

The Economic Impact of Department of Defense, Veterans and Military Retirees, and the Department of Veterans Affairs Activities in Colorado

Prepared by Summit Economics, LLC





COLORADO
Gov. John Hickenlooper



May 8, 2018

Greetings:

We have long championed our vibrant military and veterans community in the Centennial State. Over the course of my time as the Governor of Colorado, I've shared in the joy of welcoming units home from deployment and the sorrow of laying to rest American heroes who were killed in the line of duty. Never far from my mind is the daily service and sacrifice that servicemen and women, as well as their families, render for all of us.

An important part in recognizing these contributions is to understand the full scope of economic impact that our military and veterans community make in Colorado. Each job created or retained represents a daily effort that drives our state's impressive economic growth and success. With this in mind, I was pleased to sign into law SB 14-157 concerning the Colorado Department of Military and Veterans Affairs (DMVA) commissioning of the reported value of U.S. Military activities in Colorado. The bill allows the DMVA to take a holistic look at the impacts of Department of Defense activities across our entire state.

In addition to determining that our defense industry was tied with agriculture for the third largest in Colorado, we measured the economic impact of the defense industry to be \$27 billion in 2015. This figure is substantial and reflects positive impacts for every Coloradan. In light of this previous finding, we were pleased to learn that several communities had partnered to follow up on the economic portion of the 2015 study.

We think you will agree that the data contained in this report is impressive in scope and highlights the win-win nature of our role as a major center for national defense. We are fortunate to host several key missions that are critical to the daily security that we enjoy as Americans. Whether it is the sentinels of the North American Aerospace Defense Command or the member of the Colorado National Guard responding at a moment's notice to a wildfire, Colorado is a community that truly supports our military.

Sincerely,

John W. Hickenlooper
Governor



STATE OF COLORADO

DEPARTMENT OF MILITARY AND VETERANS AFFAIRS

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John W. Hickenlooper
Governor

Major General
Michael A. Loh
The Adjutant General

May 4, 2018

Fellow Coloradans,

The Colorado Department of Military and Veterans Affairs is a vital supporter of the efforts of our military across all branches and components. We proactively assist our active duty installations and missions to ensure the sustainment and development of our National Security. As most of you know, there is no better place for our military to train, have access to cutting edge technology and innovation, and to raise their children.

One of the landmark efforts in ensuring that both the Department of Defense and the citizens of the Centennial State understand the full depth and breadth of the military missions in Colorado and the jobs and enterprise they create was the 2015 *Report on the Comprehensive Military Value and Economic Impact of Department of Defense Activities in Colorado*. This report was a grass-roots concept championed by several communities. The report was funded by the Colorado General Assembly and conducted by the Colorado Department of Military and Veterans Affairs. The report marked the first time that we, as a state, had looked closely out how we benefit the Department of Defense and how their activities benefit every Coloradan.

I'm pleased that several of the same communities that helped generate the political will for the first study have come together to fund a continuation, and ultimately an expansion of the economic impact study contained in the 2015 report. It is important for every Coloradan to understand that the economic benefits of the Department of Defense are not confined to military installations, but rather span a broad range of universities, research centers, and corporations. The military members and their families that live and work in Colorado are a big part of the economic engine in our state.

While the first report was limited to Department of Defense-specific activities, this report includes Department of Veterans Affairs expenditures and other ancillary spending that is connected to the military presence in Colorado. I hope that the reader recognizes that this sector represents a significant driver of our State's economy and benefits every citizen either directly or indirectly.

In closing, I would like to thank the community partners that put this report together and hope our partners see fit to sustain this effort in the coming years. I would like to thank the reader for taking an interest in what your United States Armed Forces do every day to keep us safe. It is only through your support that we will have the resources to continue to be the best military force in the world.

Respectfully,

A handwritten signature in blue ink, appearing to read "M. A. Loh".

Major General Michael A. Loh
The Adjutant General of Colorado
Executive Director, Colorado Department of Military and Veterans Affairs

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Purpose

The purpose of this Report is to: 1) reiterate the findings of a 2015 report titled “Report on the Comprehensive Military Value and Economic Impact of Department of Defense Activities in Colorado” prepared by Whitney, Bradley, Brown (WBB) and 2) update and expand upon the 2014 data prepared by Summit Economics for the WBB report with 2016 data.

The original study, completed in 2015, was to share with the reader a better understanding of the defense enterprise in Colorado, its vital role supporting key national security objectives, and the part it plays in the lives of all Coloradans.

This report focuses on updating the economic and fiscal impacts of the Department of Defense (DoD) on Colorado’s economy, and in addition to the installations and activities considered in the original study, adds the impacts of the Department of Veterans Affairs (VA), veterans and military retirees and the Pueblo Chemical Depot to the original analysis. The aggregate of the military installations, the DVA, DoD contractors, National Guard, Reserves, VA, Veterans, and Military Retirees is termed the **Defense Sector**.

Please see the 2015 and 2017 Unabridged Reports for a more detailed explanation regarding the information provided in this summary, however the total employment impact of the Defense Sector in 2016 was approximately 246,000 jobs, compared with the 170,000 jobs in 2014. The difference is primarily due to the addition of the VA, veterans and military retirees.

