



California Research Bureau
California State Library



2021 Congressional Districts Supplement
California Statewide
National Security Economic Impacts

A U.S. Marine MV-22B Osprey takes off during a training exercise at Camp Pendleton, California.



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

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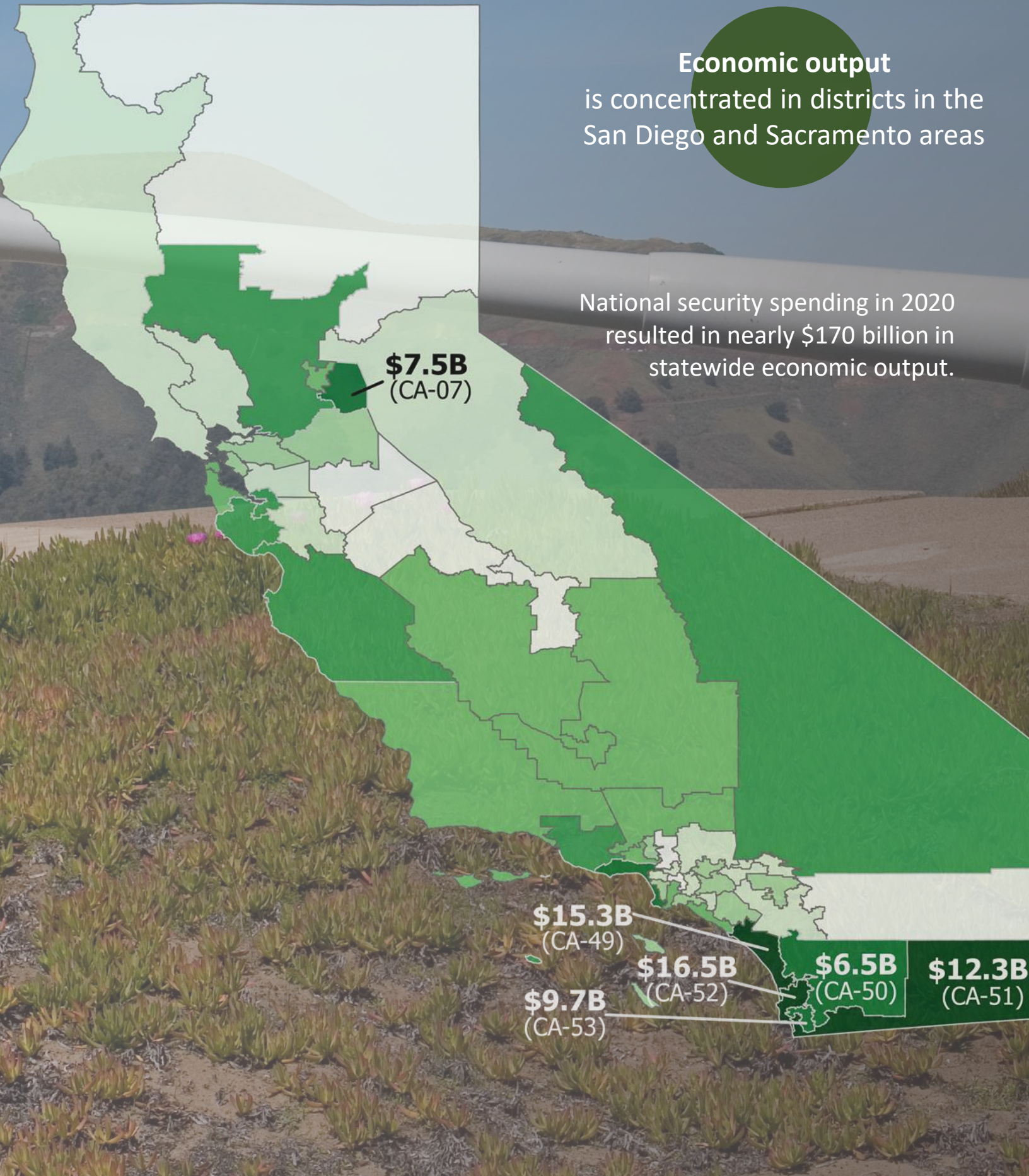
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Key Findings

Economic output

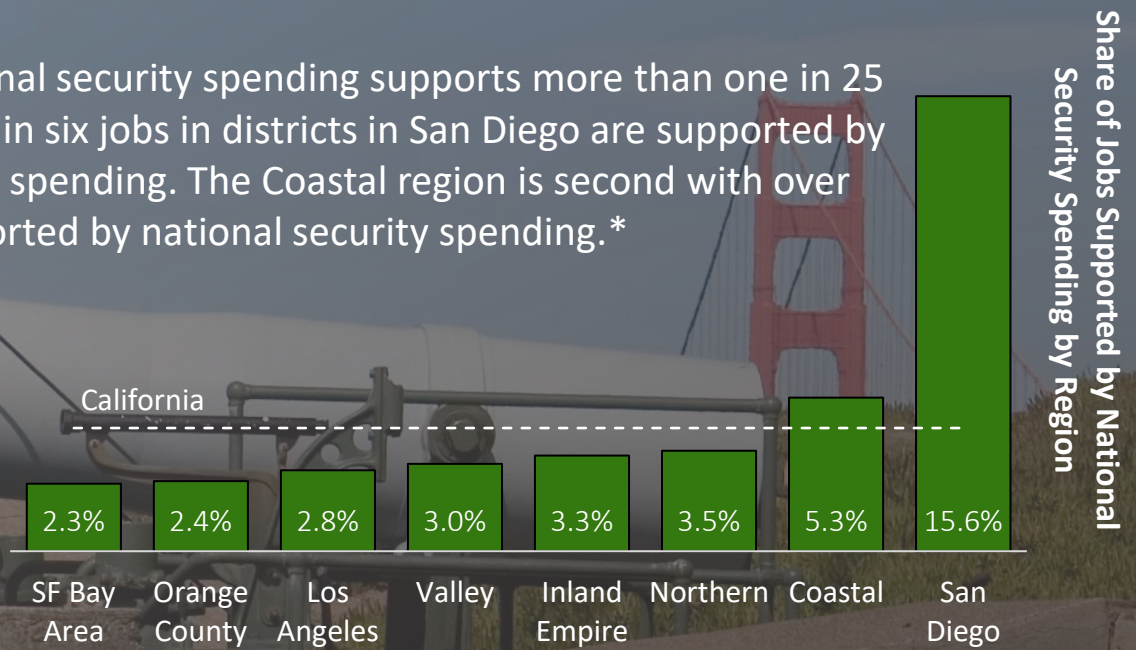
is concentrated in districts in the San Diego and Sacramento areas

National security spending in 2020 resulted in nearly \$170 billion in statewide economic output.



