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US Aerospace & Defense Labor Market Study Employment outlook upbeat, reversing job losses

February 2016

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Introduction

The US Aerospace & Defense (A&D) sector is one of the top employers and taxpayers to the US economy. With direct and indirect employment of 4.1 million workers in 2014, spread across the nation, the sector paid an estimated \$54.3 billion in corporate and individual income-based taxes to local, state, and the federal government, and paid \$115.6 billion in wages to those directly employed.¹

Over the past few years, even as sector revenue increased, total employment has decreased. At the subsector level, commercial aerospace employment increases were offset by a significant decrease in employment within the defense subsector—approximately 185,000 jobs lost since 2010. This decline has affected the industrial base and its ability to retain critical capabilities and skills for the future. In contrast, commercial aerospace revenue, production volume, and backlog considerably increased, offsetting some of the defense subsector decline in revenues.

The outlook for overall A&D sector employment over the next few years is positive, driven primarily by growth in the US defense budget due to heightened security threats and recapitalization requirements. Moreover, strong passenger travel demand and equipment replacement requirements are likely to keep the commercial aerospace subsector employment buoyant in the near future. As a result, the overall A&D sector is expected to return to growth in employment, with over 39,000 additional employees added in 2016.

Interestingly, A&D sector jobs are paying almost twice the national average, and taxes paid increased since 2010, despite the job losses, allowing for more economic value creation through increased consumer spending, investments, and home ownership.

This study provides details on the A&D sector labor market—employment, wages, taxes as well as state-by-state statistics, including the near term outlook.



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US aerospace & defense labor market outlook

The pace of decline in employment in the overall US A&D sector appears to be tapering off. The employment base is expected to turnaround with an increase in 2016, primarily led by a return to revenue growth in the defense subsector. Although the US A&D employee base is expected to have declined again in 2015, the magnitude of decline is likely to be lower as compared to previous years. We expect that the US A&D sector employee base to decline by a nominal 0.8 percent in 2015, compared to a decline of 1.1 percent in 2014. On the other hand, we expect the overall US A&D sector in 2016 to experience job growth of about 3.2 percent, which equates to an estimated 39,443 additional sector employees.²

Looking at the US defense subsector, we expect a rebound in 2016 after experiencing a period of decline during the last five years. In 2014, this subsector experienced a 2.4 percent decline in employee base, while 2015 experienced a slower decline of 1.3 percent in 2015. Increases in the US Department of Defense (DoD) budget are expected to drive increase in employment in 2016 by an estimated 3.7 percent, equating to 31,267 additional employees.³

US defense companies have been reducing their headcount over the last five years, mainly due to DoD budget cuts caused by the Budget Control Act of 2011. During the 2010-15 period, the US DoD budget, including overseas contingency operations funding, decreased 15.3 percent, from \$691 billion (2010) to \$585 billion (2015). However, with increased national security threats, global tensions and recapitalization requirements, the DoD budget for 2016 has increased by \$13.0 billion⁴. Prime defense contractors in the US are expected to be the key beneficiaries from the increase in defense budgets, thereby contributing to the expected rise in employment in the overall A&D sector in 2016.

Looking at the US commercial aerospace subsector, we expect continued growth in employment in 2016, driven by an increase in aircraft production. In addition, stable economic growth in US gross domestic product (GDP), lower commodity prices, especially crude oil, and strong passenger travel demand will contribute to additional employment. Nominal employment growth of 0.4 percent YoY was experienced in 2015, but employment in the US commercial aerospace market is likely to experience a hastening of growth, expected to be 1.8 percent YoY in 2016, which equates to an estimated 6,975 employees added.⁵ However, we expect that manufacturing, supply chain and engineering efficiencies coupled with the increased use of process automation and robotics will result in employment growth rates that are lower than revenue growth rates in this subsector.

Executive summary

The study analyzes the state of the labor market within the US A&D sector in terms of employment, wages and taxes paid. The table below provides a snapshot of key labor market and related metrics as well as the percentage change in these metrics from 2010 to 2014. Double arrows indicate double-digit percentage changes.

Financial and Economic Metrics	2010	2014	Change	Trend
Total direct employment	1,361,124	1,232,587	-9.4%	↓
Total commercial aerospace company employment	330,737	387,521	17.2%	↑↑
Employees at top 20 (large) commercial aerospace companies	255,268	319,367	25.1%	↑↑
Employees at mid-sized commercial aerospace companies	32,355	34,844	7.7%	↑
Subtotal of employees at top 20 (large) and mid-sized commercial aerospace companies	287,623	354,211	23.2%	↑↑
Employees at small commercial aerospace companies	43,114	33,310	-22.7%	↓↓
Total defense company employment	1,030,387	845,066	-18.0%	↓↓
Employees at top 20 (large) defense companies	768,002	637,141	-17.0%	↓↓
Employees at mid-sized defense companies	155,137	124,224	-19.9%	↓↓
Subtotal of employees at top 20 (large) and mid-sized defense companies	923,139	761,365	-17.5%	↓↓
Employees at small defense companies	107,248	83,701	-22.0%	↓↓
Total indirect employment	3,212,253	2,908,905	-9.4%	↓
Grand total direct and indirect employment	4,573,377	4,141,492	-9.4%	↓
Company federal and state taxes paid	\$19,132,062,300	\$21,462,883,689	12.2%	↑↑
Employee wages	\$107,873,069,058	\$115,638,544,997	7.2%	↑
Average wages per employee	\$79,253	\$93,818	18.4%	↑↑
Employee taxes paid	\$30,008,972,985	\$32,859,809,007	9.5%	↑
Average taxes paid per employee	\$22,047	\$26,659	20.9%	↑↑

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, the Bureau of Economic Analysis, company annual reports and 10-K statements, and S&P CompuStat.

Employment decreased, while wages increased

We estimate that the US A&D sector directly employed 1.23 million workers in 2014, with a payroll of \$115.6 billion. This represents a decrease of 128,537 employees (9.4 percent decrease) compared to 2010, with an offsetting increase of \$7.7 billion in wages (7.2 percent increase). Approximately 185,321 (-18.0 percent) jobs were lost in the defense subsector, but these losses were offset by 56,784 (17.2 percent) jobs gained in the commercial aerospace subsector. Many of these defense job cutbacks were precipitated by US Department of Defense (DoD) spending cuts related to the Budget Control Act of 2011, as well as the drawdown of military forces in the Middle East. Between 2010 and 2014, the top 20 US defense companies lost 130,861 jobs, or 17.0 percent of their workforce.⁶ In addition, advances in manufacturing and engineering technology have led to the substitution of automation for labor, allowing the sector to become more efficient and less labor intensive.

It is estimated that the sector has indirect employment of 2.36 jobs for every directly employed sector worker.⁷ This employment multiplier is a “direct-effect” multiplier, and accounts for primary- and secondary-effect employment associated with the A&D sector. It does not contemplate “final demand” employment or work associated with tertiary-effect employment well beyond the direct effect of the A&D sector’s employment base. Thus, we estimate that indirect employment totaled 2.91 million workers in 2014, in addition to those cited above who were directly employed. Together with these indirect employees, we estimate that the grand total direct and

indirect employment associated with the US A&D sector was 4.14 million jobs, not including A&D skilled workers employed by the US government or airlines. This represents a reduction of 431,885 jobs since 2010, a 9.4 percent decrease in total direct and indirect employment in the A&D sector.⁸

Taxes increased, despite job losses

Sector companies paid \$7.71 billion in corporate federal income taxes on their earnings, as well as \$4.13 billion in state and local income taxes and business taxes in 2014. Despite job losses, this represents a \$1.52 billion growth in total corporate income taxes paid since 2010, a 14.7 percent increase. Also, despite the 9.4 percent decrease in sector employment, individual income taxes in 2014 totaled \$23.93 billion, an increase of 9.9 percent compared to 2010. Usually, decreased employment would commensurately affect individual federal and state income taxes paid. However despite the reduction in jobs, individual taxes increased largely due to total wage growth and tax rate hikes for individuals with high incomes. Together with other corporate and individual income-based taxes, such as Social Security tax, Medicare tax, and FUTA tax, the A&D sector generated an estimated \$54.32 billion in combined wage and company income-based taxes to state and US government treasuries, not including the taxes paid by indirect sector employment nor federal A&D skilled workers.⁹

Findings at the national level

This section identifies findings at the US national level regarding the A&D sector's direct and indirect employment, wages, and taxes paid.

Employment

Direct employment by job classification

As stated earlier, we found that the US A&D sector, as broadly defined in the scope of this study, directly employed 1.23 million workers in 2014, a decrease of 9.4 percent or a -2.4 percent compounded annual growth rate (CAGR) since 2010, or 128,537 fewer employees. This reflects a sizeable reduction in workforce, but it is small in comparison to the employment cutbacks over the six-year period from 2008 to 2014, which experienced a reduction of 198,838 employees.¹⁰

These metrics include employees at companies whose primary objective is to support the A&D sector's major customers, primarily the DoD, FAA, NASA, and commercial airlines. This includes support personnel for smaller customers, such as direct-to-home television broadcast providers, data and voice communication providers, National Oceanic and Atmospheric Administration, Department of Homeland Security, and individuals or companies purchasing private general aviation aircraft. These metrics include all such employees working in the US, regardless of the employer's country of origin.

The A&D sector was analyzed by NAICS codes to stratify employment levels. The following charts illustrate our findings from 2008 through 2014, including the changes in employment.



Figure 1: Direct Employment by A&D Sector Classification (2008–2014)

NAICS Code	2008	2009	2010	2011	2012	2013	2014	Changes in Employment from 2008 to 2014	Changes in Employment from 2010 to 2014
Aerospace products and parts manufacturing (33641)	709,274	694,292	671,033	668,357	657,846	645,030	621,757	(87,517)	(49,276)
A&D-related services	340,814	328,596	330,313	325,695	317,329	316,149	303,409	(37,405)	(26,904)
Manufacture of search, detection, navigation, guidance, aeronautical, and nautical systems and instruments (334511)	221,760	215,528	209,972	189,541	176,541	164,428	173,866	(47,894)	(36,106)
Establishments engaged in operating shipyards (336611)	102,545	98,475	92,679	89,909	91,867	90,519	85,906	(16,639)	(6,773)
Ammunition manufacturing, except small arms (332993)	14,493	14,341	14,362	13,690	13,073	12,399	12,580	(1,913)	(1,781)
Military land vehicles manufacturing (336992)	22,003	25,324	22,779	21,717	19,535	15,304	18,602	(3,401)	(4,178)
Radio and television broadcast and wireless communication equipment (334220)	10,346	9,894	9,788	9,227	8,532	7,840	8,311	(2,036)	(1,477)
Ordnance manufacturing (332995)	9,791	10,406	9,784	7,945	7,671	7,483	7,719	(2,072)	(2,064)
Small arms ammunition manufacturing (332992)	182	200	211	216	194	194	192	10	(19)
Small firearms manufacturing (332994)	217	221	204	256	268	308	245	28	41
Grand Total	1,431,425	1,397,277	1,361,124	1,326,551	1,292,857	1,259,653	1,232,587	(171,772)	(128,537)

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau.

Employment decreases in defense-related NAICS codes reflect the downturn in the defense subsector, including program cancellations and reductions in units delivered. This contrasts with a significant upturn in the commercial aerospace subsector and its related supply chain networks from 2008 to 2014. The overall decrease in employment can be largely attributed to significant reductions in the workforce of several major defense contractors. The job classification with the largest percentage decrease in employment since 2008 was ordnance manufacturing (NAICS code 332995). On the other hand, the job classification with the largest percentage increase in employment since 2008 was manufacturing of small firearms (NAICS code 332994).

Figure 2: 2013 Direct Employment Growth by A&D Sector Classification

NAICS Code	% CAGR 2008–2014	% CAGR 2010–2014
Small firearms manufacturing (332994)	2.08%	4.71%
Establishments engaged in operating shipyards (336611)	-2.91%	-1.88%
Aerospace products and parts manufacturing (33641)	-2.17%	-1.89%
A&D-related services	-1.92%	-2.10%
Small arms ammunition manufacturing (332992)	0.86%	-2.33%
Ammunition manufacturing, except small arms (332993)	-2.33%	-3.26%
Radio and television broadcast and wireless communication equipment (334220)	-3.59%	-4.01%
Manufacture of search, detection, navigation, guidance, aeronautical, and nautical systems and instruments	-3.97%	-4.61%
Military land vehicles manufacturing (336992)	-2.76%	-4.94%
Ordnance manufacturing (332995)	-3.88%	-5.75%
Grand Total	-2.46%	-2.45%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, and the US Census Bureau.

