Hughes Helicopters, which won the contract for the AH-64 Apache Army attack helicopter, a successful project that produced the company's best-known

helicopter. In 1984, McDonnell Douglas purchased Hughes' helicopter business.

In 1961, Hughes formed the Hughes Space and Communications Company that resulted from the integration of its earlier Space and Communications group with its Hughes Space Systems Division. Since then, this company has been a leader in the satellite market. In 1963, Hughes built Syncom, the world's first synchronous communications satellite, and, by 2000, the company had built nearly 40 percent of the satellites in service worldwide.[xii] Hughes also built Pioneer Venus in 1978, which made the first extensive radar mapping of that planet. In 1984, the company built the first Leasat satellite that would form a global military communications network. Hughes also built the Galileo probe that became the first spacecraft to penetrate Jupiter's atmosphere in the 1990s.

Hughes Pioneer Venus

Photo Credit: NASA

After Howard Hughes' death (1976), Hughes Aircraft remained as a separate company until 1985. General Motors bought it from the Medical Institute and combined it with GM-Delco Electronics to become Hughes Electronics. Hughes Aircraft was made a subsidiary company within Hughes Electronics. In August 1992, Hughes acquired the General Dynamics' Missile Systems business. In the fall of 1997, the Hughes Electronics defense operations merged with Raytheon. Hughes Space and Communications continued building satellites until it was purchased by Boeing in 2000 and became Boeing Satellite Systems.[99]

[xii] This means a satellite that is in a geosynchronous orbit (it returns to exactly the same place in the sky at exactly the same time each day).

Aerojet	After dramatic growth in the 1950s and 1960s, Aerojet built a site for rocket engine development, testing, and production at a facility near Sacramento (the company was originally located in Azusa). The company currently produces liquid, solid and advanced propulsion rocket engines and motors. Aerojet became the defense and aerospace segment of GenCorp, after GenCorp bought the company.[100]
Robinson Helicopter Company	The Robinson Helicopter Company was founded in 1973 by Frank Robinson, an ex-employee of Bell Helicopter and Hughes Helicopter Company. It is located in Torrance. Since delivering its first helicopter in 1979, Robinson Helicopter had produced by the end of 2006 over 7,000 aircraft. Robinson currently produces two models, the two-seat R22, and the four-seat R44.[101]
Ryan Aeronautical Company	The Ryan Aeronautical Company built several historically and technically significant aircraft, including two famous V/STOL designs that never entered production. The most successful production aircraft was the Ryan Firebee line of unmanned drones used as targets and unmanned air vehicles. After being acquired by Teledyne in 1968, Northrop Grumman purchased Teledyne Ryan Aeronautical in 1999.[102]
Rutan Aircraft Factory / Scaled Composites	Elbert Leander "Burt" Rutan is an American aeronautical engineer well-known for his ability to design light and energy-efficient aircraft. The most successful of his designs is the Voyager, which was the first plane to fly around the world without refueling in 1986. Another famous Rutan design is the SpaceShipOne, a suborbital rocket plane which was the first privately-funded spacecraft to exceed an altitude of 100 Kilometers twice within a two week period. In 1974, Rutan formed the Rutan Aircraft Factory located in the Mojave Desert. This factory designed and developed a variety of aircraft prototypes, most of them homebuilt. His first design was the Rutan VariViggen, a two-seat pusher aircraft with a canard.[xiii] The canard became a standard feature in most Rutan designs. In 1982, Burt Rutan founded

[xiii] Canard is an airframe configuration of fixed-wing aircraft in which the tailplane is ahead of the main lifting surfaces, rather than behind them as in conventional aircraft.

Scaled Composites, LLC, which has become one of the world's finest aircraft design and prototyping facilities. Scaled Composites is currently a subsidiary of Northrop Grumman and it is located in Mojave, California.[103]

Rutan Voyager

Photo Credit: NASA

California Preeminent Test and Research Facilities

Vandenberg AFB

A famous testing facility in California is Vandenberg Air Force Base that conducts and supports space and missile launches. Over the years, unmanned satellites, including international satellites, were placed in orbit from Vandenberg by a variety of booster rockets including the Titan IV, Taurus, Pegasus, Delta II, Atlas IIAS, Minotaur, the Falcon 1, the Delta IV, and Atlas V. Vandenberg is the only military installation in the United States that launches unmanned government and commercial satellites into polar orbit.[104]

NASA Fields and Research Centers

NASA Ames Research Center

With the replacement of NACA by NASA, the NACA's Aeronautical Laboratory became the NASA Ames Research Center. The Ames Aeronautical Laboratory had been established in 1939 at Moffett Field, Sunnyvale, to perform aeronautical exploratory and developmental testing. In the early years, the focus of flight research was on military aircraft. Ames researchers broke new ground in subsonic, transonic, supersonic, and hypersonic flights.[105] The Ames Research Center cites among its greatest contributions as a NASA center to America's aerospace: 1) "the blunt body concept, which is used on every spacecraft to prevent

burning upon planetary entry"; 2) "the management of the Pioneer planetary spacecraft, which was the first human-made object to leave the solar system"; 3) "the Viking Life Detection experiment spacecraft, which was the first spacecraft to perform experiments on another planet"; and, 4) "the Lunar Prospector mission, which discovered water at the poles of the Moon".[106]

The Jet Propulsion Laboratory

The Jet Propulsion Laboratory (JPL) is located in Pasadena and managed by Caltech University. JPL's history dates to the 1930s, when Caltech professor Theodore von Karman supervised pioneering work in rocket propulsion. The first rocket firing took place there in October 1936. The U.S. Army Air Corps funded development of strap-on rockets (jet-assisted take off) to help Army airplanes take off from short runways. The Army Air Corps also asked Karman for a technical analysis of the German V-2 program that Allied forces had just discovered. Von Karman proposed a U.S. research project to understand, reproduce, and surpass the reach of German guided missiles. The Caltech team that participated in this pioneer research called themselves "the Jet Propulsion Laboratory".[107]

JPL built and controlled the first U.S. satellite, Explorer 1. JPL operates the Goldstone Deep Space Communications Complex (known as the Goldstone Observatory), which is located in the Mojave Desert. The observatory is part of NASA's Deep Space Network and is one of three[xiv] in the world. The Center tracks and communicates with space missions.[108]

Dryden Flight Research Center

The Dryden Flight Research Center is located at Edwards Air Force Base in the Mojave Desert. In 1976, the Center was named Dryden, in honor of Hugh L. Dryden, a director of the National Advisory Committee for Aeronautics (NACA). Previously, the center was known as the National Advisory Committee for Aeronautics Muroc Flight Test Unit, and later as the High-Speed Flight Research Station (1949) and the High-Speed Flight Station (1954).

The Mojave Desert has been a center of aeronautical success, starting with the first flight at Muroc Field of the Bell XP-59A Airacomet. In 1959, the X-15 was tested in this facility. The three X-15s built by North American Aviation made 199 flights, breaking speed and altitude records.[109] Over time, the installation has grown and become an important center associated with many developments in supersonic and hypersonic flight, digital fly-by-wire, wingless lifting bodies, supercritical and forward-swept wings, and the space shuttles.[110]

[xiv] The others are the Madrid Deep Space Communication Complex and the Canberra Deep Space Communication Complex.

Current Developments in the California Industry

Although California is no longer the aeronautics powerhouse of the United States, the presence of aerospace industry is still strong. While at the height of the Cold War fifteen of the twenty-five largest aerospace companies in the United States were based in Southern California, today the picture is different. For example, famous players such as Rockwell, North American, Hughes Aerospace, and McDonnell Douglas are now gone. Lockheed does not build planes in Burbank anymore, while some of the aerospace companies have been incorporated into Boeing, and others have changed their operations or moved elsewhere.[111]

Although the structure of the industry has changed and complete airliners are no longer built in Southern California, there is still a large subcontracting business. Today, the product line of the aerospace industry is broad because its flight vehicles require millions of individual parts. Many support systems are needed to operate and maintain them. A significant proportion of electronic components and parts are produced in California. For example, the main body section of the 747 is produced in Hawthorne; a major supplier of fasteners is based in Carson; and in the Inland Empire, Goodrich makes components for Boeing's 787.[112]

There are also significant space-related operations. According to a report of the California Space Authority, California suppliers represent 50 percent of the aerospace industry base.[113] Predator drones are built by General Atomics (north of San Diego), and there are new startups as well, such as the Space Exploration Technologies Corporation (SpaceX) in El Segundo.[114] SpaceX is a space-transportation company developing a family of partially reusable launch vehicles.

Increased antiterrorism and wartime spending is boosting defense spending in the region. With the conflicts in Afghanistan and Iraq, some analysts expect that the demand for aircraft and defense related equipment are expected to continue. The U.S. Department of Defense budget (FY-2008 estimated as $583 billion) is still significant and forecasts project high levels of spending for the next few years.

There are a variety of major defense programs in Southern California.

- One of the most visible projects is the C-17 military cargo plane produced by Boeing's McDonnell Douglas Corporation unit in Long Beach. This program, however, is close to completion and new demand for C-17 is being debated.[xv] The Department of Defense did not request funding for new C-17s in the fiscal year 2008 budget. However, the program won a $1.3 billion five-year contract in November 2007, to enhance the C-17 cargo aircraft fleet. Boeing also hopes to close new deals for more C-17s in the near future with NATO and the U.S. Air Force.[115]

[xv] A more extensive discussion of this program is included later in this paper, under the Red Teams section.

- Work related to three fighters, the F/A-18, the F-22, and the F-35 or Joint Strike fighter, is being conducted in the Los Angeles region.

- Research and development is being conducted in the Antelope Valley on a variety of unmanned aircraft (UAVs).[116]

- Firms working with satellite and ground systems have been grouping in Sunnyvale in Northern California and also near Los Angeles.

- Communications and electronics are also important products for the aerospace industry and California has a large share of companies specializing in these activities. In particular, California aerospace is benefiting from the growing importance of information warfare. This term refers to the rapid transfer of information among various units in the air, on the ground, and at sea. The strong information industry in California makes it easier for firms here to use these technologies.

EMPLOYMENT IN THE AEROSPACE INDUSTRY

In the 1990s, California lost a significant number of defense-related projects that strongly impacted the California economy due to its high share of U.S. aerospace employment (almost one third in 1986). During the decade of the 1990s, the California aerospace industry lost about 166,300 jobs, and by 1999, California employment in the aerospace industry was less than half of what it was in 1986. In 1990, California's share of national aerospace employment was 29 percent, significantly higher than the 1998 share of 22 percent. Table 1 shows employment in aerospace manufacturing from 1998 through 2006 for California and the United States.

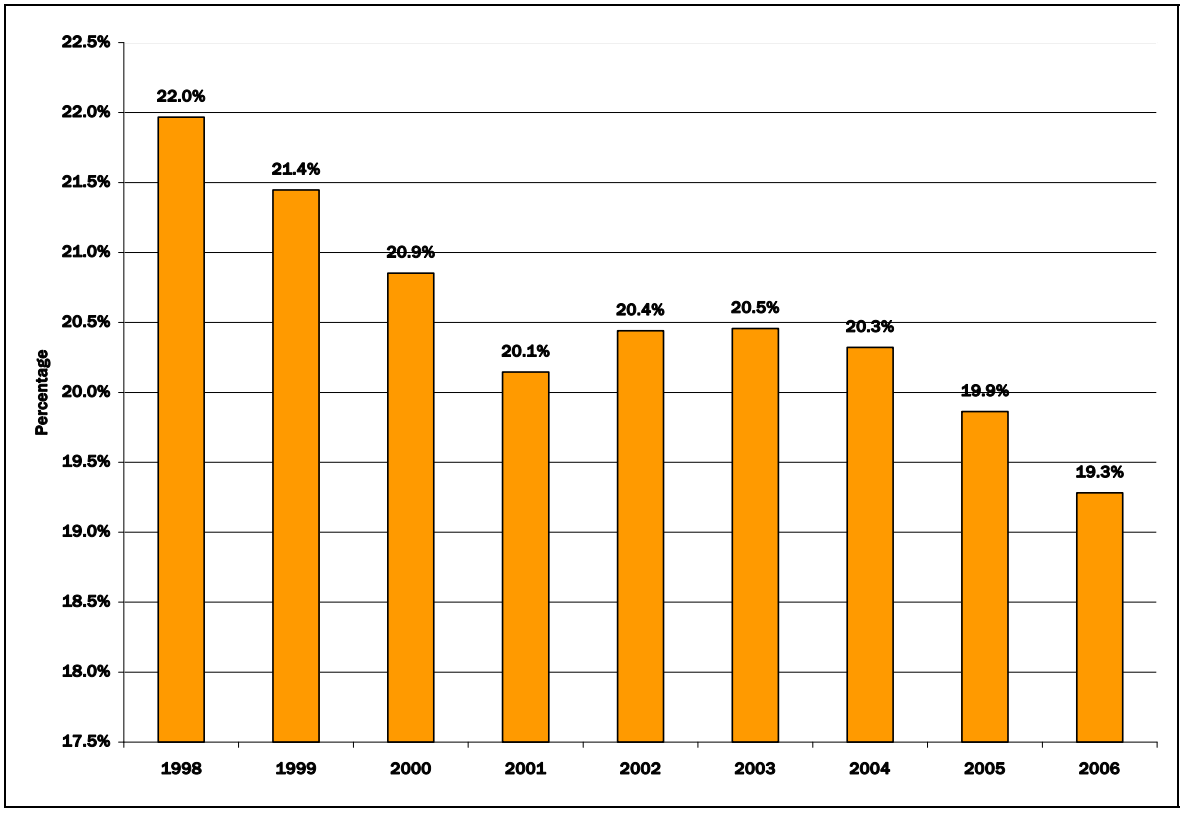
Table 1: Annual Aerospace Employment in the U.S. and California, by Sector (1998-2006)

US Aerospace Employment (In Thousands)		1998	1999	2000	2001	2002	2003	2004	2005	2006
Aerospace Product and Parts	(NAICS 3364)	578.6	547.1	516.7	510.9	470.3	442.1	441.5	455.1	471.6
Search, Detec. And Navig. Inst.	(NAICS 334511)	162.5	161.4	149.4	149.8	148.1	145.0	150.5	156.6	158.0
Total		741.1	708.5	666.1	660.7	618.4	587.1	592.0	611.7	629.6
California Aerospace Employment (In Thousands)		**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Aerospace Product and Parts	(NAICS 3364)	106.1	99.0	90.6	85.1	79.4	72.8	73.4	72.7	72.7
Search, Detec. And Navig. Inst.	(NAICS 334511)	56.7	52.9	48.3	48.0	47.0	47.3	46.9	48.8	48.7
Total		162.8	151.9	138.9	133.1	126.4	120.1	120.3	121.5	121.4

Source: U.S. data from the Bureau of Labor Statistics (BLS). California Data from Economic Development Department (EDD), Labor Market Information Division.

From 1998 to 2003, aerospace employment has been declining in both California and the United States as a whole. The situation turned around after 2003, when the industry experienced some gains in the country and remained fairly stable in the state. During the period 1998 to 2006, the aerospace industry in the rest of the country lost 12 percent of its workforce, but California lost more than one fourth. Most of the losses took place in aircraft and components manufacturing, with California having a relatively higher proportion of employment losses (31.5 percent compared to 15.6 percent in the rest of the nation). As a consequence, California's share of national aerospace employment has been declining. Although this share was fairly stable between 2002 and 2004, it declined again in 2005 and 2006. (See chart 1).

Chart 1: California's Share of U.S. Aerospace Employment



Source: U.S. data from the Bureau of Labor Statistics (BLS). California Data from Economic Development Department (EDD), Labor Market Information Division.

During the 1998-2006 period, Washington State's share of U.S. aerospace employment also decreased, while the shares of U.S. aerospace workers increased for Texas, Arizona, Georgia, Ohio, and Illinois.

Table 2 shows the 25 states with the highest shares of U.S. aerospace employment. California ranks first, followed by Washington and Texas.

Table 2: States with the Highest Share of U.S. Aerospace Employment

State	State's Share of Employment
California	19.3%
Washington	12.0%
Texas	8.9%
Kansas	6.2%
Arizona	5.8%
Connecticut	5.1%
Florida	4.5%
Georgia	3.0%
New York	3.0%
Massachusetts	2.7%
Ohio	2.6%
Missouri	2.5%
Alabama	2.0%
Colorado	1.7%
New Jersey	1.7%
Pennsylvania	1.6%
Indiana	1.4%
Utah	1.2%
Michigan	0.9%
Virginia	0.8%
Oklahoma	0.8%
Illinois	0.8%
Maryland	0.7%
Arkansas	0.6%
Louisiana	0.05%

Source: U.S. data from the Bureau of Labor Statistics (BLS). California Data from the Economic Development Department (EDD), Labor Market Information Division.

WAGES IN AEROSPACE

Nationwide, wages in the aerospace sector are higher than the average wage in the manufacturing sector as a whole. In California, wages for the aircraft and component parts manufacturing are 34 percent higher than the average manufacturing wage, while wages in the sector of search and navigation instruments is about 60 percent higher

than the average manufacturing wage. At the national level, the differences between aerospace average wages and the average manufacturing wage are higher (52 percent higher for aircraft manufacturing and 69 percent higher for the search and navigation sector).

Relative to other industries, the differential between the average wage in California and in the nation is smaller. California's manufacturing average wage is 18.4 percent higher than the nationwide average wage. The average wage for the search and navigation instruments sector in California is 13.3 percent higher than the national average, and the average wage for aircraft and parts manufacturing is eight percent higher. In 2006, the California average wage in the aerospace product and parts manufacturing sector was $84,805, while the average for the search and navigation instruments industry was $100,218. This compares to the national average of $78,023 for aerospace product and parts manufacturing and $86,906 for search and navigation.[117]

INDUSTRY OUTLOOK

According to the Aerospace Industries Association (AIA), 2006 was a good year for the industry. Shipments of large and general aviation aircraft were at record levels. Satellite sales have been steady and, although the United States controls nearly 70 percent of launch vehicles businesses, it is losing market share to European companies. Aircraft markets are expanding in India, China, and Russia. Airbus, an aircraft manufacturer owned by the European Aeronautic Defense Aerospace Company (EADS), is a keen competitor.[118]

AIA data indicate that in 2006, the U.S. aerospace industry grew more than 8 percent and generated $184.4 billion in sales. Civil aircraft sales grew by 21 percent (to $47.5 billion); missiles by 8 percent (to $14.0 billion); and military aircraft totaled $52.8 billion, growing 28 percent. AIA also indicates that, in 2006, the foreign trade surplus for aerospace products reached the highest levels ($52 billion in 2006) due to significant increases in aerospace exports.[119]

AIA forecasts U.S. aerospace industry sales in 2007 to continue growing, driven by increased sales of civil aircraft, engines, and related parts and components. The demand for commercial satellites appears to be increasing.[120] California has been a national and world leader in the space sector since the Space Age originated. Aerospace businesses based in the state continue playing critical roles in commercial, civil, and military space programs. According to data from the California Space Authority, space enterprise generated over $20 billion in revenue in 2005.[121]

New market opportunities and improved industry efficiency is helping California's ability to compete in the commercial space area and commercial applications of defense products. California could strengthen the competitiveness of its aerospace industry and the state's ability to retain and attract aerospace activities by creating more favorable business conditions for the industry.

California's advantages to attract and maintain high-tech aerospace activities include an abundance of skilled labor; a rich infrastructure of test fields, universities, and other educational and research centers; and the existence of a strong electronics industry. However, according to aerospace firms, California's high-cost of doing business, taxation policies, and state and local regulations have made other states such as Texas, Georgia, and Alabama, more attractive site locations.

It is in California's interest to focus on those dynamic high-tech new segments of the industry that have a high growth potential. To help the retention and expansion of high-growth potential aerospace activities in California, policy makers need to be aware of:

- The new structure, options, challenges, and opportunities of this industry.
- The type of policies that competitor states are implementing.
- Effective policy-options that would help the development of new aerospace activities.

In this context, this paper aims to provide updated information to policy makers on other states' policies that affect plant location and business expansion decisions in the aerospace sector. This brief also suggests some policy options that appear to be important for the future development of this industry.