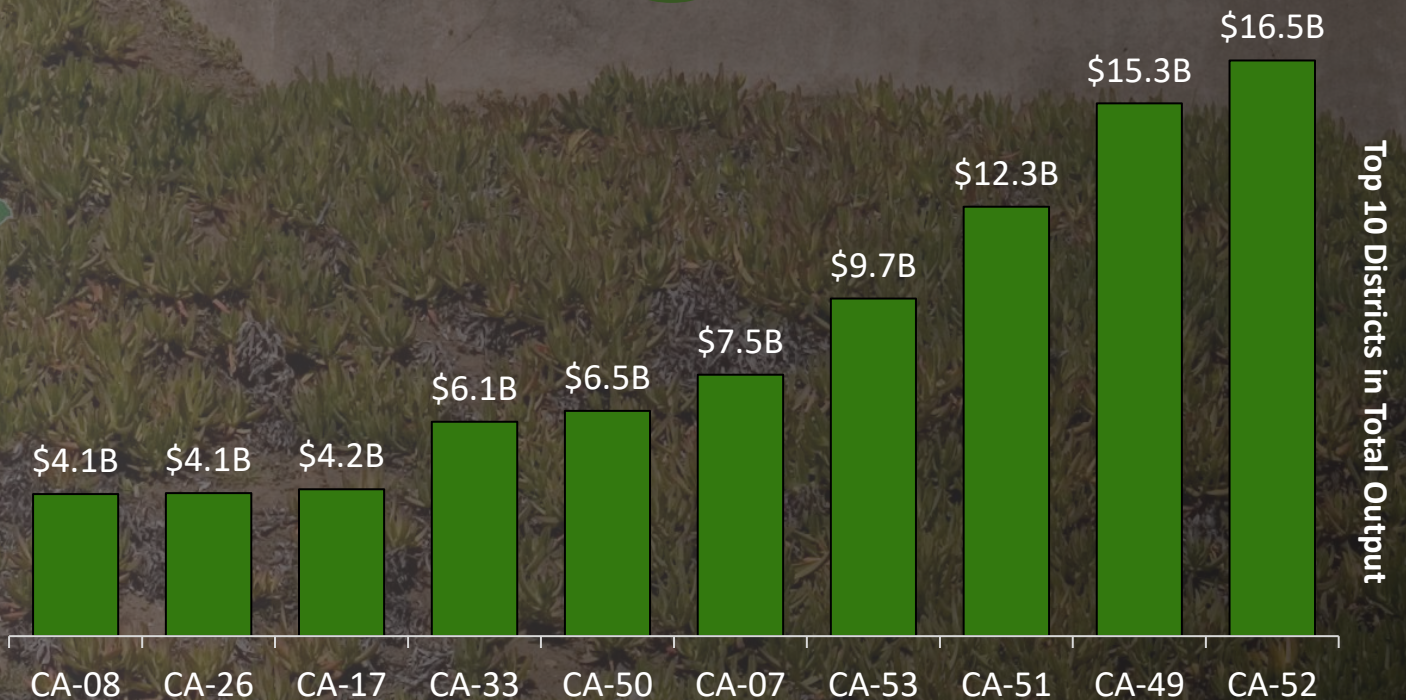
National security spending supports at least 5% of jobs in the Coastal region and almost 16% of jobs in the San Diego region.

Statewide, national security spending supports more than one in 25 jobs. Nearly one in six jobs in districts in San Diego are supported by national security spending. The Coastal region is second with over 5% of jobs supported by national security spending.*



*Regions in this report are based on Congressional Districts, so totals may vary from County-based regions in the County supplement.

Districts in the San Diego, Northern, Los Angeles and Coastal regions generate the most output.



An inside view of the Mission Control Center at the Jet Propulsion Laboratory (JPL) in Pasadena, California.



 Jet Propulsion Laboratory
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STATUS	MODE
Online	Deep Space Network
AZIMUTH	ELEVATION
247.559 deg	53.770 deg
SPACECRAFT	
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TRACKING SUPPORT SPECIALIST

DATA CONTROLLER

OPERATIONS CHIEF
DEEP SPACE NETWORK

DATA CONTROLLER

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The USS Hornet docked in Alameda, California.



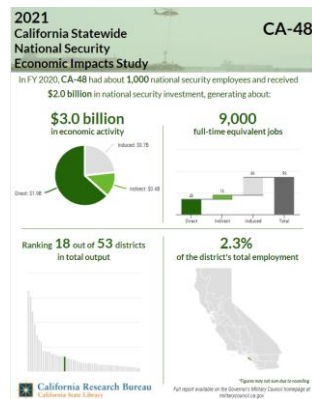
California Statewide National Security Economic Impacts, 2021 Congressional Districts Supplement

Introduction

In December 2021, the California Research Bureau at the California State Library published the fourth annual report on Statewide National Security Economic Impacts in California. The Research Bureau produced this report at the request of the Governor’s Office of Planning and Research and the Governor’s Military Council. This is the second of two years of reports produced with support from the U.S. Department of Defense. This support has allowed for an expanded scope, including two local supplements. This supplement details findings by congressional district and the second provides findings by county. Readers should refer to the California Statewide National Security Economic Impacts, 2021 Update and Counties Supplement for more information.

Using fiscal year 2020 spending and employment data from the three federal agencies that account for the bulk of national security spending and employment – the Department of Defense, the Department of Homeland Security and the Department of Veterans Affairs – this report examines the impact of national security spending and employment in California’s 53 congressional districts (map in Appendix III). Fiscal year 2020 includes the COVID-19 recession. Discussion of how this impacts the estimates is included in the statewide report.

Example of a District Factsheet – CA-48



In addition to this report, which provides an overview of economic impacts by region, factbooks highlighting key metrics for each region (detailed below) and factsheets for each congressional district are available in Appendices II and III, respectively. [An online interactive](#) map with complete results for each congressional district is also available to compare numbers between districts.

Regions in the county supplement are based on the California Employment Development Department’s “California Economic Markets.”¹ Regions in this supplement start from that structure but are adjusted to account for congressional district lines that do not align closely with county boundaries and varying levels of population density throughout the state. This results in eight regions, compared to the 11 in the county supplement: Northern, San Francisco Bay Area, Valley, Inland Empire, Coastal, Los Angeles, Orange County and San Diego, as displayed in Figure 1.