Direct employment by subsector

We found that employment in the A&D sector was generally segregated into the following subsectors: (a) commercial aerospace, including aircraft, and general aviation; (b) defense, including space and security; and (c) sector-skilled workers employed by the US government agencies, such as NASA, Defense Advanced Research Projects Agency (DARPA), and DoD depot-level maintenance and repair. We found that 387,521 workers were directly employed in the commercial aerospace subsector in 2014, while 845,066 workers were directly employed in the defense subsector. These two subsectors are populated with employees working for private, nonprofit, and registered public companies. Thus, 68.6 percent of total sector employment was in the defense subsector, while 31.4 percent of workers were employed in the commercial aerospace subsector.¹¹

As mentioned, total sector employment decreased by 128,537 employees in 2014, (9.4 percent decline) compared to 2010. Approximately 185,321 (-18.0 percent) jobs were lost in the defense subsector, which were offset by 56,784 (+17.2 percent) jobs gained in the commercial aerospace subsector.¹²

Between 2010 and 2014, the top 20 US defense companies lost 130,861 jobs, or 17.0 percent of their workforce. Many of these job losses were precipitated by DoD budget cuts caused by the Budget Control Act of

2011, as well as the drawdown of military forces in the Middle East.¹³

On the other hand, the top 20 commercial aerospace companies increased jobs in 2014 by 64,099 employees (25.1 percent) compared to 2010.¹⁴ Employment gains can be attributed to the rapid increase in production rates for commercial aircraft, which experienced a global output nearly twice that observed less than a decade ago. Employment gains in commercial aerospace may have been higher if not for the introduction of process efficiencies. Advances in manufacturing and engineering technology have led to the substitution of automation for labor, allowing the sector to become more efficient and less labor intensive.

Direct employment by size of company

Total A&D sector direct employment at large businesses declined by 66,762 employees from 2010 to 2014, a 6.5 percent decrease. In contrast, direct employment at mid-sized and small companies decreased by 15.2 percent and 22.2 percent, respectively, during the same period. Consequently, the share of labor at large companies as a percentage of total sector employment increased from 75.2 percent in 2010 to 77.6 percent in 2014.¹⁵ The data show that over half of all employment losses in the industry were at mid-sized and small companies. Figure 3 illustrates the changes in employment from 2010 to 2014 by size of company in the sector.

Figure 3: Total A&D Sector Direct Employment by Size of Company (2010 versus 2014)

Size of Company	2010	2014	Change	% Change 2010–2014
Top 20 (large) companies	1,023,270	956,508	(66,762)	-6.5%
Mid-sized companies	187,492	159,068	(28,424)	-15.2%
Small companies	150,362	117,011	(33,351)	-22.2%
Total	1,361,124	1,232,587	(128,537)	-9.4%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, the Bureau of Economic Analysis, company annual reports and 10-K statements, and S&P CompuStat.

Direct employment at large commercial aerospace businesses grew by 64,099 employees from 2010 to 2014, a significant 25.1 percent increase. In addition, mid-sized commercial aerospace companies experienced a 7.7 percent growth in direct employment for the same period. On the other hand, direct employment at small companies in the commercial aerospace subsector decreased to 33,310 employees in 2014 compared to 43,114 employees in 2010, a 22.7 percent drop.¹⁶ Decreases in employment at small companies were likely the result of acquisitions by large companies in order to gain scale economies. Small companies are challenged to become more cost competitive as large suppliers have asked for price concessions because airline customers increasingly look to aircraft pricing as a key selection discriminator. Figure 4 illustrates the changes in employment for the commercial aerospace subsector by size of company in the subsector.

Figure 4: Commercial Aerospace Subsector Direct Employment by Size of Company (2010 versus 2014)

Size of Company	2010	2014	Change	% Change 2010–2014
Top 20 (large) companies	255,268	319,367	64,099	25.1%
Mid-sized companies	32,355	34,844	2,489	7.7%
Small companies	43,114	33,310	(9,804)	-22.7%
Total	330,737	387,521	56,784	17.2%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, the Bureau of Economic Analysis, company annual reports and 10-K statements, and S&P CompuStat.

As shown in Figure 5 below, the number of direct employees at large, mid-sized, and small defense companies declined by 17.0 percent, 19.9 percent, and 22.0 percent, respectively, from 2010 to 2014, an overall 18.0 percent cutback in the subsector. Large defense companies decreased employment by 130,861 workers from 2010 to 2014, while the overall defense subsector experienced a reduction of 185,321 workers during this period.¹⁷ As stated earlier, there has been a dramatic reduction in employment in the defense subsector due to the DoD budget cuts caused by the Budget Control Act of 2011, as well as the drawdown of forces deployed in the Middle East. These budget cuts were recently mitigated by the Bipartisan Budget Act of 2013, which provided partial budget relief in 2013 and 2014. Figure 5 illustrates the changes in employment for the defense subsector by size of company in the subsector.

Figure 5: Defense Subsector Direct Employment by Size of Company (2010 versus 2014)

Size of Company	2010	2014	Change	% Change 2010–2014
Top 20 (large) companies	768,002	637,141	(130,861)	-17.0%
Mid-sized companies	155,137	124,224	(30,913)	-19.9%
Small companies	107,248	83,701	(23,547)	-22.0%
Total	1,030,387	845,066	(185,321)	-18.0%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, the Bureau of Economic Analysis, company annual reports and 10-K statements, and S&P CompuStat.

Indirect employment

The indirect employment multiplier measures how much a sector buys from elsewhere in the economy and calculates the indirect employment created by this exchange. A&D sector direct employment is supported by indirect jobs in other sectors, such as energy, professional services, health care, food service, grocery, and consumer retail. In other words, many A&D jobs create a cascading effect of additional indirect jobs that can be ultimately traced back to the A&D sector.

We found that for each direct employee in the A&D sector, there were between 1.40 and 4.64 additional indirectly employed workers, with variability caused principally by direct employee’s geographic location. Thus employment multipliers vary by state, each of which has its own rules for wage and job classifications. As a composite, we found that the average indirect employment multiplier for the United States was 2.36.¹⁸ This employment multiplier is a “direct-effect” multiplier, and it accounts for primary- and secondary-effect employment associated with the A&D sector. It does not contemplate “final demand” employment or work associated with tertiary-effect employment developed well beyond the direct effect of the A&D sector’s employment base.

Thus, we discovered indirect employment in the A&D sector were responsible for 2.91 million jobs at the national level. Together with the direct and indirect employment described above, we estimate that the A&D sector employed a grand total of 4.14 million workers.¹⁹ It should be noted that the multiplier analysis assumed additional workers taken on by a company were unemployed before their hire dates. Figure 6 illustrates our findings regarding indirect employment for each job category.

Figure 6: Indirect Employment by A&D Sector Classification

NAICS Code	2014	% Share
Aerospace products and parts manufacturing (33641)	1,489,561	51.21%
A&D-related services	730,080	25.10%
Manufacture of search, detection, navigation, guidance, aeronautical, and nautical systems and instruments (334511)	379,712	13.05%
Establishments engaged in operating shipyards (336611)	209,034	7.19%
Ammunition manufacturing, except small arms (332993)	28,632	0.98%
Military land vehicles manufacturing (336992)	35,342	1.21%
Radio and television broadcast and wireless communication equipment (334220)	18,106	0.62%
Ordnance manufacturing (332995)	17,280	0.59%
Small arms ammunition manufacturing (332992)	448	0.02%
Small firearms manufacturing (332994)	711	0.02%
Grand total	2,908,905	100.00%

Sources: Deloitte Analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, the Bureau of Economic Analysis, company annual reports and 10-K statements, and S&P CompuStat.

As seen in Figure 6, the aerospace products and parts manufacturing job classification employed 1.49 million indirect workers, more than half of the sector’s total indirect employment. We also found that A&D-related services created 730,080 indirect jobs, the second-largest class in the industry, followed by companies that manufacture search, detection, navigation, guidance, and aeronautical and nautical systems and instruments, which employed 379,712 indirect workers.²⁰

Wages

At the US national level, A&D sector payroll increased from \$107.87 billion in 2010 to \$115.64 billion in 2014, a 7.2 percent growth, despite sector employment decreases referenced earlier.²¹ Although A&D payroll was found in each state, sector wages were concentrated in states with the highest number of employees. We also found wages in each NAICS job category, but the majority of wages were concentrated in categories with the highest number of employees, in particular aerospace product and parts manufacturing and search detection and navigation instruments. Figure 7 illustrates A&D sector payroll by NAICS category, plus the changes from 2010 to 2014.

Figure 7: A&D Sector Payroll by Sector Classification

NAICS Code	2010	2014	% Change 2010–2014
Aerospace product and parts manufacturing (33641)	\$ 55,625,054,619	\$ 62,765,092,067	12.8%
Search, detection, and navigation instruments (334511)	\$ 19,895,887,735	\$ 18,237,573,234	-8.3%
Engineering services (541330)	\$ 8,790,182,997	\$ 9,677,246,977	10.1%
Ship building and repair (336611)	\$ 5,257,674,583	\$ 6,073,929,180	15.5%
Physical, engineering, and biological research (541710)	\$ 5,762,001,713	\$ 5,689,535,670	-1.3%
Facilities support services (561210)	\$ 2,017,998,673	\$ 1,990,048,626	-1.4%
Computer systems design services (541512)	\$ 1,139,483,224	\$ 1,460,736,464	28.2%
Other computer-related services (541519)	\$ 1,197,716,773	\$ 1,389,574,627	16.0%
Custom computer programming services (541511)	\$ 1,103,111,853	\$ 1,370,561,917	24.2%
Ammunition manufacturing, except small arms (332993)	\$ 944,619,660	\$ 948,827,307	0.4%
Military armored vehicles and tank parts manufacturing (336992)	\$ 1,223,230,094	\$ 946,545,949	-22.6%
Broadcast and wireless communications equipment (334220)	\$ 873,250,214	\$ 834,057,755	-4.5%
Wired telecommunications carriers (517110)	\$ 721,139,560	\$ 777,022,836	7.7%
Office administration services (561110)	\$ 569,260,886	\$ 658,003,740	15.6%
Security guards and patrol services (561612)	\$ 584,047,187	\$ 630,582,752	8.0%
Other ordnance and accessories manufacturing (332995)	\$ 642,148,319	\$ 520,643,631	-18.9%

NAICS Code	2010	2014	% Change 2010–2014
Remediation services (562910)	\$ 398,457,600	\$ 400,433,705	0.5%
Architectural services (541310)	\$ 304,719,852	\$ 331,886,755	8.9%
All other support services (561990)	\$ 252,691,459	\$ 297,289,084	17.6%
Environmental consulting services (541620)	\$ 192,536,641	\$ 212,567,330	10.4%
Janitorial services (561720)	\$ 125,581,194	\$ 141,102,090	12.4%
Landscaping services (561730)	\$ 77,435,356	\$ 87,333,489	12.8%
Data processing, hosting, and related services (518210)	\$ 49,249,831	\$ 58,398,864	18.6%
Computer facilities management services (541513)	\$ 42,210,824	\$ 48,657,322	15.3%
Other management consulting services (541618)	\$ 27,920,976	\$ 30,076,973	7.7%
All other publishers (511199)	\$ 32,304,657	\$ 26,852,613	-16.9%
Small arms and ordnance manufacturing (332994)	\$ 10,771,651	\$ 21,216,137	97.0%
Small arms ammunition manufacturing (332992)	\$ 10,308,614	\$ 10,904,567	5.8%
Directory and mailing list publishers (511140)	\$ 2,072,315	\$ 1,843,339	-11.0%
Total	\$ 107,873,069,058	\$ 115,638,544,997	7.2%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, the Bureau of Economic Analysis, company annual reports and 10-K statements, and S&P CompuStat.