FACTORS INFLUENCING PLANT LOCATION AND BUSINESS EXPANSION DECISIONS

A variety of studies show that the following factors play a key role when businesses consider the location and expansion of their operations in a geographic area:

Labor Costs

The cost of labor is an important factor determining business location, particularly in a labor-intensive industry such as aerospace. Area Development magazine conducts annual corporate surveys. Results from their 2006 survey indicate that companies ranked labor costs as the most important factor for site location.[122]

One indicator of labor costs is the average hourly earnings in manufacturing. There are a variety of assembly jobs that are performed by unskilled labor, so that, even when on average the sector pays high wages, this indicator is important. A comparison with the 25 states with the highest share of U.S. aerospace employment places California among the ten states with the lowest labor costs as measured by 2006 average hourly earnings in manufacturing. California's average of $15.95 is below the average of Michigan ($21.83), Washington ($19.90), Connecticut ($19.78), Ohio ($19.16), Indiana, New York, and Massachusetts (with $18.57, $18.29 and $18.26 respectively). Lowest labor-cost states are Arkansas ($13.75), Texas, Georgia, Florida, and Oklahoma. Texas ($14.01) and Florida ($14.75) are the lowest labor-cost states among those with a large share of U.S. aerospace employment. However, California has the fourth highest wage and salary per employee among the 25 states.[123]

A significant portion of labor costs can be workers' compensation. Many states, including California, have been changing their workers' compensation laws in order to decrease the cost of doing business in their states. Despite cost reductions after various reforms, a recent report from a consulting firm in New York that has published state cost and benefit data since 1992 indicates that California has had the highest workers' compensation cost in the 2000 to 2004 period.[124] According to the same report, the average cost in the U.S. decreased sharply after 1994, reaching bottom in 2001, and in 2002 started increasing again. In 2004, the lowest cost states (among those with significant share of aerospace employment) were Arizona, Utah, and Virginia. Recent data for 2007 provided by this group shows California as the second highest cost state while Arizona, Utah, and Virginia keep their position as the lowest

cost states.[125]

A similar picture is described by the Oregon Department of Consumer and Business Services' comparative workers-compensation cost data, based on premium rates. According to these data, the national median rate index reached the highest point in 1994 at $4.35 for $100 of payroll, and reached bottom in 2000. It increased between 2002 and 2004 and decreased to $2.48 per $100 of payroll in 2006. In 2006, the California index rate was $4.13, more than 1.5 times higher than the median, and the highest state index rate after Alaska. Texas ranked 17 (with a rate of $2.84), Washington was 35 (with a rate of $2.17) and at the bottom were Arizona, Massachusetts, Arkansas, and Virginia (the latter ranked 47, with an index rate of $1.52).[126]

Availability of Skilled Labor

The availability of a highly educated labor force is very important for high-technology industries. Educational policies, funding for universities and colleges, and proximity to university and other educational centers are important criteria for the location and expansion of high-tech manufacturing, such as aerospace. The abundance of skilled labor in California makes it an attractive site for high-tech industries. However, the U.S. produces a lower percentage of college graduates with advanced degrees than Europe and Asia.[127] In 2004, only 16 percent of California college degrees were in science, math, technology, or engineering disciplines.[128] This is important since the industry will have to replenish their workforce as their current workers age and plan to retire while other high-tech sectors are competing for a smaller pool of qualified labor. A survey commissioned by Aviation Week and Space Technology magazine profiles an industry with serious employment problems within the next five years. They project significant shortages in the labor market driven by a shrinking number of engineer graduates and a large number of employees eligible to retire (more than 30 percent of the people currently employed by 2008).[129]

Proximity to Markets for Inputs and Outputs

Firms tend to locate in areas where there is already a geographic concentration of related companies sharing technical, financial, and/or product-distribution patterns. These industrial clusters develop specialized buyer-supplier relationships and share specialized infrastructure, labor markets, and services. The location within an industry cluster facilitates working with neighboring suppliers on product quality and innovation, and makes it easier for the business to obtain financing. Companies developing electronics components and satellite and ground systems are concentrating around the Silicon Valley, where the electronics industry is clustered.

Infrastructure

Firms need infrastructure to accommodate their employees and businesses. The proximity to adequate ports, airports, and railroads is important for the distribution of the firms' products within the U.S. and abroad. California's transportation system is operating near full capacity in most highly populated areas. With increased economic growth and world trade, pressures on the existing transportation system will increase. This is an ongoing problem in California. In 2006, highway accessibility was ranked as the second most important factor for site location by companies surveyed by Area Development magazine.[130]

Quality of Life

Quality of life includes a variety of aspects such as transportation facilities for employees, affordable housing, cultural events and amenities, a healthy environment, attractiveness of the community landscape, the quality of the educational system, weather, low crime, and the time spent in commuting to the work place. California's high housing prices and cost of living make it difficult for industries to move into the state and attract labor, particularly in certain areas where clusters have been developed, such as the Silicon Valley and Southern California areas.

Utility Costs

An issue that is particularly important in plant site discussions is the price businesses pay for the electricity used to run their plants. New York, Massachusetts, Connecticut, and California have the highest electricity costs among the 25 states with the highest share of aerospace employment in the U.S. Florida and Texas are in the middle. Kansas, Alabama, Oklahoma, Arkansas, and Missouri are the states with the cheapest rates.[131] To be more competitive, some states (and localities) offer electricity sales tax exemptions or state utility tax exemptions to manufacturers. Examples of these policies are in Texas, Kansas, Florida, Illinois, Alabama, and Colorado. New York has: 1) the Power for Jobs program, offering low cost electricity available to companies who are either expanding or relocating; 2) the Economic Development Power Program that provides electricity at a lower rate; and, 3) the Niagara Hydropower Program that offers low cost electricity to businesses in Western New York.

Property Costs

A significant cost for businesses is the acquisition of their building and plant structures. Property values in California are significantly higher than in other regions in the United States. California economic opportunities, high quality of life, and favorable weather conditions have attracted a large population to the state. Population pressures have increased the cost of property, particularly in fast growing areas. New York, Massachusetts, Connecticut, New Jersey, and California (in that

order) have the highest rent costs for industrial and warehouse space on per square foot basis.[132] A variety of states provide property tax abatements to manufacturers as well as other incentives that significantly lower property costs (see appendix).

Original Location

According to many economic-development professionals, the most potent factor in retaining and expanding businesses is the company's original choice of location. Firms tend to stay where they have originally located, unless its competitiveness is dramatically threatened by changes in the business climate. The original location may have been chosen based on advantages that no longer exist; however firms do not move easily. When companies move, they do it for reasons that vary from company to company.

The Effect of Mergers and Acquisitions and Market Changes

Consolidation of the industry affects the integration and specialization of the various plants of those merging companies. Activities are rearranged according to the new needs of the combined industry and the new production plans. These choices tend to be made by the company that controls the merger, based on the geographic distribution of capital, professional resources, and the need of integration of various firms' activities to meet the new production goals.

Changes in the lines of production also lead to a rearrangement of operations. The industry will direct electronic-related activities and research and development to those areas where there is already a network and infrastructure that support those activities. Space related activities will also be located where there is plenty of space and research and development technical support. Assembly line activities will be reallocated where the cost of these operations is low and there is plenty of labor to perform these operations.

State Policies

State policies affect the cost of doing business in a given state. State policies that lower business costs and are expected to be important in the decision of business-location are:

- Those that speed up the regulatory processes (particularly the permitting process);
- Those that alleviate state and local general taxation policies; and
- Industrial development policies, including targeted tax incentives and other policies specifically tailored to support aerospace activities.

Although less regulation and less taxation benefit businesses through cost savings, the existence of a sensible regulatory system and taxes help to maintain the quality of life in the state. Government regulates business to maintain a safe workplace and to ensure a high quality of life. Environmental regulations protect the state environment from deterioration and protect the health of the state population. Businesses are attracted to areas where the quality of educational and research institutions is high and where the transportation system is efficient. Tax incentives reduce the amount of money that the state needs to provide public services and infrastructure. Furthermore, the establishment of new companies in an area requires additional public services and infrastructure. Tax breaks may reduce state and local fiscal capacity if the benefits derived from business attraction do not compensate for the loss in tax revenues. Businesses tend to weigh the costs of taxation and regulation relative to the benefits that they receive. States and localities may be better off if they allocate resources to improve infrastructure or education, rather than providing direct incentives. It is up to the state to achieve a balance that is competitive with the business environment and policies of other states.

Political Support

Firms tend to establish themselves in friendly environments, where state and local governments are supportive and sensitive to the industry's needs. For aerospace companies, the support of the congressional delegation and the influence of representatives in the contract award decisions are critical. It is in the interest of the aerospace companies to spread their operations throughout a large number of states. Their presence in those states leverage political support to lobby for defense contracts and programs. States with a large population and a larger number of representatives in Congress are important to the industry.

POLICIES RELEVANT TO AEROSPACE PLANT-SITE LOCATION DECISIONS

An Expedited Regulatory Process and Fast-Permitting Process

During the last several decades, there has been a profusion of regulatory bodies in most states, with functions that sometimes overlap. For instance, in some states, there is more than one agency responsible for issuing licenses or issuing permits for a single project. It can be difficult for a business to identify the numerous agencies from which permits must be obtained, thereby increasing the costs and time for obtaining permits. Many states have been working to simplify permit processes. For instance, the Texas Department of Commerce has a permit assistance program for businesses. Assistance consists of permit coordination between various agencies, and the arrangement of pre-permit meetings. In certain cases, they have been successful in expediting the permit process in the state.

Despite many efforts to simplify the environmental and business regulatory systems in California, the systems continue being a barrier for manufacturers' plant investment and extension. Aerospace executives and other manufacturers have indicated in many instances that California's cumbersome and less expeditious regulatory system is one of the main factors that drive the industry out of California.[133] Aerospace representatives cite the state environmental regulations as one of the major problems for the industry. Although they recognize the need for environmental protection, industrial representatives feel that the regulatory process can be more efficient. Although a position was established in the California Environmental Protection Agency to act as a liason between the aerospace industry and the administration on environmental issues, this position has been eliminated due to budget cuts.[134]

General State and Local Taxation Policies

These policies refer to tax law provisions that apply to everyone who is liable for a tax, not to exemptions, deductions, or credits targeted to particular kinds of business or activities. State taxes are important since the overall state tax burden can exceed the federal tax burden. Companies have to consider several taxes when comparing sites in various states. The 2006 corporate survey conducted by Area Development magazine indicated that corporate taxes were the third most important factor in the site selection process, after labor costs and highway accessibility.[135]

Corporate Income Taxes

For many companies, state corporate income taxes are significant. Among the 25 states with the highest aerospace activity, in 2006, California had the fourth highest corporate tax rate (8.84), after Pennsylvania (9.90), Massachusetts (9.5), and New Jersey (9.0). Kansas (4.0), Colorado (4.63), and Utah (5.0) have the lowest rates. Table 3 shows corporate income tax rates by state.

Washington, a state with a significant share of U.S. aerospace employment, does not have a corporate income tax, but it has a business and occupation tax. Michigan has the state single business tax (SBT), a modified value-added tax imposed on taxpayers engaged in business in the state. The tax rate was 1.9 percent in 2007. The tax is applied to a firm's adjusted tax base, which includes business income, interest expense, compensation, depreciation, and other adjustments allocated to Michigan. The first $45,000 is exempt. Certain small businesses may elect to pay a two percent tax on adjusted business income rather than the standard SBT. Similarly, Texas imposes a franchise tax of 4.5 percent of earned surplus or 2.5 mills of net worth.[xvi]

Apportionment Methods

In addition to tax rates, a very important issue for businesses that have operations in various states or other countries is how these taxes are computed.

To determine the fair amount of taxes that corporations need to pay in each state, states have adopted apportionment formulas for dividing companies' taxable income among all states in which a company has operations. These formulas are based on a weighted ratio of business activity within the state, which, in most states, is measured by the property, payroll, and sales present in the state. The states' apportionment formulas vary in the relative weight given to these three factors. For example, some states modify this formula to double-weight sales, establish only single sales factors, or other such variations. Depending on the company distribution of property and labor across states, some apportionment formulas are more favorable than others. The use of the four-factor, double-weighted sales formula or a single factor sales formula results in considerable tax savings when a company's sales percentage in the state is smaller than the wage and property percentages.

Table 4 shows the apportionment methods of corporate income by state, as of January 2007. The formulas listed are for manufacturing businesses in general. Some industries have special formula different than those reported.

California has a double-weighted sales formula. This means that the share of total corporate income apportioned to California is equal to the sum of 1) the state share of the corporation property; 2) the state share of the corporation payroll; and, 3) two times the state share of the corporation total sales, divided by four, so that the sales share has a double weight in the calculation.

[xvi] The term mill is used in expressing tax rates on a per-dollar basis. For example, a tax rate of 60 mills means that taxes are 6 cents per dollar

Apportionment of Corporate Income Formulas

Single Sales Factor (100 percent Sales)

The share of a corporation's total profit that a particular state would tax is based solely on the percentage of the corporation's nationwide sales occurring in the state. (State sales/world sales).

Equally Weighted Three Factors

The share of a corporation's total profit that a particular state would tax is based on the following three factors: the share of a corporation's nationwide sales occurring in the state, the share of a corporation's nationwide property that is in the state, and the share of a corporation's nationwide payroll paid in the state. Each factor has equal weight. ([State sales/world sales] plus [state property/world property] plus [state payroll/world payroll]).

Double Weighted Sales (50 percent Sales)

The share of a corporation's total profit that a particular state would tax is based on the following three factors: the share of a corporation's nationwide sales occurring in the state, the share of a corporation's nationwide property that is in the state, and the share of a corporation's nationwide payroll paid in the state. However, sales factor has 50 percent weight.

Sales Factor Greater than 50 percent but less than 100 percent

The share of a corporation's total profit that a particular state would tax is based on the following three factors: the share of a corporation's nationwide sales occurring in the state, the share of a corporation's nationwide property that is in the state, and the share of a corporation's nationwide payroll paid in the state. In this case sales factor may have 60 percent weight (Triple weighted sales) or higher weights (for example, in New York sales factor has 80 percent weight and in Michigan has 92.5 percent weight).

Election Formulas

Some states can choose between two formulas. For example, corporations in Connecticut can choose between the double-weighted sales factor and the single sales factor formulas.

Table 3: Range of State Corporate Income Tax Rates
(Tax Year 2007 As of January 1, 2007)

RANGE OF STATE CORPORATE INCOME TAX RATES
(For tax year 2007. As of January 1, 2007)

State	Tax Rates (Percent)	Tax Brackets		# of Brackets
ALABAMA	6.5	----Flat Rate----		1
ARIZONA	6.968 (a)	----Flat Rate----		1
ARKANSAS	1.0 - 6.5	3,000	100,000	6
CALIFORNIA	8.84 (b)	----Flat Rate----		1
COLORADO	4.63	----Flat Rate----		1
CONNECTICUT	7.5 (c)	----Flat Rate----		1
FLORIDA	5.5 (d)	----Flat Rate----		1
GEORGIA	6.0	----Flat Rate----		1
ILLINOIS	7.3 (e)	----Flat Rate----		1
INDIANA	8.5	----Flat Rate----		1
KANSAS	4.0 (f)	----Flat Rate----		1
LOUISIANA	4.0 - 8.0	25,000	200,000	5
MARYLAND	7.0	----Flat Rate----		1
MASSACHUSETTS	9.5 (g)	----Flat Rate----		1
MISSOURI	6.25	----Flat Rate----		1
NEW JERSEY	9.0 (h)	----Flat Rate----		1
NEW YORK	7.5 (i)	----Flat Rate----		1
OHIO	5.1 - 8.5 (j)	50,000		2
OKLAHOMA	6.0	----Flat Rate----		1
PENNSYLVANIA	9.99	----Flat Rate----		1
UTAH	5.0 (a)	----Flat Rate----		
VIRGINIA	6.0	----Flat Rate----		1

Source: Compiled by FTA from various sources. From: http://www.taxadmin.org/fta/rate/corp_inc.html.

a) Minimum tax is $50 in Arizona, $100 in Utah, and $250 in Vermont. b) Minimum tax is $800. The tax rate on S-Corporations is 1.5 percent (3.5 percent for banks). c) Or 3.1 mills per dollar of capital stock and surplus (maximum tax $1 million) or $250. d) Or 3.3 percent Alternative Minimum Tax. An exemption of $5,000 is allowed. e) Includes a 2.5 percent personal property replacement tax. f) Plus a surtax of 3.35 percent (2.125 percent for banks) taxable income in excess of $50,000 ($25,000). g) Rate includes a 14 percent surtax, as does the following: an additional tax of $7.00 per $1,000 on taxable tangible property (or net worth allocable to state, for intangible property corporations); minimum tax of $456. h) The rate reported in the table is the corporation business franchise tax rate. The minimum tax is $500. An Alternative Minimum Assessment based on Gross Receipts applies if greater than corporate franchise tax. Corporations not subject to the franchise tax are subject to a 7.25 percent income tax. Banking and financial corporations are subject to the franchise tax. Corporations with net income under $100,000 are taxed at 6.5 percent. The tax on S corporations at 0.67 percent is eliminated after June 30, 2007. i) Or 1.78 mills per dollar of capital (up to $350,000); or a 2.5 percent alternative minimum tax; or a minimum tax of $1,500 to $100 depending on payroll size; if any of these is greater than the tax computed on net income. Small corporations with income under $290,000 are subject to lower rates of tax on net income. An additional tax of 0.9 mills per dollar of subsidiary capital is imposed on corporations. For banks, the alternative bases of tax are 3 percent of alternative net income; or up to 1/50th mill of taxable assets; or a minimum tax of $250. j) Rates shown are for the Franchise tax, which is being phased out through 2010. Current rates apply to 50 percent of the liability, or 50 percent of 4 mills time the value of the taxpayer's issued and outstanding share of stock with a maximum payment of $150,000; or $50 to $1,000 minimum tax, depending on worldwide gross receipts. The Commercial Activity Tax (CAT) equals $150 for gross receipts between $150,000 and $1 million, plus 0.26 percent of gross receipts over $1 million. The CAT applies to 40 percent of receipts through March 31, and 60 percent for the remainder of the year. Banks will pay the Franchise tax. An additional litter tax is imposed equal to 0.11 percent on the first $50,000 of taxable income, 0.22 percent on income over $50,000; or 0.14 mills on net worth.

Table 4: State Apportionment of Corporate Income
(Formulas for Tax Year 2007 As of January 1, 2007)

STATE APPORTIONMENT OF CORPORATE INCOME (Formulas for Tax year 2007. As of January 1, 2007)	
ALABAMA *	3 Factor
ALASKA *	3 Factor
ARIZONA * (2)	60% Sales, 20% Property & Payroll
ARKANSAS *	Double wtd. sales
CALIFORNIA *	Double wtd. sales
COLORADO *	3 Factor/Sales & Property
CONNECTICUT	Double wtd. sales/Sales
FLORIDA	Double wtd. sales
GEORGIA (3)	90% Sales, 5% Property & Payroll
ILLINOIS *	Sales
KANSAS *	3 Factor
LOUISIANA	Double wtd. sales
MARYLAND	Double wtd. sales/Sales
MASSACHUSETTS	Double wtd. sales/Sales
MICHIGAN	92.5% Sales, 3.75% Property & Payroll
MISSOURI *	3 Factor/sales
NEW JERSEY (1)	Double wtd. Sales
NEW YORK (3)	80% Sales, 10% Property & Payroll
OHIO *	60% Sales, 20% Property & Payroll
OKLAHOMA	3 Factor
PENNSYLVANIA *	Triple wtd. sales
TEXAS	Sales
UTAH *	3 Factor/Double wtd. sales
VIRGINIA	Double wtd. sales
WASHINGTON	No State Income Tax

Source: Federation of Tax administration. At: http://www.taxadmin.org/fta/rate/corp_app.html.
Notes:
* State has adopted substantial portions of the Uniform Division of Income for Tax Purposes Act (UDIPTA):
1) A three-factor formula is used for corporations not subject to the corporation business franchise tax
2) For tax years beginning in 2008, formula changes to 70 percent sales and 15 percent property and payroll.
3) State is phasing in a single sales factor. Weightings will change until 100 percent sales factor in 2008.
4) Taxpayers are allowed only 20 percent of the reduced taxes from a single sales factor.

Property Taxes

A state's property tax burden can be an important factor for a company considering locating in a given state. Property tax rates vary from state to state. These differences

can be substantial. For instance, in California, property tax rates are one percent of assessed value, with increases capped at two percent a year, except when a change of ownership occurs and then the property value is re-assessed. In Texas, rates range between two to three percent of fair market value. These differences can be substantial for a capital-intensive company that plans to construct a $2 billion facility. The company's first year property tax burden may total $20 million in California, while in Texas it would be $50 million. To alleviate high property tax rates, many states provide special incentives and/or depreciation schedules for equipment and inventory exemptions (see appendix). For example, Alabama provides property tax abatement for real and personal property to qualified businesses, negotiable at the county level and does not levy property tax on inventory.

Sales and Use Taxes

With the high cost of materials and equipment used in manufacturing, companies are increasingly paying attention to sales and use-tax policies. Sales and use taxes are taxes on transactions. The sales tax policy from state to state can have a significant impact on businesses.

Besides the sales and use tax rates, there are generally three major issues for manufacturing facilities.

1. ***The Taxation of Manufacturing Machinery, Equipment, and Repair Parts.*** Sales taxes apply to the purchase of tangible personal property, such as equipment within a state. In transactions where no sales tax applies, a complementary tax (use tax) may apply. For instance, if equipment bought in Texas is transferred to California, California can impose its use tax. Most states, including California, provide an outright sales tax exemption for manufacturing supplies and equipment.

2. ***The Taxation of Manufacturing Consumables.*** Very few states offer an exemption for items that are consumed or used during the manufacturing process, but do not become part of the finished product (for example, lubricants). In many cases, this is a cost that is significant for the industry.

3. ***The Taxation of Utilities and Fuel.*** Most states allow some exemption for utilities used in the manufacturing process. In Georgia, for example, electricity purchased for manufacturing is exempted from sales tax when the total cost of the electricity is 50 percent higher than the cost of all materials used (including electricity) in producing the good.

Table 5 shows state sales tax rates for states with a high share of national aerospace employment. California has the highest sales taxes. Among the states with the highest state sales tax rates are New Jersey, Washington, Texas, and Illinois. Colorado, Alabama, Louisiana and Georgia have the lowest sales tax rates (2.9 through 4 percent). In some states, localities have different tax rates (California and New York, for example), and there are states where some localities do not have sales taxes, but others do (such

as Florida, where local taxes range between 0 and 1.5 percent). Some states do not have local sales taxes, as is the case in Connecticut, Michigan, and Maryland.

