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2022 California Statewide National Security Economic Impacts Study

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Governor's Office of Planning and Research
Governor’s Military Council

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California Statewide National Security Economic Impacts, 2022 Update

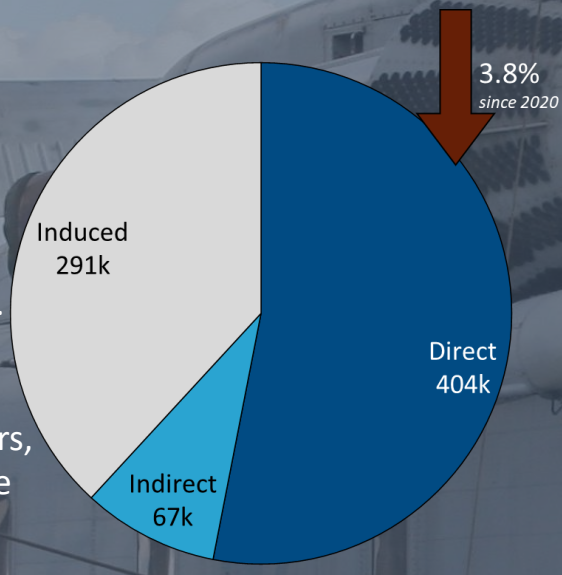
6 Key Findings

National security agencies are significant employers in the State of California and a major source of business for numerous California industries. This is the fifth annual report the California Research Bureau at the California State Library has prepared at the request of the Governor's Office of Planning and Research and the Governor's Military Council that explores the economic impact of national security activity within California.

This report, using fiscal year 2021 public data from the U.S. Departments of Defense, Homeland Security, and Veterans Affairs, finds:

1 National security activity generates 762,000 full-time equivalent jobs for residents of the State of California.

This includes 404,000 full-time equivalent jobs (FTEs) directly employed by the national security agencies and their contractors. The Departments of Defense, Homeland Security, and Veterans Affairs combined to employ approximately 340,000 Californians, including 162,000 active duty and 56,000 reserve service members, as well as 122,000 civilian employees. In addition, 67,000 FTEs are employed indirectly through the supply chain of direct activities and 291,000 FTEs are employed as a result of economic activity induced by the additional money in the economy.

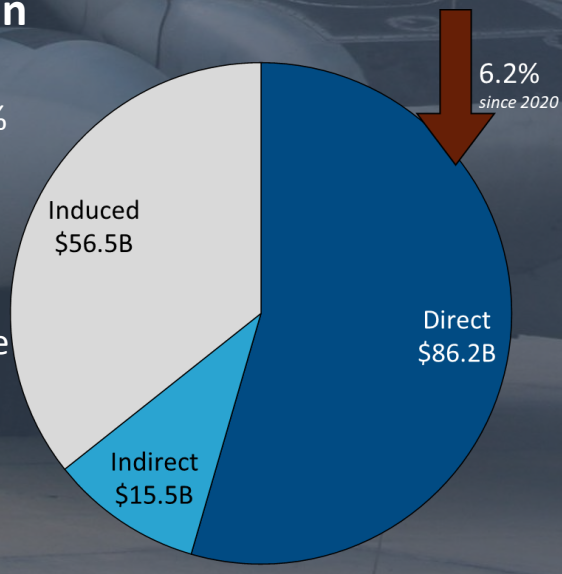


FTE Employment

2 National security activity produces $158.2 billion in economic impact across California.

$158.2 billion in economic activity represents approximately 4.7% of the state's economy. This includes:

- $86.2 billion of direct economic activity by the agencies and their contractors;
- $15.5 billion of indirect economic activity created through the supply chain of direct activities; and
- $56.5 billion of induced economic activity as a result of additional money in the economy.



Economic Output

Industries that had the largest impacts from national security activity in the state include manufacturing (particularly, aircraft and search, detection, and navigation instruments); professional services (particularly, scientific research and development); real estate; insurance; and healthcare.

3 The economic impacts of national security activity were felt in every local jurisdiction.

The Southern California region saw the largest amount of economic output and FTE jobs supported by national security activity. Top counties include San Diego ($50.3 billion in economic output and 257,000 FTEs supported), Los Angeles ($26.1 billion and 127,000 FTEs), and Sacramento ($11.3 billion and 43,000 FTEs). Top congressional districts include CA-52 ($15.6 billion and 77,000 FTEs), CA-49 ($12.6 billion and 63,000 FTEs), and CA-51 ($8.9 billion and 46,000 FTEs).

4 California is home to more security-related employment than any other state, third in spending.

California has 162,000 active duty service members, more than any other state, ahead of Virginia (131,000), Texas (119,000), and North Carolina (101,000), the next highest states. California's 122,000 civilian employees tops Virginia (117,000) and Texas (108,000), as well. California had the third largest share of security-related contracts in 2021 with $29.8 billion across the three departments, trailing Virginia ($40.0 billion) and Texas ($37.9 billion).

5 National security activity generates $20.7 billion in tax revenue for federal, state and local governments.

Federal tax revenue totals $13.1 billion. State tax revenue totals $7.6 billion, including $2.2 billion in state income tax revenue, $2.0 billion in sales tax, and $1.9 billion in property tax, as well as other smaller taxes and fees.

6 Including a portion of the Department of Energy's activities would increase total economic activity in California by approximately $5.6 billion.

The estimated portion of Department of Energy (DoE) activity related to national security leads to approximately $5.6 billion in total output and 23,800 FTEs, mostly concentrated in scientific research and development.

A tactical boat crew assigned to the Coast Guard Maritime Safety and Security Team in training off the coast of San Diego, California.

Contents

Multiple military vehicles, such as this tank, are being prepared for combat exercises at the National Training Center at Fort Irwin, California.

California Statewide National Security Economic Impacts, 2022 Update

Introduction

California is home to the nation's largest concentration of military personnel and other national security activity. Some 162,000 active duty military personnel and an additional 56,000 reservists and National Guard are stationed at more than 30 military installations across California.[1] About 1.8 million veterans call California home.[2] National security agencies employ an additional 122,000 civilians in California.[3] In fiscal year 2021, military and other national security activity in the state generated an estimated $158.2 billion in economic activity, approximately 4.7% of California's economy.

The California Research Bureau at the California State Library produced this report with U.S. Department of Defense funding at the request of the Governor's Office of Planning and Research and the Governor's Military Council. The California Research Bureau previously released a report estimating the economic impact of national security spending in California during fiscal years 2016,[4] 2018,[5] 2019,[6] and 2020.[7] This is the final report funded through a Department of Defense, Office of Local Defense Community Cooperation grant. The report uses fiscal year 2021 spending and employment data from the Departments of Defense, Homeland Security, and Veterans Affairs, to expand existing research to include estimated impacts of national security spending in each of California's 58 counties and 53 congressional districts.

Prior to this study, all studies on the impacts of national security spending in California have been limited in geography and/or scope. The Department of Defense provides annual reports

[1] DMDC (2021) Department of Defense Personnel, Workforce Reports & Publications.
[2] CAVSA (2020) The California Veteran Community: Three Year Review.
[3] Department of Defense, Department of Homeland Security and Department of Veterans Affairs.
[4] Lavelle, D.M. (2018). California Statewide National Security Economic Impacts. CRB.
[5] Lavelle, D.M. (2019). California Statewide National Security Economic Impacts, 2019 Update. California Research Bureau, California State Library, Oct. 2019.
[6] Lavelle, D.M. (2020) California Statewide National Security Economic Impacts, 2020 Update. California Research Bureau, California State Library, Dec. 2020.
[7] Lavelle, D.M. & Bedi, S. (2021). California Statewide National Security Economic Impacts, 2021 Update." California Research Bureau, California State Library, Dec. 2021.

on direct spending and employment without conducting economic impact studies.[8] The San Diego Military Advisory Council has produced an economic analysis annually since 2008.[9] It provides similar analysis to this report but is limited to San Diego County. In addition, while a number of other analyses have been completed over the years, they are generally limited to the relative impact of a specific base on its local or regional community.

This report focuses on estimated impacts from the Departments of Defense, Homeland Security, and Veterans Affairs. In addition, U.S. Department of Energy impacts are provided as a supplement and are not included in the overall estimate. Intelligence spending such as the Defense Advanced Research Projects Agency, which is responsible for the development of emerging technologies for national defense, is included if the source of funding is included under the specified agencies. Other agencies with national security responsibilities either have limited data availability due to security concerns, and/or do not have the data available to disambiguate security and non-security activities within the agency.

This report also provides a snapshot of the localized impacts from national security activity in California. The counties and congressional districts in the state that had the most direct spending, direct employment, economic output, and full-time employment (FTE) jobs are highlighted.

[8] DOD Office of Local Defense Community Cooperation Defense Spending by State.
[9] SDMAC Military Economic Impact Study.

Direct Activity

The three federal agencies identified – Defense, Homeland Security, and Veterans Affairs[10] – collectively spent $47.3 billion and directly employed approximately 340,000 civilian and military residents of California (including reservists and National Guard) in fiscal year 2021.[11] By far, the largest share of spending comes from Defense contracting, totaling $26.9 billion. Payments totaling $11.3 billion represented the bulk of the remaining direct spending and Veterans Affairs contracts added an additional $2.0 billion to the total. Homeland Security contracts add about $920 million to the total. In addition, the federal government's charge card program, SmartPay,[12] totals $890 million and grants total $5.3 billion across the three agencies, a bulk of which came from Homeland Security ($4.4 billion). Figure 1 depicts this distribution.

Direct Employment

Direct employment is also concentrated in the Department of Defense, which employed 63,000 civilians, 162,000 active duty personnel and 56,000 reserve and National Guard personnel in fiscal year 2021.[13] The Departments of Veterans Affairs and Homeland Security combined to employ an additional 60,000 civilians. Homeland Security also employed an additional 5,000 active duty and 1,000 reserve Coast Guard personnel that round out the totals in Figure 2.[14]

Figure 1: Direct Spending

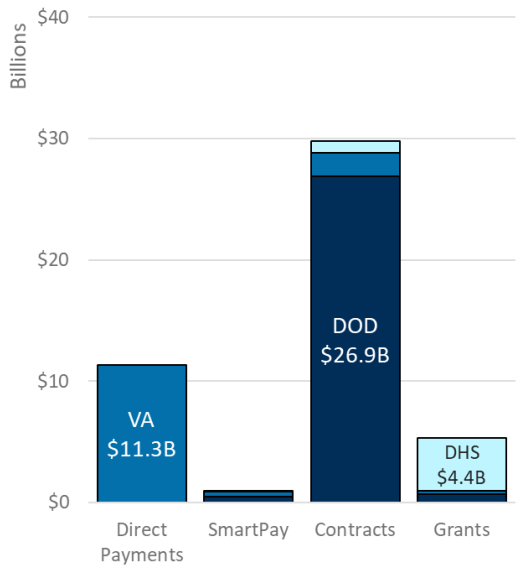
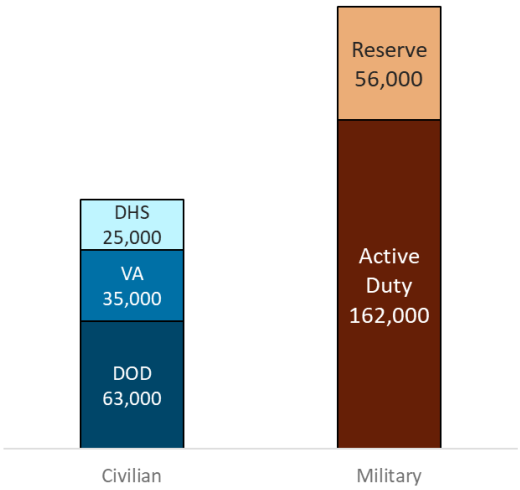


Figure 2: Direct Employment



[10] These agencies were selected in the original report based on having clear national security missions with readily available data. U.S. Department of Energy national security activities are considered in a special section.
[11] Federal fiscal year.
[12] Government purchase cards used for very small purchases.
[13] Department of Defense total does not include Coast Guard personnel employed by the Department of Homeland Security.
[14] DMDC (2021) Military and Civilian Personnel by Service/Agency by State/Country (Updated Quarterly).