Average wages for the A&D sector increased from \$79,253 in 2010 to \$93,818 in 2014, an 18.4 percent increase. The NAICS category with the highest average A&D wages in 2014 was search detection and navigation instruments at \$113,351, up 19.6 percent since 2010. In addition, we found that average wages for employees in the US A&D sector increased at a CAGR of 6.25 percent from 2008 to 2014.²²

Figure 8: Average Wages per Employee by A&D Sector Classification

NAICS Code	2008	2009	2010	2011	2012	2013	2014	% Change 2010–2014
Search, detection, and navigation instruments (334511)	\$77,793	\$84,947	\$94,755	\$99,018	\$104,025	\$108,670	\$113,351	19.6%
Custom computer programming services (541511)	\$79,257	\$83,693	\$95,130	\$99,277	\$102,646	\$106,726	\$111,324	17.0%
Broadcast and wireless communications equipment (334220)	\$70,909	\$78,530	\$89,220	\$93,796	\$99,337	\$104,227	\$108,717	21.9%
Other computer-related services (541519)	\$67,248	\$71,669	\$82,887	\$86,857	\$98,012	\$104,160	\$108,647	31.1%
Computer systems design services (541512)	\$75,410	\$80,759	\$91,591	\$96,950	\$108,523	\$103,424	\$107,880	17.8%
Wired telecommunications carriers (517110)	\$74,524	\$78,913	\$89,479	\$93,649	\$97,482	\$102,012	\$106,406	18.9%
Aerospace product and parts manufacturing (33641)	\$67,981	\$73,889	\$82,895	\$88,436	\$89,913	\$95,336	\$99,443	20.0%
Physical, engineering, and biological research (541710)	\$76,363	\$81,085	\$88,349	\$89,800	\$90,597	\$93,067	\$97,076	9.9%
Engineering services (541330)	\$67,841	\$74,119	\$82,628	\$86,218	\$89,286	\$92,998	\$97,004	17.4%
Data processing, hosting, and related services (518210)	\$63,334	\$69,396	\$78,619	\$83,067	\$86,014	\$90,821	\$94,734	20.5%
Other management consulting services (541618)	\$71,236	\$72,353	\$82,380	\$86,061	\$89,562	\$90,563	\$94,464	14.7%
Computer facilities management services (541513)	\$62,066	\$66,483	\$74,729	\$78,515	\$81,646	\$88,332	\$92,137	23.3%

NAICS Code	2008	2009	2010	2011	2012	2013	2014	% Change 2010– 2014
Office administration services (561110)	\$61,500	\$63,561	\$73,400	\$74,665	\$81,375	\$81,509	\$85,021	15.8%
Architectural services (541310)	\$61,873	\$63,494	\$69,428	\$72,305	\$75,752	\$79,205	\$82,617	19.0%
Directory and mailing list publishers (511140)	\$54,751	\$57,558	\$65,301	\$69,346	\$71,069	\$75,980	\$79,253	21.4%
Ammunition manufacturing, except small arms (332993)	\$55,037	\$59,427	\$65,773	\$68,449	\$70,914	\$74,978	\$78,208	18.9%
Other ordnance and accessories manufacturing (332995)	\$56,094	\$65,452	\$65,636	\$67,054	\$67,247	\$68,169	\$71,106	8.3%
Small arms and ordnance manufacturing (332994)	\$44,031	\$49,264	\$52,865	\$56,958	\$61,970	\$67,509	\$70,418	33.2%
Ship building and repair (336611)	\$46,946	\$50,444	\$56,730	\$60,617	\$62,520	\$65,743	\$68,575	20.9%
Military armored vehicles and tank parts manufacturing (336992)	\$37,899	\$48,131	\$53,699	\$59,889	\$57,219	\$60,596	\$63,207	17.7%
Remediation services (562910)	\$45,311	\$49,179	\$55,789	\$57,134	\$57,422	\$60,250	\$62,846	12.6%
Small arms ammunition manufacturing (332992)	\$40,842	\$45,239	\$48,920	\$52,416	\$52,750	\$55,045	\$57,416	17.4%
All other publishers (511199)	\$41,042	\$45,224	\$51,607	\$49,982	\$52,540	\$55,009	\$57,379	11.2%
Facilities support services (561210)	\$39,157	\$42,995	\$48,778	\$50,513	\$52,043	\$53,087	\$55,374	13.5%

NAICS Code	2008	2009	2010	2011	2012	2013	2014	% Change 2010–2014
All other support services (561990)	\$32,072	\$33,242	\$37,599	\$39,183	\$42,012	\$43,230	\$45,093	19.9%
Landscaping services (561730)	\$24,426	\$25,654	\$28,374	\$29,235	\$30,283	\$31,538	\$32,897	15.9%
Security guards and patrol services (561612)	\$19,826	\$21,442	\$23,620	\$24,142	\$24,655	\$25,315	\$26,405	11.8%
Environmental consulting services (541620)	\$19,702	\$21,054	\$22,611	\$22,520	\$22,086	\$21,690	\$22,624	0.1%
Janitorial services (561720)	\$15,742	\$16,993	\$18,947	\$19,488	\$20,071	\$20,825	\$21,723	14.6%
Overall Average	\$65,218	\$70,867	\$79,253	\$83,560	\$85,759	\$89,943	\$93,818	13.5%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, the Bureau of Economic Analysis, company annual reports and 10-K statements, and S&P CompuStat.



Taxes

There are several types of taxes that public and private companies, as well as individuals, must pay to various tax jurisdictions in the US. We analyzed several sources to estimate the taxes paid by the A&D sector. The most significant taxes paid by corporations are federal corporate income taxes; state corporate income taxes or their equivalents; employer payroll taxes comprising Social Security, Medicare, unemployment taxes (Federal Insurance Contributions Act (FICA), and the Federal Unemployment Tax Act (FUTA)); excise taxes; and property taxes.

On the other hand, the most significant taxes paid by workers employed by the A&D sector are federal individual income taxes and federal employee payroll taxes (FICA, Social Security, and Medicare). Only taxes based on payroll income were included in the scope of this study as data necessary to estimate these taxes was publicly available. Employee taxes paid on consumer sales, investments, personal property, and real estate are not included in the scope of this study.

In summary, for 2014 we estimate that A&D sector companies and employees paid \$21.46 billion and \$32.86 billion, respectively, in federal, state, and other taxes. Thus, we estimate the grand total of income-related taxes paid by A&D companies and their employees in 2014 to be \$54.32 billion, a 10.5 percent increase over 2010 in which A&D companies and their employees paid a total of \$49.14 billion of income-related taxes.²³ These amounts do not include indirect employee taxes, which could be substantial.

Corporate taxes

Figure 9 illustrates the income-related taxes paid by A&D companies to federal and state governments that are within the scope of this study, which amounted to \$21.46 billion in 2014. As the figure shows, total corporate taxes paid increased at a CAGR of 3.0 percent from 2008 to 2014, and overall corporate taxes paid increased at a CAGR of 2.9 percent from 2010 to 2014.²⁴ The most significant taxes paid by A&D corporations were federal corporate income taxes, followed closely by social security taxes.

Figure 9: Corporate Taxes (\$ Billion)

Type of Tax	2008	2009	2010	2011	2012	2013	2014	% CAGR 2008–14	% CAGR 2010–14
Federal corporate income tax	\$ 6.88	\$ 6.86	\$ 6.78	\$ 7.40	\$ 7.33	\$ 7.46	\$7.71	1.9%	3.3%
Social security tax	\$ 6.02	\$ 6.14	\$ 6.68	\$ 6.87	\$ 6.87	\$ 7.02	\$7.31	3.3%	2.3%
Medicare tax	\$ 1.41	\$ 1.44	\$ 1.56	\$ 1.61	\$ 1.61	\$ 1.64	\$1.71	3.3%	2.3%
FUTA tax	\$ 0.54	\$ 0.53	\$ 0.57	\$ 0.56	\$ 0.55	\$ 0.55	\$0.59	1.6%	1.1%
State business income tax	\$ 3.17	\$ 3.17	\$ 3.54	\$ 3.68	\$ 3.95	\$ 4.36	\$4.13	4.5%	3.9%
Total Corporate Taxes Paid	\$ 18.01	\$ 18.14	\$ 19.13	\$ 20.12	\$ 20.32	\$ 21.03	\$21.46	3.0%	2.9%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, the Bureau of Economic Analysis, company annual reports and 10-K statements, and S&P CompuStat.

Individual taxes

Figure 10 illustrates the income-related taxes paid by workers employed by A&D companies to federal and state governments that are within the scope of this study, which amounted to \$32.86 billion in 2014. As the figure shows, total individual taxes paid increased at a CAGR of 4.2 percent from 2008 to 2014, and overall individual taxes paid increased at a CAGR of 2.3 percent from 2010 to 2014.²⁵ The most significant taxes paid by A&D workers were federal income taxes, followed closely by social security taxes.

Figure 10: Individual Taxes (\$ Billion)

Type of Tax	2008	2009	2010	2011	2012	2013	2014	% CAGR 2008–14	% CAGR 2010–14
Federal individual income tax	\$ 16.67	\$ 17.68	\$ 19.72	\$ 20.64	\$ 20.79	\$ 21.45	\$21.75	4.5%	2.5%
Social security tax	\$ 5.86	\$ 6.14	\$ 6.68	\$ 6.87	\$ 6.87	\$ 7.02	\$7.23	3.6%	2.0%
State individual income tax	\$ 1.80	\$ 1.89	\$ 2.05	\$ 2.08	\$ 2.07	\$ 2.09	\$2.18	3.3%	1.6%
Medicare tax	\$ 1.37	\$ 1.44	\$ 1.56	\$ 1.61	\$ 1.61	\$ 1.64	\$1.69	3.6%	2.0%
Total Individual Taxes Paid	\$ 25.70	\$ 27.14	\$ 30.01	\$ 31.20	\$ 31.34	\$ 32.20	\$32.86	4.2%	2.3%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, the Bureau of Economic Analysis, company annual reports and 10-K statements, and S&P CompuStat.

Additional employees

Our scope does not include workers with A&D-sector skills employed outside of the 29 NAICS codes analyzed. Examples of such government civil service employees include those that repair and maintain KC-135 aerial refueling tankers at Tinker Air Force Base in Oklahoma City, space scientists at NASA, and engineers at DARPA who perform advanced aerospace studies. In addition, employees at the aircraft maintenance, repair, and overhaul facilities of airlines were not included in this study due to lack of consistent data in public documents.

Finally, our study includes employees verified using Bureau of Labor Statistics (“BLS”) data as the primary source. The bottom-up approach of identifying employees of each A&D company in the US resulted in a sector employee count above the number that we found using the primary methodology. Thus, it is reasonable to assume that our estimate of 1.23 million sector workers is a conservative and more accurate finding than simply using BLS data.²⁶

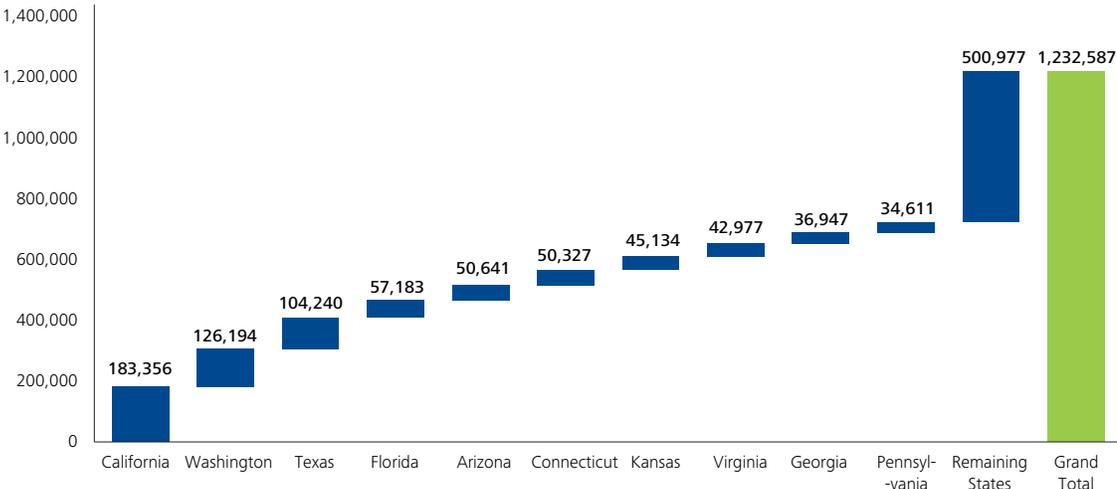
Findings at the US state level

Employment

A&D employment is concentrated in a few selected areas of the country, although sector employees can be found in every state. More than one-third of the sector’s workforce is employed in California, Washington, and Texas, the three states with the highest concentration of A&D sector. The top seven states with the most A&D employees are, in descending order, California, Washington, Texas, Florida, Arizona, Connecticut, and Kansas. As of 2014, these states accounted for 50.1 percent of the total A&D sector employment in the US. Indeed, the top 20 states account for 80.8 percent of total sector employment, an indication that the sector has a heavy geographic concentration.²⁷

Figure 11 illustrates direct A&D sector employment for the 10 states with the highest concentration of A&D sector. It shows that the sector is predominately concentrated in the top three states of California, Washington, and Texas.

Figure 11: A&D Sector Direct Employment by Top Ten States



Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, and the US Census Bureau.

California, Washington, and Texas account for more than one-third of A&D sector employees in the US. However, during the period 2010 to 2014, only South Carolina added employees and exhibited an 18.2 percent increase in employment due to significant commercial aircraft activity growth. From 2010 to 2014, 1,759 A&D sector employees were added in South Carolina. Some companies moved their headquarter locations, set up new factory locations, or closed facilities. Most notably, between 2010 and 2014, approximately 25,094 A&D sector jobs were eliminated in California, and proximity to US government customers spurred several defense companies to relocate their headquarters to Virginia and Washington DC. This reflects an evolving strategy by companies to move closer to their customers, as well as to take advantage of lower labor costs and friendlier regulatory environments in right-to-work states. Over time, we expect to see greater economic impact by the A&D sector on these growing areas.