Table 5: States Sales Taxes

US State Sales Tax Rates - 2007		
State	State sales tax rate (2007 rates)%	Combined state/local average tax rate % (2006 rates)
Alabama	4	8.05
Arizona	5.6	7.7
Arkansas	6	8
California	6.0 (7.25 inc. statewide local tax)	7.95
Colorado	2.9	6.15
Connecticut	6	6
Florida	6	6.7
Georgia	4	6.9
Illinois	6.25	7.6
Indiana	6	6
Kansas	5.3	6.95
Louisiana	4	8.6
Maryland	5	5
Massachusetts	5	5
Michigan	6	6
Missouri	4.225	6.9
New Jersey	7	6
New York	4	8.25
Ohio	5.5	6.75
Oklahoma	4.5	8.15
Pennsylvania	6	6.25
Texas	6.25	7.95
Utah	4.75	6.45
Virginia	4.0 (5.0 inc. statewide local tax)	5
Washington	6.5	8.45

Source: FTA and USA-SALES-USE-TAX-E-COMMERCE.COM at: http://www.usa-sales-use-tax-e-commerce.com/table_sales_rates.asp.

Louisiana (8.6), Washington (8.45), and New York (8.25) have the highest combined state/local average sales tax rates. California and Texas rank seventh, while Maryland, Massachusetts, and Virginia have the lowest rate (5). Many states have partial or total exemptions for manufacturing equipment and consumable supplies used in manufacturing (see appendix).

An Assessment of Total Business Tax Burden by State

It is difficult to obtain accurate and reliable comparisons of tax burden among states. States have different rates and structures of state taxes, coupled with the effects of exemptions, exclusions, deductions, credits, and special provisions making comparisons of business tax burden very difficult. The mix of taxes also matters: a state may compensate for low income taxes with high property taxes. Different types of business have different tax exemptions. Some industries may have special deals that decrease and exempt them from a variety of taxes. Hence, a comparison of businesses' tax burden by state for a particular industry may require detailed information of the financial records of the individual firms.

According to recent studies, California has a much higher tax burden than the national average. In their 2007 calculation of their cost-of-doing business index, the Milken Institute ranked California as the state with the second highest tax burden among the 25 states with significant aerospace presence, following Arkansas, while Missouri, Colorado, and Texas had the lowest ranks. The Milken Institute index is based on the ratio of annual state tax revenue as a share of personal income.

The 2008 State Business Tax Climate Index (Fifth Edition by the Tax Foundation) ranks California number 47 in terms of business tax climate, only above New York and New Jersey. However in their methodology, tax exemptions such as research and development, and other tax breaks do not improve the rankings. On the contrary, their index incorporates those exemptions as magnifying factors since they consider these exemptions are market distortions that have emerged from an adverse business climate. For example, authors state that because job credits "reward businesses who are expanding anyway, punishing firms that are already struggling…states that offer such credits score poorly on the Index."[136] Hence, tax burden indexes have to be taken with caution, since state rankings vary and show different things according to the methodology used to build the indexes.

STATE DEVELOPMENT POLICIES AND INCENTIVES

After the aerospace job losses experienced at the end of the 1990s, some states have been offering specific policy incentives targeted to attract and retain aerospace industries. New Mexico, for example, offers a package of incentives for aerospace, including: 1) a research and development tax deduction against "gross receipts" for services sold to the U.S. Air Force (gross receipts is New Mexico's version of a sales tax); 2) an aircraft manufacturing gross receipts tax deduction for sale of aircraft; 3) an aircraft refurbishing or remodeling tax deduction; and, 4) a space gross receipts tax deduction from receipts from "launching, operating, or recovering space vehicles or payloads" and other space related operation when these operations take place in a spaceport. A "spaceport" is defined as the installation of facilities (and related facilities) used for the "launching, landing, operating, recovering, servicing, and monitoring of vehicles capable of entering or returning from space."[137] Washington State also offers a

complete package of incentives for aerospace (described in the appendix of this document).

Most states have policies designed to attract a broader group of manufacturing activities, within which aerospace is included. The main objective of these broader policies is to improve the state business climate to promote the type of development states most want. For instance, most states have created a wide variety of incentives to promote high-technology development. Since the aerospace industry is a high tech industry, these policies benefit aerospace and are discussed here.

State policies can make a difference. An analysis by the Oklahoma Department of Commerce estimates a company's savings from tax incentives that the state provides to aerospace manufacturers. They base their calculations on a company of the following characteristics: 1) the company creates 1,000 jobs; 2) has $40,000 average third year worker's salary; 3) has $100 million investment; 4) has a 60 percent ratio of machinery and equipment to investment; and, 5) is located in an Oklahoma enterprise zone. The analysis concludes that such a company can save up to $128 million over ten years as a result of Oklahoma's incentives.[138]

To improve the competitive advantage of existing and emerging businesses, some states have a comprehensive package of economic development policies based on strategic planning. Others just have a variety of independent programs or policies such as business capital and funding programs for different types of businesses, enterprise zones, defense conversion, market development, export financing, strategic technology, tax incentives targeted to selected activities, and others.

Strategic Planning: Regional-Cluster Support

Many states have initiated an integrated economic planning effort. Some economic development agencies have increasingly been focusing on supporting regional industry clusters, rather than targeting individual firms or businesses. Some examples are as follows:

Enterprise Florida	Enterprise Florida is developing the "2007-2012 Roadmap to Florida's Future". This five-year plan for economic development is oriented to formulate recommendations to the Governor and Legislature. The plan is designed to identify key challenges and enhance the competitiveness of activities that promote growth in the state.[139]
Regional Technology Alliances	In 1993, the State of California established a technology program including the Regional Technology Alliances (RTAs), the California Technology Partnership (or CalTIP), and a federal-State partnership program to facilitate funding for development, application, and commercialization of technology. The RTAs were nonprofit corporations established by legislation and funded by state, local and private funds, for the revitalization of the Los

Angeles, San Diego, and San Francisco Bay regions. The alliances' work emphasized the linking of companies with ongoing activities and resources. Their mission was to promote economic growth in the region and expand innovation and use of most recent technology. These corporations provided services for governments, companies and universities, including entrepreneur training, and commercialization and technology transfer services. They also connected innovators to investors and companies. Today, the Los Angeles Technology Alliance continues its work offering these services on a consulting basis, and acting as a "facilitator" and "active incubator."[140] However, the RTAs and the CalTIP programs are no longer in existence after state funding for these programs was interrupted in 2004.

Los Angeles Technology Alliance

The California Space Authority

A California effort to support space activities is the California Space Authority (CSA), formerly known as the California Space and Technology Alliance (CSTA). It is also the state's official spaceport authority. In this capacity, CSA promotes and assists in the development of California spaceports. CSA is an industry-driven nonprofit corporation, comprised of space-related businesses, entrepreneurs, government agencies, and academic research programs. Their objective is to represent the interest of the California aerospace industry and promote the development and competitiveness of the aerospace activities in the state. The California Space Authority sponsors and supports state legislative and regulatory action that benefits space enterprise. One of the activities of CSA is gaining congressional support by working with the California Congressional Delegation for space projects.[141]

In 1998, the California Space Authority developed the first California Space Strategic Plan, with public and private participation, including private entities from the commercial, civil and national security space sectors. Thirteen entities co-sponsored the 2004 Plan and 345 public and private representatives from 146 organizations participated in its creation. The plan includes five strategic initiatives: 1) "Space Enterprise Business Development, Retention and Growth"; 2) "California Space Industrial Base Vitality"; 3) "Space Science, Research and Technology Development"; 4) "Space Education and Workforce Development"; and 5) "Public and Policymaker Awareness." Recently, CSA developed a new "2007-2010 California Space Enterprise Strategic Plan".[142]

South Bay Economic Development Partnership

The South Bay Economic Development Partnership (Torrance) and the California Space Authority have a strategic alliance which provides support and promotes South Bay space companies growth, space infrastructure, and workforce development.[143]

Targeted Tax Incentives

The most commonly used techniques to promote state and local economic development strategies involve targeted tax cuts and business tax incentives. Targeted tax incentives are created to benefit a limited number of taxpayers, or even an individual taxpayer (in the case of specific deals), to encourage some specific activity. Among the most frequently used tax incentives are investment, job creation, and research and development tax credits. The appendix of this document has a brief summary of various development policies (including tax and business incentives) that are offered by the 25 states with the highest share of U.S. aerospace employment.

Tax Incentives for Investment

Many states provide special incentives or depreciation schedules for equipment. Some states may grant property tax abatements of up to ten years on new plants and equipment. For instance, Alabama offers a capital investment tax credit of up to five percent of capital cost per year for 20 years to eligible new and expanding companies. Since 2001, the law provides lower qualifying thresholds for designated "favored geographic areas."[144] Some states offer investment tax credits to businesses located in designated areas (or enterprise zones). For example, Arkansas has Arkplus, a discretionary income tax credit of ten percent of total investment for new or expansion projects. The credit may be used to offset 50 percent of income tax liability. Any unused credits may be carried forward for nine years. The amount of investment required is based upon the tier designation of each county (see appendix).

California had a manufacturers' investment credit of six percent of qualified property from 1994 to January 2004. Proposals to revive this policy have been unsuccesful.[145]

Net Operating Loss Tax (NOL) Treatment

NOL treatment provisions have significant economic value for industries facing heavy restructuring costs, such as aerospace and defense-related industries. These provisions allow businesses that experienced losses in a given year to deduct these losses from the income earned in the following years. How these losses are deducted and for how many years depend on the states' specific legislation. Until 1993, California was one of only two states with corporate income taxes that did not offer NOL treatment. Since 1993, new businesses can carry over 100 percent of their losses that occurred during the first year of operation for up to ten years. If losses occurred during the second year of operation, 100 percent of the losses can be carried forward for seven years, and losses that occurred during the third year of operation can be carried over for six years. Existing California business can carry over 50 percent of their losses for up to five years".[146]

Tax Incentives for Job Creation

Most states have policies that promote job creation. For example, Ohio offers businesses that expand or re-locate there a job creation tax credit against the corporate

franchise tax of up to 75 percent (or more in some cases). This credit can be used for up to ten years. Many of the specific tax incentives for job creation policies in other states, including California, are part of more general policies, including enterprise zone, LAMBRA[xvii], and targeted-areas development programs. (A summary of economic development policies, including tax incentives for job creation is provided in the appendix.)

Research and Development Tax Incentives

Many states offer tax exemptions to encourage research and development research, comparable to the federal Research and Experimentation Tax Credit Program, enacted as part of the Economic Recovery Act of 1981.[147]

California research and development credit has two major components: a regular research credit, and an alternative incremental research credit (AIRC) for qualified research and development expenses. These two research credits are modeled after similar federal programs. The regular research and development credit is calculated by applying the credit rate to qualified research and development expenditures that exceed a certain base level. The base level is the product of the percentage of research and development spending of the average sales in specified years by prior four-year average gross receipts.

Taxpayers are allowed to elect an AIRC credit, designed to compensate firms with high research and development spending and rapidly growing sales, which have a low ratio of qualified expenditures to four-year average sales (so the base is lower). There are three tiers (or three categories) depending on the ratio of qualified research and development expenditures to four-year average sales. Each category has a different credit rate.

California credit rates in both programs are lower than the federal ones. The current California regular research credit rate of 15 percent is lower than the federal rate of 20 percent and the AIRC three-tiered rates are also lower than the corresponding federal rates. The California AIRC rates were increased to 90 percent of the 1999 federal rates in January 2000; however, the federal rates were raised after that adjustment and the new state rates remain significantly below the federal AIRC rates. There have been many proposals to raise California AIRC rates. For instance, AB 751 (Lieu) as introduced in February 2007 proposed to raise the California AIRC rates to the federal levels.[148]

Enterprise Zones

Most states have programs that offer special incentives for businesses that locate in designated geographic locations referred to as "enterprise zones." These zones are typically economically distressed areas. States utilize different economic criteria when offering incentives to businesses located in or moving to these zones. A brief description of other states' enterprise zone programs in states with high aerospace employment is included in the appendix.

[xvii] California Local Agency Military Base Recovery Area (LAMBRA) provides comparable incentives to those offered in Enterprise Zones. The purpose of LAMBRA is to attract investment and employment to former military bases located in eight areas.

Defense Conversion

In some states, there are specific policies to ameliorate the effect of defense budget cuts on their defense-related industries. Defense conversion efforts assist defense-related businesses to transition into new commercial markets. Some programs include matching grants and technical assistance for defense-conversion activities. For example, Florida has the Qualified Defense Contractor Tax Refund Program to help defense or homeland security contractors acquire, consolidate, or convert to commercial production new contracts or subcontracts. Projects receive tax refunds. The limit is $5,000 per job created or saved in Florida. Businesses also may receive these refunds from corporate income, sales, ad valorem,[xviii] intangible personal property, and other taxes. There is an annual limit to the amount that can be received (25 percent of the total refund). There is a maximum of $7.5 million per project and a limit of $2.5 million in tax refunds per fiscal year.[149]

Military/Defense Reuse Zones

States also provide incentives for the reuse of defense facilities. Arizona has a military reuse zone credit, for net increases in employment within a designated military reuse zone. The program targets aerospace industries willing to locate on a former military base. To qualify for credits, employees must engage primarily in manufacturing, assembling, or fabricating aerospace products. Incentives include lower property assessment ratios for a period of five years, tax credits for job creation, and transaction privilege tax exemption.[xix]

To attract investment and employment in former military bases, California Local Agency Military Base Recovery Areas (LAMBRA) provides similar incentives extended to Enterprise Zones. There are eight designated areas in this program.[xx]

Single Project Incentives

In addition to state policies oriented to enhance development in various business areas, states also offer selective packages targeted at single projects. These packages are a combination of special incentives created to attract or retain a particular firm. Incentives include payments for job creation, property tax breaks, discounted rates for electricity, grants for worker training, sales tax breaks, infrastructure support, and others. Incentives vary with each deal. These packages can be quite generous and may be designed by both the state and local governments. However, the public rarely knows the specific incentives offered in these packages since states can be secretive about these deals.

[xviii] The phrase ad valorem is Latin for "according to value." http://www.investopedia.com/terms/a/advaloremtax.asp.

[xix] A transaction privilege tax is levied on the gross receipts from various types of business activities. This is a tax on the privilege of doing business.

[xx] Designated zones are Alameda Point; Castle Airport; Mare Island; Mather\McClellan; San Bernardino International Airport and Trade Center; San Diego Naval Training Center; Southern California Logistic airport; and Tustin Legacy.

Examples of specific incentive packages offered by states include the following:

California Joint Strike Fighter Tax Incentives

The state designed a variety of incentives to retain the Joint Strike Fighter program, including a hiring wage credit and a property credit for businesses involved in the program. These credits applied to taxpayers that manufacture products to be used in a Joint Strike Fighter. Excess credits could be carried forward for a maximum of eight years. The hiring-wage credit was a percentage of new or existing employee wages for services directly related to the contract or subcontract. The percentage was 50 percent for 2001; 40 percent for 2002; 30 percent for 2003; 20 percent for 2004; and, 10 percent for 2005. The credit was limited to $10,000 per year, per employee, prorated for partial years.

The property credit was ten percent of the cost of qualified property used in activities to manufacture a product used in a Joint Strike Fighter. "The taxpayer was allowed to claim this credit together with the Enterprise Zone Sales, and the Use Tax credit for the same item."[150]

The Joint Strike Fighter credit expired in 2006. There have been efforts to renew it, but they have not been successful. The latest effort was SB 359 (Runner 2007-2008). Critics believe that the presence and expansion of the very companies benefiting from SB 359 serve as the best reason to reject it and that credits and tax deductions reward firms for investments they would have made without the credits.

Washington State Aerospace Incentives to Retain Boeing's Operations

To retain Boeing's final assembly of the 787 in Washington, Washington state offered the industry a tax incentives package that included: 1) reduction in the business and occupation rate for the aerospace industry; 2) business and occupation tax credit for research and development; 3) sales tax exemption for computer hardware and software used in the design and production of airplanes and their components; 4) sales tax exemptions for new building or enhancement, and 5) property tax breaks for new buildings and equipment. The value of the entire tax incentives package to the aerospace industry was estimated as at least $28 million in the first two-year period and more than $108 million in the following biennium. The estimated impact in the later years was around $120 million per year. These figures could be higher depending on the level of investment required by the industry and where the project is located. A more detailed summary of the current policies is in the appendix.[151]

The Texas Enterprise Fund	Some states, such as Colorado, Virginia, and Texas, have discretionary grants to attract new and expanding businesses. For example, the Texas Enterprise Fund is a discretionary fund that can be used for infrastructure and community development, job training programs, and other business needs. Eligibility requires that projects demonstrate a significant return on the invested funds and must be approved by the Governor. In 2006 Texas Governor Rick Perry publicized a $2.5 million Texas Enterprise Fund grant to help bring a new Sino Swearingen Aircraft Corporation manufacturing facility to the San Antonio area.[152]

Industry-Government Partnerships for the Development of Aerospace

These programs provide a mechanism for industry leaders to work with government for the solution of problems that affect aerospace activities. There are several examples where the government collaborates with the industrial sector in supporting the development of the aerospace industry. Some of these are:

Indiana Advanced Aerospace Manufacturing Alliance	The Indiana Advanced Aerospace Manufacturing Alliance is made up of aerospace manufacturers, suppliers to aerospace manufacturers, research organizations, educational institutions, and government agencies. Their objective is to identify and share knowledge, technologies, industry practices, and tools to promote aerospace growth.[153]
Georgia Aerospace Innovation Center	Georgia's Aerospace Innovation Center focuses on applied research and development; education and workforce improvement; and, investment and industry growth.[154] The center works with companies and the academic institutions to spur technology innovation by helping businesses to access federal research and development funds; raising investment capital; and making direct investments. The center also works with industry to identify workforce development needs. An important activity of the center is working together with authorities and communities to attract complementary aerospace employers.
Space Florida	Space Florida is a public-private partnership that promotes and supports Florida's aerospace industry. It was created by the Florida Legislature as a single point of contact for state aerospace-related activities with federal and state agencies, the military, universities, and the private sector.[155]

Space Florida develops and implements strategies to support and spur space-related economic growth. Such strategies include: 1) assistance to space-related businesses that are considering expanding or locating in Florida; 2) partnering with state and federal agencies in programs that benefit the aerospace sector; and 3) sponsoring investment in space facilities (for example, launch pads and hangars).[156] A California example of this type of effort is the California Space Authority discussed earlier.

California Red Teams

California also has "Red Teams," teams of business and government representatives that collaborate to solve business problems or encourage companies to expand in California. The Red Team approach was created by the administration of Governor Wilson.

Currently, there is a Red Team effort to retain the C-17 program, formed with Boeing and Long Beach officials. The Team designed an incentive package, including state tax credits, as well as reductions in Boeing's lease rates and water and electricity bills. The future of the plane is uncertain, depending on the number of orders from the U.S. Air Force. The 2008 budget did not include an appropriation for more orders. However, in December 2007, the Department of Defense awarded Boeing's McDonnell Douglas Corporation unit a $1.3 billion five-year contract with the U.S. Air Force for enhancement of the existing C-17 cargo aircraft fleet, including design, development, and improvement activities. Boeing continues seeking congressional support and their recognition that the Air Force needs more C-17s, as well as the enhanced version of this aircraft.[157]

About the C-17 Program

The C-17 program has a history of technical problems and funding shortfalls. In1981, McDonnell Douglas won the competition with Boeing and Lockheed to develop the C-17 to replace C-130s and C-141s. C-17 development began in 1986, but technical problems delayed the program and increased costs.

Furthermore, the Department of Defense's demand for this aircraft has increased and decreased over time. For example, in 1990 the Defense Department reduced the projected plan of 210 to 120 C-17s, due to revised demand projections and budget constraints. In 1993, the Air Force agreed to purchase another 12 C-17s. However, the agreement would end with the 40 aircraft (then on order) if McDonnell Douglas could not solve production and other problems within a two-year period. By the mid-1990s, the program's difficulties had been largely overcome; however, there was uncertainty on the number of C-17s that needed to be procured. Air Force officials that support the C-17s program mention its high payload capacity, ability to land on short airfields, and ground maneuverability. Critics debate that it might be more cost-effective to upgrade the C-5, a larger strategic airlifter built by Lockheed, which still has at least 25 years life remaining and can carry twice the payload of the C-17.

Orders increased again in 1996 and reduced again in 1998. By late 2002, Boeing had delivered 100 C-17s. The Defense Department planned to end C-17 production at 180 aircraft in FY-2007, but appropriation conferees included an unrequested $2 billion to buy ten more C-17s.

***Source*: Bolkcom, Christopher. Congressional Research Service Report for Congress. "Military Airlift : C-17 Aircraft Program." Updated June 5, 2007. CRS: Washington D.C. 2007.**

University-Industry Technology Centers

There are several federal programs that encourage the establishment and support of university-industry technology centers, such as the National Science Foundation's Engineering Research Centers and NASA's Centers for the Commercial Development of Space. A university-industry technology center may involve at least one university and multiple companies. It can also include technology centers within universities, or centers managed by third parties closely related to the university through organizational links (for instance board seats) or by sponsoring of university research. Third parties can be not-for-profit organizations or independent contracted management organizations.

State centers give priority to developing a given industrial segment, generally in an emerging technology area such as space commercialization or intelligent transportation systems. The centers provide research and services to companies in the state. Some centers help companies in solving some specific technical problem, while others emphasize the development of intellectual property. Several states have sponsored trade associations and industrial segment studies to improve recognition of the industry and its technological and commercial resources. Some centers have, in addition to research capabilities, industrial extension or program applications that focus on the improvement of production processes. For example, some centers sponsor programs for injection molders or wood products manufacturers.

The organization and objective of government-industry consortia and university-industry centers are similar; however, the universities are not central participants in this type of organization. There are also government-industry and academic consortia.