After dipping modestly as a result of budget sequestration,[15] civilian employment had grown steadily since 2014. Total civilian employment averaged a 2.0% annual increase from 2015 to 2020. 2021 showed a very slight 0.4% drop in civilian employment from 2020, as shown in Figure 3.

Military active duty employment continued to recover from budget sequestration as well, increasing from 2017 to 2020. However, employment decreased by 3.2% in 2021. The number of active duty members in California in fiscal year 2021 dropped to 162,000. Reserves, which had been steadily around 57,000 since 2019, dropped to 56,000 in 2021. Both are represented in Figure 4.

Figure 3: Civilian Employment by Year

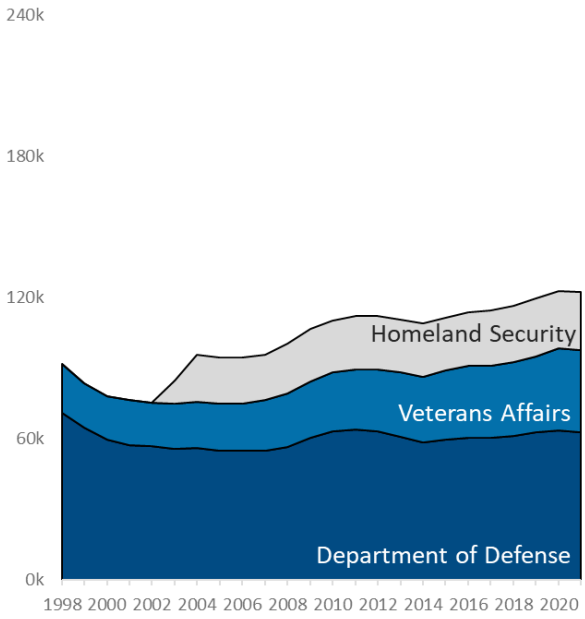
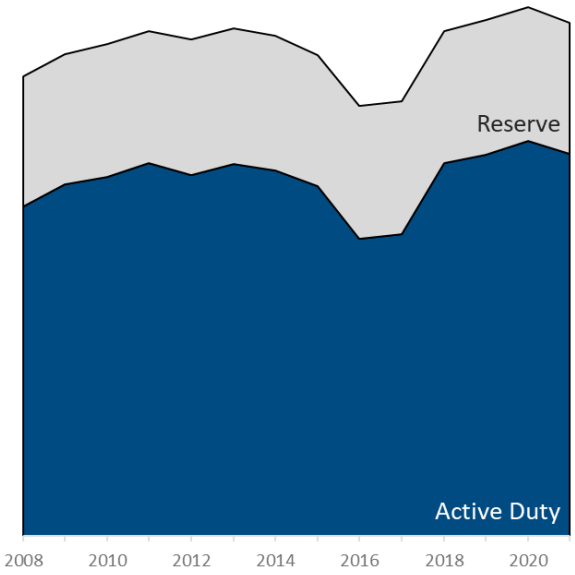


Figure 4: Military Employment by Year



[15] The Budget Control Act of 2011 implemented significant across the board cuts to federal spending, including large cuts to national security agencies, going into effect in 2013.

Direct Spending

Direct spending increased from $47.0 billion in 2020 to $47.3 billion in 2021 (a 0.6% nominal increase), as shown in Figure 5. This increase in direct spending, when accounting for inflation, would drop to an approximately 1.6% real decrease. This is in a national climate where direct spending across the three agencies dropped by 7.1%.[16]

The bulk of the increase comes from grant spending, which grew by 36.9%, a gain of over $1.4 billion. The large majority, a $1.5 billion increase, was with Homeland Security (52.8% increase) and appears to primarily be related to the COVID-19 and wildfire responses. Five of the nine largest Homeland Security grants received by California in 2021 were awarded by the Federal Emergency Management Agency (FEMA) to the Office of Emergency Services (OES) in Sacramento County to reimburse the state government for "emergency protective measures taken during the pandemic." These grants ranged from $143.6 to $517.5 million, accounting for 27.6% of the total Homeland Security grants. Three other large grants, which ranged from $270.7 to $508.7 million, were given by FEMA to OES in Sacramento County "to local government for repair or replacement of disaster damaged facilities." This accounts for 25.3% of the total Homeland Security grants. The remaining large grant, also from FEMA to OES in Sacramento County, was a $135.3 million grant simply designated as part of the "Homeland Security Grant Program."

Veterans Affairs and Defense grant spending decreased by $54.2 million (5.6%) and $18.7 million (7.8%), respectively.

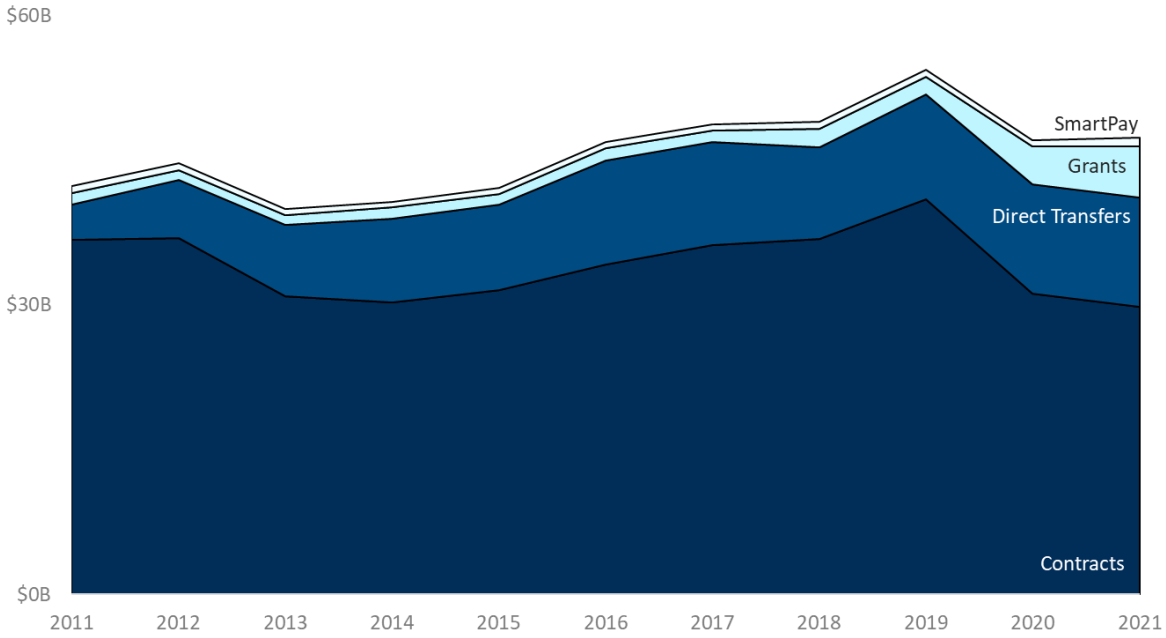
Contract spending dropped by $1.4 billion in 2021, a 4.6% nominal decrease from 2020. The decrease came from Defense, a $2.0 billion drop (7.0%). Homeland Security and Veterans Affairs contract spending increased by $378.3 million (70.2%) and $224.8 million (12.9%), respectively.

The increase in Veterans Affairs direct transfers (generally pension payments) for fiscal year 2021 brings this spending total to its highest point since 2011. After accounting for inflation, the $11.3 billion total remains just lower than in 2016 real dollars.

SmartPay had a nominal increase of 44.2% from 2020, rising to its highest level since 2011. This is mostly due to an increase in the percentage that California accounts for in the national SmartPay spending of Veterans Affairs. Updated data, accessed through a Freedom of Information Act request, showed that California had a 3.2% share in the national SmartPay spending of Veterans Affairs, an increase of 2.0% from 2016.

[16] Contracts, grants and direct payment data from DoD, DHS and VA for FY2021 compared to FY2020, with the place of performance United States, retrieved from USASpending.gov on Sept. 2, 2022.

Figure 5: Direct Spending by Year



U.S. Navy Blue Angels perform the delta breakout maneuver in front of the Golden Gate Bridge.

Economic Impacts

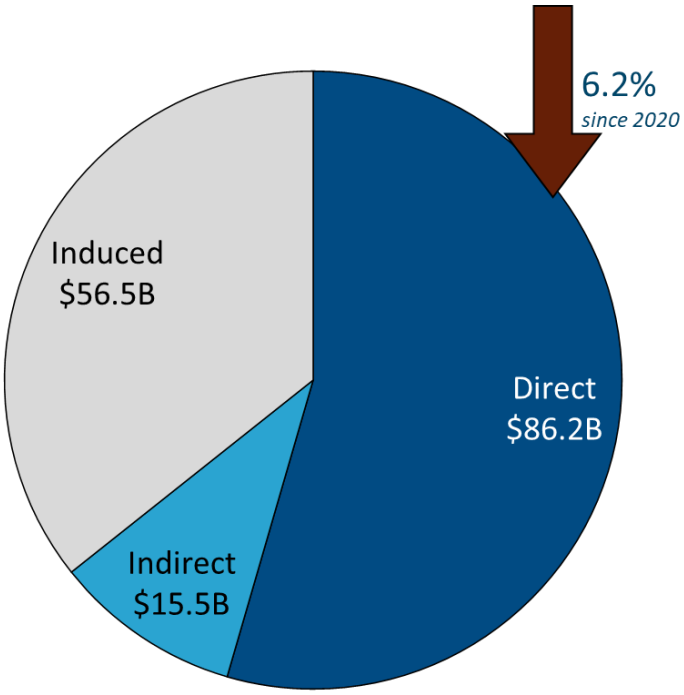
Total Output

The spending and employment included in this estimate generated $158.2 billion in total economic activity output in California during fiscal year 2021.[17] This total output includes:

- $86.2 billion of direct economic activity by the agencies and their contractors;
- $15.5 billion of indirect economic activity created through the supply chain of direct activities; and
- $56.5 billion of induced economic activity created as a result of additional money in the economy.

This total represents a 6.2% nominal decrease since 2020. This decline, which is attributable to differences in modeled spending patterns, is detailed in the COVID-19 Model Impacts section.