¹ EDD. Interactive Maps and Data Tables. [Regional Economic Markets Boundary Map | EDD Data Library \(ca.gov\)](#)

Because of limitations in the methodology developed to estimate congressional district results, this supplement omits the government revenue and industry output generated within each of the districts. While the methodology is accurate at a high level, it does not account for variations within a county. While economic activity can reasonably be assumed to be approximately proportionately distributed across the county, government revenue and industry totals are tied to specific government and business entities that are in specific locations, which are likely not evenly distributed. As a result, it would not be accurate to use the methodology to estimate government revenue and industry-specific economic activity at the congressional district level. Details on government revenue and industry-specific economic activity are available in the county supplement.



Figure 1: California Districts Grouped by Region

A helicopter crew from U.S. Coast Guard Air Station Humboldt Bay pull volunteer victims out of the water during a mass rescue drill.



Regional Overview

Direct Activity

Direct Employment

The U.S. Departments of Defense, Homeland Security and Veterans Affairs directly employed 348,000 civilian and military employees in California in 2020, making up 890 of every 100,000 residents. Employment is concentrated in Southern California, which includes the Inland Empire, Los Angeles, Orange County and San Diego regions, with 242,000² military and civilian personnel – around 70% of the statewide total. Most of this employment is in the San Diego region, with nearly 169,000 civilian and military personnel, or around 4,500 out of 100,000 residents in the region. The Inland Empire and Coastal regions each had over 30,000 military and civilian employees.

Two regions – San Diego and Coastal – have a higher proportion of military and civilian employment to the region’s population than the state average. These regions rank first and third, respectively, in military employment, but are only sixth and eighth in total population.

Figure 2: Direct Employment by Region

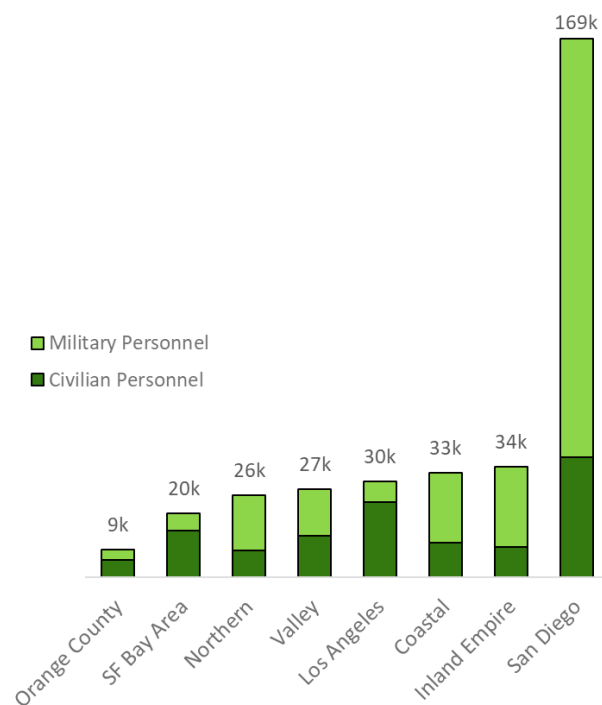
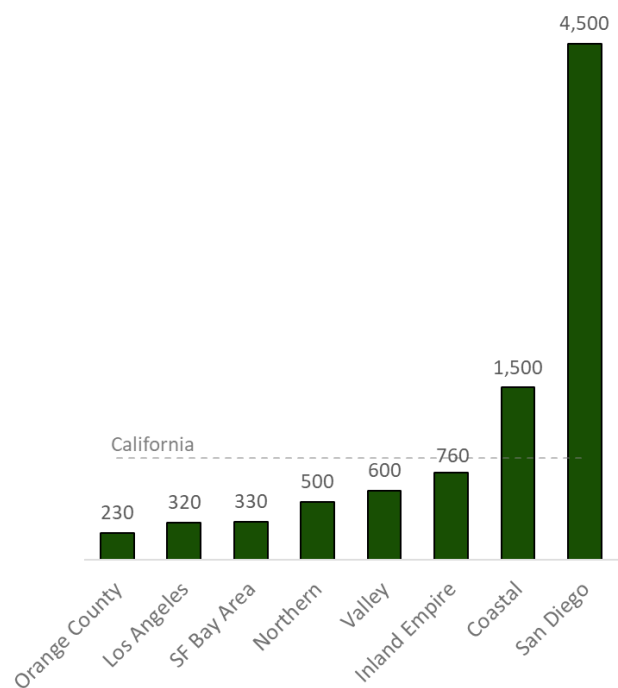


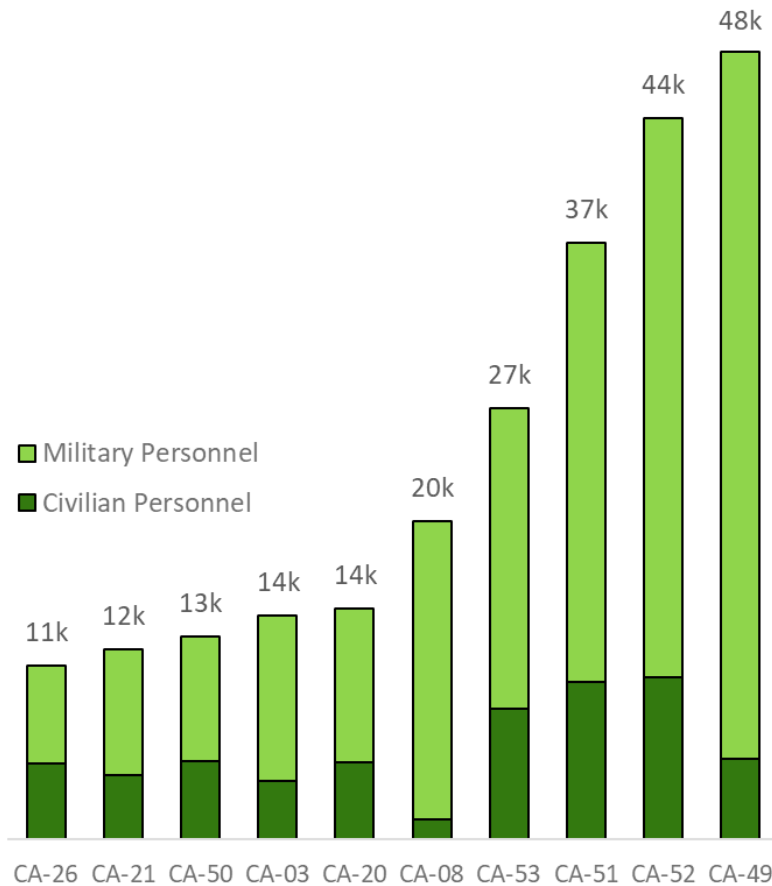
Figure 3: Direct Employment per 100k Residents by Region



² This may not match the county supplement due to differences in regional composition as defined in the reports.