The Virginia Space Grant Consortium

The Virginia Space Grant Consortium (VSGC) is a coalition of research and education organizations including five Virginia colleges and universities, NASA, state educational agencies, Virginia's Center for Innovative Technology, and other establishments. This consortium "acts as an umbrella organization" coordinating and developing aerospace and high-technology related educational and research activities throughout Virginia.[158]

The Consortium is part of NASA's National Space Grant College and Fellowship Program, a national network of colleges and universities that promotes research and educational programs important for the development of aerospace. In that capacity, among the VSGC's program goals are: 1) the promotion of science, math, engineering, and technology education; 2) the recruitment of women and minorities for careers related to science and engineering; and, 3) to inform the public of the benefits of aerospace programs.[159]

The Florida Space Grant Consortium

The Florida Space Grant Consortium (FSGC) is an association of seventeen public and private universities and colleges. The Consortium includes all of Florida's community colleges, organizations such as the Astronaut Memorial Foundation, Space Florida, Higher Education Consortium for Science and Mathematics, Kennedy Space Center, and Orlando Science Center. FSGC provides grants, scholarships, and fellowships to students and educators from institutes of higher education.[160]

Given California's size and the strength of its universities, industry research, and federal laboratories, there are numerous technology activities in the state, with hundreds of university-based centers and numerous local resources for aerospace activities. Aerospace representatives indicate that this is one of the areas where the state has a competitive advantage over other states.

Industrial Problem Solving

These are programs that provide assistance to companies. This kind of program seeks to increase the competitiveness of targeted segments of the industry (for example, small manufacturers) by disseminating and supporting the adoption of the most appropriate technology for these segments. Examples of industrial problem-solving programs are the technology extension/deployment programs:

Centers for Applied Competitive Technologies	California has the Centers for Applied Competitive Technologies, an initiative of the California Community College's Economic Development Program. There are 15 centers that serve California's technology and manufacturing industry sectors. These centers provide an extensive range of services, including customized technical training to improve the businesses' competitiveness.
California Manufacturing Excellence Programs and the California Manufacturing Technology Center	California had the California Manufacturing Excellence Programs, including the California Manufacturing Technology Center (CMTC) and the Corporation for Manufacturing Excellence (MANEX). CMTC and MANEX have become consulting organizations after state funding to these programs ended. MANEX offers consulting and business advisory services that help manufacturers significantly increase productivity, quality, scale of operation, and profitability.[161] CMTC was part of the California Manufacturing Technology Program (MTP), the state component of the Manufacturing Extension Partnership (MEP), a federally-supported-nationwide network of state centers that help manufacturers to compete globally by providing them access to technology. The MEP/MTP/Industry program was funded with federal, state, and private money, with each of these sectors contributing one-third of the funds. State funds to this program reduced from $6.7 million in 2001, to $1.6 million in 2004, the last year that the program received state funds.[162]
California Manufacturing Technology Consulting	CMTC provides specialized technical assistance in lean manufacturing, supply chain, industry specific services and relevant aspects to address the issues faced by primes and suppliers. CMTC's program "California Enhanced Manufacturing Supply Chain," in partnership with the Department of Defense, expands the possibility of California's small and medium-sized manufacturers for selling to the defense industry by informing them of the opportunities that exist given their specialization and technical capability. They also provide them with technical assistance. CMTC has also developed the Small Manufacturers Advantage program to help small manufacturers to solve their particular problems.[163]
Los Angeles Regional Technology Alliance	Los Angeles Regional Technology Alliance (LARTA) was originally formed in 1993 through state legislation to assist small companies developing new technologies. Today the LARTA Institute is an independent, private, nonprofit corporation. The Institute provides "entrepreneur training, commercialization, and technology transfer services for governments, companies, and universities."[164]

Incubators

Incubators offer business services to startup companies, such as shared facilities and low-cost office and laboratory space, for a specified period (generally three years). Incubators also foster a cooperative environment between clients and mentor relationships between start ups and established companies. Many cooperative technology incubators are affiliated with universities or other sources of innovation, such as federal laboratories or corporate innovation centers. An example of this kind of program is the Hampton Roads Technology Incubator System (HRTIS) supported by the Center for Innovative Technology, Virginia, dedicated to fostering the expansion of high-growth, high tech businesses.[165]

Technology and Business Financing

Most states, including California, provide some type of financial assistance to the industry at various business stages of development. Examples of this assistance include industrial development bonds, pollution control financing, loan guarantees, export finance, and loans for hazardous waste reduction and recycling. Most of these programs are oriented to help small and medium-sized businesses. Various states have interactive databases or electronic networks to facilitate financing by bringing together entrepreneurs requiring capital and organizations or private industries searching for investment opportunities.

Job Training

All states offer some kind of state-supported job-training programs oriented to improve the skills of the labor force. These programs provide grants and other financial assistance to businesses. There are programs for entry-level skills training and skills upgrade training for new, existing and displaced workers. Criteria to qualify for these programs vary by state (see appendix).

Programs that Enhance Competitiveness of Industry Suppliers

Programs that encourage the development of new technologies (technology development programs) and other industry-support programs are all enhancing the competitiveness of the aerospace industry. For example, the Ben Franklin Technology Partners (BFTP) in Pennsylvania works to help the expansion of industries in targeted sectors and the development of new technologies. BFTP delivers resources in sectors such as information technology, life sciences, communications, advanced manufacturing, advanced materials, and environmental technology. BFTP accomplishes this goal by investing capital in new technologies; by offering technical and business expertise; and, by providing a network to support emerging companies.[166]

There is also a variety of networks of collaborating small companies established to assist a region's key industries and increase their competitiveness through the synergy of company resources. The implementation of this type of initiative may occur through voluntary contractor programs, government sponsored pilot programs, or through

contractual incentives such as fees. Some examples of aerospace industrial networks are:

Lean Aerospace Initiative	The Lean Aerospace Initiative is a consortium of federal government, industry, academic and labor organizations. Its overall intent is to foster the use of "Lean Manufacturing" or lean enterprise principles and practices, across the aerospace (and related defense) communities of the United States. Lean means shorter production cycles, increased capacity, fast response, less time, smaller inventories, less management, etc. Intended results are reduced cost and production cycle time for military aircraft throughout the entire production chain, while continuing to improve product performance. This kind of program is important since the aerospace industry (primes and suppliers) are facing rising costs, long manufacturing/delivery lead times and rapidly changing technological environment. In California, California Manufacturing Technology Consulting (CMTC) is applying lean aerospace principles in their technical assistance and counseling to aerospace suppliers and sub-contractors.
Colorado Office of Economic Development and International Trade	The Colorado Office of Economic Development and International Trade helps aerospace companies by offering technical assistance, guidance, and access to training and other business incentive and financial programs. This organization works with a statewide network of partners to 1) help businesses with the site location process; 2) provide customized research on state comparative economic and financial conditions; and, 3) assist aerospace businesses to solve their problems.[167]
Florida Technology Coast Manufacturing and Engineering Network	The Technology Coast Manufacturing and Engineering Network ("Tec-MEN," Florida) dates from 1988. Its purpose is to organize defense-dependent firms in Okaloosa County, Florida, to cope with the downsizing of the U.S. Military. This non-profit network allows companies that are members of the Economic Development Council to participate in larger defense projects by partnering and teaming. Companies "join together to compete for and complete both defense-contracting and other substantial business opportunities that are too expansive for a single business to undertake."[168]

Are State Business Incentives Effective?

The long-term effectiveness of incentive programs is difficult to quantify. States are secretive about specific economic development deals, and the variety of deals and state programs makes it difficult to draw any comparison between them.

Advocates of tax and business incentives believe that state and local policies can lower the cost of doing business and therefore raise profits. Since corporate income, sales, and property tax incentives directly affect business profit, firms may migrate for the purpose of significantly reducing costs. Supporters of tax incentives see them as a form of job-creation financing by attracting businesses.

However, there is evidence that suggests that government incentives traditionally have not been that important in a firm's decision to locate or expand. One major reason is that most state policies are based on tax incentives, and state taxes represent less than one-half of one percent of the cost of doing business. Because state and local business taxes represent a small cost, after-tax rates of profits do not vary significantly by state. Researchers have not found significant differences between the profitability of firms located in states with lower taxes and firms located in states with higher tax burdens.

Opponents of state business incentives for specific industries defend their position with the following arguments:

- Tax and financial incentives are not the only factors considered in business-location decisions. Other aspects of the state business climate, such as geographical location, transportation, labor, raw materials, unions and infrastructure, may have more effect.

- Costs of offering incentives may be too high to justify in many of these cases.

- Opponents to business incentives feel that these measures provide advantages to large firms and shelter inefficient businesses creating market distortions. Incentives raise questions of inequity, since they may benefit only some industries and may be rewarding large companies when most jobs are created by smaller companies.

- Incentives pull dollars away from the improvement of public services and infrastructure, a factor that is very important for businesses' site selection.

A variety of studies on firms' decisions on plant location show that the cost and quality of labor, proximity to markets for input and output, access to raw materials needed for production, infrastructure, quality of life, utility costs, and the state's political business support are more important than taxes. For example, a 2005 Colorado Technology Index survey conducted by a Denver market research firm indicates that only 35 percent of the aerospace companies cited Colorado state and local incentives as an important factor for location, while 53 percent of the companies mentioned pro-business state and local governments as an important consideration. On the other hand, the 2006 corporate survey conducted by Area Development found that respondents placed state incentives as the fourth most important factor in business location and expansions decisions.

Another important issue is that generally it is the corporate headquarters rather than the division or plant that pays state taxes. In this case, disadvantages from taxes or advantages created by tax relief do not necessarily apply directly to the business unit that would move or stay.

Overall, tax cost reductions together with political support may still make a difference in some investment strategies, especially for larger projects and when all other conditions are fairly similar. Political support is very important to ensure funding for contracts, and it is very important for the defense-related aerospace sector. According to a representative of the aerospace industry, businesses look at the totality of a state's position on public policy issues rather than on a particular policy when deciding their location sites. They look for an environment that helps employers maintain and increase their competitiveness and respond quickly to the industry's needs.

One example is Boeing's selection of Chicago over Washington as its headquarters location. According to aerospace industry representatives and business relocation analysts, Chicago selection was driven by changes in Boeing's corporate strategy rather than by state and local subsidies. Boeing's position as an expanding global company is to find political support for federal contracts and the highly specialized technical and financial services that Chicago and only a few cities can satisfy.

THE WORLD TRADE ORGANIZATION (WTO) AGREEMENT AND STATE INCENTIVES

International agreements may constrain a state's power to use taxes and subsidies for economic development. The WTO agreement establishes rules for international trade between the member nations. Under the agreement, subsidies (financial contributions by government or any public organization within a member's territory that grant that member an advantage in the terms of trade) alter free market conditions, hence, are subject to restriction. The WTO has enforcement mechanisms for members to file complaints against others that are not conforming to the agreement. A panel is formed to settle trade disputes. The affected party must prove that it has been harmed by the policy.

In June 2005 the United States filed a complaint with the WTO claiming that launch-aid and other forms of assistance provided by the European Union to Airbus are illegal subsidies. The European Union filed its own complaint with the WTO maintaining that Washington State's aerospace incentives (passed in 2003), as well as other federal and state aid (infrastructure, research and development aid, and military contracts) are illegal subsidies.[169] These WTO cases depend on the ability of Washington and Brussels to demonstrate that their competitive industries have been harmed by the other's subsidies. Both have presented evidence of adverse effects on sales or prices to support their claims. The dispute continues and, according to trade officials, it may be impossible to settle the dispute for at least six months to two more years.[170] One implication is that this conflict may prevent other potential international joint-venture agreements that could favor the U.S. aerospace industry. Another implication is that the outcome of this dispute may constrain the use of tax incentives by states to spur development of targeted industries.

SUGGESTED POLICY OPTIONS TO ENCOURAGE AEROSPACE ACTIVITIES IN CALIFORNIA

California policy makers may consider the following suggested policy options that may help encourage the expansion of aerospace:

Redefinition of Tax Credits, Research Tax Credits, and Other Financial Incentives

The Legislature may consider a redefinition of current tax credits, research tax credits, and other financial incentives for manufacturing in general and aerospace in particular, in a way to assure that these policies actually benefit the state. New policies and incentives need to be designed carefully so that they actually provide the benefits they intend to achieve.

Generally, it is the corporate headquarters rather than the division or plant that pays state taxes. Tax benefits accrued to California plants of multinational or multi-state businesses are

written off the balance sheet of the whole corporation rather than written off the California plant's balance sheet. California tax credit decreases the whole company's cost of doing business rather than the California plant's cost of doing business and the tax benefit does not apply directly to the business unit that would move or stay.

To assure that the decrease in costs benefits the state, tax incentives such as research and development tax credits, investment credits, etc., should be tailored to decrease the cost of industrial activities and programs that are actually developed in California. For example, specific tax credits could be designed to decrease the cost of selected projects and defense contracts of economic significance for the state.[171]

Policy makers could consider increasing the amount of tax credit for research and development in aerospace. As discussed earlier, California regular research credit rate and alternative incremental research credit are lower than the federal rates. There have been various proposals to raise California research and development credit rates, including SB 359 (Runner, 2007-2008); SB 928 (Harman, 2007-2008); AB 751 (Lieu, 2007-2008); and, AB 1285 (Parra, 2007-2008).

Reinstatement of Manufacturing Investment Tax Incentive

According to consultants that advise aerospace manufacturers and help solve industry problems, the reinstatement of a manufacturing investment tax incentive, providing at least a six percent tax benefit, may help the competitiveness of manufacturing activities in the state.[172] Previous California law allowed qualified taxpayers a Manufacturers' Investment Credit (MIC) equal to six percent of the qualified costs paid or incurred on or after January 1, 1994, and before January 1, 2004. These costs included equipment used primarily in manufacturing, refining, processing, or recycling, as well as equipment used for research and development, maintenance and repair. The credit expired in January 2004.

Despite many proposals to renew this policy, the credit has not been reinstated. Supporters of the MIC believe that the credit helps increase investment in California since it reduces the cost of new investment. Proponents of a MIC also cite the need for California to compete with incentives offered by other states (most states provide a manufacturing investment or similar tax credit). Opponents emphasize that the previous MIC had a small impact on economic growth and job creation and the benefits do not justify the high costs of the incentive.

Workforce Development:

A challenge that U.S. aerospace and defense companies face is that they will have to replenish their workforce as their current workers age at the same time that there is a shortage of qualified new workers because few college graduates are choosing careers that fit the need of the industry. At the same time aerospace industries have to compete with other high tech sectors in the recruitment of engineers and other highly specialized employees. According to the industry, this can become a crisis in the next ten years.

Training and Certification Curricula

In this context, policy makers could consider supporting the development of programs that enhance the skills of California's workforce to meet the needs of high technology industries, such as aerospace. This includes support to the development of training and certification curricula that focus on knowledge (math) and skills required by the industry. Programs can be designed through partnerships between education providers (K-12, community colleges, and universities) and the industry. The infrastructure and expertise for these programs are already in place; however, work is needed to strengthen the linkages between industry and educational centers. Policy makers could also consider the support of loans and fellowships programs offered to attract students to careers that fit the needs of aerospace and other high tech industries.

Specialized Training

The state may design tax incentives for specialized training funded by the employer. The state may consider increasing funding for the Employment Training Panel to assist in workforce development and competitive training.

Skills Upgrades

Policy makers in California could consider the establishment of special incentive grants to small aerospace firms that need to upgrade the skills of current employees. Such a program could target the training needs of workers of rapidly growing firms or emerging technologies, such as commercial space activities. The employer could design the customized training by working with private or public education providers. Grants could be subject to fund matching requirements by interested employers.

Create a Science and Technology Advisor to the Governor

To strengthen the currently weak infrastructure for science and technical education, the California Council on Science and Technology suggests the creation of an office for a science-and-technology adviser to the Governor to help the unification of science and technology agendas and provide sound advice on this project. A position that represents the needs of the aerospace industry within such an office could help the development of programs that enhance the future labor force of

	the sector.
Research and Development Investment Strategy	A substantial investment in research, including specialized personnel and facilities, is critical to the industry. Policy makers may consider designing a strategy to increase funding sources for research and development activities related to the aerospace industry. Part of this strategy may include attracting more federal research and development funds to the state.
Innovation Hub Funding	The state may consider reinstating funding for innovation hubs, such as Los Angeles Regional Technology Alliance, currently LARTA Institute, in order to expand support for innovation.
State Matching Funds for Federal Grants	The state may consider creating a program that provides state matching funds to companies that win federal research and development awards or contracts.
Foster Regional Collaboration	The state may consider ways to foster regional collaboration for workforce development, infrastructure build out, and sharing of information databases identifying vendors, suppliers and distribution channels. For example, the state may consider expanding, financing, and implementing industrial networks and interactive databases to promote collaboration and disseminate information on: • financial resources, including venture capital, loans, etc., • existing aerospace companies information (main producers and suppliers), • human resources, and • defense programs. This kind of effort can be especially important for small companies, suppliers, and subcontractors.
Promote the State to Suppliers	The state may consider ways to expand the small vendors and suppliers base, by developing a strategy to recruit suppliers through partnerships with existing companies. For example, the state may consider providing financial incentives for the suppliers of existing companies to locate in the state.
Expand Technology Deployment Programs	An alternative to meet the need for upgrading workforce skills and help small and medium manufacturers is to provide funding to extend MANEX and CMTC activities and also to promote and financially support the creation of additional centers that have those functions. The same could be done to support Centers for Applied Competitive Technology and the expansion of their technology extension/deployment programs.

Increase Government Agency Communication	Policy initiatives that increase communication between California and federal agencies on issues/legislation of interest to the industry and the economic development of the state would help to provide a friendly environment for the aerospace sector. This could include: 1) building and implementing a "pursuit" process by the state for identifying/recruiting out-of-state missions or defense programs that could locate in California and benefit the economy of the state; 2) attract federal support to retain and reuse California military bases; and, 3) initiatives to support replacement of aging aerospace-related infrastructure.
Revise Enabling Legislation for California Infrastructure Bank	The California Space Authority recommends a revision of the enabling legislation for the California Infrastructure Bank to facilitate funding of a broader range of aerospace-related projects would help the expansion of the industry.

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APPENDIX

SUMMARY OF STATE INCENTIVES PROVIDED BY THE 25 STATES WITH THE HIGHEST SHARE OF U.S. AEROSPACE EMPLOYMENT[1]

California

Economic Development Areas Tax Credits

California offers four types of Economic Development Areas (EDAs):

Enterprise Zones. Companies located within the boundaries of any of 39 designated enterprise zones are eligible for the following tax credits:

- Annual sales and use tax credits on the first $20 million of qualified new or used manufacturing equipment purchased.
- Hiring credits determined as a percentage of the wages paid to a qualified employee. The credit is based on the actual hourly wage or 150 percent of the state-established minimum wage, whichever is less. The credit is provided over a five-year period as follows: 50 percent of the wages creditable in the first year of employment; 40 percent the second year; 30 percent the third year; 20 percent the fourth year; and, 10 percent the fifth year. The company may qualify up to $31,544 credit per qualified employee that stays in the company during all five years. Credits based on employees that stay for less than 270 days are recaptured.

Other Enterprise Zone benefits that may apply include: 1) A 15-year carryover of up to 100 percent of net operating losses; 2) Expensing of some depreciable property; 3) Lender interest income from loans to businesses may be deductible; and, 4) Businesses in enterprise zones may earn preference points on state contracts.[2]

Local Agency Military Base Recovery Areas (LAMBRA) provide similar incentives extended to Enterprise Zones. The program is designed to attract investment and employment to former military bases located in eight areas. Program incentives that are different from those for enterprise zones include: 1) sales and use tax credit for enhanced equipment acquisitions; 2) a hiring tax credit with an annual wage limitation of $2 million per year; and, 3) displaced employees of the former base can qualify for the hiring credit.[3]

The Tulare Targeted Area (TTA) is similar to the Enterprise Zone program. Incentives are available to companies engaged in food processing, certain manufacturing, trucking and warehousing, air transportation, transportation services, communications and wholesale trade.

The Manufacturer's Enhancement Area (MEA) is an incentive offering $26,894 in tax credits for each qualified employee hired within the MEA area (cities of Brawley and Calexico).

Research and Development Tax Credit

This credit allows companies to receive a 15 percent credit against their bank and corporation tax liability for qualified research expenses, and a 24 percent credit for basic research payments to external organizations. Qualified research expenses generally include wages, supplies, and contract research costs.[4]

California (Continued)

Child Care Tax Credit

Employers who contribute to the costs for the start up of a child care program or construction of a child care facility are eligible for a credit equal to 30 percent of its costs, up to a maximum of $50,000 in one year.

Net Operating Loss Carryover

California tax law allows businesses to carry annual losses forward to the next year and reduce taxable income in the following years. New businesses can carry: 1) over 100 percent of their losses for ten years for losses incurred during their first year of operation; 2) 100 percent over seven years when the loss occurred in the second year of operation; and, 3) 100 percent over six years when the loss took place during their first year of operation. For existing California business, 50 percent of the loss can be carried over for five years.[5]

Job Training

The Employment Training Panel Program is designed to help businesses improve workers' skills. Employers match at least $1 for every $1 the state spends.6

Infrastructure State Revolving Fund Program

Program provides low-cost financing for infrastructure projects to local communities.

Industrial Development Bonds

Provide financing for land, building, and equipment for new and expanding manufacturing plants and other qualifying industries. Other expenses such as architectural, engineering, legal, and others, may be paid from the bond proceeds.