Figure 6: Total Output



[17] May not sum due to rounding

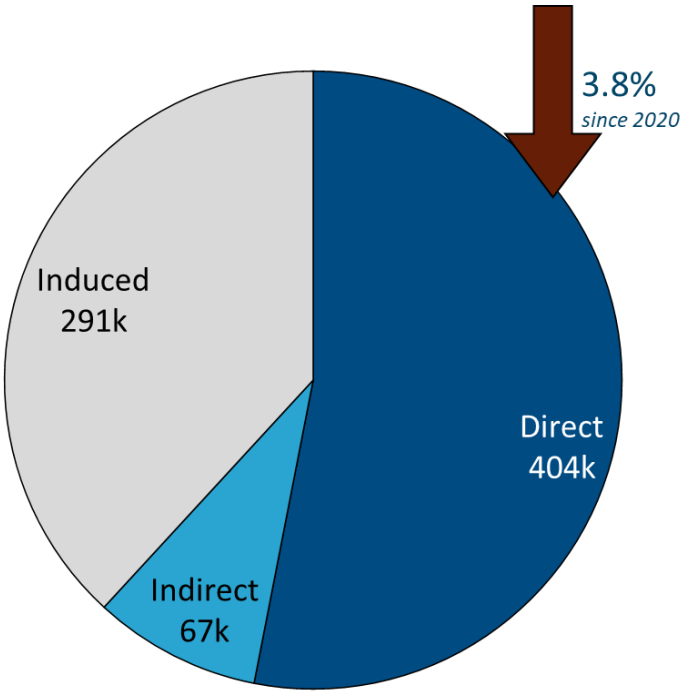
Total Employment

The spending and employment included in this estimate generated 762,000 full-time-equivalent (FTE) jobs in California.[18] This total includes:

- 404,000 FTEs directly employed by the agencies and their contractors;[19]
- 67,000 FTEs employed indirectly through the supply chain of direct activities; and
- 291,000 FTEs employed because of economic activity induced by the additional money in the economy.

This total represents a 3.8% nominal decrease since 2020. This decline, which is attributable to difference in modeled spending patterns, is detailed in the COVID-19 Model Impacts section.

Figure 7: Total Employment



[18] May not sum due to rounding

[19] Direct employment includes federal employees as well as the employment of federal contractors and vendors generated by direct government spending.

Government Revenue

Economic activity generates additional tax revenue for governments at all levels, especially through payroll and income taxes generated by hundreds of thousands of FTE employment. The economic software used for this report, described in the Methodology & Data section below, estimates that the federal government received a total of $13.1 billion in revenue, with approximately $7 billion in payroll tax and $6 billion in personal income tax as a result of the spending and employment modeled.[20]

At the state and local level, combined impacts include $2.2 billion in income tax, $2.0 billion in sales tax, $1.9 billion in property tax, and $1.5 billion in other smaller taxes and fees that make up the remainder of the $7.6 billion total.

Industries Impacted

Spending and employment modeled in this report impact a wide variety of industries. These generally fall into four broad categories. The first two categories include broad types of direct spending:[21]

- **Core Mission**: A large portion of spending and resulting economic activity occur in industries that are central to the work of the three federal agencies involved, including defense contractors (primarily aerospace and research and development) and pharmaceutical manufacturers that supply Veterans Affairs' healthcare facilities.
- **Large Employer**: Some industries benefit because they are related to employment and are similar for any large employer. This includes insurance, driven by the Department of Defense's TriCare health care program, among the top industries.

The next two categories include indirect and induced spending:

- **Subcontractors**: This category includes the contractors and suppliers of industries in the categories above, including supply chain industries such as manufacturers, transportation, and wholesalers, as well as general business-supporting industries such as janitorial and professional services.
- **Population-focused**: The remaining industries, such as restaurants, real estate, and education, primarily serve the local population and benefit when any spending occurs because it results in increased local employment and earnings.

[20] May not sum due to rounding.

[21] Overlap does exist between these groups. For example, healthcare could be considered to be part of every category. The health industry is a major contractor for the Veterans Affairs, as part of its central mission to provide healthcare to veterans. The healthcare industry also serves the Department of Defense, as an employer providing insurance for its workforce and the insurance industry, as a major subcontractor. It is also an industry that serves the local population.

Nearly every industry in the state benefits from national security spending. The largest economic impacts are in manufacturing, with the various manufacturing sectors (including Aerospace and Electronics) combining for $17.7 billion in total output (direct, indirect, and induced spending), and professional services, with over 83,000 in FTE employment. The top manufacturing sectors include aerospace ($6.5 billion in output and 10,200 in FTE employment) and electronics ($3.6 billion and 6,400 FTEs). Other top sectors in total output include professional services, with $16.6 billion in output and 83,400 FTEs (especially scientific research and development: $5.8 billion and 18,800 FTEs); real estate ($12.8 billion and 18,900 FTEs); insurance ($8.8 billion and 25,000 FTEs); and healthcare ($6.7 billion and 46,200 FTEs).

In addition, the retail ($5.3 billion and 44,100 FTEs); restaurant ($3.0 billion and 35,600 FTEs); and transportation & warehousing ($3.3 billion and 26,800 FTEs) industries saw at least 20,000 jobs generated because of national security spending in California.

Figures 8 and 9 show the industries with the largest total economic output and employment, respectively, resulting from national security spending and employment.

Policymakers may wish to consider other characteristics of the impacted industries that are beyond the scope of this report. These include: 1) economic considerations such as industries that support the generation of exports or innovation that may lead to future economic growth; 2) cultural considerations such as the importance of a particular profession or industry to the state or a local community's identity; and 3) externalities related to the industry such as environmental, health, or educational impacts.

Figure 8: Industry Impacts – Output

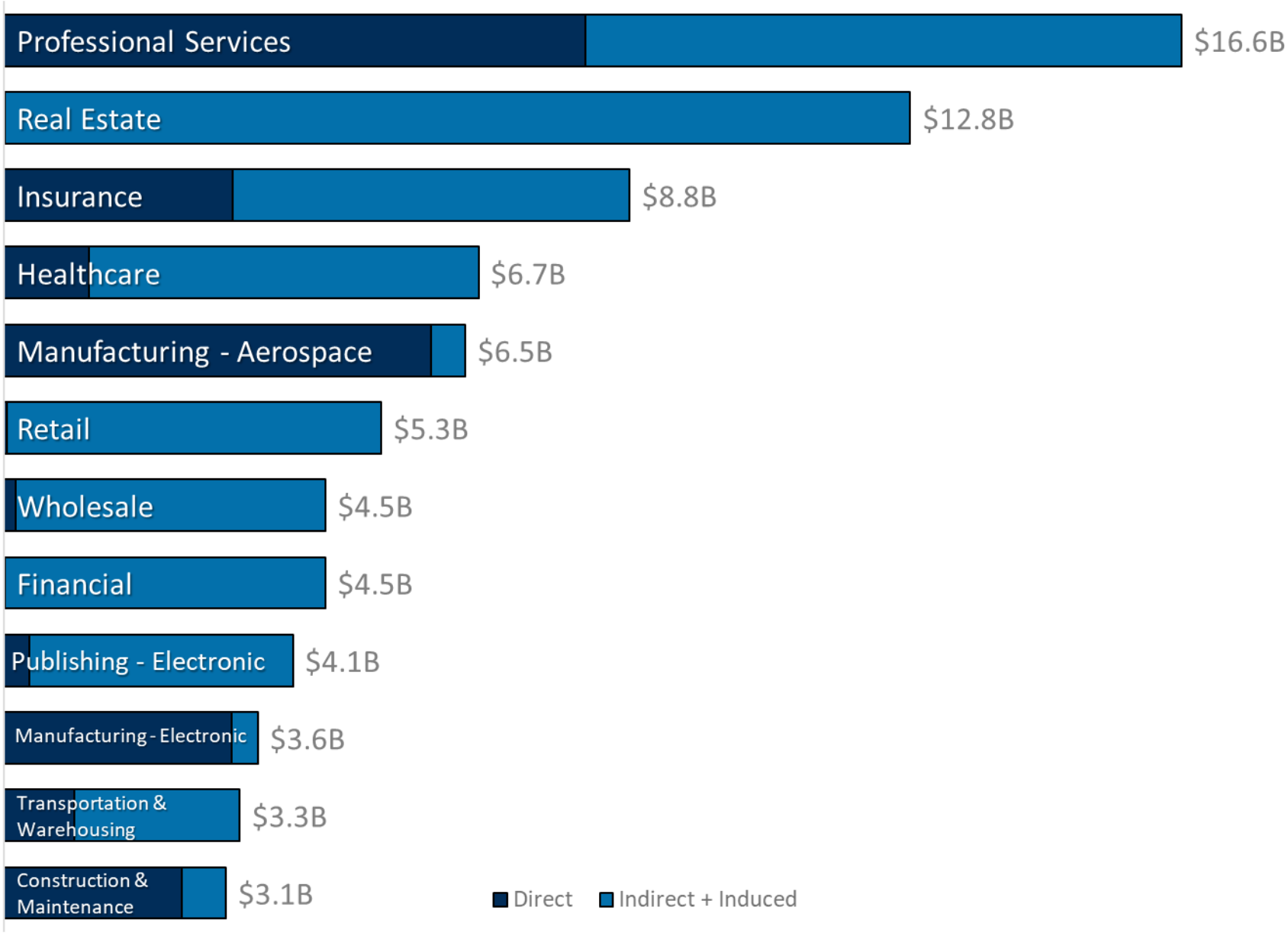
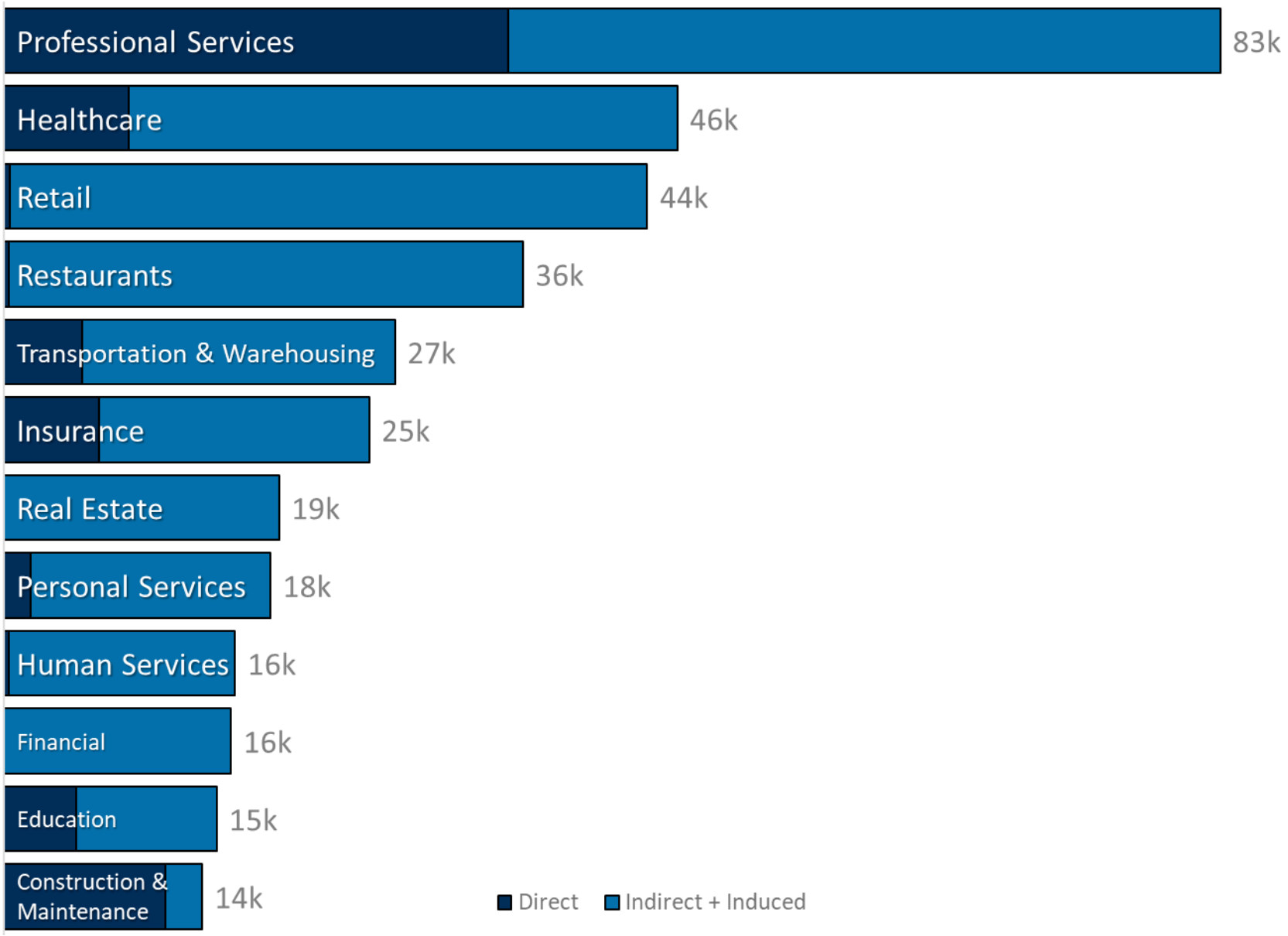