Figure 4 displays the 10 congressional districts in the state with the most national security employees. California’s eighth congressional district, or CA-08, in the Inland Empire region, is the only district outside of the San Diego region in the Top 5. In addition to CA-08 and the five congressional districts within the San Diego region, CA-20 and CA-26 in the Coastal region, CA-03 in the Northern region, and CA-21 in the Valley region comprise the Top 10.

Figure 4: Top 10 Districts in Direct Employment



Direct Spending

In fiscal year 2020, the Departments of Defense, Homeland Security and Veterans Affairs collectively spent \$47.0 billion on national security activity, or about \$120 million per 100,000 California residents. Southern California as a whole received \$27.7 billion in spending, over half of the state’s total. The largest share is in San Diego, which accounts for over 25% of all national security spending in the state, totaling \$11.8 billion. The Northern and Los Angeles regions received \$9.6 and \$9.3 billion respectively, accounting for 20.3% and 19.7% of total state spending. The San Francisco Bay Area region received around 13.3%, or \$6.3 billion, of total national security spending in the state.

Adjusted for population, San Diego remains first, the Northern region is second and above the state average, and Orange County rises to third while the San Francisco Bay Area and Los Angeles regions rank fourth and fifth, respectively.

Figure 5: Direct Spending by Region

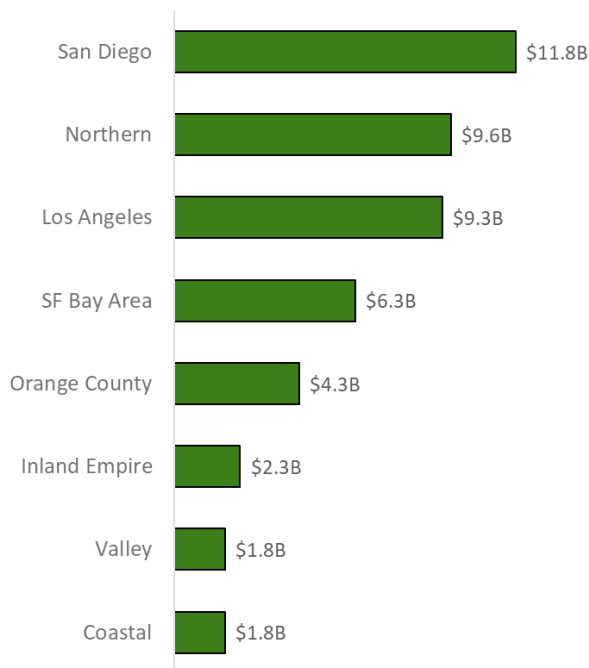


Figure 6: Direct Spending per 100k Residents by Region

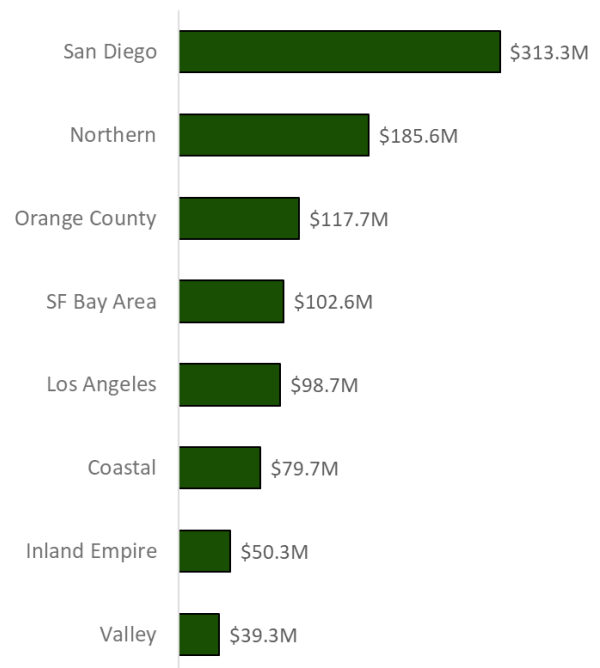
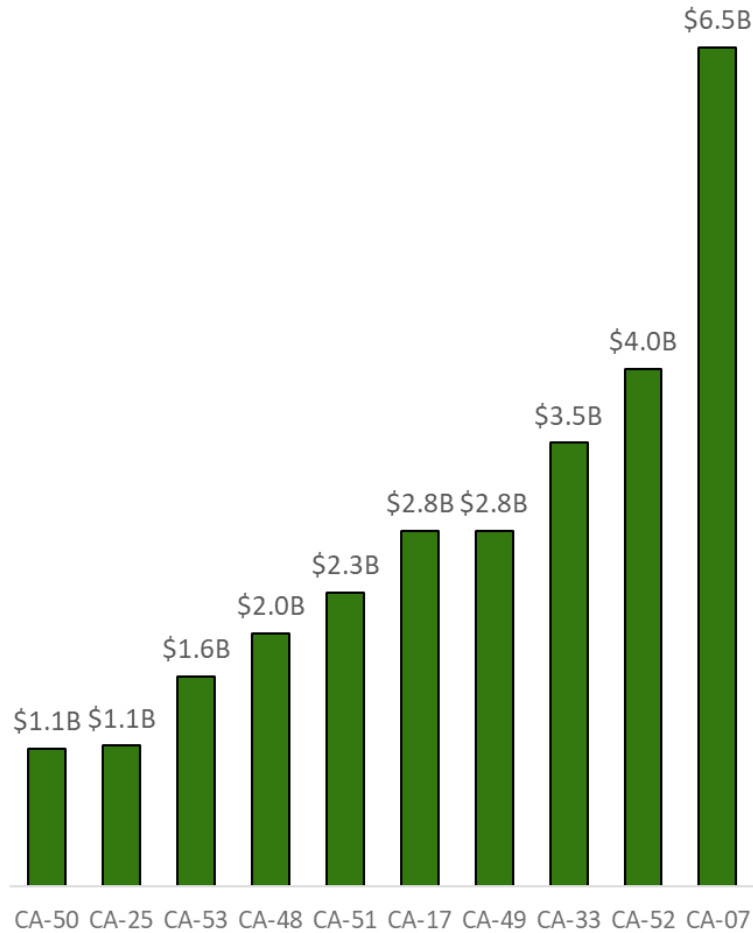


Figure 7 displays the 10 districts that received the most direct spending. All five districts in the San Diego region fall within the Top 10. The remaining five are dispersed across multiple regions: one in Northern (CA-07), two in Los Angeles (CA-33 and CA-25), one in the San Francisco Bay Area (CA-17) and one in Orange County (CA-48).