Figure 12: A&D Sector Direct Employment by State (2008 through 2014)

State	2008	2009	2010	2011	2012	2013	2014	Change	% Change 2010-2014
California	221,658	213,667	208,450	198,735	188,870	184,286	183,356	(25,094)	-12.0%
Washington	131,174	130,961	128,085	132,799	138,185	136,864	126,194	(1,891)	-1.5%
Texas	117,871	115,304	114,749	112,776	109,876	106,007	104,240	(10,509)	-9.2%
Florida	69,555	66,410	64,583	62,045	58,885	57,821	57,183	(7,401)	-11.5%
Arizona	58,988	62,048	58,039	54,722	52,799	50,006	50,641	(7,398)	-12.7%
Connecticut	60,223	58,233	56,664	54,867	52,975	49,684	50,327	(6,337)	-11.2%
Kansas	65,803	57,299	50,855	48,687	47,296	45,222	45,134	(5,721)	-11.3%
Virginia	45,920	46,720	46,988	45,959	45,205	44,606	42,977	(4,011)	-8.5%
Georgia	38,566	38,819	39,184	40,578	39,519	37,815	36,947	(2,238)	-5.7%
Pennsylvania	36,074	36,644	37,207	36,886	36,316	36,715	34,611	(2,597)	-7.0%
New York	45,583	44,762	43,105	41,647	39,323	36,556	37,727	(5,378)	-12.5%
Ohio	38,981	38,066	36,509	35,535	34,380	33,038	32,779	(3,731)	-10.2%
Massachusetts	37,166	37,039	36,923	34,652	33,911	32,806	32,499	(4,424)	-12.0%
Missouri	27,065	27,400	26,888	25,800	24,815	28,902	25,052	(1,835)	-6.8%
Alabama	31,259	31,756	30,482	29,587	28,665	28,282	27,510	(2,972)	-9.8%
Maryland	32,960	33,106	33,309	31,479	29,571	28,002	28,736	(4,573)	-13.7%
New Jersey	27,112	25,816	25,093	24,364	23,240	21,865	22,217	(2,877)	-11.5%
Colorado	24,095	23,673	22,795	21,996	21,165	20,653	20,356	(2,439)	-10.7%
Indiana	23,170	23,390	22,016	21,759	21,083	19,512	19,826	(2,190)	-9.9%
Michigan	19,825	18,279	18,198	18,645	19,184	19,186	17,707	(491)	-2.7%

State	2008	2009	2010	2011	2012	2013	2014	Change	% Change 2010-2014
Illinois	21,299	20,185	20,033	19,593	19,222	18,489	18,181	(1,852)	-9.2%
Louisiana	25,553	25,102	22,560	20,666	19,101	17,119	18,638	(3,922)	-17.4%
Mississippi	18,295	17,869	17,475	16,807	16,545	16,334	15,791	(1,684)	-9.6%
Iowa	18,095	17,769	17,522	16,309	15,403	14,514	14,969	(2,553)	-14.6%
North Carolina	14,784	14,119	13,928	14,883	14,750	14,398	13,640	(288)	-2.1%
South Carolina	7,497	7,919	9,650	12,119	12,946	13,614	11,409	1,759	18.2%
Minnesota	15,047	14,850	14,298	14,113	13,665	13,137	12,979	(1,319)	-9.2%
Oklahoma	12,075	10,999	11,027	11,320	11,827	12,226	10,930	(98)	-0.9%
Maine	12,827	12,447	11,920	11,504	11,460	11,250	10,849	(1,071)	-9.0%
Utah	16,187	15,271	13,118	11,913	11,479	11,063	11,174	(1,944)	-14.8%
Tennessee	10,641	10,260	10,106	9,847	10,107	9,994	9,424	(682)	-6.8%
New Hampshire	11,344	11,020	10,769	10,205	9,857	9,443	9,463	(1,306)	-12.1%
Kentucky	10,348	10,795	10,617	9,687	9,295	9,160	9,105	(1,512)	-14.2%
Oregon	9,215	8,262	8,438	8,668	8,827	8,844	8,187	(251)	-3.0%
Wisconsin	9,601	8,764	8,240	7,993	8,133	7,718	7,545	(696)	-8.4%
New Mexico	11,141	8,984	8,695	8,222	7,747	7,452	7,544	(1,151)	-13.2%
Arkansas	9,838	9,514	8,661	8,309	8,020	7,411	7,611	(1,050)	-12.1%

State	2008	2009	2010	2011	2012	2013	2014	Change	% Change 2010-2014
Puerto Rico	6,343	6,150	5,932	5,568	5,340	5,091	5,152	(780)	-13.2%
West Virginia	5,784	6,022	5,875	5,592	5,217	4,810	5,046	(829)	-14.1%
Rhode Island	4,795	4,676	4,538	4,311	4,207	4,078	4,027	(511)	-11.3%
Vermont	4,202	4,124	3,956	3,964	3,862	3,732	3,648	(308)	-7.8%
District of Columbia	3,648	3,597	3,669	3,498	3,331	3,272	3,236	(433)	-11.8%
Nevada	4,486	4,013	3,945	3,741	3,434	3,211	3,364	(581)	-14.7%
Hawaii	3,181	3,116	3,091	2,943	2,819	2,638	2,699	(392)	-12.7%
Nebraska	2,523	2,527	2,434	2,453	2,393	2,382	2,273	(161)	-6.6%
Idaho	2,635	2,585	2,486	2,386	2,309	2,287	2,225	(261)	-10.5%
Delaware	1,831	1,732	1,742	1,741	1,694	2,147	1,727	(15)	-0.9%
North Dakota	1,951	1,936	1,724	1,679	1,738	1,795	1,633	(91)	-5.3%
Alaska	1,796	1,857	1,706	1,673	1,693	1,653	1,582	(124)	-7.3%
Montana	1,402	1,378	1,399	1,395	1,216	1,247	1,235	(164)	-11.7%
South Dakota	1,028	1,052	974	916	899	877	862	(112)	-11.5%
Wyoming	522	491	472	440	448	439	423	(49)	-10.4%
Total	1,432,960	1,398,776	1,361,124	1,327,974	1,294,244	1,259,653	1,232,587	(128,537)	-9.4%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, and the US Census Bureau.

Figure 13 illustrates job changes experienced in the A&D sector from 2010 to 2014. As can be seen from the figure, South Carolina gained 1,759 sector jobs, the highest in the US, while California lost 25,094 sector jobs, the most of any state.²⁸

Figure 13: Nominal Employment Change by State (2010 versus 2014)

State	2010	2014	Change	% Change
South Carolina	9,650	11,409	1,759	18.2%
Delaware	1,742	1,727	(15)	-0.9%
Wyoming	472	423	(49)	-10.4%
North Dakota	1,724	1,633	(91)	-5.3%
Oklahoma	11,027	10,930	(98)	-0.9%
South Dakota	974	862	(112)	-11.5%
Alaska	1,706	1,582	(124)	-7.3%
Nebraska	2,434	2,273	(161)	-6.6%
Montana	1,399	1,235	(164)	-11.7%
Oregon	8,438	8,187	(251)	-3.0%
Idaho	2,486	2,225	(261)	-10.5%
North Carolina	13,928	13,640	(288)	-2.1%
Vermont	3,956	3,648	(308)	-7.8%
Hawaii	3,091	2,699	(392)	-12.7%
District of Columbia	3,669	3,236	(433)	-11.8%
Michigan	18,198	17,707	(491)	-2.7%
Rhode Island	4,538	4,027	(511)	-11.3%
Nevada	3,945	3,364	(581)	-14.7%
Tennessee	10,106	9,424	(682)	-6.8%
Wisconsin	8,240	7,545	(696)	-8.4%
Puerto Rico	5,932	5,152	(780)	-13.2%
West Virginia	5,875	5,046	(829)	-14.1%
Arkansas	8,661	7,611	(1,050)	-12.1%
Maine	11,920	10,849	(1,071)	-9.0%
New Mexico	8,695	7,544	(1,151)	-13.2%
New Hampshire	10,769	9,463	(1,306)	-12.1%
Minnesota	14,298	12,979	(1,319)	-9.2%
Kentucky	10,617	9,105	(1,512)	-14.2%

State	2010	2014	Change	% Change
Mississippi	17,475	15,791	(1,684)	-9.6%
Missouri	26,888	25,052	(1,835)	-6.8%
Illinois	20,033	18,181	(1,852)	-9.2%
Washington	128,085	126,194	(1,891)	-1.5%
Utah	13,118	11,174	(1,944)	-14.8%
Indiana	22,016	19,826	(2,190)	-9.9%
Georgia	39,184	36,947	(2,238)	-5.7%
Colorado	22,795	20,356	(2,439)	-10.7%
Iowa	17,522	14,969	(2,553)	-14.6%
Pennsylvania	37,207	34,611	(2,597)	-7.0%
New Jersey	25,093	22,217	(2,877)	-11.5%
Alabama	30,482	27,510	(2,972)	-9.8%
Ohio	36,509	32,779	(3,731)	-10.2%
Louisiana	22,560	18,638	(3,922)	-17.4%
Virginia	46,988	42,977	(4,011)	-8.5%
Massachusetts	36,923	32,499	(4,424)	-12.0%
Maryland	33,309	28,736	(4,573)	-13.7%
New York	43,105	37,727	(5,378)	-12.5%
Kansas	50,855	45,134	(5,721)	-11.3%
Connecticut	56,664	50,327	(6,337)	-11.2%
Arizona	58,039	50,641	(7,398)	-12.7%
Florida	64,583	57,183	(7,401)	-11.5%
Texas	114,749	104,240	(10,509)	-9.2%
California	208,450	183,356	(25,094)	-12.0%
Total	1,361,124	1,232,587	(128,537)	-9.4%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, and the US Census Bureau.

From 2010 to 2014, South Carolina had the largest percentage growth in sector jobs, primarily because of increased commercial aircraft assembly activity, whereas, Louisiana had the highest percentage of job losses at -17.4 percent.²⁹

Figure 14: Percentage Change in Employment by State (2010 versus 2014)

State	2010	2014	Change	% Change
South Carolina	9,650	11,409	1,759	18.2%
Delaware	1,742	1,727	(15)	-0.9%
Oklahoma	11,027	10,930	(98)	-0.9%
Washington	128,085	126,194	(1,891)	-1.5%
North Carolina	13,928	13,640	(288)	-2.1%
Michigan	18,198	17,707	(491)	-2.7%
Oregon	8,438	8,187	(251)	-3.0%
North Dakota	1,724	1,633	(91)	-5.3%
Georgia	39,184	36,947	(2,238)	-5.7%
Nebraska	2,434	2,273	(161)	-6.6%
Tennessee	10,106	9,424	(682)	-6.8%
Missouri	26,888	25,052	(1,835)	-6.8%
Pennsylvania	37,207	34,611	(2,597)	-7.0%
Alaska	1,706	1,582	(124)	-7.3%
Vermont	3,956	3,648	(308)	-7.8%
Wisconsin	8,240	7,545	(696)	-8.4%
Virginia	46,988	42,977	(4,011)	-8.5%
Maine	11,920	10,849	(1,071)	-9.0%
Texas	114,749	104,240	(10,509)	-9.2%
Minnesota	14,298	12,979	(1,319)	-9.2%
Illinois	20,033	18,181	(1,852)	-9.2%
Mississippi	17,475	15,791	(1,684)	-9.6%
Alabama	30,482	27,510	(2,972)	-9.8%
Indiana	22,016	19,826	(2,190)	-9.9%
Ohio	36,509	32,779	(3,731)	-10.2%
Wyoming	472	423	(49)	-10.4%
Idaho	2,486	2,225	(261)	-10.5%

State	2010	2014	Change	% Change
Colorado	22,795	20,356	(2,439)	-10.7%
Connecticut	56,664	50,327	(6,337)	-11.2%
Kansas	50,855	45,134	(5,721)	-11.3%
Rhode Island	4,538	4,027	(511)	-11.3%
Florida	64,583	57,183	(7,401)	-11.5%
New Jersey	25,093	22,217	(2,877)	-11.5%
South Dakota	974	862	(112)	-11.5%
Montana	1,399	1,235	(164)	-11.7%
District of Columbia	3,669	3,236	(433)	-11.8%
Massachusetts	36,923	32,499	(4,424)	-12.0%
California	208,450	183,356	(25,094)	-12.0%
Arkansas	8,661	7,611	(1,050)	-12.1%
New Hampshire	10,769	9,463	(1,306)	-12.1%
New York	43,105	37,727	(5,378)	-12.5%
Hawaii	3,091	2,699	(392)	-12.7%
Arizona	58,039	50,641	(7,398)	-12.7%
Puerto Rico	5,932	5,152	(780)	-13.2%
New Mexico	8,695	7,544	(1,151)	-13.2%
Maryland	33,309	28,736	(4,573)	-13.7%
West Virginia	5,875	5,046	(829)	-14.1%
Kentucky	10,617	9,105	(1,512)	-14.2%
Iowa	17,522	14,969	(2,553)	-14.6%
Nevada	3,945	3,364	(581)	-14.7%
Utah	13,118	11,174	(1,944)	-14.8%
Louisiana	22,560	18,638	(3,922)	-17.4%
Total	1,361,124	1,232,587	(128,537)	-9.4%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, and the US Census Bureau.

Employment by job classification

The types of A&D jobs that exist vary across states. In 2014, Washington had the greatest concentration of employees in aerospace products and parts manufacturing (NAICS code 33641) due to its high concentration of commercial aircraft production activity. Similarly, Virginia had the greatest number of employees engaged in shipbuilding activities (NAICS code 336611) due to its high concentration of shipbuilding activity.