Figure 9: Industry Impacts – Employment



Select State Comparisons

Employment

In 2021, the U.S. Departments of Defense, Homeland Security, and Veterans Affairs collectively employed 1.4 million civilians and stationed an additional 1.2 million active duty military members in domestic locations. Of these 2.6 million jobs, about 760,000 are concentrated in just three states: California (285,000), Virginia (248,000) and Texas (227,000). Figure 10 displays the breakdown of civilian employment by state.

Figure 10: Civilian Employment by State

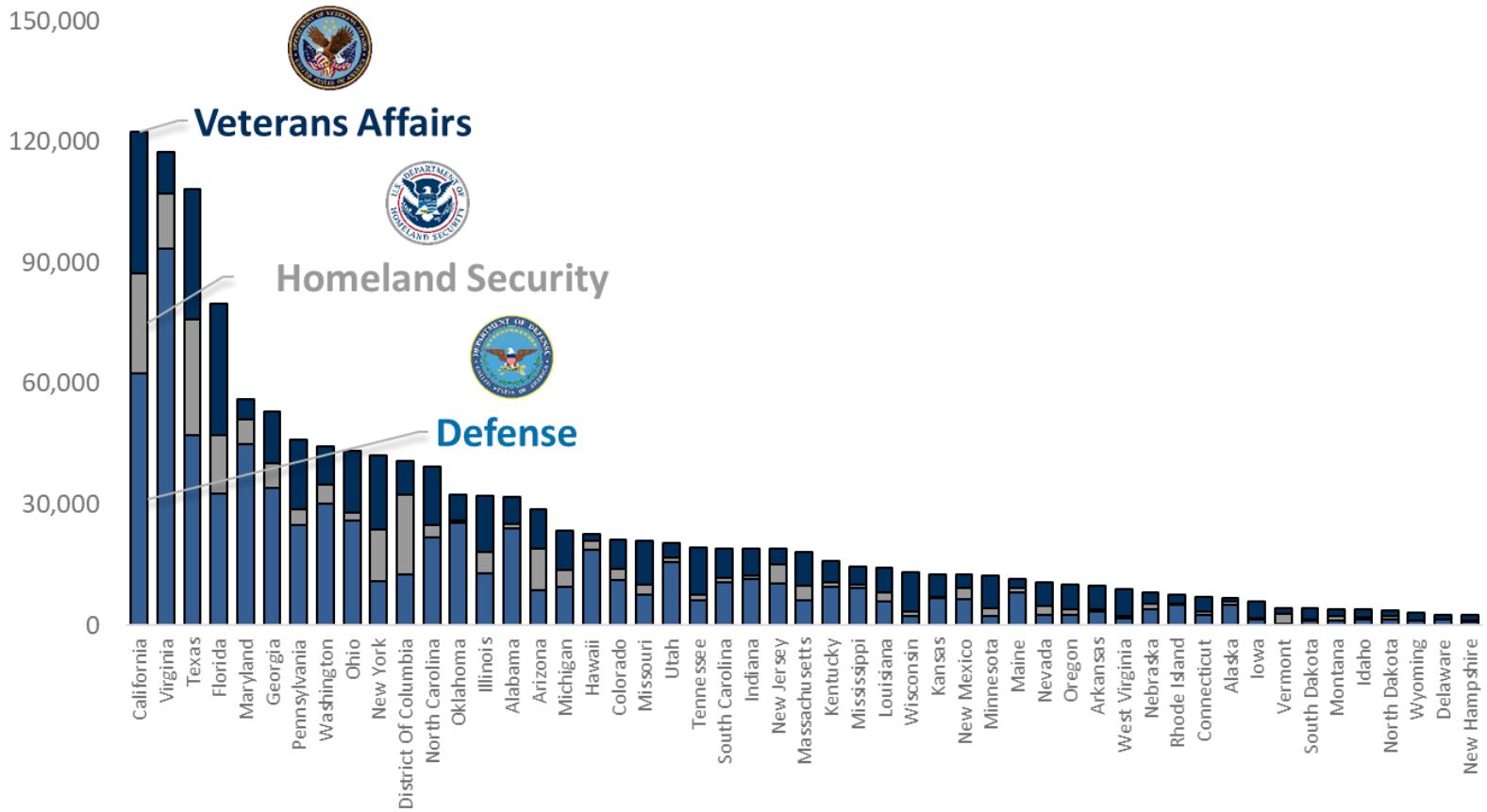
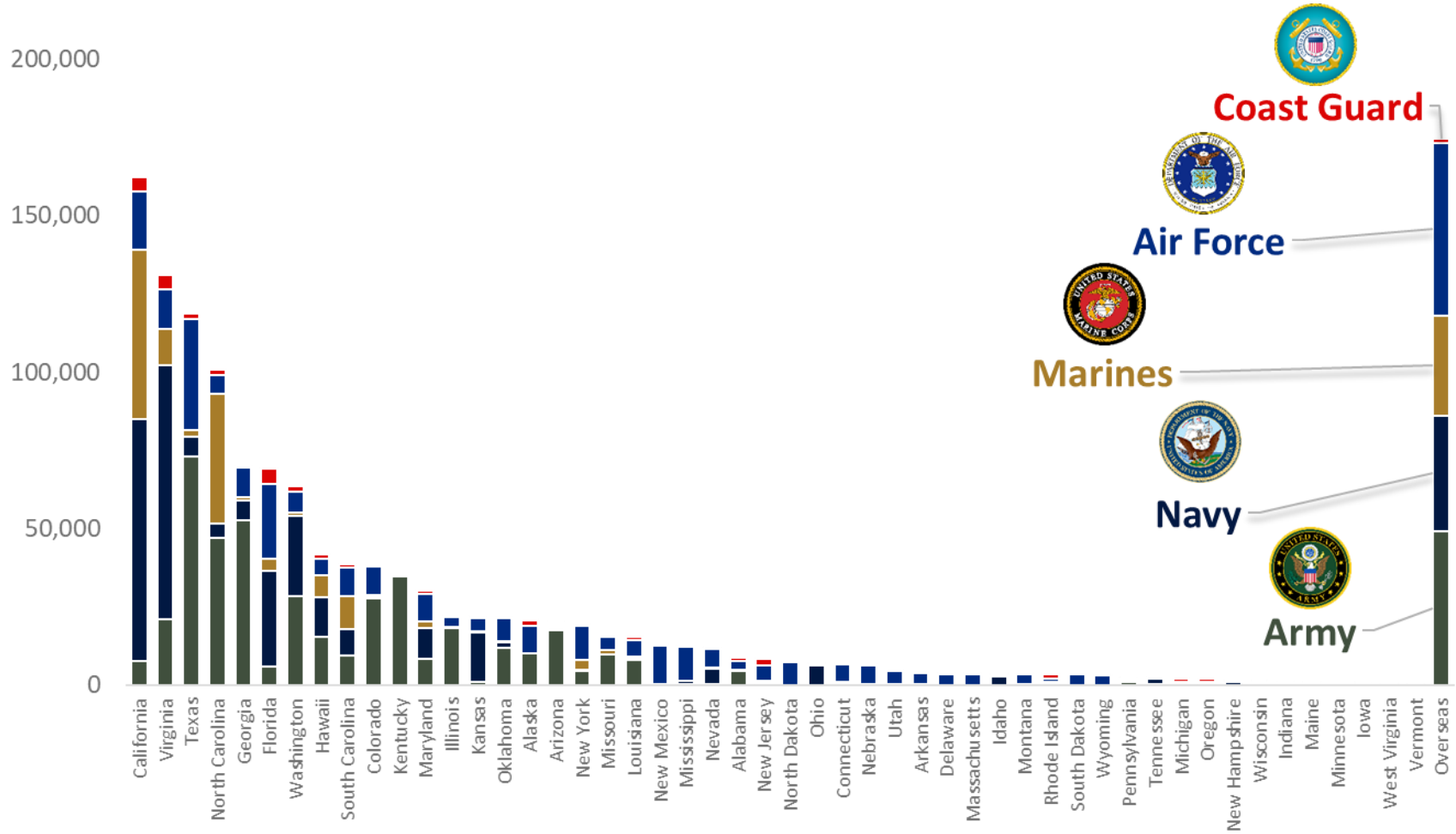


Figure 11 displays active duty military employment by state, broken out by branch. In addition to having the largest concentration of active duty military overall, California has the largest Marine Corps concentration, the second largest among the Navy and Coast Guard, and the third largest among the Air Force.

Figure 11: Active Duty Military Employment by State



Historical Comparisons

This section details a comparison over the last several years of the three states with the largest share of national security-related employment (California, Texas, and Virginia), examining their experience over time. Civilian employment data by state is currently available since 1998, while military employment data is available since 2008.

Through 2012, the three states appeared to follow similar trends. California and Virginia had a similar number of national security employees in their states, while Texas fell 20,000 to 30,000 FTE jobs behind. Gains or falls in each year happened at about the same rate. The three states had somewhat different experiences in the early years of the budget sequestration. California's total employment declined by 3% before bottoming out in 2014. Texas declined by 4% and Virginia by 7%. California's civilian employment has grown modestly faster since then, surpassing its pre-sequestration peak in 2016. Texas surpassed its 2012 level in 2017, while Virginia remained below its 2012 level until 2020. In 2021, California dipped 0.4% from its peak in 2020, while Texas and Virginia gained 1.1% and 0.4% more from their 2020 levels, respectively. Even so, California still had 9% more civilian employment in 2021 from 2012, while Texas had 8% more and Virginia had just 2% more.