Figure 7: Top 10 Districts in Direct Spending



Economic Impacts

This report used economic impact assessment software to develop standard input-output models to estimate the direct, indirect and induced economic activity that typically results in a region from spending and employment within a given industry. Direct effects include the employment and economic output from the federal government as well as the employment and economic output of its direct contractors. Indirect effects include the output and employment of subcontractors. Induced effects include the employment and economic output generated because of spending created from earnings generated in the first two categories.

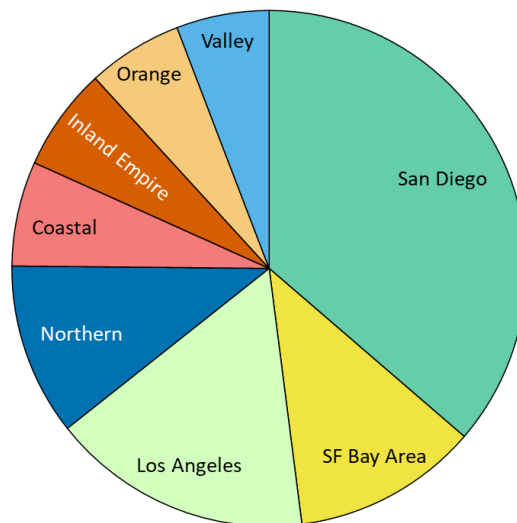
For more information about the methodology and software employed in this study, please refer to the methodology section in Appendix I of this report.

Total Output

Economic output follows a similar pattern to spending and employment. The San Diego region has the largest share, \$60.1 billion, accounting for over one-third of California’s \$168.7 billion in total economic output generated by national security spending and employment. The Los Angeles region is second with \$27.2 billion, followed by the San Francisco Bay Area and Northern regions with \$19.3 and \$17.9 billion, respectively. In total, Southern California accounts for \$107.9 billion in economic output, almost two-thirds of the state’s total, due to the concentration of military facilities, major contractors and servicing industries in the area.

(Note that, throughout the report, local estimated outputs add up to a modestly smaller amount than the statewide figure. A small amount of leakage from congressional districts is unable to be accounted for within the software available for this project, resulting in this difference).

Figure 8: Share of Total Output by Region



The San Diego and Coastal regions had larger output shares per resident than the state average. The Northern and San Francisco Bay Area regions were third and fourth, respectively.

Figure 9: Total Output by Region

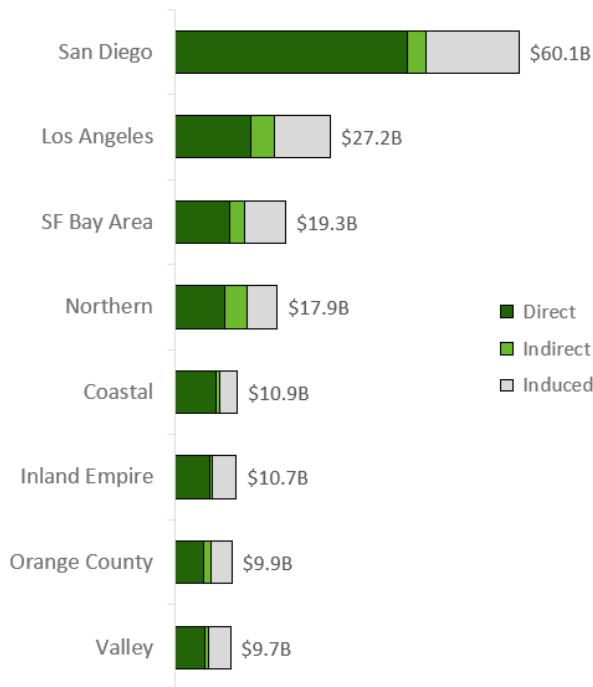


Figure 10: Total Output per 100k Residents by Region

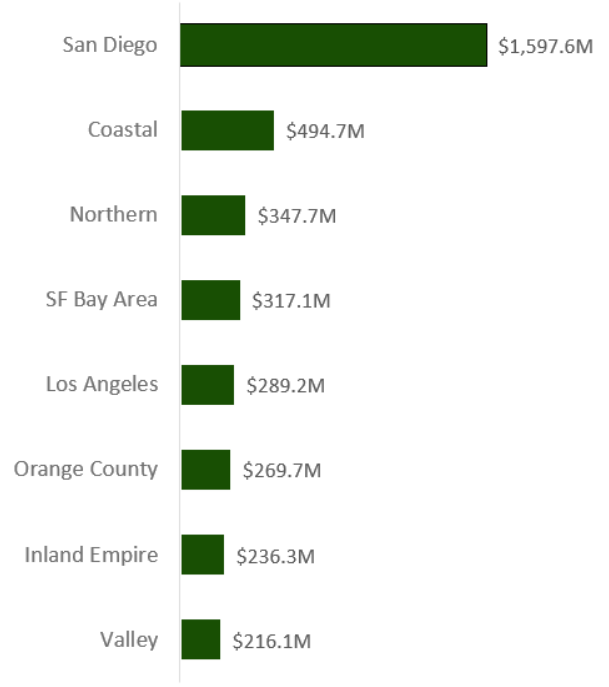
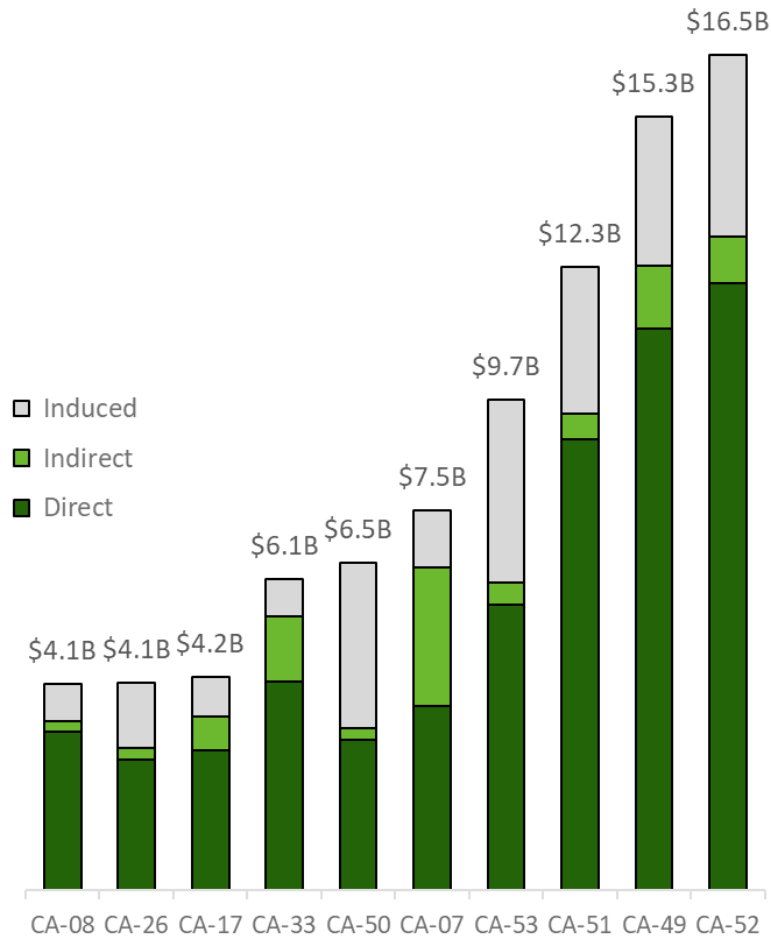