Washington

Tax Incentives and Credits for Aerospace

Effective December 1, 2003, HB 2294 (Second Special Session, Chapter 1, Laws of 2003) offers a comprehensive tax incentive program for persons engaged in manufacturing commercial airplanes and/or component parts of commercial airplanes.[7]

Decrease of the Business and Occupation (B&O) Tax Rate.[8] Manufacturers and processors for hire of commercial airplanes or its component parts qualify for these incentives. The rate applies to both the manufacturing activity and the consecutive sale of the manufactured product by the producer. The manufacturer also qualifies for the multiple activities tax credit (MATC). Rates decrease according to the following agenda:

Period	Rate
December 1, 2003 - September 30, 2005	.00484
October 1, 2005 - June 30, 2007 (reduction of 12.5 percent)	.004235
July 1, 2007 - June 30, 2024 (reduction of 40.0 percent)	.002904

(The reduction to the .002904 B&O tax rate takes effect on the later of July 1, 2007, or when “final assembly of a super efficient airplane has begun.”)

Washington
(Continued)

B&O Tax Credit for Preproduction Development Expenditures.[9] The law offers to manufacturers and processors a B&O tax credit equal to 1.5 percent of qualified development expenditures (expenses incurred in research, development, and engineering activities performed in relation to the development of a product) used in manufacturing of airplanes and component parts of commercial aircraft.[10]

B&O Tax Credit for Property Taxes Paid on Property Used in Manufacturing Commercial Airplanes and Component Parts of Commercial Airplanes.[11] A B&O tax credit matching the property taxes paid on "new buildings, the land upon which the new buildings are located, the increased value of renovated buildings, and tangible personal property eligible for the manufacturing machinery and equipment (M&E) exemption when the buildings, renovations, and tangible personal property are used in manufacturing commercial airplanes or component parts of commercial airplanes."[12]

Retail Sales and Use Tax Exemption for Computers. "Effective December 1, 2003, a retail sales/use tax exemption is available for computer hardware, software, and computer peripherals used primarily in the design, development, and engineering of commercial airplanes or component parts of commercial airplanes when purchased by manufacturers and processors for hire of commercial airplanes or component parts of commercial airplanes. The exemption applies to computer equipment not otherwise eligible for the manufacturing machinery and equipment (M&E) exemption. The exemption also applies to charges for labor and services related to the installation of qualifying computer hardware, software, and computer peripherals."[13]

"Chapter 1, Laws of 2003 Second Special Session, also provides a package of tax incentive programs exclusively for manufacturers of super efficient airplanes."[14]

"Manufacturers of commercial airplanes and manufacturers of component parts thereof also qualify for the Manufacturing Machinery and Equipment (M&E); Sales/Use Tax Exemption; and may qualify for the High Technology Research and Development B&O Tax Credit; New Employee B&O Tax Credit; and Distressed Area Sales/Use Tax Deferral/Waiver."[15]

Economic Development Areas Tax Credits

Distressed Area Sales and Use Tax Deferral/Exemptions Program. Under this program an exception for sales and use tax may be offered for manufacturing, research and development, or computer-related businesses locating in targeted geographic areas. One of the requirements to qualify is the creation of one full-time position for every $750,000 of investment.

New Employee B&O Tax Credit

The program grants a tax credit based on annual wages. For new jobs with annual wages and benefits of $40,000 or less, the credit is $2,000. For higher wages and benefits, the credit is $4,000.

High Technology Business and Occupation Tax Credit

Qualifying high-tech businesses that perform research and development in Washington and meet certain qualifications receive an annual credit of up to $2 million.

Washington (continued)

Job Training

The Washington State Job Skills Program provides grants for customized training projects. The program also requires at least 50 percent matching funds from the industry.[16]

Industrial Revenue Bonds

Tax-exempt bonds are used to finance industrial development. Bonds provide low interest financing.

Texas

Economic Development Areas Tax Credits

The Texas Enterprise Zone Program (EZ) allows local communities to partner with the State of Texas to promote job creation and capital investment in economically distressed areas of the state. Projects are eligible to apply for state sales and use tax refunds on qualified expenditures. The program incentives are related to the level of capital investment and number of jobs created at the qualified business site. A maximum level of investment of $250,000,000 or more with 500 jobs can have a potential refund up to $3,750,000 and of $7,500 per job allocated. In addition, local communities must offer incentives to participants under the enterprise zone program, such as tax abatement, tax increment financing and one-stop permitting. Projects may be physically located in or outside of an Enterprise Zone depending on residence requirements of new employees.[17]

The Strategic Investment Area (SIA). This program also provides benefits for companies based on designated locations. SIA differs from the EZ program in that companies are not required to apply for the benefits, which are not granted on a competitive basis. Eligible firms can apply for job creation credit, investment credits, and research credit bonus. The job creation credit is equal to five percent of the wages paid per year. Amount of credit is limited to 50 percent of the firm's tax liability in the year that credits are claimed. The difference can be carried forward for a maximum of five years. As of January 1, 2008, these credits will expire under Texas House Bill 3. To qualify, a corporation must create at least ten new full-time jobs; pay at least 110 percent of the county's average weekly wage; pay health benefits; and, operate in a qualifying industry or service sector.[18]

Corporations that invest at least $500,000 in machinery and equipment can qualify for a franchise tax credit equal to 7.5 percent. The limit is 50 percent of the firm's tax liability. Unclaimed credits may be carried forward for a maximum of five years or until December 31, 2012, whichever is first. As of January 1, 2008, these credits will expire under Texas House Bill 3.

Defense Economic Readjustment Zone Program (DERZ). An area designated as a DERZ qualifies for SIA benefits. The credit or refund are related to the sales and use tax on qualifying expenditures and to the number of jobs either created or retained in the area. The maximum number of jobs eligible for a refund is 500 or 110 percent of the anticipated new permanent jobs retained. The maximum refund per job is $2,500. Local communities may also offer additional benefits such as tax abatements, tax increment financing, and others.

Sales and Use Tax Exemption

There is a sales and use tax exemption on machinery and equipment used in the

Texas
(Continued)

manufacturing process. This exemption may be extended to replacement parts and accessories that last more than six months and are used in the manufacturing process. Texas cities have the option of imposing a local sales and use tax that can include land acquisition, buildings, equipment, infrastructure improvements, and others.

There is also an exemption from sales taxes on the use of natural gas and electricity for manufacturers.

Property Value Limitation

"Abatement is available for qualified businesses based upon the limitation on appraised value and school district tax rates. The business must enter into an agreement to create a specific number of jobs and type of investment. The abatement applies only to reinvestment zones and must be a qualified industry."[19]

Property Tax Credit

Certain property can receive a refund of state franchise tax and sales and use taxes. The amount of the refund matches the difference between "the amount of tax actually paid and the amount of tax that would have been paid based on the value limitation exemption."[20]

Research and Development Tax Credit

There is a credit of five percent of qualified research and development expenses. The amount of the credit may be up to 50 percent of the business' franchise tax liability. The tax report must be originally due between 2002 and before January 1, 2008. Unused credits may be claimed over a period of up to 20 years or until December 31, 2027, whichever occurs first. Research and development activities conducted in a SIA may receive a bonus on the research credit.[21]

Reinvestment Zone Abatement

A real and personal property in a reinvestment zone qualifies for property tax abatement on a portion of the value for up to ten years. The business is required to enter into a tax abatement agreement.

Tax Increment Financing (TIF)

The TIF program is restricted to the cities, which establish the TIF designated zone. The amount of the tax increment is determined by negotiation between the taxing unit and the municipality.

Job Training

The Skills Development Fund is a program where qualifying businesses and colleges participate to provide customized job training. The program offers grants per trainee.

Industrial Revenue Bonds

Industrial revenue bonds provide financing for land, building and equipment for new and expanding qualifying industries. They also offer financing benefits through both taxable and tax exempt bonds.

Texas (Continued)

Discretionary Grants

- Texas Enterprise Fund is a discretionary fund that finances infrastructure and community development, job training programs, and other business needs. Eligibility requires that the project demonstrate a significant return on the state's investment and must be approved by the governor.
- Several communities administer funds financed by a half-cent sales tax. A portion of these funds is allocated for incentives offered to qualifying businesses expanding or locating in the community. The amount of the incentive is determined by the size of the business's capital investment in the community and the number of jobs created.
- Chapter 380 Financing authorizes municipalities to provide a grant or loan from city collection or offer services to qualifying projects. The grant or loan portion can be used for a variety of projects. Services include the use of city staff, city facilities, and other services at very low charge or free of charge. This financing is at the discretion of the municipality.

Kansas

Economic Development Areas Tax Credits

Enterprise Zone Credits. Enterprise zone incentives are based on the location of the facility, the economic sector (manufacturing, nonmanufacturing, or retail), the capital investment, and the number of jobs created. Eligibility depends on the type of business and the number of jobs created. For example, a manufacturer would need to create at least two new jobs to qualify. The program provides state income tax credits for job creation and capital investment. The job creation tax credit in the metropolitan areas of Kansas City, Topeka, Wichita, and Lawrence is $1,500 per new job created. This amount could be $2,500 per new job created in designated non-metropolitan areas. There is a credit of $1,000 for each $100,000 of qualified investment. The investment tax credit is one percent of qualified investment. Up to 100 percent of corporate income tax liability can be claimed in a given year. Unused credits may be carried over indefinitely.[22]

Job Expansion and Investment Credit

The credit is an annual $100 for each qualified employee and $100,000 of qualified investment, for ten years, with a maximum equal to 50 percent of income tax liability. The law does not provide for carrying over the credit in future years.

High Performance Incentive Program

This program provides for a ten percent income tax credit that does not exceed current tax liability; sales and use tax exemption on qualified items; training tax credit, and grants for 50 percent of qualified consulting expenses with a maximum of $12,500.

No Local Income Taxes

Kansas cities and counties do not impose income or earnings taxes on either personal or corporate income.[23]

Kansas
(Continued)

Sales Tax Exemption

There are sales and use tax exemptions for qualified machinery and equipment, electricity costs used in production, labor and services used in production equipment, building materials used with revenue bonds or enterprise zone projects, and other costs.

Property Tax Exemptions

This is a discretionary exemption allowed for real and personal property and the amount of the exemption varies. Requires approval by the local county and State Board of Tax Appeals.

Any new machinery and equipment purchased or transferred to the State of Kansas is property tax exempt for the life of the equipment. Low cost items (from $400 to $1,500) are exempted.

Research and Development Credit

There is a credit against income tax liability of 6.5 percent for qualified research and development expenses. Unused credits may be carried over in 25 percent increments until all the credit is utilized.

Tax Increment Financing

It allows for taxes generated by the project to pay for construction of public infrastructure and other improvements. Property taxes can be frozen for as much as 23 years.

Net Operating Loss Carryover

Net operating losses can be carried over for ten years following the taxable year when the net operating loss occurred.

Job Training Program

Kansas Industrial Retraining Program (KIR) offers retraining assistance of existing employees. A business must have at least five existing employees. The Impact Training Program provides grants for training related expenses and also capital expenses for new and expanding businesses.

Industrial Revenue Bonds

Industrial Revenue Bonds provide financing for land, building, and equipment for new and expanding qualifying industries.

Discretionary Grants

The Kansas Economic Opportunity Initiatives Fund provides grant/forgivable loans to existing or expanding businesses, based upon the creation of new jobs and capital investment. Funds may also be utilized for retention of existing businesses. Generally, the negotiable grant/forgivable loan is for five years with zero percent interest.

Arizona

Economic Development Areas Tax Credits

Enterprise Zone Credit. Arizona provides an income and premium tax credit for new job creation. These credits may be up to $3,000 per new qualified job over three years. The credits are equal to 1/4 of wages in the first year and 1/3 of wages in the following two years. The amount of the credit to be taken in each of the three years is limited. Any unused amount may be carried forward for up to five years. Thirty five percent of the new employees must live within an enterprise zone when hired.

Military Reuse Zones

This zone targets manufacturers, assemblers, or fabricators of aviation or aerospace products and providers of aviation or aerospace services. Companies locating within these zones receive property tax reductions of as much as 80 percent for five years, state income tax credits of up to $7,500 for each new employee, and some exemptions from the transaction privilege (sales) tax. [24]

Aerospace Employee Tax Credit

An aerospace company that generates new permanent employment is eligible for income tax credits. The company can receive up to $7,500 over five years per new employee, if the employee is a new "dislocated" employee this amount can be as much as $10,000 over five years.

Aviation or aerospace companies qualify for any combination of the Military Reuse Zone benefits offered: tax credits, property reclassification or transaction privilege tax (TPT) exemption. An aviation or aerospace company is eligible for property reclassification on both real and personal property. The property is reclassified from "class one (25 percent assessment ratio) to class six (five percent assessment ratio) on both primary and secondary taxes."[25]

Defense Contractor Credit

Qualified defense contractors may claim tax credits for employment increases due to: 1) defense related contracts, or 2) from transferring jobs from operations directly defense related to commercial activities. The employees must be engaged at least 51 percent of the time in aviation or aerospace activities (aerospace services or in manufacturing, assembling, or fabricating aerospace products).

Sales and Use Tax

There is an exemption for manufacturing equipment.

Other Taxes

This state has no corporate franchise tax; no business inventory tax; no income tax on dividends from out-of-state subsidiaries; no worldwide unitary tax; virtually all services are exempted from sales tax.[26]

Research and Development Income Tax Credit

For qualified expenses up to $2,500,000, the credit is 20 percent of this amount. For higher expenses, the credit amount is $500,000 plus 11 percent

Arizona (Continued)

of the amount of expenses above $2,500,000, subject to certain conditions. The maximum amount of credit carry over allowed in a given taxable year is equal to the amount by which the tax liability surpasses the specific-year credit for increased research activities.

Net Operating Loss Carryover (NOL)

Allows businesses to carry forward 100 percent of NOL for five subsequent years. Machinery and equipment used directly in the manufacturing process are exempt of transaction privilege tax.[27]

Job Training Program

Provides grants (up to 75 percent of the training costs) to qualified businesses to train new employees that meet some wage requirements. The Incumbent Worker Program provides grants (up to 50 percent of the costs) for training to upgrade skills of existing employees.

Industrial Revenue Bonds

Provide financing for land, building, and equipment for new and expanding manufacturing and. qualifying industries.

Connecticut

Economic Development Areas Tax Credits

Enterprise Zone.[28] The Enterprise Zone Program is the central program on which other business incentive programs are based. There are currently 17 Enterprise Zones in Connecticut. Benefits may include an 80 percent local property tax abatement for five years and a 25 percent or a 50 percent credit on the state corporate business tax of qualifying businesses.

Targeted Investment Community (TIC) Benefits.[29] A Targeted Investment Community is defined as a municipality with a designated Enterprise Zone. Each municipality may have only one enterprise zone; however, a Targeted Investment Community may, under certain conditions, designate areas within the municipality as recipients of benefits equivalent to those provided by enterprise zone. The Urban Jobs Program provides benefits to eligible companies located in a Targeted Investment Community, but outside of the Enterprise Zone. There are also three other types of zones (Contiguous Municipality Zone, Defense Plant Zone, and Manufacturing Plant Zone). Benefits include: 1) property and personal property tax abatements for five years (as much as 80 percent for manufacturers and at least 50 percent to other qualifying businesses) and 2) manufacturers or firms conducting research and development related for manufacturing and other eligible businesses may be qualify to receive a state corporate business tax credit of 25 percent for ten years.

Urban and Industrial Site Tax Credit Program

Corporate tax credit of up to 100 percent of an investment up to a maximum of $100 million.

Corporate Business Tax Credits

Ten percent credit for increased investment in machinery and equipment for companies with up to 250 employees, or five percent credit for companies with 251 to 800 employees.

Connecticut (Continued)

Sales Tax Exemptions

Tax exemption for repair, replacement, and component parts for manufacturing machinery expenses. "No taxes for the cost of aircraft, repair, parts and services on aircraft exceeding 6,000 lbs. maximum takeoff weight."[30]

Real and Personal Property Tax Exemptions

Exemption for five years on newly acquired and installed machinery and equipment eligible for five to seven year depreciation. No taxes for inventories.

Research and Development Tax Credit

From one to six percent of research and development expenditures depending on the level of expenditures and size of the company. Twenty percent of the research and development expenditures in the state in the current income year exceeding research and development expenditures of the prior taxable year.

Human Capital Investment Credit

Five percent tax credit for "investments in human capital," including employee training, childcare facilities, and subsidies and donations to higher education for advancement of technology.

Industrial Revenue Bonds

These bonds provide financing for land, building and equipment for new and expanding manufacturing and other qualifying industries.

Florida

Economic Development Area Tax Credit

The Enterprise Zone Program offers various tax incentives to businesses locating in rural or urban enterprise zones. For rural zones, benefits can include a) sales and use tax credit, as well as income tax credit of 30 percent or 45 percent of new employee wages, b) income tax credit of 96 percent of property taxes, c) sales and use tax exemption of building materials, and d) 50 percent of sales tax exemption of electrical energy. Benefits for urban zones include a) sales and use tax credit and income tax credit of 15 percent or 20 percent of new employee wages, b) income tax credit of 96 percent of property taxes, c) sales and use tax exemption of building materials, and d) 50 percent of sales tax exemption of electrical energy.[31]

The Qualified Target Industry Tax Refund

Provides for refunds on income, sales, ad valorem, intangible personal property, insurance premium, and other taxes. The program allows up to $3,000 per new full-time job created and up to $6,000 per job when located in an Enterprise Zone or rural county. Businesses paying 150 to 200 percent of the state, county, or city average wage may have additional per job benefits. There is a total limit of $5 million per single applicant.

The Qualified Defense Contractor Tax Refund

This tax refund has a maximum of $5,000 per job created. The project must generate at least a 25 percent increase in jobs, or a minimum of 80 jobs.

Florida
(Continued)

Businesses may also receive refunds on corporate income, sales, ad valorem, intangible personal property, and certain other taxes. Up to 25 percent of the total refund may be received per year as long as the business is maintaining the agreed levels of employment and wages. There is a limit of $7.5 million per qualified applicant and no more than $2.5 million in tax refunds may be received in any fiscal year.[32]

The Capital Investment Tax Credit

This is an annual credit against the corporate income tax that can be received for a maximum of 20 years. Projects must also create a minimum of 100 jobs and invest at least $25 million in qualified capital costs (costs incurred in acquisition, construction, installation, and equipping of a project). The level of investment and the amount of the project's corporate income tax liability for the 20 initial years determine the amount of the annual credit. Eligible projects include transportation equipment manufacturing high-impact projects.

Sales and Use Tax Exemptions

Florida offers exemptions on:

- Semiconductor, defense, and space technology-based industry transactions involving manufacturing or research equipment;
- Purchases of machinery and equipment used by a new or expanding Florida business to manufacturers or processors;
- Labor, parts, and materials used in repair of or production of machinery and equipment that qualify for sales tax exemption;
- Electricity used in the manufacturing process;
- Aircraft parts, modification, maintenance and repair, sale or lease of qualified aircraft;
- Production items used at Spaceport Florida (launch vehicles, fuel, etc.);
- Labor costs of research and development expenditures;
- Any facility, device, equipment required for pollution control, abatement, or monitoring of equipment used in manufacturing processing or production for sale;
- All goods produced in the state for export are exempt from sales and use taxes; and
- Purchases of raw materials and intermediate goods used in production and co-generation of electricity are exempt from sales tax.

Firms located in enterprise zones obtain additional zone benefits.

Property Tax

All business inventories are exempt from property taxation. Goods in transit are exempt from property taxation for as long as 180 days.

Job Training

The Quick Response Training Program provides grants for customized training for new and expanding businesses. The incumbent worker training program provides grant funding for existing employee training.[33]

Industrial Revenue Bonds

These bonds provide financing for land, building and equipment for new and expanding manufacturing and other qualifying industries, offering benefits

Florida (Continued)

through both taxable and tax exempt bonds.

Economic Development Transportation Fund

The program provides grants for transportation infrastructure to qualified projects.

High Impact Performance Incentive Grant

This is a negotiated grant provided to businesses in certain high-economic-impact sectors designated by the Governor's Office of Tourism, Trade and Economic Development (OTTED).

Job Creation Grants

Local counties or communities may enact local ordinances that allow for grants for employment growth. These negotiable grants are typically based upon the number of new jobs created and can be in addition to the Qualified Target Industry grants.

Georgia

Economic Development Areas Tax Credits

Tier Designation. Georgia assigns a tier designation similar to enterprise zones to each Georgia county.

Jobs Tax Credits[34]

Taxpayers must choose between job tax credits or investment tax credits. Credits are available to qualified businesses or to its headquarters engaged in manufacturing, telecommunications, warehouse distribution, research and development, processing, and tourism. The amount of the jobs tax credit varies depending on the tier designation of the county, ranging from $750 (Tier 4) to $3,500 (Tier 1) per new job. An additional $500 bonus may be allowed. Businesses in Tiers 1 and 2 can use the credit against 100 percent of income tax liability, while this proportion is 50 percent for businesses in Tiers 3 and 4. Unused credits may be carried over for ten years. Local government may offer tax breaks for businesses that create jobs in depressed communities. Job tax credits are available to all businesses in counties designated as the 40 least developed counties.

Headquarters Credit

Companies establishing or relocating their headquarters in any county in Georgia are qualified for an income tax credit of $5,000 per job for five years. An additional $2,500 tax credit is available if the wages are greater than the designated county average wage. Each tiered county has a different wage requirement to qualify for the credit. The credit can be used to offset the total income tax liability and any credits not applied to the tax liability may be used to reduce withholding tax. Businesses must invest in capital at least $1 million, create 50 new jobs, and meet the established average wage of the tiered county.

Investment Tax Credit

This credit is available to qualified manufacturing or telecommunication businesses. The amount of the credit ranges from one to five percent of the

Georgia
(Continued)

qualified investment, depending on the county tier designation. An additional credit for recycled, pollution control equipment and for conversion of a defense plant to a new manufacturer is available. The range of this additional credit is from three to eight percent depending on the county tier designation. Businesses must elect either the investment tax credit or the job tax credit, but not both. The credit is used against 50 percent of state income tax liability. Unused credits may be carried over for ten years.