Figure 12: Civilian Employment by Year

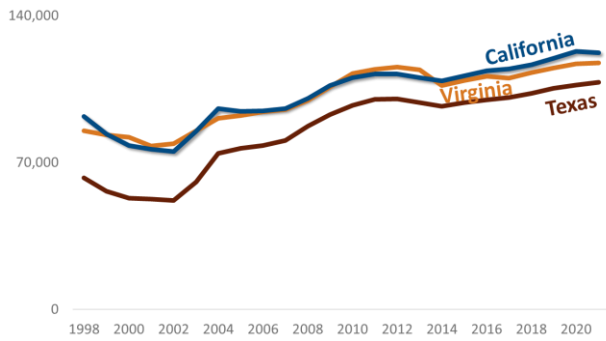
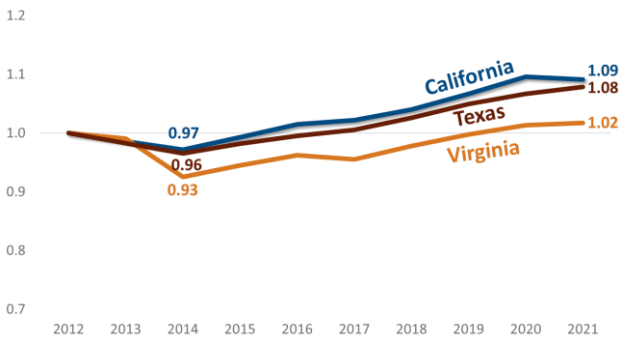


Figure 13: Indexed Civilian Employment



While civilian trends, with the exception of the depth of loss from budget sequestration, were largely similar, active duty employment trends have been more varied. California has consistently been the top state in military employment, while Texas and Virginia have exchanged second and third place four times in the past 12 years.

The states' experiences with budget sequestration varied as well. Virginia initially saw an increase in active duty employment lasting through 2015 before falling the furthest of the three states in 2016 and 2017, dropping 20% from 2012 and 29% from its 2015 peak. California was initially relatively stable, increasing slightly in 2013 before declining slowly through 2015 and falling rapidly in 2016. This totaled an 18% drop from 2012 and 20% decline from its 2013 peak. Texas, on the other hand, saw a rapid decline in 2013 and then continued to decline slowly through 2017, but yielded the smallest overall decline of the three states at only 13%. Since 2017, however, Texas has grown the most slowly and is 7% below 2012 active duty

employment levels. Virginia has grown the most quickly and surpassed its 2012 total by 17%. California has fallen in the middle with a 6% increase since 2012. In 2021, California dropped 3% from 2020 levels, while Virginia and Texas grew by 1% during the same time period.

Figure 14: Active Duty Employment by Year

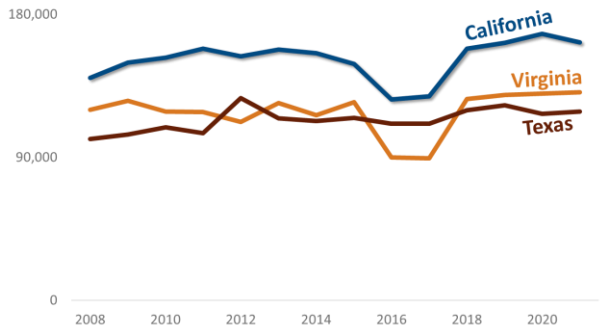
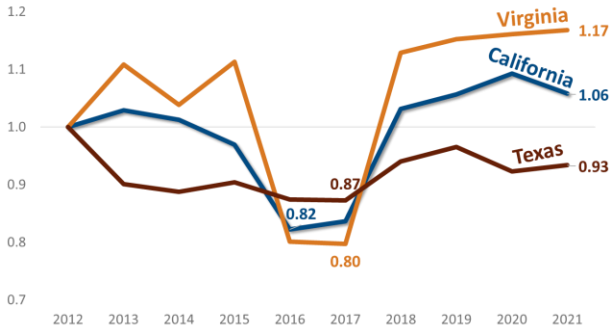


Figure 15: Indexed Active Duty Employment



Direct Spending

2021 Comparisons

California received $29.8 billion in security-related contracts across the three national security agencies in 2021, a roughly 4.6% nominal decrease from the $31.2 billion in 2020. Overall, California received the third-most in national security-related contracts among all states, trailing Virginia ($40.0 billion) and Texas ($37.9 billion). New York ($26.3 billion); Massachusetts ($19.3 billion); Connecticut ($17.6 billion); Florida ($15.7 billion); Arizona ($13.5 billion); Maryland ($10.4 billion); and Washington ($9.5 billion) round out the Top 10 states.

Historical Comparisons

This section details a comparison over the last several years of the aforementioned three states with the largest share of national security-related spending. USAspending data by state is currently available since federal fiscal year 2008.

Since 2008, the states have followed different spending trends. Texas' national security spending has been the most volatile among the Top 3 states. From 2008 to 2009, Texas' national security spending dropped by over 60%. After its 2009 low, Texas began to see gradual increases until slipping again in 2014. Texas saw big spikes in 2017 and 2020, which can largely be attributed to big contracts with Defense contractors like Lockheed Martin. Texas' peak in 2020 was more than double that amount of national security spending they had in 2012.

Virginia showed steady growth from 2008 to 2011, before declining from 2012 to 2014 during budget sequestration. Beginning in 2015, Virginia once again saw steady growth, before a small dip in 2021.

California has followed a similar path to Virginia, with steady growth prior to sequestration, followed by a dip during the early years of sequestration and steady growth for the next several

years. California reached a record high in 2019, with nearly $40.7 billion in national security spending. Over the last two years, California's spending appeared to decrease by about 19% since its 2012 level. This is due to McKesson moving its headquarters from California to Texas. As a result, its large Veterans Affairs contract is counted by USASpending.gov in Texas instead of California. It is likely that a significant portion of the economic activity remains in California, but it is missed by our current accounting approach.

Figure 16: Direct Spending by Year (in billions)

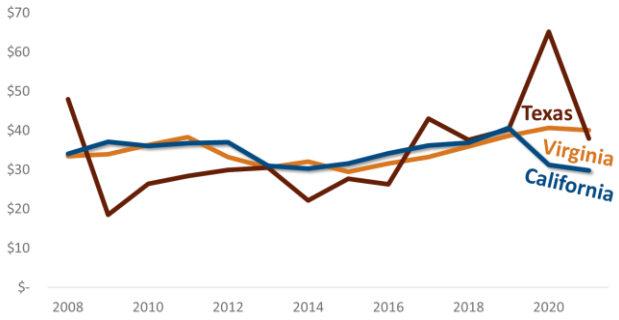


Figure 17: Indexed Direct Spending

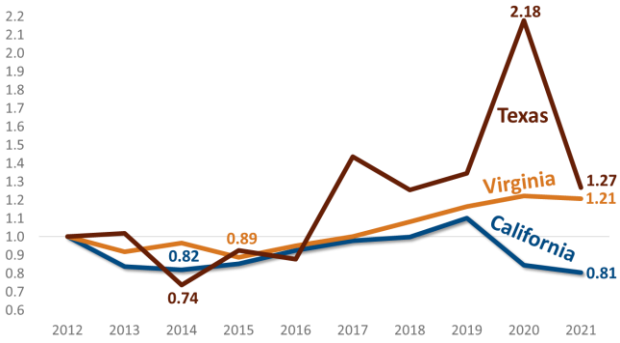
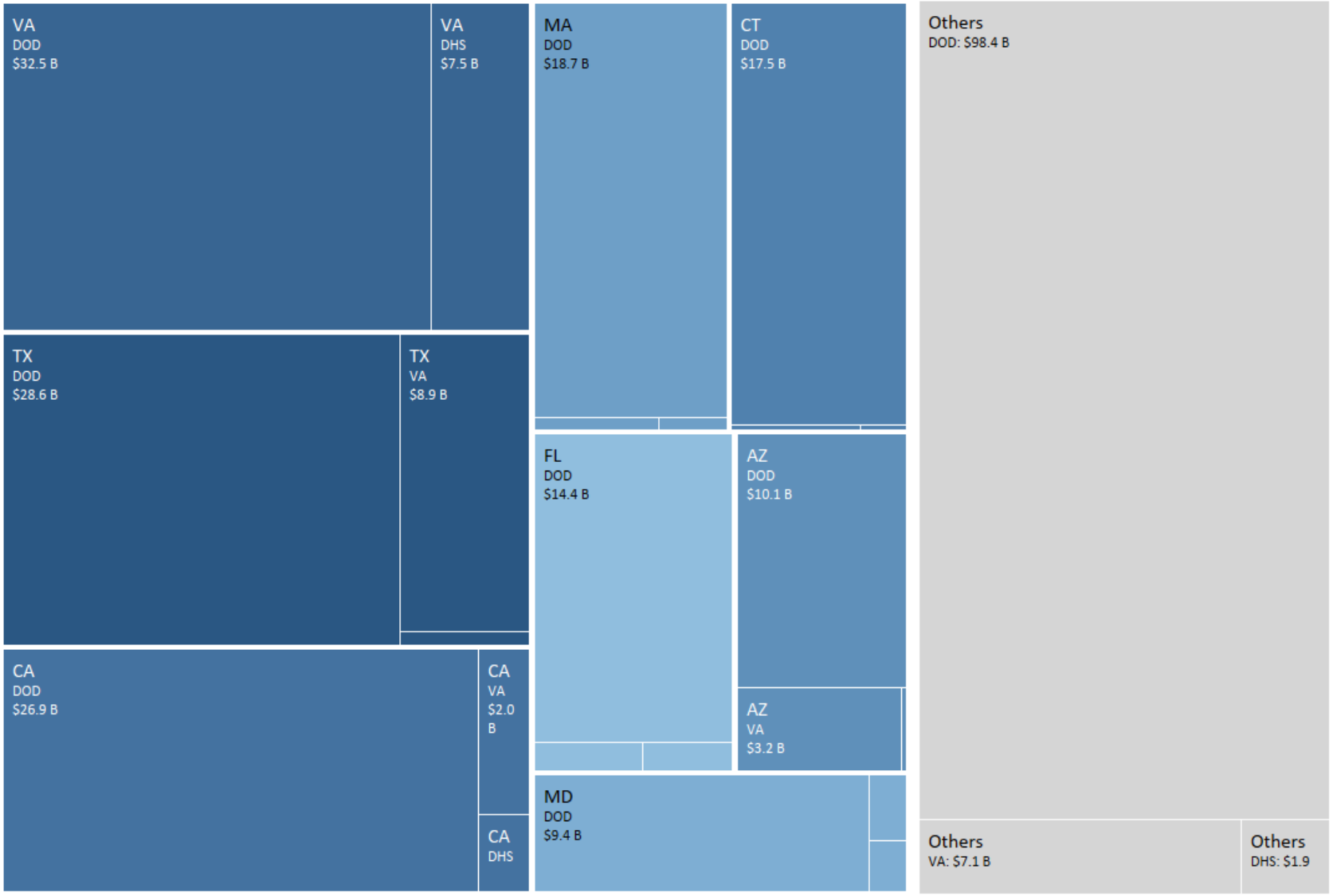


Figure 18: 2021 Contract Spending by State (in billions)



U.S. Department of Energy

The Department of Energy (DOE) conducts a wide variety of work, including some national security related activities. Prior reports have not attempted to quantify this activity and instead noted the total impact of national security activity would likely be higher if these factors were considered.

This report takes the initial steps of developing a methodology to estimate this activity.