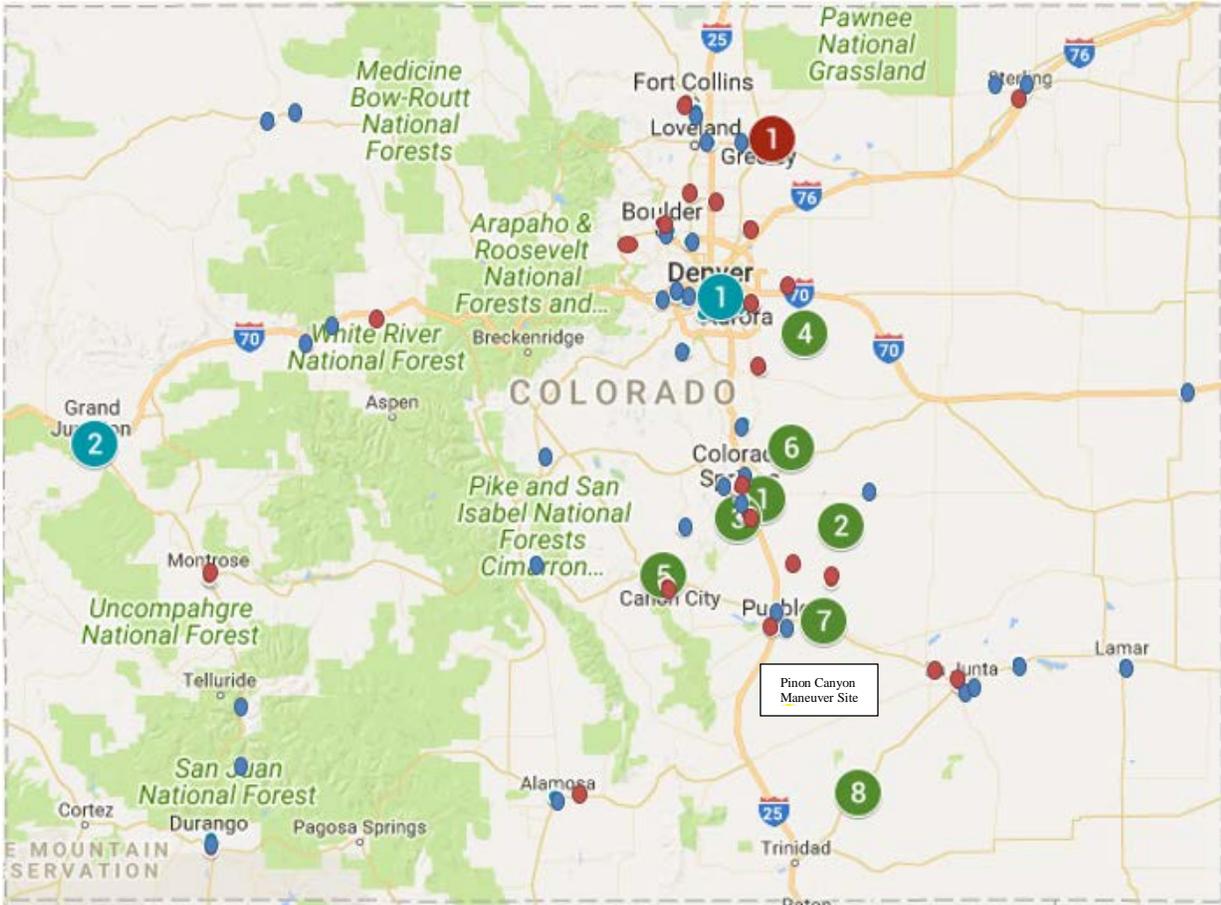


Map of Major Installations

Colorado's major military installations are noted by large green circles on this map. They include the Greeley Air National Guard Station, Buckley Air Force Base (AFB), the United States Air Force Academy, Peterson AFB, Cheyenne Mountain Air Force Station, Schriever AFB, Fort Carson, the Pueblo Chemical Depot, and the Pinon Canyon Maneuver Site. There is also a High Altitude Army Training Facility in Eagle County, as well as ICBM missile sites in northeastern Colorado (not shown on the map) managed by Warren AFB in Cheyenne Wyoming, and some remaining buildings at the Rocky Mountain Arsenal.

Several key points emerge from this constellation of installations and facilities.

- They all enjoy robust ground transportation networks for movement of military, civilian and contractor personnel to and from the installation.
- The proximity of the bases to each other fosters effective shared mission operations and joint training.
- The multitude of commercial and military airports serving both the greater metropolitan Denver region and the Pikes Peak area promote international movement of military members and the high-technology industrial work force associated with enterprises satisfying Department of Defense needs. The defense related activity at the Colorado Springs airport helps support the airport's operational 24/7 status.
- They attract a constellation of supporting civilian contractors and suppliers.
- They contribute to the diversity of defense missions, technologies and skill sets within Colorado.
- They expand the economy beyond the defense related installations through the agglomeration effect of attracting related civilian firms and/or other government activities.
- They provide strong ties to the workforce through the provision of well-educated and trained veterans with relevant skills to 21st century industry needs.



LEGEND

- 1 Peterson Air Force Base
- 2 Schriever Air Force Base
- 3 Cheyenne Mountain Air Forc...
- 4 Buckley Air Force Base
- 5 Fort Carson
- 6 United States Air Force Acad.
- 7 Pueblo Chemical Depot
- 8 Piñon Canyon Maneuver Site.

- 1 VA Eastern Colorado Health ...
- 2 VA Medical Center-Grand Ju...

- 1 CO Air National Guard

- Other VA Facilities including Ft. Logan, Ft. Lyons, Fountain, Cemeteries and Veteran's Homes

- Other National Guard Facilities

Defense Sector installations/offices are located throughout Colorado, with VA and National Guard facilities distributed across numerous counties across the state.

Measuring Military Value

As concluded in the original study, Colorado's military value to the DoD is reflected in the extent to which installations, units and assigned missions contribute to successfully achieving national military strategy objectives. The DoD recognizes ten strategic mission areas for which the nation needs organized, trained and equipped armed services:

- Counter terrorism and irregular warfare
- Deter and defeat aggression
- Project power despite anti-access/area denial challenges
- Counter weapons of mass destruction
- Operate effectively in cyberspace and space
- Maintain a safe, secure, and effective nuclear deterrent
- Defend the homeland and provide support to civil authorities
- Provide a stabilizing presence
- Conduct stability and counterinsurgency operations
- Conduct humanitarian, disaster relief, and other operations

Colorado's installations, DoD personnel (uniformed military, civilian and contractor) and the substantial commercial industrial enterprise supporting them all contribute significantly to these ten mission areas, generating military value to DoD while simultaneously creating a positive economic and patriotic impact on local, regional and state

As well as the value created by the active military installations and civilian defense industry firms, this update also shows how Colorado provides a home for our veterans and military retirees, as well as the infrastructure needed to support them through the Veterans Administration and other Department of Defense facilities and programs.