Figure 11 displays the 10 congressional districts that generated the most economic output. CA-07, in the Northern region, is the only district outside of the San Diego region to crack the Top 5. In addition to CA-07 and the five congressional districts in the San Diego region, CA-33 in the Los Angeles region, CA-17 in the San Francisco Bay Area region, CA-26 in the Coastal region and CA-08 in the Inland Empire region comprise the Top 10.

Figure 11: Top 10 Districts in Total Output



Total Employment

Estimated total employment follows a similar pattern to total output across the regions. The San Diego region supported 290,000 full-time equivalent (FTE) jobs, accounting for 36.6% of the 792,000 FTEs generated by national security activity in California in fiscal year 2020. Southern California as a whole accounts for nearly two-thirds of all employment, about 527,000 FTEs. The Los Angeles region includes 128,000 FTEs, or 16.2% of national security supported employment.

Only two regions are above the state average of 4.2% of employment being supported by national security activity. The San Diego region is by far the leader with 15.6% of jobs supported by national security activity, while the Coastal region was next with 5.3%.

Figure 12: Total Employment by Region (FTEs)

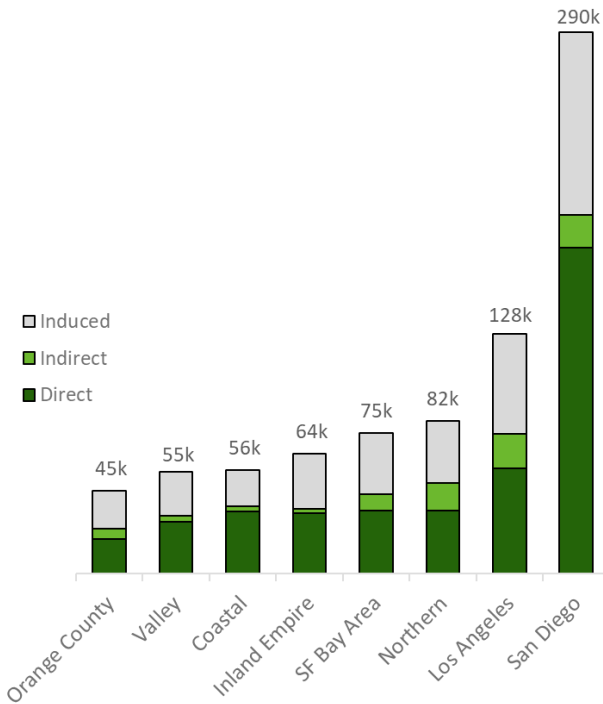


Figure 13: Total Employment as Percentage of Region's Employment

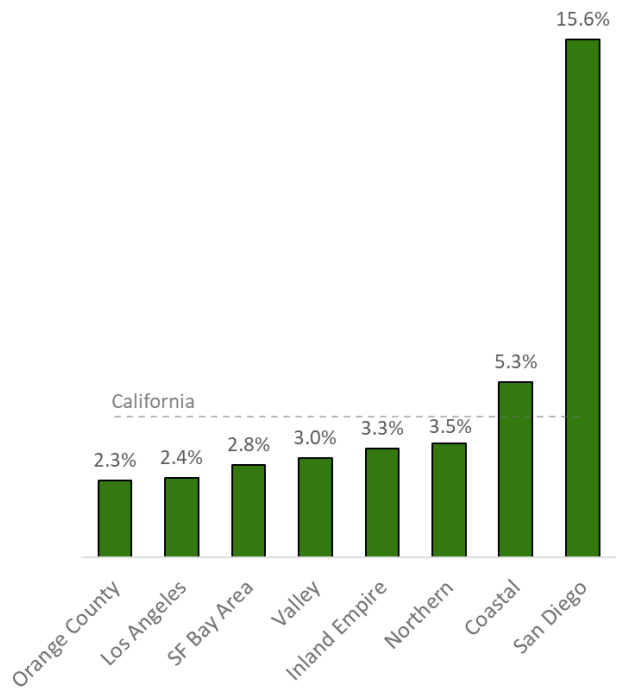
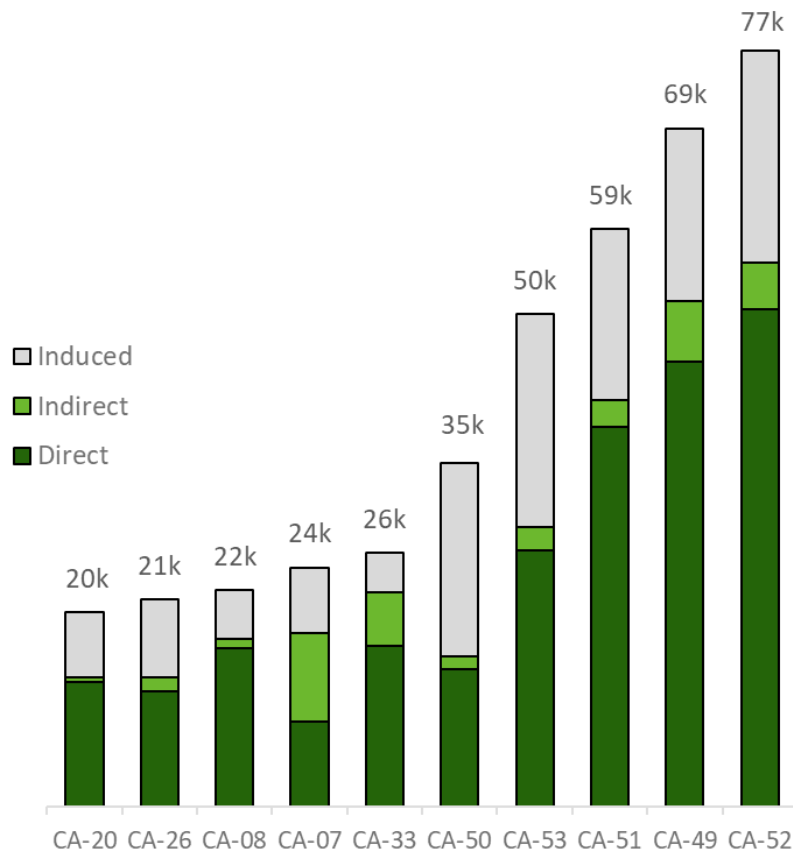