Direct Spending

In fiscal year 2021, DOE awarded $4.5 billion to California contractors for projects performed in California. In addition, DOE issued $570 million in grants. Large portions of this spending are for non-specified research funded by the department's Science Office. For example, this included six of the 10 largest contracts in fiscal year 2021.[22] Since we cannot verify if these funds were spent on national security-related research, contracts such as these were omitted from the analysis.

In order to ensure conservative results, this analysis only includes spending from sub-agencies that are directly related to national security.[23] Contracts and grants from these funding sub-agencies total $2.7 billion, 53.4% of the DOE's total spending in the state.

Employment

The Department of Energy is among the smaller Cabinet-agency employers, with 14,680 staff nationwide. The largest share is in the District of Columbia (4,170). Among the states, Washington (2,004), Oregon (1,209), Maryland (901), New Mexico (873), and Colorado (808) make up the Top 5. California is seventh with 361 DOE staff.

As discussed in the prior section, a portion of the work performed by DOE staff is not national security related. For the purpose of this estimate, we use the portion of contract spending estimated to be national security related (53.4%) to apportion employment, yielding an estimate of 193 staff.

[22] This includes five contracts with the University of California and one with Stanford University.

[23] Funding sub-agencies included: Department of Defense Advanced Research Projects Agency (DARPA), Department of the Army, Department of the Air Force, Missile Defense Agency (MDA), Defense Threat Reduction Agency (DTRA), Department of Defense, Department of the Navy and Department of Energy spending with the National Nuclear Security Administration as the funding office.

Economic Impacts

Estimated Output from DOE Activity

Estimated security related spending and employment in California from the Department of Energy results in approximately $5.6 billion in economic activity. This includes $2.8 billion in direct activity, $1.3 billion in indirect activity, and $1.6 billion in induced activity.[24] Over 50% ($2.9 billion) of that activity is concentrated in scientific research and development services within the professional services sector.

Estimated Employment from DOE Activity

Estimated security related spending and employment in California from DOE results in approximately 24,000 FTEs. This includes 9,700 in direct employment, 5,800 in indirect employment, and 8,300 in induced employment. About 40% (9,400) of that activity is concentrated in scientific research and development services within the professional services sector.

Local Results

Direct Activity

As previously mentioned, the Departments of Defense, Homeland Security, and Veterans Affairs collectively spent $47.3 billion on national security activity in California in fiscal year 2021. In addition, these agencies directly employed approximately 340,000 civilian and military California residents. A breakdown of this statewide data by county and district allows for a fuller picture of the effects of national security activity in California. A map displaying all of California's counties and districts is available in Appendix I and II, respectively.

Figures 19 and 20 display the Top 10 counties and congressional districts, respectively, that had the most direct spending. Spending was particularly concentrated in the San Francisco Bay Area and Southern California regions. Top counties include Los Angeles ($10.9 billion), San Diego ($10.8 billion), Sacramento ($8.6 billion)[25], Alameda ($4.9 billion), Santa Clara ($4.0 billion), and Orange ($3.5 billion). Top districts include CA-07 ($8.0 billion) in the Sacramento region, CA-52 ($4.8 billion), and CA-49 ($2.5 billion) in the San Diego region, CA-33 ($3.5 billion) in the Los Angeles region, and CA-15 ($3.0 billion) and CA-17 ($2.9 billion) in the Bay Area region.

[24] May not sum due to rounding.

[25] This may overstate the true local spending, however, as a portion of this spending flows through the state government in Sacramento to other regions where the actual economic activity occurs.

Figure 19: Top 10 Counties in Direct Spending

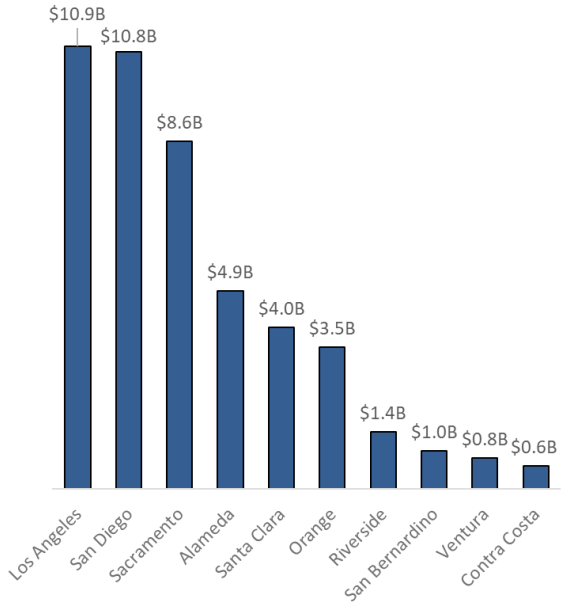


Figure 20: Top 10 Districts in Direct Spending

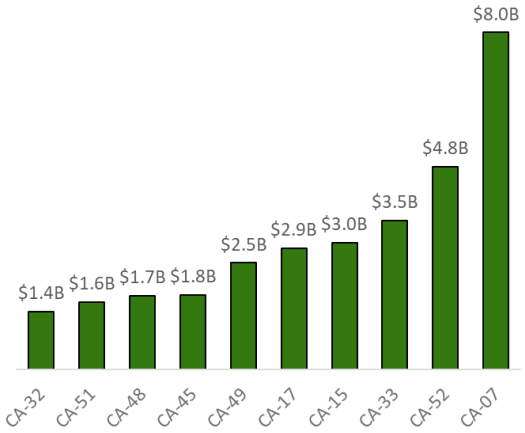


Figure 21: Top 10 Counties in Direct Employment

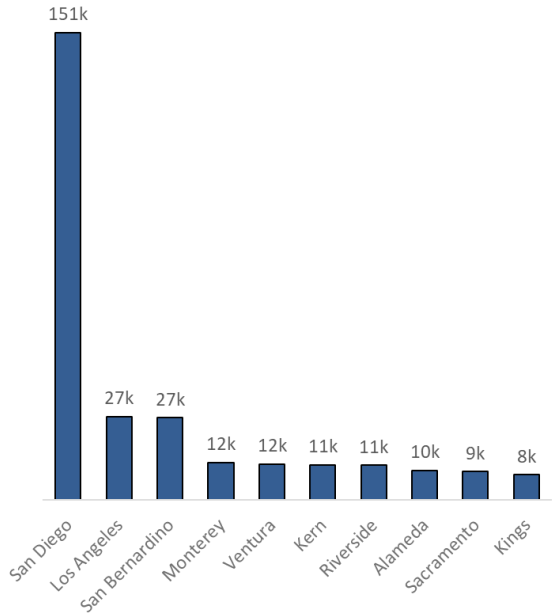
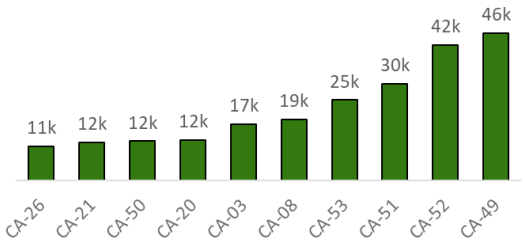


Figure 22: Top 10 Districts in Direct Employment



Figures 21 and 22 display the Top 10 counties and districts, respectively, with the highest number of civilian and military personnel. Employment was concentrated in Southern California (in particular, San Diego) and parts of the Central Coast. Top counties include San Diego (151,000), Los Angeles and San Bernardino (27,000 each) and Monterey and Ventura (11,000 each). Top congressional districts include CA-49 (46,000), CA-52 (42,000), CA-51 (30,000), and CA-53 (25,000) in the San Diego region, CA-08 (19,000) in the Inland Empire region, and CA-03 (12,000) in the North Bay region.

Economic Impacts

The above national security-related spending and employment led to $158.2 billion in output and supported around 762,000 FTE jobs in California.

Figures 23 and 24 display the Top 10 counties and districts, respectively, that had the most economic output. Top counties include San Diego ($50.3 billion), Los Angeles ($26.1 billion), Sacramento ($11.3 billion), Orange ($7.8 billion), Santa Clara ($6.8 billion), and San Bernardino ($6.4 billion). Top districts include CA-52 ($15.6 billion), CA-49 ($12.6 billion), CA-51 ($8.9 billion), CA-53 ($8.5 billion), and CA-50 ($5.8 billion) in the San Diego region, as well as CA-07 ($7.8 billion) in the Sacramento region, and CA-33 ($5.0 billion) in the Los Angeles region.

Figure 23: Top 10 Counties in Economic Output

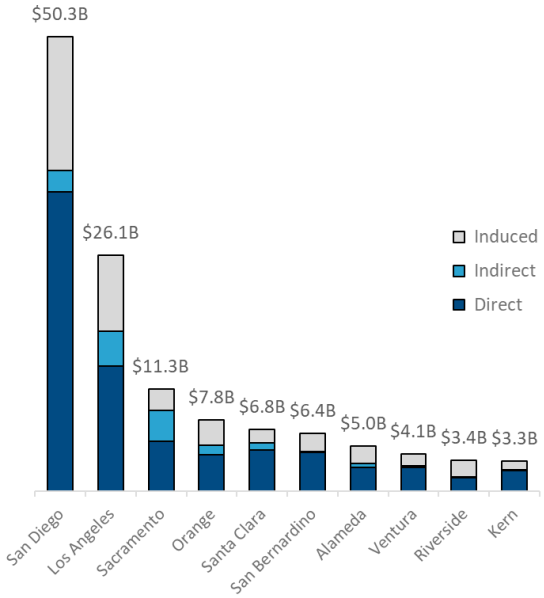
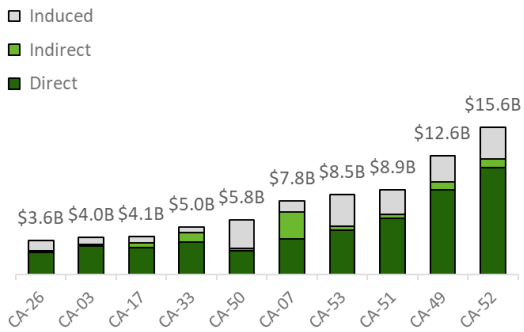


Figure 24: Top 10 Districts in Economic Output



Figures 25 and 26 display the Top 10 counties and districts, respectively, with the highest number of FTE jobs supported by national security activity. Top counties include San Diego (257,000), Los Angeles (127,000), Sacramento (43,000), San Bernardino (38,000), and Orange (35,000). All of the Top 5 districts are in the San Diego region: CA-52 (77,000), CA-49 (63,000), CA-51 and CA-53 (46,000 each), and CA-50 (32,000).