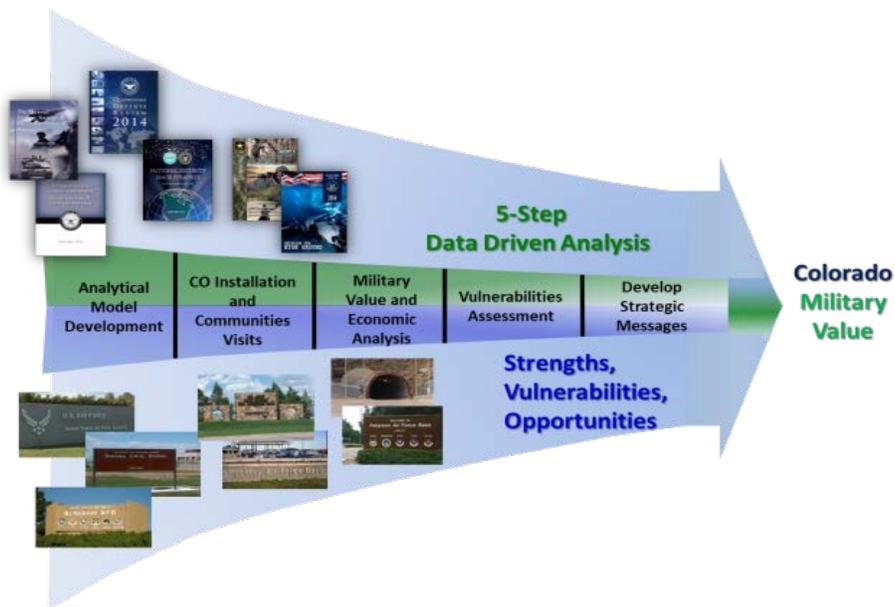
Colorado's ability to attract military retirees and veterans also generates military value to DoD while creating additional positive economic impact on local, regional and state

Military Value and Economic Impact Criteria

The 2015 Study model used to measure Colorado’s military value to DoD are the same 11 criteria used to evaluate military installations across the nation. Note the last criteria relates to the economic contribution of the installations to the local economy.

- Military capabilities
- Availability and condition of land
- Availability and condition of airspace
- Condition of facilities/infrastructure
- Ability to accommodate contingency mobilization
- Surge capability/capacity
- Future total force requirements
- Cost of operations
- Manpower implications/personnel availability
- Community Interaction
- Economic Contribution

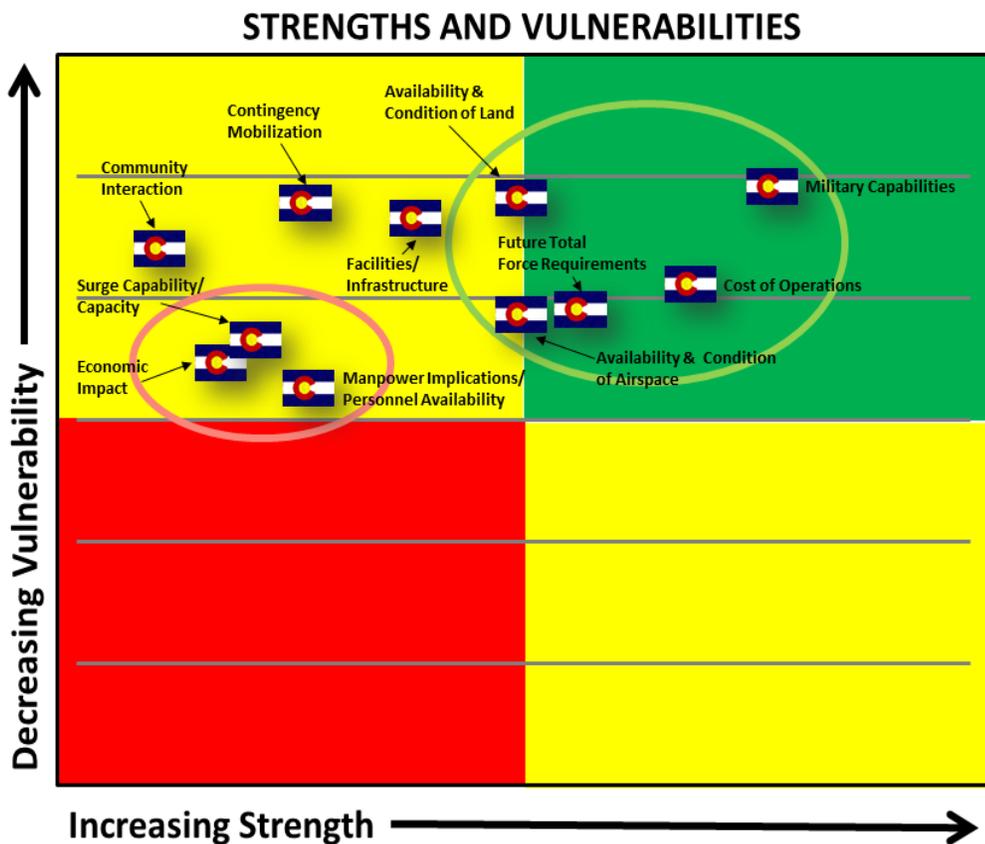
For the 2015 study, the Study Team followed a five-step process to complete the data-driven analysis. For the 2017 study, the economic contribution has been updated and expanded to include the addition of the Pueblo Chemical Depot; the operations of the VA, including payments made on behalf of veterans; and the expenditures of pensions and compensation received by veterans and retired military.