Figure 14 displays the 10 congressional districts with the most FTEs generated by national security activity. The five congressional districts within the San Diego region had more FTEs than any other district. The remaining districts in the Top 10 include CA-33 in the Los Angeles region, CA-07 in the Northern region, CA-08 in the Inland Empire region, and CA-26 and CA-20 in the Coastal region.

Figure 14: Top 10 Districts in Total Employment (FTEs)



The Navy Medical Center in San Diego, California.



Appendix I: Methodology – District Analysis

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.

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.

For a full discussion of the overarching methodology and IMPLAN’s input-output model, refer to the Methodology and Data section in the 2021 Statewide National Security Economic Impacts Study. This supplement builds on the analysis in the aforementioned study.

As in prior versions of the report, this supplement analyzes the localized impacts. It follows the same methodology as the 2019 report,³ but provides expanded detail, estimating results for each of California’s 53 congressional districts. A separate supplement provides estimates for California’s 58 counties. These supplements use a two-model approach to estimate the impacts for local areas. This accounts for the fact that a traditional, single-model approach would understate the impacts occurring within a given geographic area, omitting spillover effects from spending in other districts.

Traditional models estimate the impacts that spending and employment within a given congressional district has within that same district. For example, it would capture most of the economic impacts associated with the employment of a government worker who both works and lives in CA-06. The large majority of the induced economic activity from their employment or spending on housing, shopping, healthcare, etc., would likely occur within the district because they both live and work there. While it would account for most of the economic activity resulting from their employment, it would miss some aspects. For example, if they went to a restaurant in neighboring CA-07 or went on vacation to San Diego in CA-53, the resulting economic activity would be omitted. The CA-06 model would miss the spending that occurs outside of CA-06, and the CA-07 and CA-53 models would miss the original employment data that led to that induced activity because it occurred outside those districts.

Even more economic activity is missed when economic relationships occur across congressional districts. For example, if a Los Angeles company based in CA-25 contracted with an Orange

³ Lavelle, D.M. [California Statewide National Security Economic Impacts, 2019 Update. California Research Bureau, California State Library, Oct. 2019.](#)

County law firm based in CA-48, the resulting indirect and induced economic impact would be missed altogether. Because the contractor is outside Los Angeles, the CA-25 model would not include it while the CA-48 model would not account for the initial spending that occurred outside of CA-48. Moreover, simply including the Los Angeles data in the CA-48 model is not viable because it would then overcount economic activity associated with the spending that is actually occurring within CA-25.

Economic activity omitted from a traditional model approach is significant in aggregate. In this case, such a methodology would overlook approximately 14% of total state output, using the county models. This is larger than reported in the 2019 report because of the larger number of geographic entities included (congressional districts instead of regions). Because there are more geographic entities, each covering less area, there is more spillover between them. This can also distort regional information significantly. For example, 80% of economic activity in Tuolumne County would be excluded by a traditional model. These impacts appear most significant in areas with large tourist economies and districts that are home to a large number of commuters from nearby congressional districts.

This supplement uses the same two-model approach as the 2019 report. This is refined and streamlined from the original three-model approach used in the 2018 report with the assistance of IMPLAN's Multi-Regional Input-Output (MRIO) tool. This tool estimates the impacts that spending within a given geography has on other selected geographies. "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."⁴

Because of the complexity of these models, however, IMPLAN is only able to analyze seven geographies within the MRIO tool. This prevents us from simply running a single MRIO model for each district.

Instead of using the MRIO tool to estimate all of the spillover resulting from spending in a congressional district, we use it in reverse to calculate all of the spillover it receives resulting from spending in other districts. First we run a standard model for each district using spending and employment within that district. We then set up a second MRIO-based model. This model uses a custom region that is composed of all of the congressional districts in the state, except

⁴ Clouse, C. (2019) [MRIO: Introduction to Multi-Regional Input-Output Analysis. IMPLAN.](#)

the district⁵ from the first model. Similarly, the input data for the analysis is the spending and employment from those 52 districts, omitting the spending and employment that was included in the first model. The district from the first model is then used as the secondary region within the MRIO framework. By doing so, the MRIO tool estimates the indirect and induced activity that occurs within that district as a result of spending and employment that occurs within the other districts. These outputs are then added to the outputs from the first model to calculate the total outputs for that district. This approach, combining the economic activity resulting from direct inputs as well as spillover from outside the district, more fully accounts for the localized impacts within the state without impacting the statewide estimates.

Developing this report identified a limitation in the IMPLAN model. Most economic data is based on counties. As a result, the IMPLAN model is structured based on counties as well. Since congressional districts often do not align with county boundaries, IMPLAN builds these from zip code data that is estimated from the county data.⁶ Due to challenges in estimating this data, a large portion of indirect and induced effects estimated in the statewide and county models is omitted, which IMPLAN staff attribute to aggregation bias,⁷ omitted data sources and lagged data.

While these problems are inherent to the model, it appears to be a particularly significant issue for California due to the state's large number of congressional districts and relatively small number of counties. The variation identified was much more significant in districts in dense urban areas than in rural areas, where some counties are wholly contained within a single congressional district.

In order to more accurately estimate the indirect and induced activity across congressional districts, we developed a workaround methodology based on induced and indirect activity detailed in the county supplement and distributed estimated impacts across each congressional district. Indirect impacts were distributed proportionately based on the estimated share of direct impacts. Induced impacts were distributed proportionately based on the share of population.