Figure 25: Top 10 Counties in FTE Employment

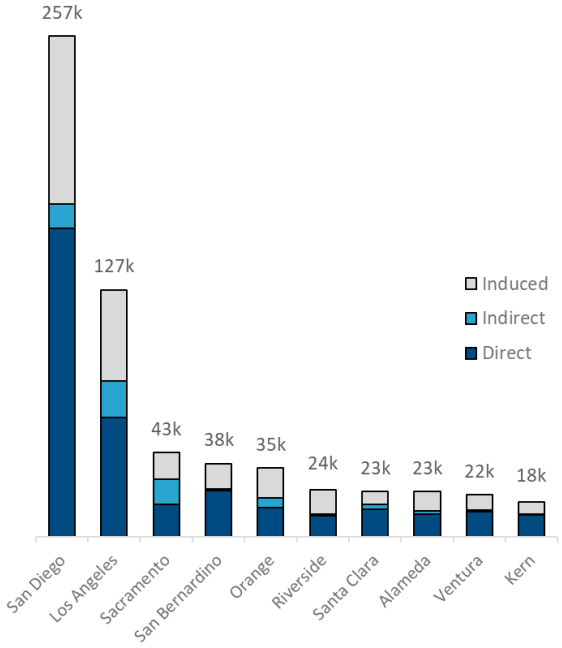
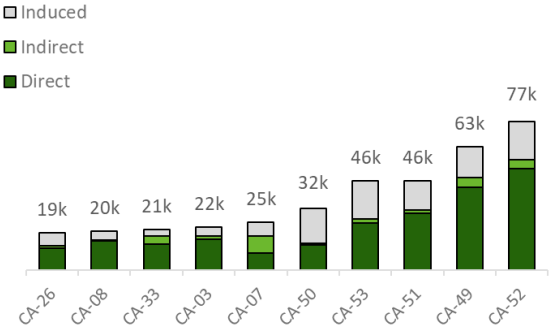


Figure 26: Top 10 Districts in FTE Employment



COVID-19 Model Impacts

IMPLAN, the economic modeling software used for this report, updates its model annually based on its estimates from economic activity in a given year. In typical economic times, this results in only minor changes, however COVID-19 led to significant shifts in economic activity. IMPLAN typically updates its model approximately one full calendar year after the end of the calendar year, meaning the most recent model available is for 2020, a year when economic activity was limited due to lockdown policies and consumer choices regarding health and safety. As a result, IMPLAN has documented caution, noting, "Data Year is going to have some unique caveats that will reflect the state of the national economy during the global pandemic." for a variety of reasons, including the amount of government stimulus seen in 2020 and its subsequent effect on economic impacts derived from the model, such as tax impacts.[26]

This series of reports has always used the most recent model available, which was the calendar year one year behind the fiscal year of the data. So, for example, the 2019 report used the 2018 fiscal year data and the 2017 model, which was the most recent then published. Normally, this discrepancy has little impact, but, as noted in the 2021 report and continuing this year, the choice of model year causes significant variation under COVID-19. Using the same 2021 data but changing the model year yielded the following results:

- 2020 Model Year: $158.2 billion in economic output and 762,000 FTE employment.
- 2019 Model Year: $166.1 billion in economic output and 770,000 FTE employment.

This report continues with the practice established in prior years, using the most recent model year available. This likely yields conservative overall results, as the economy had improved significantly in 2021, relative to 2020. But since it had not yet returned to 2019 levels, and may never return to the same industrial distributions, it is not clear that the 2019 model would provide more accurate results. Given the impact of COVID-19, these results, especially the industry and tax impacts, should be considered to have a higher level of uncertainty. For more information on the IMPLAN tool, please refer to the Methodology & Data section.

Summary

National security contributes significantly to California's economy. The federal government invests at least $47.3 billion and directly employs approximately 340,000 residents in the state. This results in $158.2 billion in economic output and supports over 762,000 full-time equivalent jobs in California. The total impact appears similar to high-profile sectors such as the agriculture[27] and film industries.[28]

[26] IMPLAN Data Team (2022). 2020 Data Release Notes.
[27] CDFA (2019) California Agricultural Production Statistics.
[28] BEA (2020) Arts and Cultural Production Satellite Account, U.S. and States.

A SpaceX Falcon-9 rocket carrying internet satellites launches from Vandenberg Space Force Base.

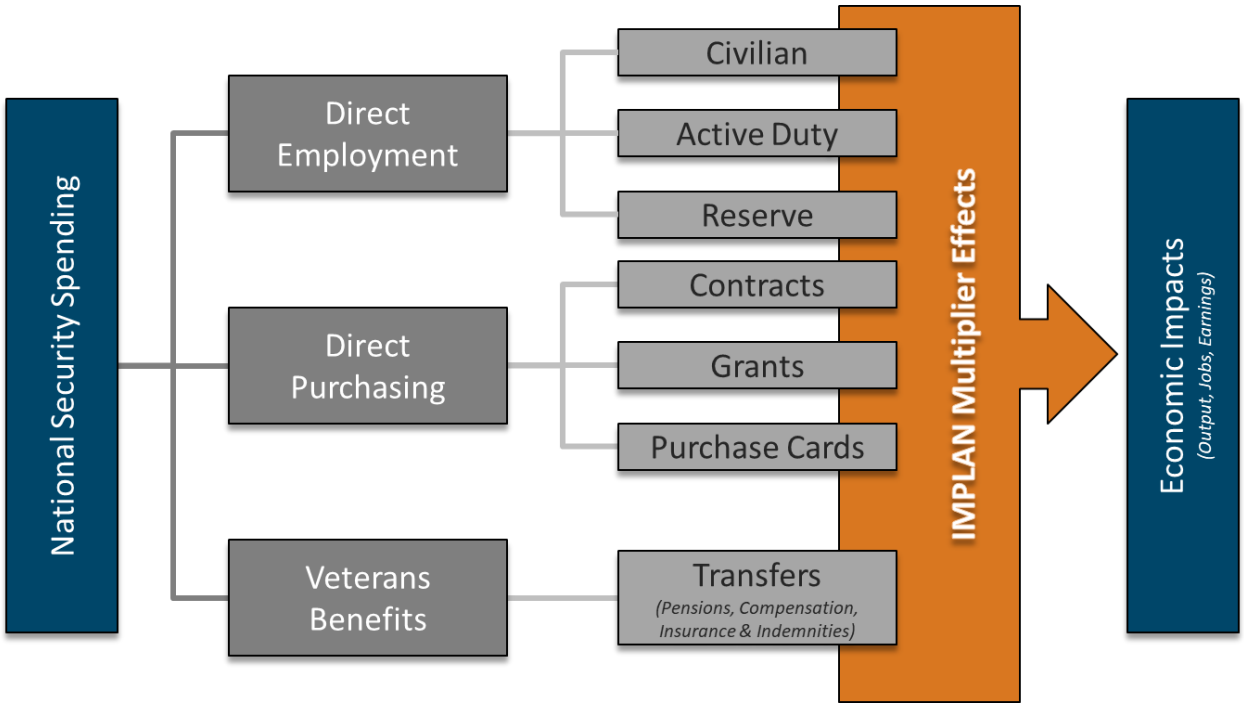
Methodology & Data

Scope

As discussed in the introduction, this report focuses on the U.S. Departments of Defense, Homeland Security, and Veterans Affairs.

Within these three federal agencies, three broad areas of economic activity are examined: direct employment; direct purchasing; and spending on veterans' benefits. Figure 27 details the components of these spending areas.

Figure 27: Scope of Analysis



This report does not include impacts from activities other than direct spending and employment by the Departments of Defense, Homeland Security, and Veterans Affairs. Examples of what is not included in this report:

- Purchasing of military equipment by international governments that is enabled by the infrastructure and research performed to provide this equipment to the U.S. government;
- Tourism related to celebrations, conferences or other gatherings related to the military installations; and
- Other partnerships that aerospace and defense companies may have with universities enabled by their security work.

Data

All data was acquired from U.S. government sources. Data is publicly available from the USA Spending database or regularly updated reports.

Spending

USASpending.gov remains the primary source for spending data. USASpending.gov provides a public database of nearly all federal spending. Although the database has limitations[29,30] it is a very useful tool that provides comprehensive data. Given these limitations, only spending from California-based prime contractors and their California-based subcontractors for projects completed within California are analyzed.

SmartPay data was acquired from the General Services Administration.[31] Data provided by the departments was inconsistent or unavailable. Thus, spending was apportioned to counties and congressional districts based on the share identified in the prior report. For this report, Veterans Affairs provided updated data in response to a Freedom of Information Act request and the data is updated to account for that. Updated SmartPay data from Homeland Security and Defense was not received at the time of this report's publication.

Employment

Civilian employment was previously acquired from the Office of Personnel Management (OPM), reported by county. This source is no longer available. Data was instead acquired from OPM's FedScope.[32] This tool reports data at the statewide level. In addition, the location of many investigative[33] employees have been suppressed in recent years. These suppressed positions were allocated to California based on the ratio of investigative positions to total positions that existed in prior years. County and congressional district distribution is estimated based on data received from OPM, in response to a Freedom of Information Act request, that details total civilian employment for Homeland Security and Veterans Affairs by county and district.

Military employment was acquired from the Department of Defense's Defense Manpower Data Center's (DMDC) Location Report. DMDC only provides data by state, however. County and district distribution is estimated based on the distribution drawn from the American Community Survey. In addition, full-time equivalent estimates for reservists and National Guard were made based on relative salaries for reservists and active duty personnel matched by rank and experience. Reservist salaries range from 17.5% of matched active duty pay to a high of

[29] POGO (2013) USASpending.gov: NOT Your One-Stop Shop for Following Taxpayer Dollars.
[30] Sunlight Foundation (2017) A brief history of the DATA Act.
[31] Available at About GSA Smartpay under the "Statistics" and "Sales, Transactions, Account Holder Data" menus.
[32] U.S. Office of Personnel Management (2020) FedScope Employment Cube September 2010-2020.
[33] This includes the large majority of Transportation Security Administration, Customs and Border Protection, Immigration and Customs Enforcement and Citizenship and Immigration Services staff.

21.2%, with an average of 18.25%. As a result, reservists are estimated at 0.1825 FTE (or 5.5 reservists are considered the equivalent of 1 active duty employee for economic purposes).

Methodology

Input-Output Modeling

This report models economic impacts using IMPLAN software, based on standard Input-Output methodology. The purpose of the study is to estimate the impacts of existing spending, rather than modeling any policy changes or other counterfactuals. As a result, the analysis estimates gross benefits and does not account for alternate federal spending or other use of resources that might occur in California in the absence of national security spending and employment.

Input-output (I-O) models identify relationships between industries, estimating how changes in one industry flow through into other industries. For example, the purchase of required inputs that result in logistics or business services and changes to household purchasing due to shifts in employment and earnings.

Cumulatively, I-O models estimate the amount of times the modeled dollar is re-spent within a geographic area before it fully leaks out.

The concept was pioneered by Wasilly Leontief, who was awarded the Nobel Prize in 1973 "for the development of the I-O method and for its application to important economic problems."[34]

IMPLAN Economic Model

The IMPLAN (IMpact Analysis for PLANning) I-O economic model was selected for this analysis based on its reputation and the resources available. IMPLAN was developed by the U.S. Department of Agriculture Forest Service in the 1970s to fulfill the requirements of the Rural Development Act of 1972 to estimate the impacts of alternate uses for U.S. public forest resources.