Overview of Strengths and Vulnerabilities of Colorado Military Installations

The key conclusions from the 2015 study and the update regarding strengths and vulnerabilities of Colorado's military installations are as follows:

- Colorado installations, assigned personnel and missions provide technologically advanced aerospace and other defense-related capabilities that DoD needs to successfully advance and protect US interests around the world
- The land and airspace requirements for Colorado military unit training are consistently satisfied and not impacted by encroachment pressures
- The Colorado military, civilian and contractor work force is agile enough to meet both current and future total force requirements
- The cost of operating installations, combined with the regional and state costs of living, are attractive characteristics for DoD and for the workforce



The quad chart indicates that, when all Colorado military installations are evaluated with the 11 military value criteria, they collectively exhibit great strengths and minimal vulnerabilities. The most significant strengths are the five that fall within the green circle in the upper right quadrant. Where there are some vulnerabilities, they generally fall within the cluster of three military value criteria within the red circle.

Major Strengths

Colorado possesses innovative and open technological capacities:

- The broad diversity and locational stability of Colorado's DoD related technology-based industries provides a greater level of stability during the peaks and valleys of product and technology lifecycles
- The local military and civilian population living on and around military installations is well-educated, technically proficient and satisfied with a positive quality of life in their work and recreational pursuits
- There is a cross-flow from DoD into industry and vice versa that nurtures strong bonds between those two major sectors and is a self-reinforcing relationship that concentrates talent, productive capacity, and innovation



Colorado possesses tremendous depth and scope in military, academic and technical organizations and training opportunities

- The state hosts over 470 institutions including publicly supported (made up of research universities, four-year state colleges, community colleges and local district colleges), private accredited (which includes for-profit, non-profit, and seminary), area technical, and private occupational institutions educating approximately 400,000 students. In 2016, 23,602 students received Post 911 GI Bill benefits while attending 116 different public and private educational institutions. The students, through the institutions, received \$186 million in awards.
- Colorado's aerospace industry sector ranked second in 2016 out of 50 states in both total private-sector employment and percentage of total employment. The industry embraces widespread collaborations with out-of-state industry partners as well as in-state and out-of-state universities and colleges. The ties with University of Colorado Boulder (UCB) and Laboratory for Atmospheric and Space Physics (LASP) are exceptional. UCB just broke ground on a very expensive aerospace building (\$86B building and hub).
- The US Air Force Academy alone boasts sponsorship of 20 Research Centers that partner with a number of industries and research and development arms of other universities, fostering a \$65 million enterprise in 2014. The University of Colorado system has \$1 billion in sponsored research



Major Strengths (continued)

Colorado possesses the resources needed to meet Service and Joint training opportunities

- There is diversity and depth in the institutional or operational “presence” of DoD tenants on military installations with critically important and well-funded national defense missions
- The space missile warning and defense enterprise hosted at Buckley AFB, Peterson AFB, Schriever AFB, Cheyenne Mountain Air Force Station, and Greeley Air National Guard Station creates a vast joint footprint for air and space training requirements
- Tenant organizations like the Missile Defense Agency at Schriever AFB and the Aerospace Data Facility at Buckley AFB are funding significant infrastructure improvements in part to enhance the operational training effectiveness of assigned personnel and mission sets
- The Pinon Canyon Maneuver Site and associated airspace above it, consisting of 238,000 acres and roughly 4,400 feet above ground level, provide world-class training environments for Fort Carson units, out-of-state US Army units, and units from joint organizations and allied partners



Colorado has the geography that best supports DoD’s strategic guidance for training armed forces

- Operational training of land, air and space forces assigned to Colorado are positively impacted by Colorado's climate and geography.
- Colorado military installations and their associated mission sets are successful in part because geography promotes rather than prohibits vital training activities that ensure mission readiness. The unique combination of the flat plains landscape that quickly rises to meet the Rocky Mountain range allows a rich mix of geographical environments for land and air training.
- The Colorado Army National Guard hosts its HAATS program near Eagle Colorado, providing a training environment extremely useful for US and coalition armed forces and Allies enhancing Theater Secondary Cooperation.



Major Strengths (continued)

Colorado possesses the resources that support and sustain the defense and aerospace industry:

- The strategic importance of aerospace missions within DoD, combined with the congruence of well-funded space-oriented tenants at several Colorado military installations, ensures sustained DoD expenditures and investments that will support and sustain Colorado's industries
- The DoD contractor work force provides better returns on investment, higher levels of productivity, and promotes industry-level economies of scale that make existing military installations attractive to DoD investment
- The current balance of Active Duty, National Guard Reserve Component and civilian personnel assigned to Colorado military installations, and the flexibility individuals demonstrate in transitioning from one career area to another, promote a level of "human capital" resiliency that fosters the defense and aerospace industry's success and Colorado's economic stability
- Colorado employs more than 7 percent of the nation's aerospace workforce, according to a 2017 study by the Metro Denver Economic Development Corporation



Measuring Economic Impact

There are several ways to measure the economic impact of the Defense Sector. One of the most obvious indices is the number of jobs within the state that can be directly attributed to the Defense Sector.

The updated and expanded 2017 study added to the impacts considered in the 2015 study by including the expenditures by the VA, and the impacts resulting from the veteran and military retiree population in the state. It also incorporated impacts from the construction and operations of the chemical weapon demilitarization program at the Pueblo Chemical Depot.

The analytical model is focused on four primary domains: 1) the activity that takes place on or in association with the eight assessed military installations in Colorado; 2) the contracts between the DoD and both private contractors and recipients of DoD assistance awards; 3) the operations of the VA in Colorado, which includes the provision of services to veterans such as health, education, insurances and indemnities, vocational rehab, burial, and; 4) the pension and compensation payments received and then spent in Colorado by veterans and military retirees.