Figure 15: State with the Highest Employment by Selected A&D Sector Segment in 2014

NAICS Code	State with the Highest Employment
Aerospace products and parts manufacturing (33641)	Washington
A&D-related services	California
Manufacture of search, detection, navigation, guidance, aeronautical, nautical systems and instruments (334511)	California
Establishments engaged in operating shipyards (336611)	Virginia
Military land vehicles manufacturing (336992)	Pennsylvania
Ammunition manufacturing, except small arms (332993)	Texas
Ordnance manufacturing (332995)	Minnesota
Radio and television broadcast and wireless communication equipment (334220)	California
Small arms ammunition manufacturing (332992)	Illinois
Small firearms manufacturing (332994)	New Hampshire

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, and the US Census Bureau.

Direct employment by size of company

As described earlier, commercial aerospace sector employment is distributed among large, mid sized, and small companies across nearly all states. California had the highest concentration of commercial aerospace employers in all three company-size categories. Washington had the second highest concentration of large commercial aerospace employers, while Texas had the second highest concentration of small and mid-sized commercial aerospace employers. We also found that states with the fewest sector employees had a heavy concentration of small commercial aerospace employers.

Figure 16: State Employment by Size of the Business in 2014

State	Total direct employment	Employment in large businesses	Employment in small and medium sized businesses	% Employment in large businesses	% Employment in small and medium sized businesses
California	183,356	105,613	77,743	57.6%	42.4%
Washington	126,194	108,905	17,289	86.3%	13.7%
Texas	104,240	68,173	36,067	65.4%	34.6%
Florida	57,183	31,393	25,789	54.9%	45.1%
Arizona	50,641	40,209	10,432	79.4%	20.6%
Connecticut	50,327	40,714	9,612	80.9%	19.1%
Kansas	45,134	30,601	14,533	67.8%	32.2%
Virginia	42,977	38,292	4,684	89.1%	10.9%
New York	37,727	5,885	31,842	15.6%	84.4%
Georgia	36,947	16,330	20,616	44.2%	55.8%
Pennsylvania	34,611	9,518	25,093	27.5%	72.5%
Ohio	32,779	13,111	19,667	40.0%	60.0%
Massachusetts	32,499	4,030	28,469	12.4%	87.6%
Maryland	28,736	11,466	17,270	39.9%	60.1%
Alabama	27,510	13,122	14,388	47.7%	52.3%
Missouri	25,052	19,365	5,687	77.3%	22.7%
New Jersey	22,217	4,554	17,662	20.5%	79.5%
Colorado	20,356	6,636	13,720	32.6%	67.4%
Indiana	19,826	8,684	11,142	43.8%	56.2%
Louisiana	18,638	6,318	12,320	33.9%	66.1%
Illinois	18,181	3,454	14,727	19.0%	81.0%
Michigan	17,707	2,302	15,406	13.0%	87.0%
Mississippi	15,791	13,912	1,879	88.1%	11.9%
Iowa	14,969	9,311	5,658	62.2%	37.8%
North Carolina	13,640	7,025	6,616	51.5%	48.5%
Minnesota	12,979	1,207	11,772	9.3%	90.7%
South Carolina	11,409	2,966	8,443	26.0%	74.0%

State	Total direct employment	Employment in large businesses	Employment in small and medium sized businesses	% Employment in large businesses	% Employment in small and medium sized businesses
Utah	11,174	8,268	2,905	74.0%	26.0%
Oklahoma	10,930	6,580	4,350	60.2%	39.8%
Maine	10,849	8,256	2,593	76.1%	23.9%
New Hampshire	9,463	6,908	2,555	73.0%	27.0%
Tennessee	9,424	980	8,444	10.4%	89.6%
Kentucky	9,105	-	9,105	0.0%	100.0%
Oregon	8,187	2,137	6,050	26.1%	73.9%
Arkansas	7,611	3,547	4,064	46.6%	53.4%
Wisconsin	7,545	-	7,545	0.0%	100.0%
New Mexico	7,544	7,068	475	93.7%	6.3%
Puerto Rico	5,152	1,061	4,090	20.6%	79.4%
West Virginia	5,046	1,625	3,421	32.2%	67.8%
Rhode Island	4,027	4,027	-	100.0%	0.0%
Vermont	3,648	1,248	2,400	34.2%	65.8%
Nevada	3,364	1,026	2,338	30.5%	69.5%
District of Columbia	3,236	-	3,236	0.0%	100.0%
Hawaii	2,699	-	2,699	0.0%	100.0%
Nebraska	2,273	-	2,273	0.0%	100.0%
Idaho	2,225	-	2,225	0.0%	100.0%
Delaware	1,727	938	789	54.3%	45.7%
North Dakota	1,633	-	1,633	0.0%	100.0%
Alaska	1,582	-	1,582	0.0%	100.0%
Montana	1,235	-	1,235	0.0%	100.0%
South Dakota	862	-	862	0.0%	100.0%
Wyoming	423	-	423	0.0%	100.0%
Total	1,232,587	676,767	555,820	54.9%	45.1%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, and the US Census Bureau.

Indirect employment

The top 10 states with the highest number of indirect employees were California, Washington, Texas, Florida, Arizona, Connecticut, Kansas, Virginia, New York, and Georgia. Figure 17 illustrates direct and indirect employment across the US.

Figure 17: Direct and Indirect Employment in the A&D Sector by State in 2014

State	Direct Employment in A&D Sector	Indirect Employment in A&D Sector	Direct + Indirect Employment in A&D Sector
California	183,356	432,720	616,076
Washington	126,194	297,817	424,011
Texas	104,240	246,006	350,246
Florida	57,183	134,951	192,134
Arizona	50,641	119,513	170,154
Connecticut	50,327	118,771	169,097
Kansas	45,134	106,516	151,649
Virginia	42,977	101,425	144,402
New York	37,727	89,037	126,764
Georgia	36,947	87,194	124,141
Pennsylvania	34,611	81,681	116,291
Ohio	32,779	77,357	110,136
Massachusetts	32,499	76,698	109,197
Maryland	28,736	67,817	96,552
Alabama	27,510	64,923	92,433
Missouri	25,052	59,123	84,175
New Jersey	22,217	52,431	74,648
Colorado	20,356	48,040	68,397
Indiana	19,826	46,790	66,616
Louisiana	18,638	43,986	62,625
Illinois	18,181	42,907	61,088
Michigan	17,707	41,790	59,497
Mississippi	15,791	37,267	53,058
Iowa	14,969	35,327	50,296
North Carolina	13,640	32,191	45,832
Minnesota	12,979	30,630	43,609
South Carolina	11,409	26,926	38,335

State	Direct Employment in A&D Sector	Indirect Employment in A&D Sector	Direct + Indirect Employment in A&D Sector
Utah	11,174	26,370	37,543
Oklahoma	10,930	25,794	36,724
Maine	10,849	25,603	36,451
New Hampshire	9,463	22,332	31,795
Tennessee	9,424	22,241	31,664
Kentucky	9,105	21,489	30,594
Oregon	8,187	19,321	27,507
Arkansas	7,611	17,962	25,573
Wisconsin	7,545	17,806	25,351
New Mexico	7,544	17,803	25,347
Puerto Rico	5,152	12,158	17,310
West Virginia	5,046	11,909	16,955
Rhode Island	4,027	9,503	13,530
Vermont	3,648	8,609	12,257
Nevada	3,364	7,940	11,304
District of Columbia	3,236	7,637	10,872
Hawaii	2,699	6,370	9,069
Nebraska	2,273	5,364	7,636
Idaho	2,225	5,252	7,478
Delaware	1,727	4,076	5,803
North Dakota	1,633	3,853	5,486
Alaska	1,582	3,734	5,316
Montana	1,235	2,914	4,149
South Dakota	862	2,033	2,895
Wyoming	423	998	1,421
Total	1,232,587	2,908,905	4,141,492

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, and the US Bureau of Economic Analysis.

Wages

In 2014, A&D sector payrolls were highest in California, with an estimated \$20.0 billion paid out in wages to employees. Washington state had the second-highest total wages, amounting to \$13.4 billion.³⁰

Figure 18: A&D Sector Payrolls by State (\$ Million) (2008–2014)

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010-2014
California	\$16,859.7	\$17,795.2	\$19,322.1	\$19,323.7	\$19,007.1	\$19,016.0	\$20,015.5	3.6%
Washington	\$9,588.1	\$10,262.8	\$11,362.4	\$12,699.1	\$13,300.8	\$13,977.7	\$13,384.6	17.8%
Texas	\$7,825.5	\$8,406.3	\$9,306.7	\$9,575.1	\$9,553.6	\$9,875.5	\$9,997.0	7.4%
Connecticut	\$4,207.5	\$4,364.2	\$4,820.8	\$5,003.4	\$4,981.1	\$4,963.3	\$5,159.4	7.0%
Arizona	\$4,177.7	\$4,723.7	\$4,843.9	\$4,899.8	\$4,960.5	\$4,902.4	\$5,117.6	5.7%
Florida	\$3,905.8	\$4,060.1	\$4,399.9	\$4,420.3	\$4,326.4	\$4,460.2	\$4,595.7	4.4%
Massachusetts	\$3,084.1	\$3,260.8	\$3,648.4	\$3,623.5	\$3,728.1	\$3,719.5	\$3,841.9	5.3%
Virginia	\$2,888.1	\$3,156.7	\$3,520.0	\$3,615.1	\$3,653.1	\$3,717.4	\$3,785.2	7.5%
Kansas	\$3,644.0	\$3,459.2	\$3,512.3	\$3,539.4	\$3,465.2	\$3,467.7	\$3,650.8	3.9%
New York	\$2,926.6	\$3,153.6	\$3,364.1	\$3,369.9	\$3,279.9	\$3,195.3	\$3,449.1	2.5%
Georgia	\$2,315.3	\$2,521.0	\$2,867.6	\$3,134.5	\$3,056.0	\$3,129.6	\$3,179.7	10.9%
Maryland	\$2,284.5	\$2,498.7	\$2,790.0	\$2,915.8	\$2,894.6	\$2,973.9	\$3,065.3	9.9%
Pennsylvania	\$1,925.6	\$2,046.0	\$2,282.6	\$2,351.5	\$2,397.1	\$2,943.1	\$3,020.1	32.3%
Ohio	\$2,396.1	\$2,576.6	\$2,679.8	\$2,786.6	\$2,809.4	\$2,859.9	\$2,905.6	8.4%
Missouri	\$2,500.2	\$2,733.1	\$3,045.6	\$2,974.0	\$2,882.8	\$2,835.1	\$2,599.7	-14.6%
New Jersey	\$1,891.7	\$2,005.4	\$2,183.3	\$2,215.0	\$2,196.2	\$2,291.4	\$2,376.8	8.9%
Colorado	\$2,039.5	\$2,122.1	\$2,296.6	\$2,307.8	\$2,258.4	\$2,241.0	\$2,318.9	1.0%
Alabama	\$1,709.6	\$1,887.7	\$2,064.7	\$2,094.5	\$2,072.5	\$2,146.6	\$2,186.6	5.9%

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010-2014
Illinois	\$1,379.6	\$1,417.9	\$1,550.4	\$1,577.4	\$1,574.9	\$1,591.7	\$1,642.8	6.0%
Michigan	\$1,239.2	\$1,194.0	\$1,303.7	\$1,372.7	\$1,418.1	\$1,464.3	\$1,450.0	11.2%
Iowa	\$1,138.1	\$1,159.9	\$1,238.7	\$1,364.9	\$1,317.4	\$1,320.7	\$1,394.4	12.6%
Indiana	\$1,169.4	\$1,250.8	\$1,376.7	\$1,333.5	\$1,322.5	\$1,307.1	\$1,367.7	-0.7%
Louisiana	\$1,161.6	\$1,351.7	\$1,395.9	\$1,351.5	\$1,241.8	\$1,176.2	\$1,349.8	-3.3%
North Carolina	\$868.4	\$904.9	\$969.2	\$1,114.2	\$1,122.7	\$1,146.0	\$1,134.8	17.1%
Minnesota	\$350.1	\$415.3	\$607.6	\$823.0	\$933.6	\$1,062.7	\$1,103.3	81.6%
Mississippi	\$855.3	\$909.4	\$989.4	\$1,006.7	\$1,025.9	\$1,055.8	\$1,064.0	7.5%
New Hampshire	\$929.2	\$1,007.1	\$1,045.5	\$1,064.0	\$1,068.0	\$1,049.4	\$1,029.3	-1.6%
Utah	\$877.9	\$928.6	\$1,016.2	\$993.5	\$960.7	\$971.3	\$937.0	-7.8%
South Carolina	\$932.9	\$986.0	\$970.4	\$896.2	\$854.4	\$865.7	\$891.6	-8.1%
Maine	\$552.0	\$563.5	\$621.4	\$687.8	\$754.3	\$824.8	\$818.4	31.7%
Oklahoma	\$673.0	\$696.3	\$759.3	\$766.1	\$791.1	\$820.0	\$752.7	-0.9%
Tennessee	\$572.4	\$603.3	\$646.4	\$656.4	\$689.4	\$715.2	\$706.3	9.3%
Oregon	\$543.7	\$524.3	\$603.7	\$635.9	\$649.0	\$694.7	\$673.8	11.6%
New Mexico	\$636.1	\$564.8	\$611.3	\$604.0	\$588.8	\$587.4	\$624.4	2.1%
Kentucky	\$450.6	\$526.7	\$569.7	\$546.1	\$546.3	\$556.1	\$579.2	1.7%
Wisconsin	\$446.7	\$429.9	\$449.7	\$457.0	\$470.2	\$484.5	\$485.7	8.0%