Manufacturing and telecommunication businesses can choose an optional investment credit instead of the investment tax credit, which provides for a higher percentage of the qualified investment; percentage range depends upon county tier.

A retraining tax credit for new equipment, new technology, or new operating system is available, which must be approved by the Georgia Department of Technical and Adult Education.

Sales Tax Exemption

There is a sales tax exemption to qualified industries, which applies primarily to manufacturing equipment, equipment used to enhance or replace existing machinery, material handling equipment (if $5 million or more), computer equipment of high technology companies (if exceeds $15 million in purchases), and, qualified electricity costs. New machinery in an existing plant used directly in the remanufacture of aircraft engines, parts and components, and overhead materials by a government defense contractor for DOD or NASA are exempt from sales and use taxes.

Property Tax Abatements

Each Georgia county may negotiate to consent to property tax abatements under specified conditions. Amounts and the length of the abatement vary with the local authorities.

Other Tax Credits

There is county's discretion to exempt a percentage of the inventory tax that is shipped out of state. After a county authorizes the inventory exemption, the county elects the percentage of the inventory to exempt. The exemption ranges from 20 percent to 100 percent.

Research and Development Tax Credit

This credit is 10 percent of a base amount. Credit can be used against 50 percent of the income tax liability remaining after all other credits and may be carried over for ten years.

Child Care Credits

Credits can be 75 to 100 percent of costs. Employers who purchase or build qualified child care facilities may receive Georgia income tax credits matching the cost of construction. Employers who provide or sponsor child care for employees are eligible for an income tax credit equivalent to 75 percent of employers' direct costs.

Georgia (Continued)

Ports Activity Job And Investment Tax Credits

Companies are qualified for higher job or investment tax credits if they increase the state's port traffic as measured by 1) more than ten percent over their 1997 level of their "port traffic tonnage" (net tons, containers, or TEUs), or 2) by a specified amount of units during the previous 12-month period. In addition, businesses must meet the criteria established by the county in which they are located. The additional credit is $1,250 over and above the job tax credit. The port bonus increases the investment tax credit to five percent in all tiers, but replaces the investment tax credit. The port bonus is limited to 50 percent of income tax liability. Unused credits may be carried over for ten years.

Job Training

The Quick Start program offers customized training services at no cost to new or expanding businesses in Georgia. Training can be given on the job or in a classroom.

Industrial Revenue Bonds

Industrial revenue bonds provide financing for land, building and equipment for new and expanding manufacturing and other qualifying industries.

New York

Economic Development Areas Tax Credits[35]

The Empire Zones Program offers tax incentives to businesses that invest or provide jobs in designated areas. Empire zones are classified as either Investment Zones (IZ), which cover economically distressed areas, or Development Zones (DZ) which are county zones. Most credits apply to both IZ and DZ. Certain projects, including high-tech businesses investing $10 million in capital and creating 20 or more jobs can qualify for the program even if they are located outside of the designated areas.

Qualified Empire Zone Enterprises (QEZEs) offer many benefits that locate or expand in the zones. The intended effect of the program is to give companies generating employment growth the opportunity to operate on an almost tax-free basis for as much as ten years in QEZEs areas, with additional savings offered in the following five years. Significant credits include sales and use tax exemptions, wage tax credit, real property tax credit and a utility costs reduction.

Qualified Emerging Technology Companies (QETC) Credits

There are tax credits for creation of new jobs for emerging technology companies. The QETC credits include the Capital Tax Credit, Employment Tax Credit, and Facilities, Operations and Training Credit. The Capital Tax Credit offers a ten percent break of qualified investments up to $150,000 held for four years, or 20 percent of qualified investments maintained for nine years with a limit of $300,000. The credit may not exceed 50 percent of tax liability before any other tax credits are taken and is not refundable, however can be carried over. The Employment Tax Credit is $1,000 for each new employee hired over a base year employment level, for three years. Credit is refundable. The Facilities, Operations, and Training Credits apply for tax years beginning on or after January 1, 2005 through 2011.

New York (Continued)

Tax Credit for Job Creation in Tandem with the Investment Tax Credit

This employment incentive credit to manufacturers is based on increases from base year employment. The incentive is 1.5 percent of the investment tax credit amount if the tax year employment is 101 percent; 2.0 percent if the base year employment is 102 percent; and, 2.5 percent of the investment tax credit amount if the tax year employment is 103 percent of base year.

The Investment Tax Credit (ITC) is five percent of the initial $350 million of new or expanded manufacturing facilities and four percent of investments for more than that amount.

No Personal Property Tax. Unlike many other states, which tax both real property and personal property, property taxes in New York State are imposed on real property only. Personal property, whether tangible or intangible, is exempt from state and local taxes.

Sales Tax Exemptions

Purchases for expanding or relocating projects qualify for sales tax exemptions. Expenses for production machinery and equipment, research and development property, and fuels and utilities used in production are exempt from sales tax.

Research and Development Credit

Investments for research and development facilities are eligible for a nine percent corporate tax credit.

Utility Rate Reductions

The state has programs to provide low cost electricity to companies who are either expanding or relocating or located in qualified geographic areas.

Job Training

There is the High-Tech Training Credit of $4,000 per employee per year. Companies that enhance the skills of existing workers or train new ones can receive grants to help with training expenses.

Tax-Exempt Bonds

Qualifying companies can use these bonds for construction and expansion of their facilities and to purchase machinery and equipment.

Massachusetts

Economic Development Areas Tax Credit

The Economic Development Incentive Program (administered by the Massachusetts Office of Business Development) is designed to attract and retain businesses in target areas or ETAs.

An Economic Target Area (ETA) is three or more bordering census tracts, in one or more municipalities, meeting one of eleven criteria for determining economic need. Criteria are established by law. There are 34 ETAs throughout the state.

Massachusetts (Continued)

Economic Opportunity Areas (EOA) are areas within an ETA with specific need and priority for economic development. Individual communities select these areas, which to be established must meet one of four criteria determined by law. Businesses expanding, relocating, or building new facilities that generate permanent new jobs within these areas qualify for various state tax incentives, including a five-percent investment tax credit for certain tangible and depreciable assets. There is also a ten percent tax deduction for costs due to renovation of an abandoned building. In addition, such businesses qualify for municipal tax incentives, such as special tax assessment and tax increment financing.[36]

Investment Tax Credit

There is a three percent credit against the state corporate excise tax for eligible businesses that purchase and lease property used in their operations.

Exemptions from Sales and Use Taxation

There is an exemption offered to manufacturers for machinery and parts and utilities. Other exemptions include fuel and materials used in manufacturing; fuel for heating, railroads, aircraft, water, steam, and gas. Containers are also exempted.

Research and Development Tax Credit

There is a tax incentive for research and development investment offered to both manufacturers and research and development companies. The tax credit is ten percent credit for qualified expenses, and a fifteen percent credit for costs related to donations and contributions made to research organizations. Credit is permanent and can be obtained together with the investment tax credit.

Job Training

The Express Program is designed for small firms. The program grants a maximum of $3,000 per employee per course and up to $15,000 per year per employer. The General program offers grants for larger employers with a limit of $50,000 and in some exceptions may provide higher amounts. The Hiring Incentive Training Grant Program grants up to $2,000 per employee and up to $30,000 a year per employer for training.

Tax-Exempt Bonds

Tax-exempt financing is provided for manufacturers.[37]

Ohio

Economic Development Areas Tax Credits[38]

Enterprise Zones. Expanding and relocating businesses in Ohio Enterprise Zones qualify for real and personal property tax abatements. For incorporated areas the exemption is up to 75 percent, and for unincorporated areas, this maximum is 60 percent. Exemptions apply for real property improvements or tangible personal property tax valuation for a maximum of 15 years; exemptions may exceed these limits depending on Local School Board approval. The program provides for significant tax reductions on new real and/or personal property investments, which applies to the increase in assessed value for real property and items first used by the company for personal property. Ohio Tax Reform in 2005 phased out the personal property tax over four years and

Ohio
(Continued)

eliminated taxes on new personal property placed in service after January 1, 2005; therefore, the personal property tax incentive will no longer apply after 2008.

Community Reinvestment Areas. This policy offers real-property tax incentives for residents and businesses that invest in the state. The investor may receive up to 100 percent of the improved real property tax valuation with a limit of 15 years. The local jurisdiction determines the legislative authority to both evaluate a project and the terms and conditions of the agreement.

Job Creation Tax Credit

When the law was introduced in 2005, this credit applied on business's gross receipts. Beginning on July 1, 2008, the credit may be applied to the Commercial Activity Tax (CAT), which is an annual privilege tax on gross receipts. The credit is refundable and is determined by the number of new jobs created (at least 25 net positions).

Job Retention Tax Credit

This credit provides nonrefundable corporate franchise or state income tax credits. The credit may be applied to the Commercial Activity Tax beginning January 2008. Eligible businesses are manufacturers or major corporate administrative services employing 1,000 full-time employees and making a capital investment of at least $200 million. The tax credit must play a significant role in the company's decision to stay in Ohio. The program requires that the local community provides additional financial support. The credit is determined as a percentage of the income tax withholding of all employees retained under the program.

Warehouse Inventory Tax Exemption

There is an exemption from the personal property tax on qualifying inventory until the personal property tax is eliminated.

Manufacturing Machinery and Equipment Sales Tax Exemption

There is a use tax exemption for the entire state and county sales tax for new machinery and equipment used in manufacturing activities. There is also an exemption for supplies and fuel used in manufacturing production.

Warehouse Machinery and Equipment Sales Tax Exemption

Businesses are exempt from state and county sales tax for purchases of machinery and equipment used in warehouse operations, distribution center operations, or activities in similar facilities as long as the inventory is exported from Ohio.

Research and Development Tax Credit

There is a nonrefundable tax credit against the corporation franchise and income taxes. Investments that meet the criteria under "Qualified Research Expenses" as defined under Section 41 of the Internal Revenue Code are eligible. The credit is seven percent of the excess amount of qualified research expenses. Any unused credit may be carried over a maximum of seven years.

Equipment used in eligible research and development activities is exempted

Ohio (Continued)

from state sales tax.[39]

Other Taxes

Local Jobs Tax Credit. There is a tax credit against a company's municipal corporate income tax. The credit is related to the municipal income tax withholdings of new employment generated by the business. Credits may be refundable or non-refundable at the discretion of the municipalities. Requirements to qualify include a minimum of 25 jobs (in some technology industries can be 15) in a three-year period and approval to receive the Jobs Creation Tax Credit.[40]

Property Tax Exemptions

Machinery and equipment purchased and operated after January 1, 2005 is tax exempt. Tax on all other items defined as tangible personal property will be phased out over four years, at a rate of 25 percent per year.[41]

Job Training

This is a nonrefundable tax credit for businesses training employees that face the possibility of losing their jobs due to insufficient skills. The maximum is $100,000 per year. Ohio Investment In Training Program (OITP) offers financial and technical assistance for customized training provided to employees of new and expanding businesses.

Tax Increment Financing

Municipalities and counties may establish Tax Increment Financing Districts that permit the use of new property tax increment to finance costs of economic development projects. The program helps finance public infrastructure, demolition costs and other qualified costs.

The Business Development Account (412) Grant Program

Grants are offered to projects that create a large number of jobs (one job for every $1,000) such as private infrastructure, site preparation, machinery and equipment purchases, and other costs.

Industrial Revenue Bonds

Provide financing for land, building and equipment for new and expanding manufacturing and other qualifying industries.

The Ohio Enterprise Bond Fund finances large commercial or industrial projects (between $1.5 million and $10 million). Qualified activities include land and building acquisition, construction, expansion or renovation, and equipment purchases.

Missouri

Economic Development Areas Tax Credit[42]

Enhanced Enterprise Zone. This program offers tax credits to businesses expanding or relocating to designated zones. The agreement may last for ten years after the project starts. The program requires businesses to create two new jobs and make $100,000 eligible investment to qualify for the tax incentives. Credits may not be carried over, but unused credits are refundable

Missouri (Continued)

or may be sold or transferred.

Job Credits

The Business Use Incentives for Large Scale Development (BUILD) Program offers income tax credits for the creation of jobs.

Missouri Quality Jobs Program. This program provides tax credits depending on new job payroll to assist in the creation of quality jobs. Credits are not carried forward. However, credits may be transferred, sold or assigned. The program defines three business categories: a) small expanding businesses; b) technology businesses; and c) high impact businesses. Job creation requirements vary according to this classification.

Work Opportunity Tax Credit Program. This program provides a tax incentive for a business to create employment in one of eight targeted groups. The maximum amount of the credit is $2,400 and may be carried backward one year, or carried over for 20 years. The credits may not be sold or transferred.

Sales Tax Exemptions

Machinery and equipment used for a new manufacturing facility or for the expansion of an existing one are exempt from state and local sales and use taxes.

Research Expense Tax Credit Program

There is a credit of up to 6.5 percent of qualified research expenses.

Job Training Program

The Customized Training Program offers financing for customized training provided to new or existing employees, when the training is necessary due to new capital investment. There is also the New Jobs Training Program, which is developed by local community colleges to support employers who have a good credit rating and are generating a significant number of new jobs.

Industrial Development Bonds

Qualified businesses are allowed under the Internal Revenue Code to participate in this program that provides 100 percent financing with a low interest rate for construction, purchase, expansion or improvement. The program is available to all types of manufacturing, assembly, and processing plants, as well as for solid waste water distribution plants.

Alabama

Economic Development Areas Tax Credit[43]

Enterprise Zones. Alabama has designated 28 enterprise zones in distressed areas of the state. Businesses located in those areas qualify for state and local tax credits/exemptions and non-tax incentives. They also qualify for "favored geographic areas (state enterprise zones or less developed counties)" for income tax capital credits.

The state has two types of tax incentives for enterprise zones: a tax credit under Section 5, and an exemption under Section 11 (sections of the original law, Act 87-573. Section 5 offers a tax credit against the income tax liability or the

Alabama
(Continued)

business privilege tax liability up to $2,500 per new permanent employee. Section 11 provides for other tax exemption(s) against taxes from enterprise zone operations. Exemptions can apply to income, sales and use, and the business privilege tax liability.

Gulf Opportunity Zone (GO). Businesses investing or expanding operations, buildings, or equipment within the GO Zone are eligible to receive various incentives, including: a) a 50 percent bonus depreciation deduction in addition to a normal depreciation deduction; b) tax exempt financing for a variety of commercial projects; c) exemption for the first year equipment expense deduction; small businesses can expense up to $200,000 of equipment and computer software expense; d) demolition and clean-up expense (50 percent for 2007 costs); and, e) other employer incentives.

Capital Tax Credits

A capital credit is available over 20 years, calculated at five percent annually of the total capital costs of qualifying projects. The credit begins in the first year and is offered to all types of business entities. The new or expanding companies must be involved in eligible industrial, warehousing, and research activities, and meet employment and wage requirements. There are lower qualifying thresholds for businesses located in designated "favored geographic areas."

Income tax credits are available to: 1) certain process and treatment facilities that reuse/recycle materials; 2) headquarters facilities, and 3) trade or businesses conducted in locations of the Alabama State Port Authority.

Sales Tax Exemptions

The State provides for an exemption for qualified machinery and equipment, raw materials used by manufacturers, pollution control equipment, qualified construction materials, enterprise zones (Section 11), and film production.

Property Tax Abatements

Eligible businesses may receive a property tax abatement for real and personal property. The size is negotiable at the county level and does not include the tax rate for school districts.

Other Tax Incentives

- Inventory is not subject to property taxes, with the exception of inventory used for lease or rental purposes. There are also exemptions for raw materials inventory, and finished goods.
- All equipment, facilities, or materials used primarily for the control, reduction, or elimination of air or water pollution are exempt from property taxation.
- Goods in transit are exempted for up to 36 months prior to shipment out of state.

Tax Increment Financing

Tax increment financing is available for public infrastructure costs, including commercial, industrial, and residential developments. Qualified costs include roads, utilities, business and industrial recruitment, and others.

Alabama (Continued)

Utility Tax Exemptions

Certain types of manufacturing and compounding processes are subject to an exclusion from utility gross receipts tax and utility service use tax. Water may be exempt if at least 50 percent is used in a manufacturing process. Furthermore, there are other utility exemptions or abatements through the local utility provider.

Job Training

Alabama Industrial Development Training (AIDT) program assists in recruiting, assessing, and training potential employees at no cost. The program supports new and expanding industries.

Industrial Revenue Bonds

Industrial revenue bonds provide financing for land, building and equipment for new and expanding manufacturing and other qualifying industries.

Industrial Development Grant Program (Site Preparation)

Grants are offered to "counties, municipalities, local industrial development boards, airport authorities and economic development councils organized as public corporations. To attract new industry or assist an existing industry in expansion, the money can be used to pay a portion of the costs of site improvement on land to which the recipient holds the title or controls."[44]

Colorado

Economic Development Area Tax Credits[45]

Enterprise Zone. There are 18 enterprise zones and subzones in Colorado. Businesses located in a zone may qualify for ten different Enterprise Zone Tax Credits and Incentives. Benefits include:

A $500 income tax credit for each new employee prorated according to the number of months of employment during the tax year. Expansion facilities could claim the credit if they have brought at least $1 million in new investment and added at least ten employees or increased employment by ten percent or more from the previous year. Credits may be carried over for five years. New businesses located in an enhanced rural enterprise zone receive an additional $2,000 credit per employee. Any unused portion can be carried over for a maximum of seven years.

For the first two income tax years in an enterprise zone, businesses get a credit of $200 per new employee under a health insurance plan or program. Unused credits can be carried forward for up to five years.

An investment tax credit is offered for acquired or new property located in an enterprise zone, which can be carried back three years and forward for up to 12 years if not used in the tax year.

Taxpayers who make expenditures on research and experimental activities are eligible for a three percent income tax credit. The credit applies on the increase in expenditures over the previous two years. Up to one fourth of the calculated credit can be claimed in a tax year.

Colorado
(Continued)

At the discretion of the local community, new or expanding businesses located in enterprise zones may be eligible for up to 50 percent of the personal property taxes, for as much as ten years.

Aviation Development Zone is any airport that is a public-use facility designated by the FAA in its latest National Plan of Integrated Airport Systems and registered with the Colorado Office of Economic Development and International Trade (OEDIT). Aircraft manufacturers and producers developing an aircraft and who are located in a Colorado aviation development zone are eligible for an income tax credit of $1,200 per new employee.

New Aviation Zone Employees. This credit applies to employees working at least 35 hours per week. The facility must employ ten or more employees to receive the credit, which depends on the increase in the average number of employees in the zone from the average of the previous tax year. Qualified activities do not include maintenance of aircraft.

The Job Creation Performance Incentive Fund (PIF)46

PIF provides a performance-based incentive payment to eligible businesses that meet established requirements based on the creation of net new jobs paying above average wages.

The Enhanced Incentive Program (EIP)[47]

This program provides incentives for the creation of high-paid jobs. EIP offers an additional performance-based incentive payment to businesses that have qualified under the Job Creation Performance Incentive Fund (PIF) and have created more new high-paid jobs than the amount required under the PIF program.

Investment Credit

Qualified investments receive a one percent credit that may be carried over for three years.

A ten percent credit against income tax liability could apply for costs in a qualified training program. The credit can apply to on-site or off-site costs. Excess credits may be carried over for up to 12 years.

Sales and Use Taxes

The purchase of machinery, machine tools and parts used for manufacturing are exempt from sales and use tax. State sales or use taxes on manufacturing equipment or machine tools are not collected on purchases over $500. There are additional sales or use taxes exemptions on component parts, fuels and electricity, general maintenance aircraft parts, clean-fuel vehicles, and other items.[48]

Property Tax Rebates/Refunds

A "credit of $500 (or the actual amount paid if less than $500)" exists for "income tax for local personal property taxes paid. If tax liability is over $500, an additional credit of 13.3 percent of personal property tax is allowed." Credits depend on the availability of budget surplus.[49]

Colorado
(Continued)

Research and Development

There is 50 percent sales/use tax refund for tangible personal property used for research and development in all industries contingent on a budget surplus in the particular year.

Tax Increment Financing

Tax increment financing is offered for public infrastructure costs and other developments within the designated tax increment financing district.

Other Taxes

There are no inventory taxes in the state.

Job Training

The Colorado First Program provides training grants to new businesses or expanding existing companies. The state also offers customized training programs for existing companies implementing new technology to remain competitive and retain jobs in the state.[50]

Infrastructure Grants

These grants provide funds for construction and/or improvement of qualified infrastructure including water lines and wastewater facilities, sewer lines, sewage treatment facilities, roadways, electric power services, lighting, sidewalks, alternative power sources, etc. Grants range between $100,000 and $500,000.

Industrial Revenue Bonds

These bonds provide financing for land, building and equipment for new and expanding manufacturing and other qualifying industries.

New Jersey

Economic Development Areas Tax Credits[51]

Enterprise Zone. The Urban Enterprise Zone Program offers tax credits and other incentives to companies located in areas. Financial incentives offered include: sales tax exemptions for purchases of materials and property; one time tax credit against the corporation business tax ($1,500 per new employee residing in the zone); subsidized unemployment insurance for new employees, financial assistance, BEIP grants; and, Enhanced Business Retention and Relocation Assistance Grants (See below.)

Redevelopment Areas. Businesses located in redevelopment areas qualify for:

Redevelopment Authority Project Tax Credit is a “one time” tax credit for the creation of new jobs which may be carried forward for one year.

Tax Increment Financing. Businesses may use additional tax revenue generated by the project for development costs.