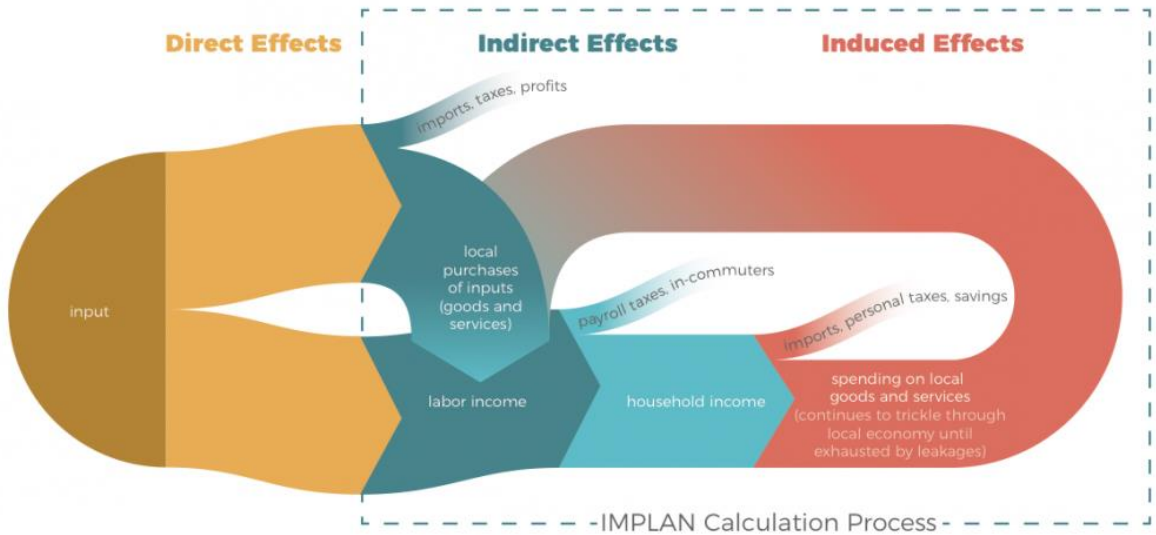
IMPLAN models the economy within a specified region as 546 sectors with unique spending patterns derived from U.S. Bureau of Economic Analysis expenditure patterns.

As depicted in Figure 28, the model begins with the direct effects of the modeled economic activity. This includes the employment/wages and output of the sector being analyzed. From here, the model estimates the supply chain impacts for the output of the direct effects. This includes leakages, such as imported inputs, taxes and profits, and local purchases of inputs toward the final product. These local purchases generate labor income (which includes total compensation of both the employee and the proprietor), which joins the stream with the labor income from the direct effect. This stream then has leakages, including imports, income to employees living beyond the modeled region, taxes and savings. Remaining income – spent on

[34] NobelPrize.org. Wassily Leontief – Facts.

locally purchased goods and services – cycles back around and the cycle begins anew until all remaining funds are exhausted due to leakage.

Figure 28: IMPLAN Model[35]



MRIO Analysis

IMPLAN's Multi-Regional Input-Output (MRIO) analysis tool offers a simplified path to fully account for localized impacts, without the need to generate 174 models required to complete the custom methodology employed in 2018 and prior reports.

"MRIO expands backward supply linkages beyond the boundaries of a single-region Study Area. MRIO analyses utilize interregional commodity trade and commuting flows to quantify the demand changes across many regions stemming from a change in production and/or income in another region. This powerful analytical method allows analysts to go beyond a single study region, measuring the economic interdependence of regions. In an MRIO analysis, the Direct Effect in one region, Region A, can trigger Indirect and Induced Effects in linked regions, capturing some of what would have been a leakage in a traditional I-O model."[36]

An approach like MRIO more fully accounts for the localized impacts within the state, but does not impact the statewide estimates. While a single economic model can be run to estimate the impact of spending within each region, this methodology would understate the total impact, because it would omit spillover effects from spending in other counties. This more basic methodology would have overlooked approximately 10% of total state output in the 2019

[35] IMPLAN. Assisted Economy.
[36] Clouse, C. (2019) MRIO: Introduction to Multi-Regional Input-Output Analysis. IMPLAN.

regional structure and approximately 17% in the 2018 county structure.[37] The number of regions impacts the amount of activity that would be omitted by the simpler methodology. If there are more regions, each region includes less economic activity and, thus, loses more spillover activity to surrounding regions. For example, if one were to consider the greater Sacramento region, as in the 2019 report, it would include the spillover that spending in Sacramento County would provide to nearby Yolo County. However, if it was focused on specific counties, as in the 2018 report, Yolo County would be considered separately from Sacramento County. This would result in the spillover being missed in the simpler methodology and explains why the estimate for 2019 was less than 2018. In either case, these spillover impacts are captured by the methodology used in these reports and are included in the results.

Figure 29: MRIO[38]

Limitations of the Input-Output model

Readers should be aware of a number of limitations with the modeling techniques employed, as Leontief himself acknowledged.[39]

I-O models are based on fixed assumptions about the economy being modeled. It assumes that X input leads to Y output. Reality, however, may play out differently. For example, if the scenario led to the need to purchase more widgets, the model would assume the local widget industry would be able to expand as necessary to maintain the level at which it currently fulfills local widget needs. This assumption could be flawed in ways that could over or understate the impact. The local economy might not have the resources, physical space, capital and/or workforce to support that expansion and the widget industry may not grow at all. Conversely, if it is able to expand to fulfill the modeled needs, expansion may lead to the widget industry investing the capital to expand sufficiently to fulfill all of the added demand or even supplant demand currently fulfilled by imports. Similarly, the growth will impact the workforce in ways that could further grow the economy by bringing in additional workers or shrink other aspects

[37] Clouse, C. (2019) MRIO: Introduction to Multi-Regional Input-Output Analysis. IMPLAN.
[38] Clouse, C. (2019) MRIO: Introduction to Multi-Regional Input-Output Analysis. IMPLAN.
[39] Leontief, W. (1955) Some Basic Problems of Empirical Input-Output Analysis. Input-Output Analysis: An Appraisal.

of the economy by competing for a limited pool of employees. Similarly, it assumes that prices are fixed and that ratios for intermediate inputs (i.e., efficiency) are fixed.

These issues are most pronounced at the largest scales (both relatively and absolutely). For example, if we were to introduce an additional $10 trillion in spending nationally, it would not double the overall size of the economy, as an I-O model would estimate. Instead, it would largely crowd out other economic activity, since the country's workforce and resources could not absorb the extra demand for goods and services, resulting in significant inflation, but little real economic growth.

Because the purpose of this study is to estimate the existing impacts of current spending levels, these limitations are less significant.

Beyond specific limitations of I-O modeling, as Leontief described it, the "theoretical formulation is designed to protect the investigator from this danger: it does not permit him to draw any special or general conclusions before he or someone else completes the always difficult and seldom glamorous task of ascertaining the necessary facts."[40] In other words, any model is only as good as its data.

The inputs used are entirely U.S. administrative data, which is typically considered among the most reliable sources. There are limitations, however. Several datasets do not perfectly align with the model or the needs of this study. Some spending data is tagged to a specific company but not a specific industry. In these cases, the California Research Bureau made a judgement as to which IMPLAN sector code to assign that spending. In cases where sufficient detail is not available to differentiate between similar sectors, the sector with multipliers closest to the average of the other sectors was assigned. Provision of SmartPay data by the departments has proven unreliable. As a result, national data is apportioned based on the most recent year when more detailed data was available, which varies by department. As discussed above, this analysis does not include data on in-state subcontractors operating under out-of-state prime-contractors, largely because of the condition of the original datasets and concerns about duplicating counts.

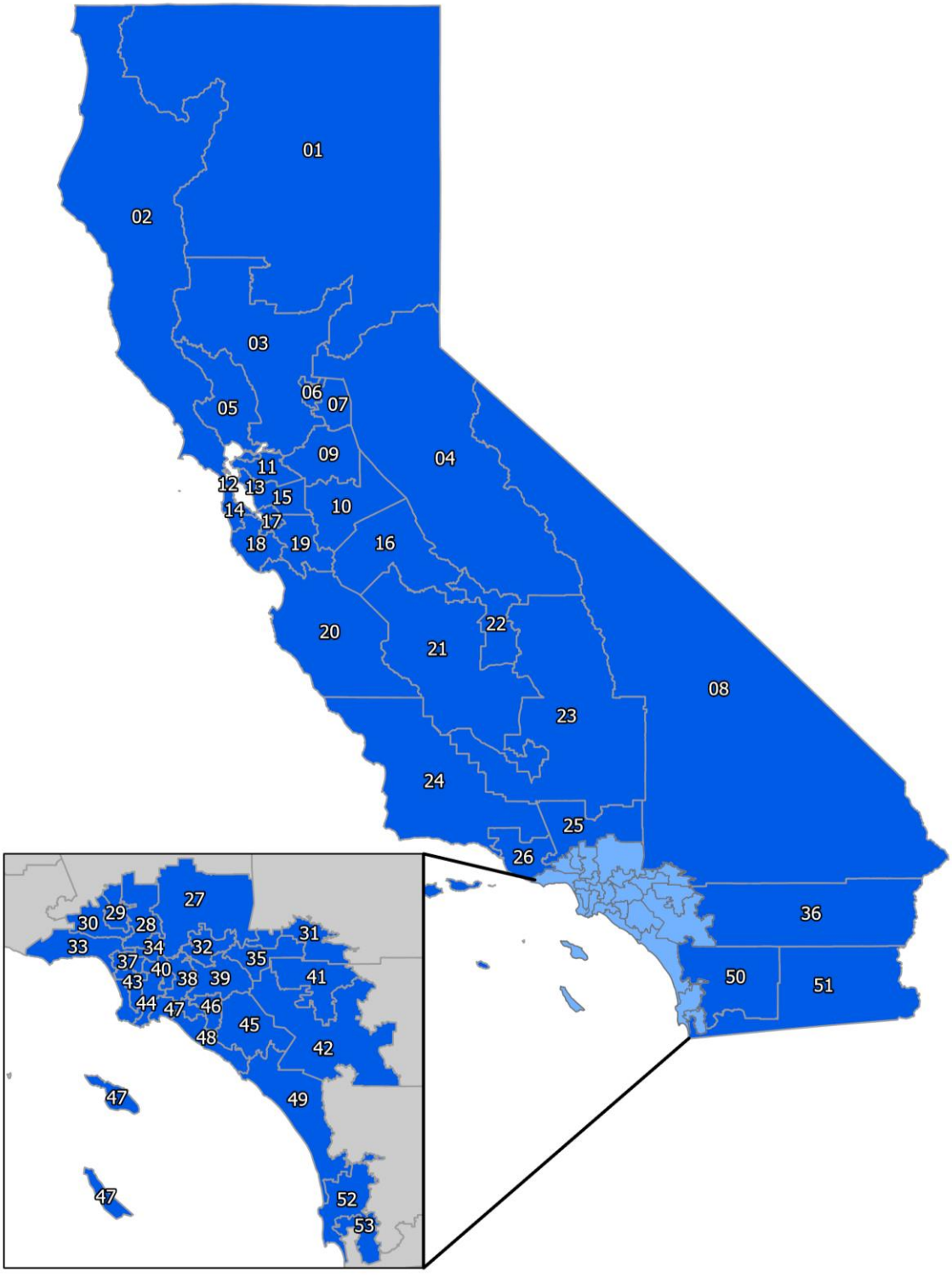
These limitations notwithstanding, I-O modeling generally, and the IMPLAN model specifically, are widely accepted tools for estimating impacts for government spending. The estimates provide a reasonable approximation of the impacts.

[40] Dietzenbacher, E. & Lahr, M.L. (2004) Wassily Leontief and Input-Output Economics. Cambridge University Press.

Soldiers with the California Army National Guard pull the lanyard on an old cannon at Joint Forces Training Base Los Alamitos.

Appendix I: California Counties

Appendix II: California Congressional Districts



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