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010-2014
Arkansas	\$437.8	\$455.2	\$445.1	\$450.8	\$452.0	\$439.9	\$466.7	4.8%
West Virginia	\$262.0	\$301.1	\$328.7	\$331.5	\$318.0	\$312.7	\$337.1	2.5%
Vermont	\$253.4	\$278.5	\$285.8	\$309.0	\$300.6	\$301.7	\$312.4	9.3%
Rhode Island	\$251.1	\$262.5	\$286.4	\$287.0	\$288.4	\$292.8	\$301.4	5.2%
District of Columbia	\$227.9	\$241.6	\$279.4	\$271.7	\$265.1	\$269.9	\$283.6	1.5%
Nevada	\$233.1	\$221.1	\$244.1	\$236.5	\$225.6	\$219.0	\$241.7	-1.0%
Hawaii	\$173.3	\$186.2	\$204.2	\$203.3	\$200.3	\$197.4	\$210.2	3.0%
Idaho	\$113.5	\$115.1	\$127.6	\$130.3	\$128.7	\$162.5	\$160.4	25.6%
Delaware	\$137.6	\$143.4	\$153.9	\$154.2	\$151.4	\$154.9	\$143.2	-7.0%
Nebraska	\$101.0	\$108.5	\$112.5	\$118.2	\$119.3	\$126.5	\$124.3	10.5%
Alaska	\$77.1	\$83.5	\$88.5	\$90.9	\$103.2	\$110.4	\$107.9	21.9%
North Dakota	\$85.8	\$97.6	\$101.5	\$101.6	\$103.5	\$106.9	\$102.4	0.9%
Montana	\$52.4	\$55.5	\$65.8	\$70.0	\$69.5	\$75.1	\$73.1	11.2%
South Dakota	\$43.2	\$42.9	\$44.0	\$44.2	\$45.9	\$47.8	\$47.9	8.8%
Puerto Rico	\$39.6	\$45.3	\$45.7	\$43.6	\$46.8	\$47.4	\$47.4	3.7%
Wyoming	\$20.9	\$21.4	\$23.6	\$22.4	\$22.9	\$23.3	\$24.1	2.0%
Total	\$93,455.2	\$99,127.1	\$107,873.1	\$110,965.0	\$110,993.0	\$113,297.3	\$117,652.5	9.1%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, and the Bureau of Economic Analysis.

Figure 19: Average Wages per Employee by State (2008–2014)

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010 - 2014
Massachusetts	\$82,981	\$88,038	\$98,809	\$104,566	\$109,938	\$113,377	\$118,215	19.6%
Colorado	\$84,644	\$89,645	\$100,750	\$104,921	\$106,705	\$108,508	\$113,916	13.1%
California	\$76,062	\$83,285	\$92,694	\$97,233	\$100,636	\$103,188	\$109,162	17.8%
New Hampshire	\$81,905	\$91,389	\$97,088	\$104,261	\$108,345	\$111,128	\$108,769	12.0%
New Jersey	\$69,775	\$77,682	\$87,007	\$90,914	\$94,497	\$104,796	\$106,983	23.0%
Maryland	\$69,311	\$75,475	\$83,763	\$92,628	\$97,887	\$106,202	\$106,672	27.4%
Washington	\$73,095	\$78,365	\$88,710	\$95,626	\$96,254	\$102,128	\$106,064	19.6%
Missouri	\$92,376	\$99,746	\$113,273	\$115,273	\$116,174	\$98,093	\$103,772	-8.4%
Connecticut	\$69,866	\$74,943	\$85,077	\$91,191	\$94,028	\$99,898	\$102,518	20.5%
Arizona	\$70,822	\$76,130	\$83,459	\$89,539	\$93,951	\$98,036	\$101,057	21.1%
Texas	\$66,390	\$72,905	\$81,105	\$84,904	\$86,949	\$93,159	\$95,904	18.2%
Iowa	\$62,896	\$65,278	\$70,696	\$83,691	\$85,528	\$90,996	\$93,151	31.8%
New York	\$64,204	\$70,453	\$78,045	\$80,916	\$83,409	\$87,408	\$91,423	17.1%
Illinois	\$64,774	\$70,248	\$77,393	\$80,509	\$81,935	\$86,090	\$90,359	16.8%
Ohio	\$61,468	\$67,688	\$73,400	\$78,417	\$81,717	\$86,563	\$88,645	20.8%
Virginia	\$62,894	\$67,565	\$74,914	\$78,659	\$80,812	\$83,340	\$88,077	17.6%
District of Columbia	\$62,470	\$67,187	\$76,148	\$77,663	\$79,589	\$82,495	\$87,637	15.1%
Pennsylvania	\$53,380	\$55,836	\$61,347	\$63,750	\$66,008	\$80,161	\$87,261	42.2%
Georgia	\$60,033	\$64,943	\$73,182	\$77,247	\$77,331	\$82,761	\$86,062	17.6%

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010 - 2014
Vermont	\$60,301	\$67,526	\$72,240	\$77,938	\$77,852	\$80,841	\$85,632	18.5%
Minnesota	\$23,268	\$27,965	\$42,494	\$58,317	\$68,322	\$80,892	\$85,010	100.1%
Utah	\$54,232	\$60,806	\$77,469	\$83,399	\$83,693	\$87,797	\$83,857	8.2%
North Carolina	\$58,741	\$64,092	\$69,588	\$74,864	\$76,114	\$79,593	\$83,197	19.6%
Delaware	\$75,154	\$82,799	\$88,319	\$88,561	\$89,383	\$72,144	\$82,894	-6.1%
New Mexico	\$57,095	\$62,864	\$70,308	\$73,458	\$76,002	\$78,819	\$82,773	17.7%
Oregon	\$59,000	\$63,453	\$71,553	\$73,360	\$73,528	\$78,553	\$82,303	15.0%
Michigan	\$62,504	\$65,320	\$71,641	\$73,621	\$73,919	\$76,322	\$81,888	14.3%
Kansas	\$55,377	\$60,372	\$69,065	\$72,697	\$73,265	\$76,683	\$80,888	17.1%
Florida	\$56,154	\$61,137	\$68,128	\$71,244	\$73,472	\$77,138	\$80,369	18.0%
Alabama	\$54,691	\$59,445	\$67,734	\$70,794	\$72,300	\$75,898	\$79,483	17.3%
South Carolina	\$124,440	\$124,507	\$100,564	\$73,952	\$65,996	\$63,586	\$78,145	-22.3%
Hawaii	\$54,500	\$59,744	\$66,053	\$69,068	\$71,053	\$74,851	\$77,886	17.9%
Maine	\$43,032	\$45,270	\$52,134	\$59,785	\$65,822	\$73,317	\$75,438	44.7%
Tennessee	\$53,791	\$58,800	\$63,959	\$66,662	\$68,212	\$71,560	\$74,946	17.2%
Rhode Island	\$52,376	\$56,147	\$63,102	\$66,573	\$68,554	\$71,812	\$74,836	18.6%
Louisiana	\$45,457	\$53,848	\$61,873	\$65,400	\$65,012	\$68,704	\$72,418	17.0%
Idaho	\$43,077	\$44,538	\$51,344	\$54,620	\$55,756	\$71,077	\$72,061	40.4%
Nevada	\$51,960	\$55,092	\$61,885	\$63,220	\$65,694	\$68,196	\$71,836	16.1%
Indiana	\$50,468	\$53,475	\$62,531	\$61,285	\$62,729	\$66,990	\$68,985	10.3%

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010 - 2014
Oklahoma	\$55,736	\$63,301	\$68,858	\$67,676	\$66,894	\$67,075	\$68,863	0.0%
Alaska	\$42,916	\$45,001	\$51,885	\$54,340	\$60,927	\$66,749	\$68,213	31.5%
Mississippi	\$46,751	\$50,895	\$56,616	\$59,901	\$62,004	\$64,639	\$67,382	19.0%
West Virginia	\$45,293	\$50,005	\$55,956	\$59,288	\$60,952	\$65,022	\$66,801	19.4%
Wisconsin	\$46,525	\$49,054	\$54,574	\$57,179	\$57,814	\$62,769	\$64,373	18.0%
Kentucky	\$43,549	\$48,793	\$53,658	\$56,373	\$58,773	\$60,714	\$63,606	18.5%
North Dakota	\$43,960	\$50,404	\$58,906	\$60,541	\$59,534	\$59,530	\$62,736	6.5%
Arkansas	\$44,504	\$47,850	\$51,389	\$54,252	\$56,353	\$59,356	\$61,315	19.3%
Montana	\$37,370	\$40,289	\$47,021	\$50,173	\$57,161	\$60,213	\$59,213	25.9%
Wyoming	\$39,957	\$43,513	\$50,068	\$51,012	\$51,192	\$53,060	\$56,968	13.8%
South Dakota	\$42,018	\$40,824	\$45,163	\$48,221	\$51,057	\$54,425	\$55,564	23.0%
Nebraska	\$40,045	\$42,924	\$46,206	\$48,174	\$49,857	\$53,085	\$54,679	18.3%
Puerto Rico	\$6,249	\$7,374	\$7,708	\$7,829	\$8,758	\$9,301	\$9,206	19.4%
Total	\$65,218	\$70,867	\$79,253	\$83,560	\$85,759	\$89,943	\$93,818	18.4%

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, and the Bureau of Economic Analysis.

Taxes

As stated earlier, we found that A&D companies paid \$4.13 billion in state business income taxes in 2014. Individuals employed by the A&D sector paid \$2.18 billion in state income taxes in 2014.³¹

Corporate taxes

We found that the most significant state taxes paid by corporations are corporate income taxes. Four states—Alaska, Montana, New Hampshire, and Oregon—do not levy a corporate income tax. On the other hand, Ohio, Delaware, Texas, Virginia, and Washington impose a gross receipts or similar business tax. Figure 20 illustrates the taxes paid by A&D companies to state governments. This chart does not imply a heavy or light tax burden for A&D companies because it is not weighted by revenue or number of employees as it illustrates the total amount of corporate taxes paid in each state. As indicated earlier, although companies pay a host of other state taxes, such as property taxes, sales and use taxes, and excise taxes, we did not include these in the scope of our study.

Figure 20: A&D Sector State Business Income Tax by State (2008–2014)

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010 - 2014
Washington	\$1,439,252,589	\$1,470,171,561	\$1,607,755,333	\$1,769,344,954	\$1,898,415,557	\$2,093,000,375	\$1,956,335,558	21.7%
Texas	\$409,004,241	\$413,574,145	\$465,373,679	\$477,307,148	\$512,125,865	\$564,618,017	\$536,975,319	15.4%
California	\$310,059,723	\$305,576,410	\$346,356,459	\$336,485,877	\$361,031,930	\$398,037,175	\$383,877,502	10.8%
Arizona	\$82,476,295	\$86,002,513	\$95,940,533	\$93,597,596	\$100,425,376	\$110,718,830	\$106,662,810	11.2%
Connecticut	\$78,530,220	\$78,284,619	\$93,186,733	\$92,281,975	\$99,013,783	\$109,162,551	\$104,754,071	12.4%
Virginia	\$66,073,710	\$73,106,971	\$86,925,612	\$84,652,221	\$90,827,451	\$100,137,132	\$96,513,740	11.0%
Kansas	\$92,124,402	\$80,838,473	\$84,887,087	\$83,834,528	\$89,950,109	\$99,169,864	\$95,232,134	12.2%
Florida	\$72,247,135	\$70,925,796	\$79,471,438	\$78,626,693	\$84,362,372	\$93,009,392	\$89,274,774	12.3%
Ohio	\$71,703,698	\$66,274,548	\$72,232,516	\$69,295,404	\$74,350,382	\$81,971,187	\$79,318,690	9.8%
Massachusetts	\$40,732,890	\$40,970,719	\$48,535,487	\$45,267,892	\$48,570,105	\$53,548,469	\$52,208,752	7.6%
Pennsylvania	\$37,020,035	\$34,651,634	\$42,762,595	\$42,701,779	\$45,816,798	\$50,512,953	\$48,368,739	13.1%
Maryland	\$34,045,708	\$35,349,220	\$40,536,641	\$38,155,239	\$40,938,597	\$45,134,743	\$43,896,904	8.3%
Georgia	\$30,124,539	\$30,049,414	\$35,456,238	\$37,773,297	\$40,528,793	\$44,682,935	\$42,095,360	18.7%
Indiana	\$41,570,470	\$34,091,689	\$36,775,085	\$35,806,144	\$38,418,139	\$42,355,943	\$40,825,462	11.0%
New York	\$30,804,383	\$31,488,923	\$33,200,258	\$31,922,523	\$34,251,214	\$37,761,914	\$36,518,035	10.0%
New Jersey	\$29,023,269	\$28,261,798	\$30,944,274	\$29,667,632	\$31,831,833	\$35,094,550	\$33,964,514	9.8%