New Jersey (Continued)

Redevelopment Area Bond Financing provides for tax exempt bonds issued by municipalities to help fund projects' infrastructure.

New Jobs Investment Tax Credit

There is a nonrefundable tax credit for businesses that create new jobs. Smaller corporations must create five new jobs while larger corporations must add 50 jobs. Tax credits may not be carried over.

Business Retention And Relocation Assistance Grant (BRRAG)

Companies that relocate or expand in New Jersey may qualify for this grant against their business tax liability.

Business Employment Incentive Program (BEIP). This program offers grants to expanding or relocating businesses that create jobs in the state. Grants range between 10 and 80 percent of the total amount of state income taxes withheld by the business during the calendar year following the hiring of the new employee. Grants can be received for up to ten years. Businesses are required to create at least 25 new jobs, with the exception of high-tech/biotech companies, which must create at least ten.[52]

Manufacturing Equipment And Employment Investment Tax Credit

There is an income tax credit of two percent of the investment base for qualified equipment, with a $1,000,000 limit. Small businesses receive a four percent credit. There is also a separate employment investment credit for increases in the average number of qualified employees.

Property Tax Abatement

Businesses may be eligible for property tax abatement over a five-year period. Taxes are abated 100 percent the first year and reduced by 20 percent each subsequent year.

Sales and Use Tax Exemption

The State provides exemptions for the purchase of fixtures, furniture, building materials and equipment needed for business relocation. Sales and use tax exemptions can be used in combination with BRRAG.[53]

Research and Development Tax Credits

There is an income tax credit for qualified research and development expenditures, as defined by IRC 41.2.

Technology Business Tax Certificate Program

A new high tech or biotech firm with 225 employees and at least 75 percent of them in the state may sell their unused tax credits to a New Jersey business. Credits may be sold for 75 percent of their value.

Job Training

The Office Of Customized Training offers companies a matching grant through the state's Department of Labor and Workforce Development for a reimbursement of 50 percent of the direct costs of the training program. The

New Jersey (Continued)

office also helps businesses to customize the training program to meet their specific needs.[54]

Industrial Revenue Bonds

Tax exempt bonds are available to manufacturing firms that needs assistance with the purchase of real estate, machinery and equipment, building construction and renovations though tax exempt bonds. The minimum amount to borrow is $750,000 and may not exceed $10 million.

Pennsylvania

Economic Development Areas Tax Credits

Enterprise Zone. Zones are designated for a term of seven years, but a zone may request an extension of the designation for an additional two years, depending on economic conditions and potential investment opportunities. [55] This program offers tax credits to businesses investing in or making improvements to properties within designated zones. All businesses in the zone qualify for tax credits up to 20 percent on all eligible investments. Credits may be carried over for five years.

Keystone Opportunity Zones. Businesses are eligible for income tax credits, insurance premiums, net profits tax exemptions, sales and use tax exemptions, and other tax incentives for locating or expanding in one of 12 designated zones.[56]

Strategic Development Areas (SDAs) Credit. There are numerous exemptions, abatements, and credits for companies located in these areas, including sales and use tax exemption for retail sales of services or tangible personal property. The program also offers a credit up to 100 percent of net income tax and a property tax credit up to 100 percent for real property taxes. For a business to be eligible for the incentives, they must own or lease real property in an SDA on which the business is conducted. Companies are required to: 1) create or maintain a minimum of 500 jobs within the first three years of operations within the SDA and 2) invest a minimum of $45 million in the SDA location within the first three years of operation.

Base Retention and Conversion

Funds are provided for BRAC-related activities.[57]

Job Creation Tax Credits

There is a nonrefundable $1,000 tax credit per job for businesses that, in three years from the start of operations, have created at least 25 jobs, or whose employment has increased by 20 percent. New employee's earnings must be at least 150 percent of federal minimum wage, excluding benefits. Businesses must operate in Pennsylvania at least five years.

Property Tax Abatements

Local Economic Revitalization Tax Assistance (LERTA)

This is a tax abatement program that allows municipalities, school districts and counties to offer abatements to new and current businesses. Real estate taxes are reduced by 50 percent for up to ten years.

Pennsylvania (Continued)

Research and Development Credit

There is a nonrefundable tax credit for companies that may be carried over up to 15 years. Businesses meeting the criteria established for the federal credit may apply for a state credit of ten percent of their increased research and development expenses in a given year.

Manufacturer's Exemption

"Manufacturers pay no sales tax on machinery and equipment used in manufacturing, and no capital stock tax on assets used in manufacturing. There is no tax on personal property or inventory. And, businesses located in one of Pennsylvania's Keystone Opportunity Zones pay virtually no taxes for ten years."[58]

Net Operating Loss Carry Forward

The net operating loss carry forward allows companies to discount from the corporate net income tax liability losses from one year against profits in subsequent years. Losses can be carried over for as many as 20 years. Taxpayers are allowed to offset annually up to $2 million in taxable income by applying the losses starting with those incurred in the oldest period.

Job Training

The Customized Job Training Program (CIT) helps employers provide training tailored to their needs. The Guaranteed Free Training Program offers assistance for basic skills and information technology training.
Infrastructure Grants

The Infrastructure Development Program (IDP) and the Infrastructure and Facilities Improvement Program provide financial assistance for qualifying infrastructure projects.

Opportunity Grant Program

This program provides flexible cash grants to help preserve and expand businesses in Pennsylvania. Funds may be used for a variety of purposes including job training; construction or rehabilitation of infrastructure; buildings; purchase or upgrading of machinery and equipment; working capital; etc.

Industrial Revenue Bonds

These bonds provide financing for land, building and equipment for new and expanding manufacturing and other qualifying industries.

Indiana

Economic Development Areas Tax Credits

Enterprise Zones. These specially designated zones offer state income tax credits. To be eligible, a business must locate in an Enterprise Zone, must make a contribution to the Urban Enterprise Zone Association and must be an all-for-profit entity.

Certified Technology Park Program. This program supports high-technology

Indiana
(Continued)

businesses in Indiana and promotes technology transfer. The program encourages the location of high-technology businesses within areas determined by local redevelopment commissions. Once the Indiana Economic Development Corporation designates an area as a Certified Technology Park, the redevelopment commission may provide property tax credits or bonds for public facilities associated with the Certified Technology Park.

Headquarters Relocation Tax Credit

Businesses that relocate their corporate headquarters (the location of the principal office of the principal executives) to Indiana qualify for a credit against their state tax liability equal to half of the costs incurred in relocating the headquarters. To qualify, a company must have global-annual revenue of at least $100 million.[59]

Job Credit

Economic Development for a Growing Economy (EDGE) Tax Credit. There is a refundable income tax credit up to 100 percent of projected withholdings from new jobs for up to ten years. A business must create a given amount of new jobs at a project site in Indiana, demonstrate a need for the tax credit, and maintain operations after the term of the tax credit.[60]

Hoosier Business Investment Tax Credit

This is an income tax credit based on a company's qualified capital investment, with the final credit amount determined by the Indiana Economic Development Corporation based on an analysis of the economic benefits of the proposed investment. The period to apply for investment credits ends December 31, 2011. Projects increasing wage levels in Indiana may apply for the credit before the investment takes place. The credit is up to ten percent of the amount of the investment.[61]

Sales Tax Exemptions

Manufacturing activities can claim the following exemptions from the sales tax: raw materials, equipment, power, electricity, and utilities. In addition, after July 2007, equipment purchases for research and development activities are exempted.

Property Tax Abatement

The abatement is authorized in the form of deductions from assessed valuation. Property owners in locally designated Economic Revitalization Areas who make improvements to the real property or install new manufacturing equipment are eligible for this abatement. Used manufacturing equipment can also qualify. Local units of government can grant tax abatement on research and development equipment from one to ten years. Real property tax abatements are available to businesses in most industries. Personal property tax abatements are limited to manufacturing projects.

Research and Development Tax Credit

Applied against income liability, this credit (also known as the Research Expense Tax Credit) is based on the increase in Indiana research and development over the prior three-year base. Research expenses in the current year must have been at least twice the research expenses in the base year. Since 2008 the

Indiana (Continued)

credit is 15 percent of eligible research expenses on the first $1 million of investment. Credit may be carried over for ten years. The credit is nonrefundable. This program is administered by the Department of Revenue and uses the definition of "qualified research expense" from the Internal Revenue Code (which includes the costs of wages and supplies).[62]

Tax Increment Financing

Municipalities and counties may allocate the additional real and personal property taxes generated by a new project to fund the project's costs or to finance general public infrastructure in designated areas.

Job Training

The Skills Enhancement Fund reimburses eligible training expenses over a two year term. Training can be for new and existing employees. The Technology Enhancement Certification For Hoosiers (TECH) offers grants to businesses conducting high tech information training programs. The maximum grant amount is $50,000 per business or $2,500 per employee and total reimbursement does not exceed 50 percent of the training costs.

Infrastructure Grants

The Industrial Development Grant Fund provides grants to local governments for off-site infrastructure projects associated with expansions of construction or new facilities. Programs in which eligible entities may qualify, include construction of airports, airport facilities, tourist attractions, construction, and extension, or completion of sanitary sewer lines, storm sewers, and other related drainage facilities.

Designation as a Certified Tech Park allows for the recovery of certain state and local tax revenue for investments in the development of the park. The maximum allowed to be recaptured is five million dollars over the life of the park in incremental sales and income taxes.

Industrial Revenue Bonds

Bonds provide financing for land, building and equipment for new and expanding manufacturing and other qualifying industries.

Utah

Economic Development Area Tax Credits[63]

Enterprise Zones. Nonrefundable Utah tax credits available to qualifying businesses expanding or relocating to an enterprise zone include:

- A credit of $750 for each new full-time position filled for not less than six months during a tax year. If new jobs pay 125 percent of the average monthly wage of that position, an additional credit of $500 is offered.
- For employers who provide health insurance and pay at least 50 percent of the premium there is a $200-tax credit.
- A ten percent investment tax credit per year is available on the first $250,000 of investment and five percent on the next $1,000,000. Qualified investment includes investment in plant, equipment, or other

Utah
(Continued)

depreciable property.

Economic Development Zones. Economic Development Tax Increment Financing (EDTIF) is a state program that grants local communities the authority to establish Economic Development Zones to spur capital investment. The business may receive a 15 percent tax rebate over five years of taxes paid to the state. To qualify, companies must create new jobs in the state that pay the median county wage. The length of the project may last no more than ten years. The rebate may not be more than 50 percent of the total state revenue paid. Projects must be approved by the Board of Business and Economic Development.

Aerospace/Aviation Development Zones. The Utah Aerospace and Aviation Tax Increment Finance (AATIF) was created in 2003 to encourage the development of the aerospace industry. It assists companies creating new aerospace and aviation manufacturing jobs. Eligible businesses may receive up to 30 percent rebate of state revenues. Eligible projects must be at or around airports with an instrument landing system, a manned air traffic control tower, and with land available for commercial development.

Industrial Assistance Fund (IAF)

The IAF is a job-creation incentive fund for expanding and relocating companies. The IAF provides grants for the creation of jobs paying higher than the prevailing wages in the community. Grants are made after jobs have been created and retained.

Targeted Business Tax Credit

A refundable credit is available to businesses providing a qualifying community investment project. Individuals claiming this credit may not claim an enterprise zone tax credit or recycling market development zone tax credit.[64] Applicants must be located in an enterprise zone and a county with a population of less than 25,000, where the unemployment rate is at least one percentage point higher than the state average for a period of six months or more. Another requirement is to have a facility in the zone in which at least 51 percent of the employees are individuals who, at the time of employment, reside in the county in which the enterprise zone is located. The incentive also requires the applicant to provide a community investment project within the enterprise zone.

Sales Tax Exemptions

Manufacturers do not pay sales tax on the purchase of new equipment for plant start-ups. Replacement manufacturing equipment purchases are also exempt.

Research And Development Tax Credit

There is a six percent tax credit for companies conducting qualified research in the state. Qualified research and development expenses include acquisition of equipment and machinery, wages paid to employees, computers, computer equipment and software. Machinery and equipment are not eligible for the tax credit if they qualify for sales and use tax exemption.

Tax Increment Financing

Funds are awarded from the increase in tax dollars generated by the development project to be used for infrastructure development or land costs.

Utah (Continued)

Job Training

The Custom Fit Training Program grants employers up to $500 per employee and up to $100,000 per employer for training provided by Utah College of Applied Technology centers and state colleges and universities. The Short Term Intensive Training Program offers training incentives for employers using third party instructors. Custom Fit training grants for existing workers are generally administered through state colleges and state applied technology centers. Training must enable the employee to learn skills they can use in other related fields of employment and with other companies.

Industrial Revenue Bonds

The Manufacturing Facility Program offers tax exempt bonds issued by local governments as a low-cost financing alternative for manufacturing businesses.

Michigan

Economic Development Areas Tax Credits[65]

Renaissance Zones. There are 152 designated geographic areas where businesses or residents of the zone are exempted from nearly all state and local taxes. Renaissance Zones include three former military bases and nine agricultural processing zones in addition to numerous urban zones.

SmartZones Michigan's 11 SmartZones allow municipalities to use tax increment financing for property, infrastructure, business incubators, park facilities, management, and marketing. SmartZones are designed to stimulate the growth of tech-businesses by helping the formation of specialized clusters of new and emerging businesses.[66]

Technology-Based Initiatives

The 21st Century Jobs Fund uses the state's tobacco settlement revenue to create new jobs and diversify Michigan's economy. The fund directs resources for capital investment, commercial lending and to encourage development and commercialization of four competitive-edge technologies: life sciences, alternative energy, advanced manufacturing, and, homeland security and defense. Activities that are also supported are advanced computing or electronic device technology, design, engineering, testing, diagnostics, or product research and development related to any one of the four technologies.

Michigan Economic Growth Authority (MEGA) Tax Credits

MEGA tax credits are offered to relocating and expanding businesses making a significant investment and creating new jobs. Manufacturing, research and development, wholesale trade and office operations are activities that qualify for the credit. The company must be able to demonstrate that without the tax credit, the project would not be possible. Companies located in the state must create a minimum of 75 new jobs and out-of-state companies must create a minimum of 150 new jobs.[67]

MEGA High-Tech Job Creation Tax Credit

This is a tax credit up to 100 percent against the Single Business Tax (SBT) for job creation The SBT will be eliminated in 2008 and replaced with a revenue business tax structure. Qualified businesses include advanced computing,

Michigan (Continued)

biotechnology, electronic device technology, engineering and lab testing related to product development, medical device technology, research and development, advanced vehicle technology or technology that assists in the assessment or prevention of threats or damage to human health or the environment. The credit is also available to qualified manufacturing, research and development, wholesale trade and office operations.[68]

Sales Tax Exemptions

There are many industrial and consumer goods and transactions exempt from Michigan sales taxes, including sales for resale, property in interstate or foreign commerce, computers used in industrial processing, custom computer software, information services, railroad rolling stock, air and water pollution-control facilities, and energy fuels. Purchases of machinery and materials used directly in a manufacturing process are also exempt.[69]

Industrial Property Tax Abatement

There is a reduction/abatement up to 12 years of both real and personal property taxes to qualifying businesses that renovate or expand aging manufacturing plants or build new plants.

Job Training

Job training reimbursements are offered to businesses providing training to new and existing employees.

Industrial Revenue Bonds

These bonds provide financing for land, building and equipment for new and expanding manufacturing and other qualifying industries.

Virginia

Economic Development Area Tax Credits[70]

Enterprise Zone. Eligible businesses in an enterprise zone may receive grants for the creation of new jobs that are dependent upon the hourly wage. The amount is $500 or $800 per new job created. The minimum is four new jobs. The grant is awarded each year and depends on the jobs maintained and wages paid. There is a limit of 350 jobs annually above the four-job threshold. Companies receiving enterprise zone grants do not receive the business job tax credit.[71]

Companies investing up to $2 million are qualified for a grant up to 30 percent of the investment with a maximum of $125,000. Companies that invest above $2 million are eligible for a grant of up to $250,000. Investments in rehabilitation and/or expansion projects are also eligible for this grant.[72]

Additionally, local enterprise zone incentives are offered.

Technology Zones

Local communities can establish technology zones for targeted industries. Potential benefits may include permit and fee waivers, property tax exemptions, grants, and other local incentives. These incentives are at the discretion of the local community and may be provided for up to ten years.

Virginia
(Continued)

Major Business Facility Job Tax Credit

Eligible companies locating or expanding in Virginia receive a $1,000 corporate income tax credit for each new full-time job created over an established number of jobs. The $1,000 credit is available for all qualifying jobs above the established number and is received in equal installments over three years. Credits are available for taxable years beginning on or after January 1, 1995, but before January 1, 2010. Unused credits may be carried forward for ten years. Companies locating in enterprise zones or economically distressed areas are required to create a minimum of 50 jobs. The threshold for all other locations is 100 new jobs.[73]

Property Tax Abatements

Property tax abatements are determined by the city or county. There is an exemption for inventory and manufacturers' furniture and fixtures. At the discretion of the local community, full or partial exemptions can be applied to pollution control, recycling equipment, enhanced commercial and industrial facilities, and to manufacturers' generating equipment.[74]

Sales Tax Exemptions

Virginia offers Sales/Use Tax exemptions for eligible businesses and purchases. Qualified purchases include among others: manufacturing equipment, pollution control, software, and research and development costs.[75]

Day Care Facility Investment Tax Credit

Businesses may claim a tax credit equal to 25 percent of all expenditures incurred in the construction, renovation, planning or acquisition of facilities that provide day care for employees' children. Unused credits may be carried over for the next three taxable years.[76]

Tax Increment Financing (TIF)

The local community may establish a Tax Increment Financing district for public investments. Incremental property taxes from the existing and new developments replenish the TIF bonds.

Jobs Training

There are two programs: 1) The New Jobs Training Program that offers grants to qualified companies that make an investment of more than $1 million and create at least 25 new jobs. The amount of the grant is at the discretion of the state and determined on a per employee basis. 2) The Retraining Program provides consulting services and funds to assist in retraining the existing workforce. To qualify, a company must demonstrate that it is experiencing changes in technology, product, or delivery processes. At least ten full-time employees must be involved in the retraining. Qualified companies are required to provide a minimum capital investment of $500,000 within 12 months.[77]

Worker Retraining Tax Credit. Virginia employers will be eligible to receive an income tax credit of 30 percent of all expenditures made by the employer for worker retraining, with a limit of $2.5 million in any taxable year. Eligible worker retraining includes courses at Virginia community colleges and private schools or retraining programs through apprenticeship agreements approved by the Virginia Apprenticeship Council.

Virginia
(Continued)

Virginia Coalfield Economic Development Authority

This program works to promote economic growth in seven counties and one city of far southwestern Virginia (Buchanan, Dickenson, Lee, Russell, Scott, Tazewell and Wise Counties and the City of Norton). Low-interest loans are available to qualified new or expanding industries through its financing program. The loans may be used for real estate purchases, construction or expansion of buildings, and the purchase of machinery and equipment.

Governor's Opportunity Fund (GOF)

The GOF is designed as a "deal closing" fund to be employed at the Governor's discretion when necessary to secure a company location or expansion in Virginia. The GOF is a final resource for Virginia to be used in situations of serious competition from other states or countries. Grants are awarded to localities on a local matching fund basis. Capital is provided for a variety of purposes including site acquisition and development, transportation access, training, construction or build-out of publicly owned buildings.[78]

Virginia Investment Partnership Grant Fund

This is a discretionary investment grant program for existing Virginia manufacturers or research and development services supporting manufacturing, and major employers. The program is designed for companies that have operated in Virginia for at least five years and that are proposing expansion projects that meet specified criteria.

The Virginia Economic Development Incentive Grant

This program assists and encourages companies to invest and to provide new employment opportunities by locating significant headquarters, administrative, research and development and/or similar service and basic sector operations in the state. Grants are negotiated and made to selected projects.

This program requires that companies be located in a Metropolitan Statistical Area with a population of 300,000 or more in the 2000 census; create at least 400 jobs with average salaries at least 50 percent greater than the average wage; and, invest at least $5 million or $6,500 per job, whichever is greater. Companies located in other parts of the state are required to create at least 200 jobs, with average salaries at least 50 percent greater than the existing average wage, and with a capital investment of at least $6,500 per job.[79]

Infrastructure Grants

The Industrial Access Road Program assists new and expanding manufacturing and processing companies to provide access roads. Awards can be up to $300,000. The Rail Industrial Access Program provides funding to construct railroad lines for new or expanding manufacturing and commercial businesses. Financial assistance to a given locality is limited to $450,000.

Industrial Revenue Bonds

Industrial Revenue Bonds provide financing for land, building and equipment for new and expanding manufacturing plants and other qualifying industries.

Oklahoma

Economic Development Areas Tax Credit[80]

Enterprise Zone. Businesses located in an enterprise zone qualify for doubled income tax/jobs credit, one additional year of property tax abatements, and sales tax exemptions/refunds.

Investment/New Jobs Tax Credit

Businesses can choose between two primary business incentive options for newly locating or expanding companies, Option 1 or Option 2.[81]

Option 1. Quality Jobs Ten-Year Cash Incentive. Oklahoma's Quality Jobs provides incentives to manufacturers and certain service industries that have a new payroll investment of $2.5 million or more. Companies may receive a quarterly cash payment of up to five percent of new taxable payroll. A lower payroll threshold is determined for research and development projects and for businesses in targeted areas. Average wage requirements vary among counties, with a lower limit of $27,393.