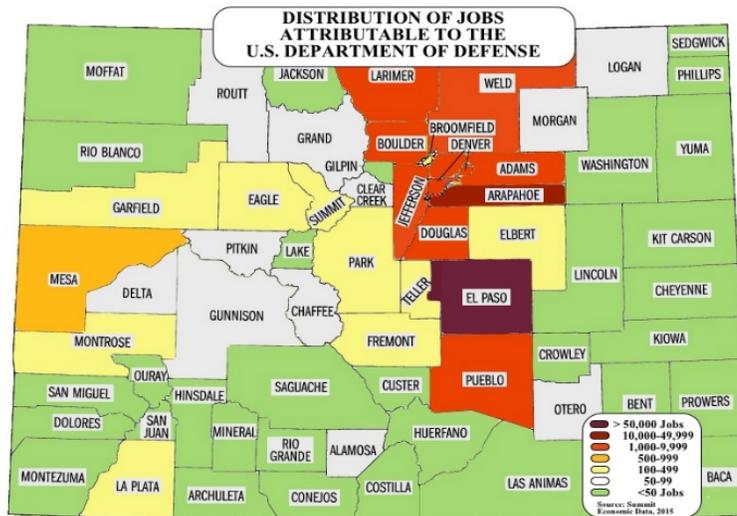
Key Findings

- Total Defense Sector related employment in Colorado is 247,000 jobs, up from the 170,000 found in the 2015 study that looked only at military installations and DoD contracting. It makes up about 7.5 percent of the total state wage and salary employment based on North American Industrial Classification System (NAICS), up from 5.2 percent in the 2015 study. This includes both persons employed directly by the Defense Sector, as well as the multiplier effect of indirect and induced jobs.
- The concentration is in the Front Range, where the eight major military installations are located. The total labor income from Defense Sector employment in El Paso, Arapahoe, Pueblo and Weld counties (the four counties with significant military installations) is almost \$11.0 billion. Defense Sector related labor income is about 41% of total El Paso County labor income and 12% of Arapahoe County labor income.
- There are approximately 68,000 Defense Sector jobs outside of the El Paso, Arapahoe, Weld and Pueblo counties -- 47 Colorado counties have more than 100 jobs attributable to the Defense Sector, while 13 of those gain more than 1,000 jobs. The Defense Sector helps stabilize the economies of smaller counties, as non-defense related employment is trending downward in many rural areas.

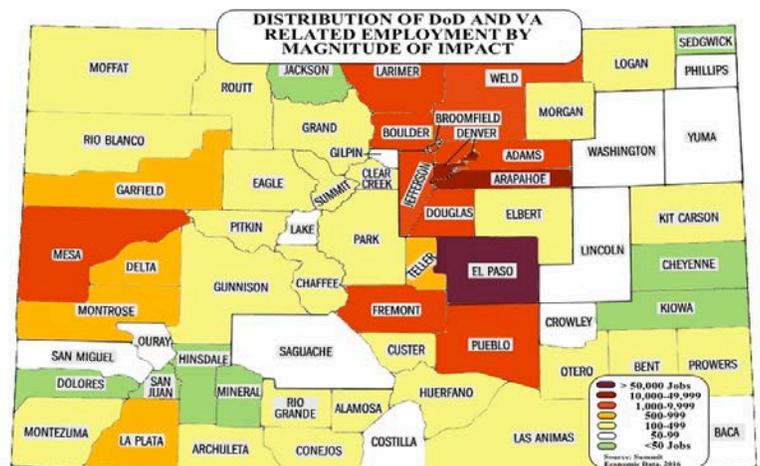
- In Fiscal Year 2016, \$18.1 billion flowed into Colorado from the Department of Defense for military pay, installations operations, DoD contracting, operations of the VA, military retiree and veteran compensation and pensions, and the federal share of the Colorado Air National Guard. That inflow created more than \$25 billion in gross regional product and \$36 billion in total output.

The impact of the Defense Sector on individual counties has increased with the addition of employment impacts of VA, veterans and military retiree expenditures. Many of the counties that had fewer than 100 jobs attributable to the Defense Sector in the 2015 study have now moved into the 100-500 category, while several have moved in the 500-1,000, and 1,000-10,000 categories, due to the addition of the VA, veterans and military retirees.

Distribution of Defense Sector Jobs in 2014



Distribution of Defense Sector Jobs in 2016



Economic Impact of the Military on Colorado

The economic impact analysis is based on a complex set of inputs from a variety of sources. The data represent the most recent complete set of inputs that can be found, generally for calendar or fiscal year 2016. The analysis addresses the economic activity that has taken place in Colorado which can be attributed to the DoD, the Veterans Administration, and the military or VA pensions and compensations that flow to veterans and military retirees.

The model examines the direct, indirect and induced effects of having DoD and VA activity located and performed in Colorado. The impacts come primarily from:

- The presence of a combination of active duty military and civilian workforces at the military installations
- The expenditures of those installations for construction and operations
- A large network of recipients of DoD contract and assistance award expenditures for work done in the state
- National Guard and Reserve forces located in the state
- Impacts from VA expenditures in Colorado
- Impacts from veteran and military retiree pension and compensation expenditures

Not included is DoD travel to the state originating from outside Colorado, and certain other DoD education benefits paid to active duty military and federal civilian workers from budgets other than through the VA or through Colorado installations. Nor are expenditures made by DoD, VA, veterans and retirees who visit the state for recreation or to visit family and friends.

The total employment impacts also include jobs created in one county due to the military installation or DoD contracting in another, termed the “trade flow effect”. Most of the jobs created in the counties without military installations can be attributed to the trade flow effect, DoD contracts and assistance, veterans and retirees, National Guard and Reserves.

Employment at Military Installations, 2014 and 2016										
Military Installations	Peterson Air Force Base/				Total El Paso County	Buckley - Arapahoe County	Greeley ANG - Weld County	Pueblo Chemical Depot & CSEPP		All Installations
	Ft Carson	Cheyenne Mtn	Schriever Air Force Base	Air Force Academy				Chemical	All Installations	
2016 Employment										
Military	25,514	5,632	2,026	6,113	39,285	7,925	305	400	47,915	
Civilian	6,527	4,297	675	1,878	13,377	3,802	12	115	17,306	
Total 2016	32,041	9,929	2,701	7,991	52,662	11,727	317	515	65,221	
2014 Employment										
Military	26,455	6,795	2,145	5,800	41,195	6,779	305	Not Incl	48,279	
Civilian	3,372	5,499	660	2,306	11,837	2,151	12	Not Incl	14,000	
Total 2014	29,827	12,294	2,805	8,106	53,032	8,930	317	-	62,279	
<p>Military employment includes active duty and national guard and reserves stationed on the installation. Contractor employment is provided separately by each installation and is limited to those on the installation. They are a subset of all defense contractors.</p> <p>Sources: Summit Economics, LLC and Reports/Briefings Provided by Each Installation</p>										

There is a wide dispersion of veterans and military retirees around the state. The number of jobs by Congressional District grew dramatically for the smaller districts across the state between the two studies. All Congressional Districts now have at least 10,000 jobs attributable to the impacts of the DoD and/or VA. A listing of jobs by county by separate source of those jobs and a listing of jobs by county by Congressional District is shown in the full unabridged report.