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010 - 2014
Alabama	\$25,006,575	\$24,163,653	\$28,410,763	\$27,867,206	\$29,900,070	\$32,964,783	\$31,712,289	11.6%
Missouri	\$21,665,707	\$22,332,008	\$26,432,422	\$25,716,366	\$27,592,329	\$30,420,503	\$29,327,167	11.0%
Mississippi	\$18,504,888	\$21,441,587	\$27,166,004	\$25,132,765	\$26,966,156	\$29,730,148	\$29,050,170	6.9%
Iowa	\$22,515,066	\$22,141,168	\$26,049,920	\$25,153,653	\$26,988,568	\$29,754,857	\$28,742,522	10.3%
Minnesota	\$16,365,814	\$15,106,218	\$16,860,105	\$18,877,799	\$20,254,902	\$22,331,000	\$20,787,310	23.3%
Illinois	\$17,451,265	\$17,908,609	\$18,866,629	\$17,944,151	\$19,253,145	\$21,226,564	\$20,586,874	9.1%
Louisiana	\$20,987,277	\$17,240,790	\$20,254,191	\$17,168,982	\$18,421,429	\$20,309,599	\$20,339,347	0.4%
Utah	\$19,330,935	\$18,449,579	\$18,305,080	\$16,827,324	\$18,054,848	\$19,905,443	\$19,484,098	6.4%
Michigan	\$16,128,396	\$14,236,288	\$16,698,727	\$16,726,163	\$17,946,307	\$19,785,777	\$18,930,959	13.4%
Maine	\$9,882,691	\$11,218,011	\$13,993,593	\$13,056,799	\$14,009,269	\$15,445,199	\$15,057,120	7.6%
Kentucky	\$10,504,115	\$11,008,941	\$13,130,886	\$12,194,191	\$13,083,736	\$14,424,800	\$14,080,365	7.2%
South Carolina	\$4,865,727	\$5,886,159	\$9,524,027	\$13,143,258	\$14,102,035	\$15,547,473	\$13,827,448	45.2%
Colorado	\$10,652,229	\$10,730,508	\$12,317,449	\$11,931,783	\$12,802,186	\$14,114,391	\$13,622,679	10.6%
Arkansas	\$10,966,113	\$10,494,284	\$11,388,371	\$11,445,317	\$12,280,233	\$13,538,939	\$12,942,884	13.7%
Oklahoma	\$9,576,761	\$8,633,255	\$10,449,559	\$11,420,368	\$12,253,464	\$13,509,426	\$12,648,346	21.0%
North Carolina	\$9,913,148	\$9,746,403	\$9,650,109	\$10,818,850	\$11,608,067	\$12,797,876	\$11,909,576	23.4%
Tennessee	\$7,575,772	\$7,368,936	\$8,731,071	\$8,662,027	\$9,293,907	\$10,246,519	\$9,828,090	12.6%
West Virginia	\$6,753,497	\$7,170,033	\$8,387,970	\$8,117,679	\$8,709,850	\$9,602,597	\$9,270,369	10.5%
Rhode Island	\$5,295,625	\$5,808,823	\$7,004,539	\$6,487,101	\$6,960,324	\$7,673,747	\$7,496,088	7.0%

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010 - 2014
Wisconsin	\$6,331,693	\$6,022,525	\$6,715,846	\$6,395,654	\$6,862,206	\$7,565,572	\$7,335,069	9.2%
New Mexico	\$8,058,522	\$5,956,718	\$6,776,867	\$6,333,836	\$6,795,878	\$7,492,445	\$7,300,865	7.7%
Puerto Rico	\$5,251,151	\$5,201,190	\$6,137,206	\$5,755,899	\$6,175,782	\$6,808,790	\$6,628,485	8.0%
Vermont	\$5,624,780	\$4,335,879	\$5,133,015	\$5,726,339	\$6,144,065	\$6,773,823	\$6,311,019	22.9%
Nevada	\$2,918,978	\$2,741,195	\$3,206,757	\$2,898,861	\$3,110,328	\$3,429,132	\$3,372,083	5.2%
Nebraska	\$1,781,657	\$1,774,343	\$1,781,512	\$1,988,160	\$2,133,193	\$2,351,842	\$2,190,969	23.0%
Delaware	\$1,568,689	\$1,563,269	\$1,685,476	\$1,785,304	\$1,915,539	\$2,111,879	\$1,992,403	18.2%
North Dakota	\$1,704,448	\$1,694,062	\$1,815,177	\$1,723,140	\$1,848,840	\$2,038,343	\$1,977,922	9.0%
Hawaii	\$1,425,451	\$1,487,843	\$1,808,226	\$1,668,086	\$1,789,770	\$1,973,218	\$1,929,601	6.7%
Idaho	\$1,464,991	\$1,645,682	\$1,763,393	\$1,515,542	\$1,626,098	\$1,792,771	\$1,788,261	1.4%
District of Columbia	\$894,240	\$995,676	\$1,253,092	\$915,854	\$982,664	\$1,083,385	\$1,135,284	-9.4%
South Dakota	\$582,980	\$527,090	\$564,201	\$614,283	\$659,094	\$726,651	\$680,957	20.7%
Wyoming	\$180,828	\$176,597	\$196,523	\$171,042	\$183,519	\$202,329	\$201,095	2.3%
Alaska	-	-	-	-	-	-	-	-
Montana	-	-	-	-	-	-	-	-
New Hampshire	-	-	-	-	-	-	-	-
Oregon	-	-	-	-	-	-	-	-
Total	\$3,166,523,317	\$3,174,825,754	\$3,542,798,676	\$3,682,904,684	\$3,951,566,104	\$4,356,595,849	\$4,129,310,078	16.6%

Alaska, Montana, New Hampshire, and Oregon do not levy state business income tax.

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, and the Bureau of Economic Analysis.

Individual taxes

We found that the most significant state taxes paid by individuals are individual income taxes. Total individual state income tax collections for A&D employees amounted to \$2.18 billion in 2014.³² Figure 21 provides a state-by-state breakdown of total state income tax collections for individuals employed in the A&D sector. This figure does not imply a heavy or light tax burden per employee, as it illustrates the total amount of state income taxes paid in each state by workers in the A&D sector.

Although individuals pay other taxes that might be significant, such as property and sales taxes, our study does not include these taxes. Only taxes based on employee wages were included in the scope of this study because the data used to estimate taxes was derived solely from public sources.

Figure 21: A&D Sector State Individual Income Tax by State (2008–2014)

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010 - 2014
California	\$494,095,029	\$515,338,813	\$559,545,021	\$559,581,329	\$550,388,732	\$550,489,451	\$585,192,028	4.6%
Connecticut	\$128,789,608	\$132,006,066	\$145,820,198	\$151,345,900	\$150,676,616	\$150,134,246	\$157,608,265	8.1%
New York	\$126,916,547	\$135,160,762	\$144,169,595	\$144,428,853	\$140,570,799	\$136,955,416	\$149,240,177	3.5%
Massachusetts	\$98,077,583	\$102,477,892	\$114,667,225	\$113,884,111	\$117,186,753	\$116,923,829	\$121,951,651	6.4%
Maryland	\$85,632,058	\$92,503,758	\$103,090,537	\$100,674,439	\$97,593,581	\$95,974,275	\$104,750,032	1.6%
Virginia	\$71,242,535	\$76,955,690	\$85,827,698	\$88,159,750	\$89,090,606	\$90,657,543	\$93,230,078	8.6%
Ohio	\$68,585,647	\$72,881,942	\$75,798,539	\$78,824,879	\$79,475,881	\$80,900,285	\$83,018,278	9.5%
Kansas	\$80,505,244	\$75,524,996	\$76,692,634	\$77,287,150	\$75,666,897	\$75,718,988	\$80,492,990	5.0%
Pennsylvania	\$56,002,779	\$60,536,448	\$67,596,981	\$70,654,065	\$70,133,881	\$72,057,289	\$73,909,963	9.3%
Georgia	\$48,955,199	\$52,677,199	\$59,928,244	\$65,508,523	\$63,862,861	\$65,402,249	\$67,120,259	12.0%
Arizona	\$51,859,461	\$57,942,892	\$59,415,846	\$60,101,954	\$60,846,452	\$60,133,379	\$63,391,727	6.7%
Missouri	\$40,065,519	\$42,082,771	\$46,955,178	\$48,370,582	\$49,305,542	\$60,553,002	\$54,053,937	15.1%
New Jersey	\$45,014,632	\$46,283,257	\$50,095,240	\$50,350,526	\$49,250,532	\$48,866,400	\$52,341,627	4.5%
Colorado	\$37,258,260	\$39,034,412	\$42,485,331	\$43,109,857	\$42,746,050	\$44,598,695	\$45,580,276	7.3%
Alabama	\$29,154,194	\$31,814,181	\$34,798,325	\$35,300,510	\$34,930,946	\$36,179,465	\$37,218,035	7.0%
Indiana	\$28,769,717	\$28,975,893	\$30,945,098	\$34,102,861	\$32,918,722	\$33,001,412	\$34,514,649	11.5%

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010 - 2014
Minnesota	\$28,091,283	\$30,086,659	\$31,232,660	\$31,784,768	\$31,901,006	\$31,344,135	\$33,281,306	6.6%
Illinois	\$26,511,725	\$26,927,319	\$29,445,948	\$29,957,116	\$29,915,841	\$30,232,728	\$31,510,769	7.0%
North Carolina	\$23,760,663	\$24,462,740	\$26,205,000	\$30,111,756	\$30,344,672	\$30,975,252	\$30,994,742	18.3%
Iowa	\$25,915,155	\$27,391,465	\$30,149,990	\$29,204,702	\$28,966,225	\$28,629,140	\$30,831,147	2.3%
Michigan	\$22,500,509	\$21,420,054	\$23,390,139	\$24,627,979	\$25,444,528	\$26,272,044	\$26,282,415	12.4%
Oregon	\$19,993,402	\$19,047,127	\$21,939,075	\$23,109,428	\$23,587,556	\$25,249,215	\$24,739,440	12.8%
Maine	\$18,170,605	\$18,577,137	\$20,259,348	\$20,439,839	\$21,106,797	\$21,878,324	\$22,055,172	8.9%
Utah	\$21,904,508	\$22,875,336	\$22,514,324	\$20,790,522	\$19,818,152	\$20,078,828	\$21,937,561	-2.6%
Louisiana	\$15,458,503	\$17,776,872	\$18,357,682	\$17,774,509	\$16,329,619	\$15,465,980	\$17,911,378	-2.4%
Kentucky	\$13,186,138	\$15,233,876	\$16,477,927	\$15,793,945	\$15,799,392	\$16,085,834	\$16,912,718	2.6%
South Carolina	\$6,289,831	\$7,376,375	\$10,800,562	\$14,640,990	\$16,613,814	\$18,913,439	\$16,051,013	48.6%
Mississippi	\$12,081,264	\$12,692,979	\$13,808,380	\$14,050,670	\$14,317,720	\$14,735,068	\$14,999,433	8.6%
Wisconsin	\$12,062,597	\$11,469,376	\$11,997,195	\$12,195,016	\$12,550,802	\$12,931,695	\$13,091,843	9.1%
Oklahoma	\$8,676,852	\$8,754,093	\$9,655,783	\$10,687,638	\$11,722,798	\$12,822,411	\$11,825,027	22.5%
Arkansas	\$9,670,942	\$9,936,193	\$9,713,749	\$9,838,171	\$9,865,100	\$9,600,658	\$10,284,955	5.9%
New Mexico	\$9,546,904	\$8,375,321	\$9,065,636	\$8,957,278	\$8,732,048	\$8,711,050	\$9,349,329	3.1%
West Virginia	\$6,773,320	\$7,694,870	\$8,398,546	\$8,469,375	\$8,125,662	\$7,992,918	\$8,695,666	3.5%
District of Columbia	\$6,703,422	\$7,034,885	\$8,141,727	\$7,805,797	\$7,591,337	\$7,729,131	\$8,243,062	1.2%
Rhode Island	\$5,343,976	\$5,519,717	\$6,021,455	\$6,035,298	\$6,065,107	\$6,159,690	\$6,400,134	6.3%
Vermont	\$5,106,235	\$5,545,463	\$5,691,039	\$6,152,704	\$5,987,335	\$6,008,614	\$6,282,826	10.4%