Option 2. Investment/New Jobs Tax Credit Package. Primarily for manufacturing, the Investment/New Jobs Tax Credit incentive allows a five-year tax credit. The credit is calculated as either one percent per year of investment in eligible new depreciable property, or $500 per new job, whichever is higher. These incentives double in an enterprise zone to two percent of new investment or $1,000 per new job. Applicants may also qualify for additional sales tax refunds and/or income tax exemptions/credits.

Small Business Quality Jobs Seven-Year Cash Incentive. The Small Employer Quality Jobs incentive allows eligible small businesses (90 or fewer employees) that create new jobs within one year to receive up to a five percent refund to locate or expand in Oklahoma. The qualifying average wage requirement will vary among counties.

Income Tax Credit for Computer, Data Processing, and Research and Development Jobs

These credits are offered for up to eight years based on the number of new employees with at least a $35,000 annual wage. The credit is $500 per employee limited to 50 employees. This credit is not available to participants in the Quality Jobs Program.

New Products Development Income Tax Exemption

Inventors on products developed and manufactured in the state are exempt for seven years from income tax on royalties. Also available is an exclusion of 65 percent of the cost of depreciable property purchased and used directly in manufacturing of a product developed in Oklahoma.[82]

Technology Transfer

There are special income tax exemptions on royalties for corporations assisting small business with technology transfer.

Sales Tax Exemptions

Oklahoma (Continued)

Sales tax exemptions for manufacturers apply to machinery and equipment, goods consumed in manufacturing, and energy used in manufacturing. There is also an aircraft manufacturing facility sales tax exemption.

Aircraft Maintenance Facilities. Sales at aircraft maintenance facilities operated by an air common carrier with at least 2,000 workers for aircraft and aircraft parts are tax exempt. A variety of specified sales, including sales of aircraft engine repairs, replacement parts, sales of aircraft frame, aircraft interior modification and paint, are also exempt.

Aircraft Manufacturing Facility. Sales tax refunds are offered for sales of computers, data processing equipment, and related telecommunications equipment for use in a new or expanding aircraft maintenance or manufacturing facility that have a total construction cost above $5 million and employ at least 250 new employees upon completion. Companies must pay at least $2 million for computer services/data processing equipment.

Property Tax Abatements

Ad Valorem Tax Exemptions. Qualified businesses are eligible to receive property tax abatement for real property and personal property for up to five years. Eligibility requires businesses to meet investment, job creation, and wage thresholds.

Freeport Inventory Exemption. Oklahoma's Freeport Law exempts from taxation goods, wares, and merchandise that originated from outside the State and do not remain in Oklahoma for more than nine months.

Aircraft Manufacturers Exemption License. Manufacturers of aircraft may purchase an exemption license of $250 in lieu of any ad valorem tax upon aircraft owned by the manufacturer.[83]

Utility Tax and Rate Incentives

Some local utility providers grant rate reductions at their discretion.
Childcare Credit

Eligible businesses may qualify for a credit of 20 percent of qualifying costs.

Job Training

The Training For Industry Program provides grants to eligible businesses to cover the cost of specific training needs. The amount of the grant is related to the number of jobs created and wages paid. The grant is at the discretion of the State of Oklahoma.

Tax Increment Financing

Tax increment financing may be used to finance public and private developments in a designated local development area for a period not to exceed 25 years. Incremental property, sales, and use taxes may be part of the tax increment financing.

Infrastructure Grants

The Industrial Access Roads Program is designed to provide assistance to local communities to provide infrastructure and access facilities directly to the state

Oklahoma (Continued)

or local road system.

Industrial Revenue Bonds

Bonds provide financing for land, building and equipment for new and expanding manufacturing and other qualifying industries.

Illinois

Economic Development Areas Tax Credits[84]

Enterprise Zone. The program offers state and local tax incentives to businesses that make investments to create or retain jobs in any of the 95 certified zones. Incentives differ according to specific requirements and include:

- An investment tax credit of .5 percent.
- A jobs tax credit for each certified dislocated worker or disadvantaged individual is hired.
- Additional state sales tax exemption on personal property purchases used or consumed in the manufacturing or operation of a pollution control facility.
- An exemption of the state utility tax on electricity and natural gas.
- Telecommunications excise tax.

Each enterprise zone also provides additional local incentives.

The Illinois Economic Development for a Growing Economy Program (EDGE)[85]

As a tax credit, the EDGE program is administered by the Illinois Department of Commerce and Economic Opportunity (DCEO). A Business Investment Committee of the Illinois Economic Development Board (IEDB) makes recommendations regarding the types of projects that may seek this tax credit. The tax credits could be as high as the amount of tax receipts collected from income taxes paid by newly hired and/or retained employees of the firm. If the company receives other assistance from the state, the amount of credits can be reduced. The amount of the Tax Credit is calculated on a case-by-case basis. The credit is granted for up to ten years. The development project must add to the export potential of Illinois (For example, manufacturing or services exported out of state qualify.).

Eligible projects must be new and expansion must occur in the state. Plant relocations within the state may be considered if there is a business reason why their current location is inadequate. Each project must either commit to make a capital investment in the state of at least $5 million and create a minimum of 25 new jobs, or meet the investment, job creation, and/or retention requirements.

High Impact Business Program

This program provides incentives to companies making large scale investments for the creation and retention of jobs outside of an enterprise zone, similar to those of an enterprise zone. The program offers investment tax credits; state sales tax exemption on building materials; sales tax exemption on natural gas and electricity; and, state sales tax exemption on manufacturing equipment purchases, repair and replacement parts. Minimum investment required is $12 million with the creation of 500 new jobs, or $30 million and the retention of 1,500 jobs. The business must also be designated a "high impact business" by the Department of Commerce and Economic Opportunity.

Illinois
(Continued)

Sales Tax Exemptions

Sales tax exemptions are offered for manufacturing machinery, computers used to run the equipment, farm machinery, pollution controls, building materials bought and used in enterprise zones and materials used in manufacturing in an enterprise zone. Requirements to qualify are based on job creation criteria.

Property Tax Abatement

This is a program for new or expanding businesses to enhance development at the local level. Businesses may be exempt from local property taxes up to $4,000,000 over a ten-year period. For those businesses in enterprise zones, the dollar amount is unlimited for the life of the zone (up to 30 years from the time of the zone's establishment).

Manufacturer's Purchase Credit

Qualifying manufacturers may earn a Manufacturer's Purchase Credit (MPC) for purchases of machinery and equipment that qualify for the existing sales/use tax exemptions. The credit is equal to half of the 6.25 percent state tax.[86]

Research and Development Credit

There is a tax credit for businesses that increase research activities in the state.

Large Business Development Program (LBDP)

The LBDP offers grants to businesses undertaking a major expansion or relocation, which result in substantial private investment and the creation and/or retention of a large number of jobs. Funds can be used for bondable business activities, including financing the purchase of land or buildings, building construction or renovation, and certain types of machinery and equipment.

Utilities Tax Exemption

Tax exemptions are available on natural gas and electricity for those businesses located in an Illinois enterprise zone.

Job Training

The Employer Training Investment Program provides grants to businesses that update employee skills. The Training Expense Tax Credit helps businesses provide educational or vocational training in semi-technical, semi-skilled and skilled fields.

Tax Increment Financing

Tax increment financing is an economic development tool used by local governments to help finance infrastructure projects. Projects that are eligible include land costs, consulting costs, sewer, water, streets, reconstruction, repair, renovation, parking, site work, landscaping, job training, construction, and others. The cost of a newly constructed building is not eligible.

The Business Development Public Infrastructure Program (BDPIP)

Illinois (Continued)

This is a grant program designed to help local governments make infrastructure improvements on behalf of businesses that are planning to expand or relocate in the state.

Illinois Finance Authority (IFA) Industrial Revenue Bonds

Provides low-cost financing to manufacturers for the purchase of fixed assets. Bonds may be used for either construction or renovation.

Maryland

Economic Development Areas Tax Credits[87]

Enterprise Zones. Businesses located in enterprise zones are eligible for income tax credits for wages paid to eligible employees in the zones, and property tax credits for new or expanding businesses that meet certain requirements.

One Maryland Economic Development Tax Credit

There are income tax credits for businesses establishing or expanding facilities and creating new jobs in a priority funding area or in a distressed county. Businesses may receive up to $5.5 million in tax credits and start ups may receive up to $500,000. Credits based on the costs of furnishing and equipping a new facility are offered for start up businesses relocating to Maryland.

Job Tax Credits

Businesses creating new jobs may qualify for a tax credit, depending on the number of jobs added or the amount of wages paid to new employees. Credits may be used against income tax, insurance premiums tax or public service company franchise tax. The amount of the credit is two and half percent of the total annual wages not to exceed $1,000 times the number of jobs created. Employers must create at least 60 new positions. The threshold decreases to 30 jobs for new high-paid positions.

For businesses in state enterprise zones, a federal empowerment zone, or a Department of Housing and Community Development neighborhood, the credit increases to $1,500 times the number of jobs created. In Priority Funding Areas, the program requires only 25 positions to qualify.[88]

Sales and Use Tax Exemptions

There are no general sales or use taxes levied in the counties or municipalities.

Personal Property Tax Exemptions

Many municipalities and counties exempt personal property taxes for manufacturing machinery, equipment, materials and supplies. Manufacturing inventory is not subject to taxes in all counties and Baltimore city. Commercial inventory for warehouse/distribution is generally exempt. Customized computer software is exempt, and local jurisdictions may grant a tax credit for off-the-shelf software. Local jurisdictions may offer additional tax exemptions and credits.

Research and Development Tax Credit

Maryland
(Continued)

Businesses that undertake qualified research and development expenses may receive an income tax credit. The basic research and development tax credit is three percent of eligible expenses, and the Growth Research and Development tax credit is ten percent of eligible expenses.[89]

Manufacturing and Research and Development Personal Property Exemption

Local governments are authorized to exempt from taxation personal property used in manufacturing.

Provided Long-Term Care Insurance Tax Credit

Maryland offers a tax credit for employers who provide long term care insurance as part of their benefits package.

Job Training

The Partnership for Workforce Quality provides matching grants to small and mid-size manufacturing and technology companies for the enhancement of workers' skills.[90]

The Smart Growth Economic Development Infrastructure Fund (One Maryland)

Businesses may be eligible for up to $5.5 million in income tax credits under the One Maryland Income Tax Credit Program. The program provides direct funding for creation of industrial parks and other needed infrastructure in qualified distressed counties. Project Tax Credits under this program are offered for land acquisitions, infrastructure improvements, acquisition of fixed assets, feasibility studies and preparation for a local economic development plan.[91]

Industrial Revenue Bonds

The Maryland Industrial Development Financing Authority encourages private sector financing through the issuance of tax-exempt and taxable revenue bonds and linked deposits.

The Economic Development Opportunities Fund (Sunny Day Fund)

Provides funding for "extraordinary" economic development opportunities that need funding beyond the capabilities of existing state and local financing programs. The Sunny Day Fund is a revolving fund administered by the Department of Business and Economic Development.[92]

Significant Strategic Development Opportunities[93]

This program provides loans for significant economic developments, to a maximum of $10 million or 20 percent of the current fund balance.

Local Economic Development Opportunity

This program offers direct loans or grants from the local jurisdiction in an amount equal to at least 10 percent of the state's financial assistance. Loans may be up to $5 million, while conditional loans and grants may be up to $2 million.

Maryland (Continued)

Local jurisdictions also have other funds available for economic development purposes.

Arkansas

Economic Development Areas Tax Credits

Tier System and Enterprise Zones. Arkansas Enterprise Zone legislation, passed in 1983, designed the zones based on specific poverty criteria. In 1993, the Legislature eliminated these criteria and made the entire state an enterprise zone. In 2003, the law was amended and established poverty criteria for determining the size of zone credits. Counties are now grouped into four tiers based upon the rate of unemployment, population growth, per capita income, and poverty growth. The tier system makes employers in poorer counties eligible for larger credits than the ones offered in richer counties. Since the change in the law, the size of the credits is determined as a percentage of the payroll for new employees rather than by the number of new jobs.[94]

Jobs Credits[95]

Advantage Arkansas.[96] A credit of up to 50 percent against income tax liability is offered for the creation of new jobs. The amount of the benefit ranges from one to four percent depending upon the tier designation of the county. The credit may be carried forward for nine years and may be combined with other incentives.

Investment Credits

Tax Credit ArkPlus. This is a discretionary income tax credit for new or expansion projects. The amount of the credit is ten percent of total investment and may be used to offset 50 percent of income tax liability. Any unused credits may be carried forward for nine years. The amount of investment required to qualify for the credit and the minimum amount of payroll of new employees are determined in relationship to the tier designation of each county. Investment requirements vary between $2 to $5 million and payroll requirements range between $800,000 and $2 million, depending on the tier designation.[97]

Targeted Businesses

Businesses that qualify as "targeted businesses" may receive three special incentives designed to help start-ups, knowledge-based businesses. These discretionary incentives include: 1) a refund of sales and use taxes paid on the purchase of building materials and machinery and equipment associated with the approved project; 2) A credit equal to 10 percent of payroll for up to five years, which is transferable; and 3) a transferable income tax credit of 33 percent of qualifying research and development costs, also transferable.[98]

Sales and Use Tax Incentives

Tax Back. Advantage Arkansas participants investing at least $100,000 are eligible for the Tax Back program. This program provides a refund of sales and use taxes for building materials and taxable machinery and equipment associated with the approved project.

InvestArk is a sales and use tax credit program available to businesses established in Arkansas for at least two years and invest $5 million or more in plant or equipment for new construction, expansion, or modernization. A credit

Arkansas
(Continued)

against the state sales and use tax liability is equal to one half percent above the state tax rate in effect and cannot exceed 50 percent of the businesses' tax liability. Any unused credit may be carried over for up to five years.[99]

Property Tax Abatements

Abatements may be allowed at the discretion of each individual county. The amount of any awarded abatement varies in years and percentages.

Research and Development Credits

This is an income tax credit of ten percent limited to $10,000 a year for in-house research. The rate also offers transferable income tax credits equal to 33 percent of expenses for targeted businesses.

Goods in Transit

New aircraft manufactured or completed in the state and exported from the state are exempt from sales tax. An exemption from the use tax is allowed for aircraft and aircraft equipment, railroad cars, parts, equipment, and others as long as the items do not remain in the state for more than 60 days.

Freeport Law

Raw materials and finished goods in transit or awaiting shipment to out-of-state customers are exempt from property tax.

Job Training

The Business and Industry Training Program provides financial assistance for recruiting and training new employees, while the Existing Workforce Training Program offers financial assistance for skills enhancement training for existing employees.

Rebate Program (Payroll Rebate)

A payroll rebate is authorized for a taxpayer who is considering locating in another state. The business must receive at least 75 percent of its sales revenue from out of state and pay at least 100 percent of the county average wage where it is located. Eligible businesses creating new jobs may be eligible to receive and annual rebate of payroll taxes that ranges from 3.9 percent to 5 percent depending upon the tier designation of the county. Companies must meet a minimum payroll of $2 million.

Infrastructure Grants

Economic Infrastructure Funds (EIF) provides grants to cities and counties for public infrastructure needs.

Industrial Revenue Bonds

Bonds provide financing for land, building and equipment for new and expanding manufacturing and other qualifying industries.

The Arkansas Capital Corporation

Arkansas (Continued)

This is an alternative source of financing for businesses in the state. Loans generally range from a minimum of $100,000 to a maximum of $1.25 million.

ASTA Investment Fund

The Arkansas Science and Technology Authority (ASTA) administers a special Investment Fund of $1.7 million designed to provide seed capital for new and developing technology-based businesses through loans, royalty agreements, and limited stock purchases.

In addition, ASTA administers a program that encourages the transfer of technology and technology development programs.

Louisiana

Economic Development Area Tax Credits

Enterprise Zone Program (EZ).[100] A program to spur jobs creation offers tax credits to businesses hiring at least 35 percent of their net new permanent jobs from one of four targeted groups. If the job requirement is met, sales/use tax rebates or a refundable investment tax credit may be available. EZs are areas where there are a significant number of residents receiving public assistance. Businesses must increase employment by ten percent or generate a minimum of five jobs. Benefits include:

- A one time $2,500 job tax credit for each net new job created. Aerospace and automobile parts manufacturers may qualify for a $5,000 credit.
- A sales/use tax rebate paid on materials, furniture, fixtures, machinery and equipment purchased and used exclusively in the EZ site or, a refundable investment tax credit (ITC) equal to 1.5 percent of capitalized investment minus cost of land, interest, existing building acquisition costs, and the portion of manufacturing equipment that is exempt under sales/use tax laws. The credit is earned the year the project started.

Quality Jobs Program[101]

This incentive provides a refund of various income taxes based upon the number of new jobs created and minimum annual payroll requirements. Businesses with more than 50 employees are required to have an annual gross payroll for new jobs of at least $500,000 within three years of obtaining a contract with the state. For small business, the minimum payroll is $250,000. The amount of the benefit will be determined by the percentage over federal minimum hourly rates paid to employees and ranges from five to six percent. Health care benefits must also be provided.[102]

Corporate Jobs Tax Credit

There is a tax credit of up to $225 per new employee against state corporate income taxes. This credit cannot be used if the property tax exemption or enterprise zone credits are obtained.[103]

Sales Tax Exemption

As part of the Quality Jobs Program, a sales/use tax rebate on materials

Louisiana
(Continued)

purchased for new infrastructure and machinery and equipment is exempt from sales tax. A four percent tax credit applies to sales, use, consumption, distribution, or storage of tangible personal property, and others.

Inventory Tax Credit

A credit against corporate income taxes and franchise tax is allowed for locally paid property taxes. Eligible businesses include manufacturers, distributors, and qualified retailers.

Industrial Property Tax Exemption

This is a discretionary exemption for new manufacturers and may be granted for up to ten years. Eligible items include buildings and machinery and equipment. The manufacturer is required to file advanced notification if the project cost is greater than $5 million.[104]

Industrial Ad Valorem Tax Exemption Program

The program provides parish property tax exemptions for a five-year period and renewal for an additional five years for new or expanding manufacturers' capital expenditures not including land. The exempt taxes comprise all millages, including school board millage. There are parish taxes and municipal property taxes, but no state property taxes.

Research And Development Tax Credit

There is an income or franchise tax credit from 8 to 20 percent (according to the size of the company) for research and development expenses.

Goods In Transit

Goods in transit, imported goods that remain on the dock or common carrier, and goods held in a storage facility for export are exempt from ad valorem property taxes.

Industry Assistance Program

The Industry Assistance Program offers a tax exemption when manufacturers and their contractors give preference and priority to Louisiana manufacturers or Louisiana suppliers, engineers, contractors and labor. The Louisiana manufacturer must have facilities in the state; maintain current employment; and, commit to significant investment to continue doing business in Louisiana.

Tax Equalization Program

The Tax Equalization Program promotes the expansion of manufacturing, headquarters, warehousing, and distribution establishments in Louisiana by supporting them when taxes in Louisiana are higher than in an alternative location.

Job Training

The Workforce and Training Program offers funding for customized training. The Incumbent Worker Training Program reimburses tuition, textbooks, manuals and other material costs. Assistance is limited to $3,000 per trainee.

Louisiana (Continued)

The Economic Development Award Program

This program offers grants for publicly-owned infrastructure to assist industrial development projects. The minimal award request is $25,000. Preference is given to targeted industries and projects located in areas of high unemployment. Eligible costs may include, but are not limited to, engineering and architectural expenses, site acquisition, site preparation, construction expenses, building materials, and capital equipment.

Tax Increment Financing

Tax increment financing is available for public and private development.

Industrial Revenue Bonds (IRBs)

Bonds provide financing for land, building, and equipment for new and expanding manufacturing and other qualifying industries.

APPENDIX: END NOTES

[1] State incentives are mostly based on three main sources:
1) Area Development's Corporate Location Directory, http://www.corporatelocationdirectory.com/.
2) Incentis Group, http://www.fastfacility.com/incentis/IncentisSearch.asp, and
3) Individual states' government sites as referenced in the notes below.

[2] California Housing and Community Development Department, http://www.hcd.ca.gov/fa/cdbg/ez.

[3] Ibid., http://www.hcd.ca.gov/fa/cdbg/ez/lambra/.

[4] California Franchise Tax Board, http://www.ftb.ca.gov/forms/misc/1082.pdf.

[5] State of California: California Business Investment Services, "An Overview of Advantages, Assistance, Taxes and Permits," 2006, http://www.labor.ca.gov/calBIS/cbbusincentives.pdf.

[6] Ibid.

[7] Washington State Department of Revenue: *Special Notice,* January 15, 2004 revised, http://www.dor.wa.gov/docs/Pubs/SpecialNotices/2004/sn_04_aero.pdf.

[8] Ibid.

[9] Ibid.

[10] Ibid.

[11] Ibid.

[12] Ibid.

[13] Ibid.

[14] Ibid.

[15] Ibid.

[16] Ibid., http://dor.wa.gov/docs/Pubs/SpecialNotices/2004/sn_04_aero.pdf, and http://dor.wa.gov.

[17] Texas. Economic Development and Tourism, http://www.governor.state.tx.us/divisions/ecodev/ed_bank/enterprise_zone, http://www.dcbelton.org/FAQs % 20Enterprise % 20Zone.pdf, and http://www.fastfacility.com/incentis/ViewIncentiveGuide.asp.

[18] Franchise Tax Credits for Research, Jobs Creation and Investment: Strategic Investment Area for Calendar 2007, http://www.cpa.state.tx.us/news/si2007color.pdf; See also Franchise Tax Credit "Special Report" 2007, http://www.window.state.tx.us/specialrpt/sb441_07/96-780-07-FranTax.pdf.

[19] Incentis Group, http://www.fastfacility.com/incentis/ViewDescription.asp?State=TX&Ref=Sec2No1.

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