In total, the Defense Sector contributes to Colorado’s economy in a multitude of ways. The grand total of 247,000 jobs are estimated to be created as a result of the Defense Sector in Colorado. That total comes from seven vectors.

- Military Installations – 96,000

This includes the impacts of uniformed and civilian employees at all 8 military installations, as well as non -contract operations expenditures. It also includes the impacts of National Guard and/or Reserve units stationed at the 8 installations

- DoD Contracts and Awards – 55,000

This includes the impacts of all DoD contracts and DoD Assistance Awards and Grants, including those spent on and off installations

- National Guard and Reserves – 4,000

This includes the impacts of National Guard and Reserve personnel at locations other than the 8 primary installations, as well as the impacts in the communities where smaller National Guard facilities are located. This figure has been significantly reduced from the 2015 report to show full time equivalent impacts instead of positions. Most of the 4,000 personnel are part time, so that the actual full time equivalent impact is about 2,500 jobs.

- Veterans Administration – 38,000

This includes the impacts resulting from expenditures of the VA for both operations of VA facilities as well as expenditures made on behalf of veterans for health care, education, burials, indemnities, and other benefits. It excludes direct payments to veterans

- Veterans and Military Retirees - 29,000

The impacts resulting from the expenditures made by veterans and military retirees from direct payments from the VA or DoD creates this employment impact

- Tricare Expenditures not through Military Installations – 13,000

These impacts come from expenditures for health care for military personnel, their families, military retirees and certain veterans, but are not included in the installation budgets

- Trade Flow Effects – 13,000

The impacts of the previous 6 categories are estimated on a county wide basis. In addition, some of the expenditures are made outside the county where the facilities or veterans/retirees reside. These “outside” expenditures, as well as further expenditures made from downstream impacts, result in additional jobs throughout the state. This trade flow effect is part of the total impact within Colorado

The estimated basic jobs due to the Defense Sector can be compared to the basic job estimates of the Colorado Department of Local Affairs. The industries of Colorado are arranged from largest to smallest in terms of number of basic jobs created in each industry as provided by the Colorado Department of Local Affairs. Basic essentially means an industry that exports goods and services and imports dollars, and is lower than total job impacts.

Subtracting the estimated impact for the military installations, DoD contractors, VA, Military Retirees and Veterans, the National Guard and Reserves by industry category above, the Defense Sector would be one of the largest industries of Colorado

Economic Impact (continued)

Figure 3 - Colorado Basic Sector Industry Analysis	
Sector	Estimated Employment as Basic (1)
Retirees	238,475
Government	234,095
Tourism	225,138
Prof & Business	220,732
All Other Households	200,591
Health & Educ	197,867
Agribusiness	114,057
Manufacturing	89,247
Trade & Transportation	72,272
Mining & Construction	71,994
Finance, Insurance & Real Estate	54,624
Information, Comm.	20,031
Indirect Basic	358,598
Total Colorado Basic Employment - 2016	2,097,721
Total Colorado Employment	3,232,675
Estimated Basic Jobs Due to the Defense Sector (2)	173,000
Ratio Basic/Total	64.9%
Source: (1) Colorado Dept of Local Affairs, (2) Estimated by Summit Economics	

As the table above shows, retirement income coming to Colorado households from out-of-state creates the largest number of basic jobs in the state, at 238,475 jobs, followed by government and then tourism. If the basic employment of each industry were adjusted downward by subtracting out Defense Sector related jobs, the Defense Sector makes up the fourth largest basic sector in Colorado, lagging only to Tourism at 225,138 jobs, non-military retirees at about 210,000, and non-military professional and business services at about 190,000. Of the goods and services producing sectors, Defense is the third largest industry of Colorado.

Non-defense related basic government jobs and basic health & education totals would be lower than the Defense Sector. The Defense Sector is also larger than either Agriculture, Manufacturing, Trade & Transportation, Mining, or Finance/Insurance/Real Estate.

Economic Impact (continued)

The next figure summarizes the economic impact of the Defense Sector in a few key variables: employment, labor income, state tax revenue, and value added (gross regional product). From these values, it would be accurate to say that Defense Sector represents more than 7% of the total economy of Colorado.

Fiscal Impacts on the State of Colorado from Defense Sector Related Employment, Earnings and Expenditures	
Total State Employment	3,287,598
Total Employment from Defense Sector Expenditures	246,723
Total Revenue to the State of Colorado from Taxes Derived Directly or Indirectly from the Defense Sector, 2016	\$ 859,206,216
Total State Tax Revenues from All Sources, 2016	\$ 11,819,158,006
Share of Total State Tax Revenues from Defense Sector Related Activities	7.3%
Source: Summit Economics, LLC; Colorado Department of Revenue, 2016 Annual Report	

- **Employment:** 7.5% of all Colorado wage and salary jobs are Defense Sector direct, indirect and/or induced employment
- **Labor Income:** 7.4% of Colorado labor income is derived from Defense Sector employment
- **State Taxes and Fees:** 7.3% of Colorado sales taxes, personal income taxes, corporate income taxes, and fees generated from licenses and other taxes are derived from Defense Sector activities
- **Value Added or Gross Regional Product (GRP):** 8.6% (\$25.0 billion) of Colorado’s GRP is reflected in Defense Sector employee compensation, proprietor’s income, income from rents, royalties and dividends, and indirect business taxes
- **Total Output:** 7.9% (\$36.6 billion) of Colorado’s total output is generated by the Defense Sector

No matter how it is measured, the impact of DoD and VA jobs and related industries on Colorado’s economy is significant.