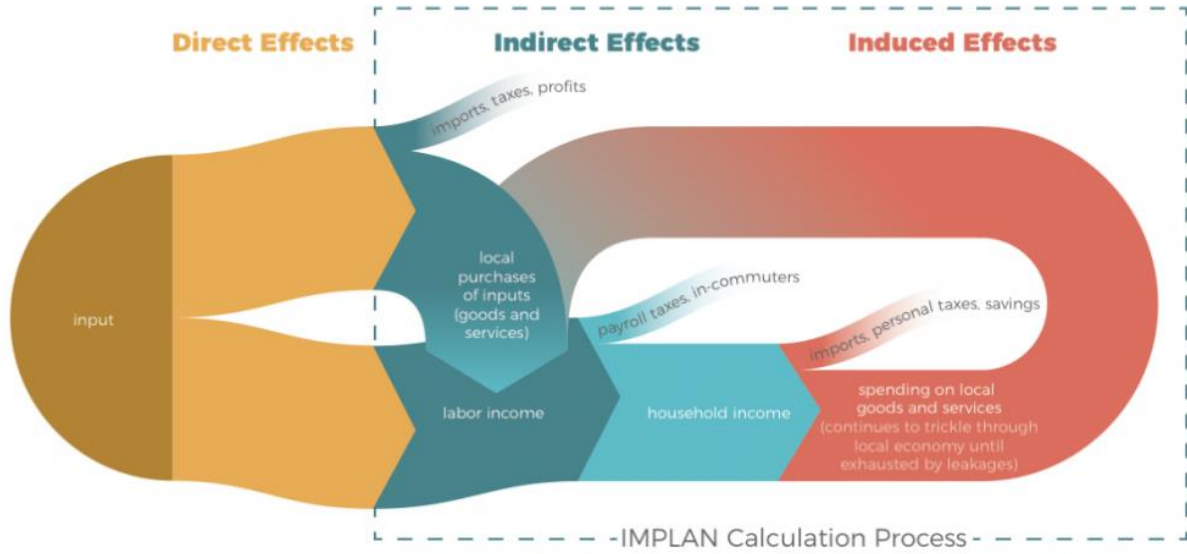
While this methodology is expected to yield reliable results, estimated differences between neighboring districts should be understood to come with a lower level of precision than differences estimated between counties and regions.

⁵ Due to limitations with IMPLAN's software, the MRIO-based models utilize the counties completely outside of the district under analysis.

⁶ For more information, refer to [IMPLAN's article on estimating Zip Code Data](#)

⁷ For more information, refer to [IMPLAN's article on aggregation bias](#).

Figure 15: IMPLAN Model⁸



⁸ IMPLAN. [Assisted Economy](#).

A jet fighter on an aircraft carrier in front of a sunset sky.



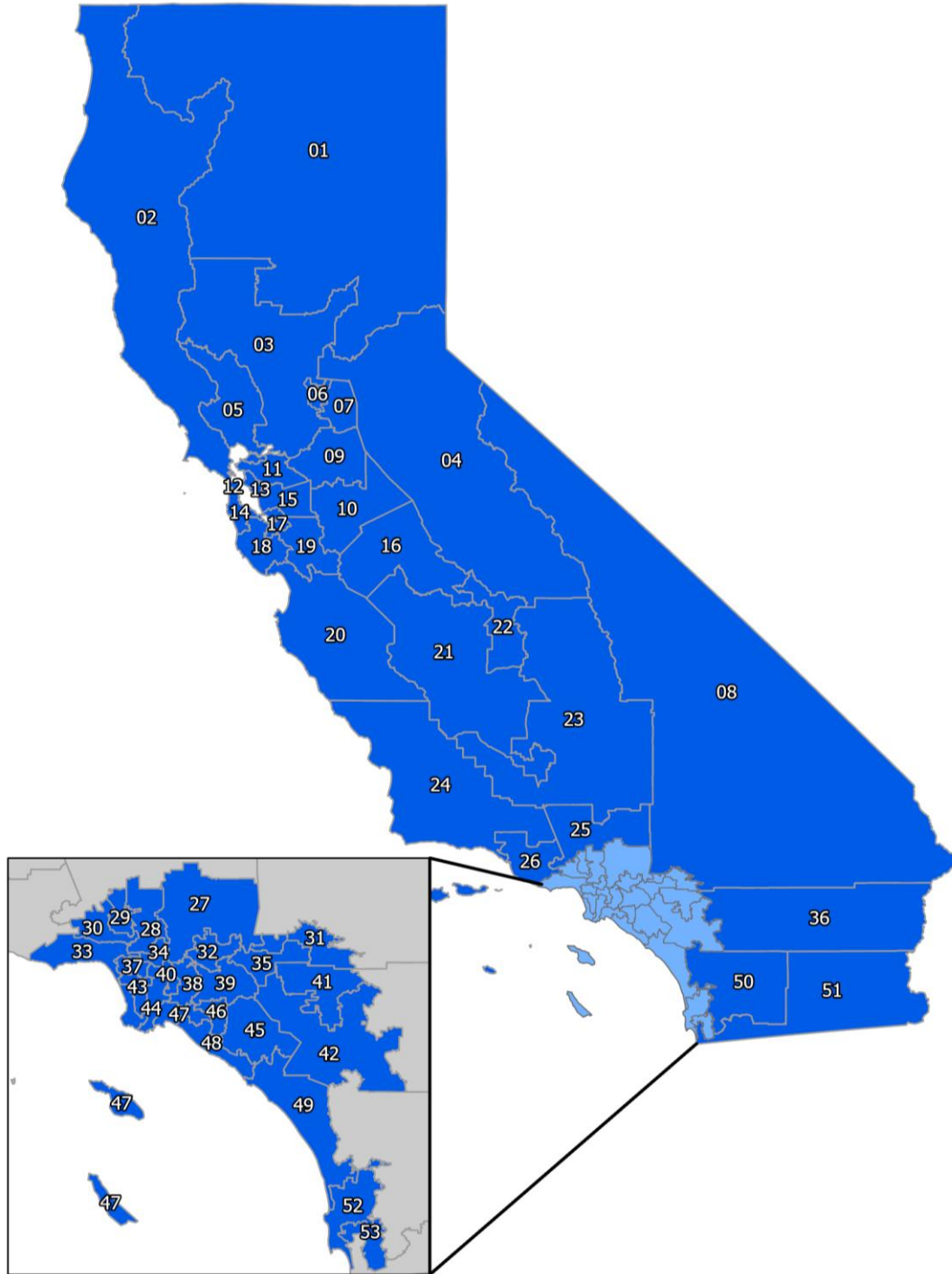
Appendix II: Regional Factbooks

Economic impacts for the eight regions described in this supplement are detailed in a separate appendix which can be found on the Governor’s Military Council website at militarycouncil.ca.gov.



Appendix III: District Factsheets

Economic impacts are detailed for all 53 California congressional districts in a separate appendix which can be found on the Governor’s Military Council website at militarycouncil.ca.gov.





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