Table 14 - DOD Contracts (Prime and Sub) by County, 2016

ADAMS	\$ 1,027,145,730	LAS ANIMAS	\$ 794,872
ARAPAHOE	\$ 2,306,136,422	MESA	\$ 39,582,600
BENT	\$ 336,869	MONTEZUMA	\$ 98,145
BOULDER	\$ 590,015,638	MONTRROSE	\$ 379,627
BROOMFIELD	\$ 65,510,959	MORGAN	\$ 7,544
CHAFEE	\$ 250,744	OTERO	\$ 30,127
CHEYENNE	\$ 29,742	OURAY	\$ 49,919
DELTA	\$ 65,300	PARK	\$ 106,862
DENVER	\$ 96,768,914	PITKIN	\$ 53,218
DOUGLAS	\$ 9,126,923	PUEBLO	\$ 53,135,687
EAGLE	\$ 1,532,259	ROUTT	\$ 31,592
EL PASO	\$ 2,143,956,817	SAN JUAN	\$ 85,200
ELBERT	\$ 1,961,867	SAN MIGUEL	\$ 494,927
JEFFERSON	\$ 101,397,549	SUMMIT	\$ 42,820
LA PLATA	\$ 1,050,673	TELLER	\$ 11,899,660
LAKE	\$ 3,488,888	WELD	\$ 2,522,382
LARIMER	\$ 78,022,530	WASHINGTON	\$ 95,164
Grand Total			\$ 6,536,208,170

Source: Summit Economics, LLC and USASpending.gov

The DoD and VA inject money into county economies through direct contracts and assistance awards. Assistance awards added another \$149 million to the \$6.5 billion in contracts shown in the accompanying table.

Comparing the impacts of the Defense Sector between the 2015 and 2017 studies shows the effects of both an increase in DoD contracting, the addition of the Pueblo Chemical Depot, off-budget personnel at Buckley, the

VA, veterans and military retirees. Note that the figure given in the table is not the number of veterans and retirees, but the jobs supported by their pensions and compensation income.

Comparison of 2014 and 2016 Employment Impacts

	2014	2016	2016 Distribution
Employment by Economic Driver			
Military Installations	95,241	96,402	39.1%
DoD Contractors	48,610	54,898	22.3%
Guard/Reserves	11,085	2,499	1.0%
Veterans & Military Retirees	-	29,181	11.8%
Veterans Administration	-	38,009	15.4%
Other Tricare	-	13,149	5.3%
Trade Flow	14,856	12,586	5.1%
Total	169,792	246,723	100.0%

Source: Summit Economics

As might be expected, the impacts that are due to the presence of the military installations are quite large, with about 39% of the impact from the installations themselves. This includes active duty and civilian employees, as well as the purchases of installation goods and services not purchased through contracts.

Associated with the military installations is the DoD contractor segment. While many contractors are physically located on-site at installations, many others are not. The combined impact of all contractors is about 22% of the Defense Sector.

The impact of the operations of the VA contributes more than 15% to the total impact. This includes running the VA hospitals and health care system, the expenditure of funds with private sector healthcare providers, educational and vocational rehabilitation services, the VA cemetery, and operating other VA facilities. Almost as large of an impact as the VA is the impact coming from the presence of veterans and retirees based on the pensions and compensations that they receive, at 12%. Tricare expenditures that are paid directly to providers by the DoD and not through the military installation budgets, adds another 5% of the impact.

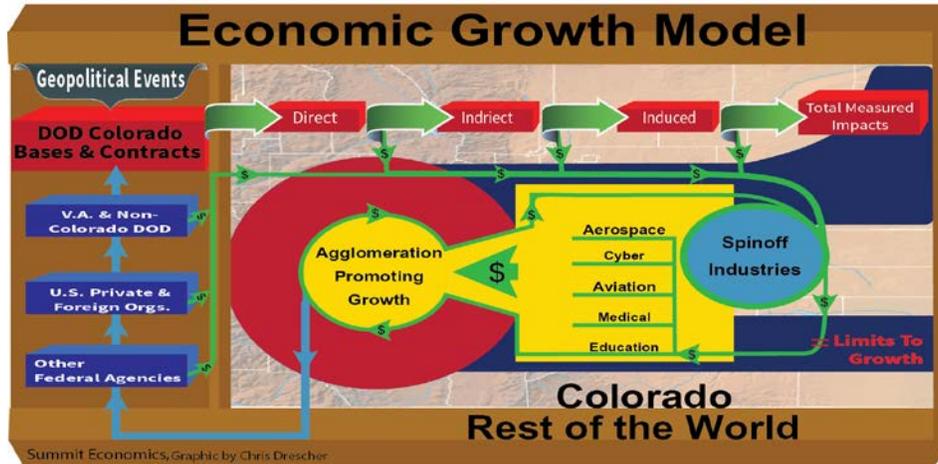
The National Guard and Reserves makes up 1% to the total employment impact. It is worth noting that the figures for the National Guard have dropped significantly from the 2015 study due to a combination of better input data and a change in reporting methodology. The 2015 study showed the number of Guard personnel while the 2017 study shows the full-time equivalency of jobs. Most Guard positions are part time.

The trade flow effect contributes another 5%. As an example of the trade flow effect, when people are employed in Arapahoe County at Buckley AFB, they will spend a portion of their income in other counties: perhaps to go skiing, shopping or visiting friends and relatives. The impact models are initially based on the county level impact, but are then adjusted for the statewide impact, which is higher since the impact area is much larger. In essence, the multipliers get larger the larger the impact area.



Economic Impact (continued)

The Colorado map and flag represent the Colorado economy related to and stimulated by defense spending. Outside the Colorado map, in brown, is the rest of the world including (on the left side) DoD funding for Colorado bases or installations and contracts (red box), as well as spending from non-Colorado DoD, the VA, other federal agencies, and private and foreign organizations (blue boxes).



The green lines and arrows represent money flowing into and within the Colorado economy. The top boxes in red depict impacts that are measured in typical economic impact analysis. Money coming from those impacts as well as the blue boxes to the left create *spinoff industries* as noted in the light blue circle. Some of the spinoffs become large enough (shown in the yellow area) that they complement the defense industry through *agglomeration*, which promotes further growth not measured in standard economic impact models.

As noted by the blue line and arrows, these agglomeration effects cause even greater spending by the DoD as well as other agencies and companies so that the process becomes self-reinforcing causing growth acceleration over time.

As the agglomeration effect continues, the diversity of operations increases. One of the best examples however might be aerospace. While the 400 firm strong aerospace industry is responsible for 188,000 total jobs ⁽¹⁾ and \$12.6 billion in gross regional product, almost 60% is military related (and captured in this study's finding). It may be that the other 40% of the impact might not have located in Colorado to the same degree as it did if not for the defense related work of these firms. That 40% represents 64,400 jobs and \$4.9 billion in state output.

(1) Aerospace Cluster Report, Metro Denver Economic Development Corporation | January 26, 2017

Current Life Cycle Position of DoD Colorado Elements

Elements include technologies and war fighting operational modalities



Developed by Summit Economics, LLC

One way to view DoD as an economic driver in Colorado is to consider different defense elements placed on a life cycle curve as shown in this figure. All of the depicted elements have a presence in Colorado, with several of the technologies moving further up along the life cycle curve since the 2015 study was released. In addition to being a driver, the technology life cycle curve also highlights the potential diversification added to the defense sector assuming Colorado's defense sector has activities positioned throughout the lifecycle. From this perspective, Colorado fares well economically as it has DoD operations dispersed throughout the cycle. The state is especially well positioned in the aerospace sector, including missile defense and cyber, evidenced by the state's designation of a National Cyber Security Center in Colorado Springs, the growth of cyber related R&D and training, the emphasis being placed on cyber both at the State and local government level, and growth in cyber related degree programs at Colorado higher education institutions.

Economic Impact Conclusion

Analysis of DoD's economic impact on Colorado shows four major contributing factors:

- The employment effects of a combination of active duty, National Guard/Reserves and civilian workforces at military installations
- The expenditures of those installations for construction and operations
- The size of the network of recipients of DoD contract and assistance award expenditures for work done in the state
- The additional non-employment economic contribution provided by National Guard and Reserve forces located throughout the state

Analysis of the VA and veteran/military retiree economic impact on Colorado shows three major contributing factors:

- The employment effects of the expenditures of the VA, both for operations of VA facilities and for provision of benefits and services for veterans
- The expenditures of veterans and military retirees based on their income from VA and/or DoD pensions and compensation
- With the opening of the new VA hospital in Denver, future years will also see an impact from the patients and families coming to Colorado for medical care

The historical growth of DoD expenditures and the associated indirect impacts create spinoff sectors and economies of agglomeration that become self-sustaining “engines” of economic growth. Economic agglomeration is a cumulative, self-reinforcing process that concentrates talent, productive capacity and innovation creating spin-off industries and organizations that attract funding from the other firms in the same industry (in this case, DoD) as well as non-DoD entities such as other federal agencies and public and private organizations from around the world.

This is especially relevant when considering veterans and military retirees who, often having been exposed to Colorado during their military service, find it a suitable place for second careers as they often have ready-made social networks to integrate into. Unlike many people who are tied to a given locale, veterans and military retirees, when leaving the service, often select a location based upon favorable experiences and opportunity as opposed to family or friend networks.

Summary

Colorado champions the military value provided to the DoD by the state's military installations, assigned personnel and mission sets. In return, DoD investments and spending provide Colorado with a defense-oriented "industry", which generates significant economic impact. DoD is responsible for about 8% of the state's total economy in terms of employment, earnings and state tax revenues.

Percentage of all jobs in Colorado that are attributable to the Defense Sector:

7.5%

The state's educated and highly skilled work force, low taxes and business costs, and attractive quality of life conditions foster innovation, collaboration and integration across the entire economy. The U.S. Chamber of Commerce acknowledged this by ranking the State as the second best in the nation for entrepreneurship and innovation in 2014. In 2013, CNBC surveys rated Colorado as 7th in the nation for quality of life.

Colorado promotes a vital synergy linking DoD activities, industrial enterprises, research and development and higher education opportunities, creating an effect where growth and expansion in one industry sector inspire related growth in other sectors. Recognizing this dynamic, Business Insider ranked the state as the nation's #1 fastest growing economy in 2014.

Colorado's deep ties to the DoD and patriotic commitment to providing for the nation's security will ensure the state's legacy of success and prosperity.

*Total Colorado Value Added that is attributable to the Defense Sector:

\$25.0B

**Value Added = Amount of value created or produced in Colorado*

*Total Colorado Output Added from Defense Sector expenditures:

\$36.6B

**Total Output = Value of products or services sold – May incorporate value added outside CO before completion*



Fort Carson

Colorado Air National Guard



Grand Junction Veterans Health Care Center



Pueblo Plex



Cheyenne Mountain Air Force Station



Colorado and the DoD: Partners in Security and Prosperity



302nd Airlift Wing, Peterson Air Force Base



Pueblo Chemical Depot

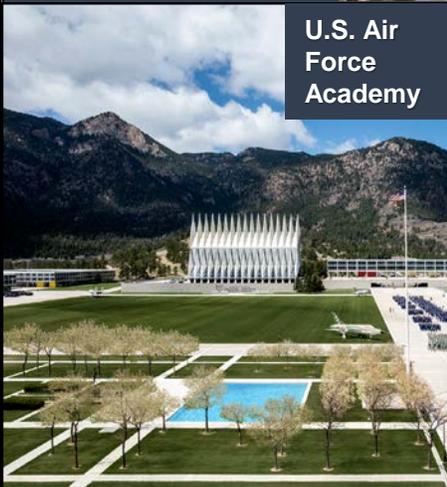


Buckley Air Force Base

HQ NORAD & USNORTHCOM



U.S. Air Force Academy



Windsor Readiness Center



HQ Air Force Space Command