State	2008	2009	2010	2011	2012	2013	2014	% Change 2010 - 2014
Delaware	\$3,519,261	\$3,526,356	\$3,911,338	\$3,994,883	\$3,947,073	\$4,986,977	\$4,436,460	13.4%
Hawaii	\$3,466,057	\$3,667,473	\$4,020,546	\$3,989,672	\$3,959,465	\$3,896,729	\$4,182,554	4.0%
Idaho	\$2,986,052	\$3,074,074	\$3,299,512	\$3,307,022	\$3,246,774	\$3,322,928	\$3,473,066	5.3%
Nebraska	\$2,120,874	\$2,250,290	\$2,334,432	\$2,452,882	\$2,477,453	\$2,626,623	\$2,606,568	11.7%
Montana	\$1,117,789	\$1,169,896	\$1,386,584	\$1,475,857	\$1,465,056	\$1,582,945	\$1,557,436	12.3%
New Hampshire	\$1,145,226	\$1,196,879	\$1,309,813	\$1,280,518	\$1,238,212	\$1,251,860	\$1,339,284	2.3%
North Dakota	\$903,020	\$967,460	\$1,024,949	\$1,052,574	\$1,194,737	\$1,278,164	\$1,198,949	17.0%
Tennessee	\$442,834	\$461,214	\$494,166	\$501,840	\$527,205	\$546,929	\$545,564	10.4%
Alaska	-	-	-	-	-	-	-	-
Florida	-	-	-	-	-	-	-	-
Nevada	-	-	-	-	-	-	-	-
South Dakota	-	-	-	-	-	-	-	-
Texas	-	-	-	-	-	-	-	-
Washington	-	-	-	-	-	-	-	-
Wyoming	-	-	-	-	-	-	-	-
Puerto Rico	-	-	-	-	-	-	-	-
Total	\$1,804,372,961	\$1,886,708,469	\$2,048,879,196	\$2,082,168,040	\$2,067,486,339	\$2,089,855,231	\$2,184,633,787	6.6%

Alaska, Florida, Nevada, South Dakota, Texas, Washington, Wyoming, and Puerto Rico do not levy state individual income tax.

Sources: Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, and the Bureau of Economic Analysis.

Scope

The scope of this study includes commercial and military aircrafts, as traditionally viewed, as well as naval platforms, military land vehicles, arms, armaments, defense-contracting services, and several other categories of employment. The following US-based categories were specifically included in our study:

- Military, civil passenger, freight, and general aviation aircrafts, space-crafts, launch vehicles, military land and naval platforms, missiles, munitions, arms, and armaments
- Command, control, communications, computing, intelligence, surveillance, reconnaissance (C4ISR), security, mission software, and government contracting services
- Other related supply chain portions of the sector

It is important to note that the activities included within the scope of this study primarily focus on the sector that serves the US government defense subsector, as well as the commercial aircraft, general aviation, and commercial space subsectors. Airline data were excluded from the scope of this study.



Methodology

The analysis in this study is based on inputs from various sources, including Export-Import Bank of the United States, US Census Bureau, US Bureau of Labor Statistics, US Bureau of Economic Analysis, USA Trade Online, and UN Comtrade Database. The data was assessed for the years 2010 through 2014.

We also utilized data from the Deloitte Touche Tohmatsu Limited Global Aerospace & Defense Sector Financial Performance Studies to develop total employment and revenue metrics for companies with greater than \$500 million in sales. These metrics originate from company financial filings.

We analyzed a universe of 29 codes from the North American Industry Classification System (NAICS), which represents companies directly involved in A&D manufacturing or A&D-related service industries. We also conducted secondary research on state governments and associated agency sources to identify specific states that published statewide A&D sector metrics.

The process utilized to assess the economic impact of the US A&D sector involved the analysis of a broad subset of employment, revenue, GDP, wages, taxes paid, and other financial metrics. Job descriptions were characterized by a universe of NAICS codes that represent organizations directly involved in A&D manufacturing or in A&D-related service sectors. The following chart illustrates the A&D manufacturing sector NAICS codes assessed in this study.

Figure 22: A&D Manufacturing Sector NAICS Codes

NAICS Code	Description
332992	This sector comprises establishments primarily engaged in manufacturing small arms ammunition.
332993	This sector comprises establishments primarily engaged in manufacturing ammunition (except small arms). Examples of products made by these establishments are bombs, depth charges, rockets (except guided missiles), grenades, mines, and torpedoes.
332994	This sector comprises establishments primarily engaged in manufacturing small firearms that are carried and fired by individuals.
332995	This sector comprises establishments primarily engaged in manufacturing ordnance (except small arms) and accessories.
334220	This sector comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment.
334511	This sector comprises establishments primarily engaged in manufacturing search, detection, navigation, guidance, aeronautical, and nautical systems and instruments. Examples of products made by these establishments are aircraft instruments (except engine), flight recorders, navigational instruments and systems, radar systems and equipment, and sonar systems and equipment.

NAICS Code	Description
33641	<p>This sector comprises establishments primarily engaged in one or more of the following:</p> <ul style="list-style-type: none"> • Manufacturing complete aircraft, missiles, or space vehicles • Manufacturing aerospace engines, propulsion units, auxiliary equipment, or parts • Developing and making prototypes of aerospace products • Aircraft conversion (i.e., major modifications to systems) • Complete aircraft or propulsion systems overhaul and rebuilding (i.e., periodic restoration of aircraft to original design specifications)
336611	<p>This sector comprises establishments primarily engaged in operating shipyards. Shipyards are fixed facilities with dry docks and fabrication equipment capable of building a ship, defined as watercraft typically suitable or intended for other than personal or recreational use. Activities of shipyards include the construction of ships, as well as their repair, conversion and alteration; the production of prefabricated ship and barge sections; and specialized services, such as ship scaling.</p>
336992	<p>This sector comprises establishments primarily engaged in manufacturing complete military armored vehicles, combat tanks, specialized components for combat tanks, and self propelled weapons.</p>

Figure 23: A&D Services Sector NAICS Codes

NAICS Code	Description
511140	<p>This sector comprises establishments primarily engaged in publishing directories, mailing lists, and collections or compilations of fact. The products are typically protected in their selection, arrangement, and/or presentation. Examples of products made by these establishments are lists of mailing addresses, telephone directories, directories of businesses, collections or compilations of proprietary drugs or legal case results, compilations of public records, etc. These establishments may publish directories and mailing lists in print or electronic form.</p>
511199	<p>This sector comprises establishments generally known as publishers (except newspaper, magazine, book, directory, database, music, and greeting card publishers). These establishments may publish works in print or electronic form.</p>
517110	<p>This sector comprises establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies. Establishments in this sector use the wired telecommunications network facilities that they operate to provide a variety of services, such as wired telephony services, including VoIP services; wired (cable) audio and video programming distribution; and wired broadband Internet services. By exception, establishments providing satellite television distribution services using facilities and infrastructure that they operate are included in this sector.</p>
518210	<p>This sector comprises establishments primarily engaged in providing infrastructure for hosting or data processing services. These establishments may provide the following services to clients:</p> <ul style="list-style-type: none"> • Specialized hosting activities, such as web hosting, streaming services, or application hosting • General time-share mainframe facilities <p>Data processing establishments provide:</p> <ul style="list-style-type: none"> • Complete processing and specialized reports produced from data supplied by clients • Automated data processing and data entry services

NAICS Code	Description
541310	This sector comprises establishments primarily engaged in planning and designing residential, institutional, leisure, commercial, and industrial buildings and structures by applying knowledge of design, construction procedures, zoning regulations, building codes, and building materials.
541330	<p>This sector comprises establishments primarily engaged in applying physical laws and principles of engineering to the design, development, and utilization of machines, materials, instruments, structures, processes, and systems.</p> <p>The assignments undertaken by these establishments may involve any of the following activities:</p> <ul style="list-style-type: none"> • Provision of advice • Preparation of feasibility studies • Preparation of preliminary and final plans and designs • Provision of technical services during the construction or installation phase • Inspection and evaluation of engineering projects and related services
541511	This sector comprises establishments primarily engaged in writing, modifying, testing, and supporting software to meet the needs of a particular customer.
541512	This sector comprises establishments primarily engaged in planning and designing computer systems that integrate computer hardware, software, and communication technologies. The hardware and software components of the system may be provided by this establishment or company as part of integrated services or may be provided by third parties or vendors. These establishments often install the system and train and support users of the system.
541513	This sector comprises establishments primarily engaged in providing on-site management and operation of clients' computer systems and/or data processing facilities. Establishments providing computer systems or data processing facility support services are included in this sector.
541519	This sector comprises establishments primarily engaged in providing computer-related services (except custom programming, systems integration design, and facilities management services). Establishments providing computer disaster recovery services or software installation services are included in this sector.
541618	<p>This sector comprises establishments primarily engaged in providing management consulting services (except administrative and general management consulting; human resources consulting; marketing consulting; or process, physical distribution, and logistics consulting).</p> <p>Establishments providing telecommunications or utilities management consulting services are included in this sector.</p>
541620	<p>This sector comprises establishments primarily engaged in providing advice and assistance to businesses and other organizations on environmental issues, such as the control of environmental contamination from pollutants, toxic substances, and hazardous materials. These establishments:</p> <ul style="list-style-type: none"> • Identify problems (e.g., inspect buildings for hazardous materials) • Measure and evaluate risks • Recommend solutions <p>These establishments employ a multidiscipline staff of scientists, engineers, and other technicians with expertise in areas, such as air and water quality, asbestos remediation, and environmental law. Establishments providing sanitation or site remediation consulting services are included in this sector.</p>

NAICS Code	Description
541710	This sector comprises establishments primarily engaged in conducting research and experimental development in the physical, engineering, and life sciences, such as agriculture, electronics, environmental, biology, botany, biotechnology, computers, chemistry, food, fisheries, forests, geology, health, mathematics, medicine, oceanography, pharmacy, physics, veterinary, and other allied subjects.
561110	This sector comprises establishments primarily engaged in providing a range of day-to-day office administrative services, such as: <ul style="list-style-type: none"> • Financial planning • Billing and recordkeeping • Personnel • Physical distribution and logistics for others on a contract or fee basis These establishments do not provide operating staff to carry out the complete operations of a business.
561210	This sector comprises establishments primarily engaged in providing operating staff to perform a combination of support services within a client's facilities. Establishments in this sector typically provide a combination of services to support operations within facilities, such as janitorial, maintenance, trash disposal, guard and security, mail routing, reception, laundry, and related services. These establishments provide operating staff to carry out these support activities; however, they are not involved with, or responsible for, the core business or activities of clients. Establishments providing facilities (except computer and/or data processing) operation support services and establishments providing private jail services or operating correctional facilities (i.e., jails) on a contract or fee basis are included in this sector.
561612	This sector comprises establishments primarily engaged in providing guard and patrol services, such as bodyguard, guard dog, and parking security services.
561720	This sector comprises establishments primarily engaged in cleaning building interiors, interiors of transportation equipment (e.g., aircraft, rail cars, ships), and/or windows.
561730	This sector comprises: <ul style="list-style-type: none"> • Establishments primarily engaged in providing landscape care and maintenance services, such as installing trees, shrubs, plants, lawns, or gardens • Establishments primarily engaged in providing these services along with the design of landscape plans and/or the construction (i.e., installation) of walkways, retaining walls, decks, fences, ponds, and similar structures
561990	This sector comprises establishments primarily engaged in providing day-to-day business and other organizational support services (except office administrative services, facilities support services, employment services, business support services, travel arrangement and reservation services, security and investigation services, services to buildings and other structures, packaging and labeling services, and convention and trade show organizing services).
562910	This sector comprises establishments primarily engaged in one or more of the following: <ul style="list-style-type: none"> • Remediation and cleanup of contaminated buildings, mine sites, soil, or ground water • Integrated mine reclamation activities, including demolition, soil remediation, waste water treatment, hazardous material removal, land contouring, and revegetation • Asbestos, lead paint, and other toxic material abatement

Approximation and extrapolation procedures and methodologies were applied to develop estimates for various metrics. As mentioned previously, metrics calculated to assess the economic impact of the A&D sector include employment, GDP, taxes paid, exports, imports, and economic multiplier data.

For this study, we segmented the companies as large, mid-sized, and small businesses. Large A&D enterprises had more than 11,100 employees in 2013, while small A&D companies had less than 680 employees over the same period. When considering the commercial aerospace subsector, the smallest company among the top 20 had more than 2,650 employees. For the defense subsector, the top 20 companies included those that had more than 7,460 employees in 2013, while small companies had less than 220 employees over the same period.

Employees	Commercial	Defense	Total
Top 20 (large)	>2,650 employees	>7,460 employees	>11,100 employees
Rest of top 100 (mid-sized)	125 employees to 2,650 employees	220 employees to 7,460 employees	680 employees to 11,100 employees
Small	<125 employees	<220 employees	<680 employees

Estimating A&D employment

The Bureau of Labor Statistics was our primary source for estimating employment. Our process involved calculating employment statistics for each state and for all NAICS codes. We then gathered missing data to smooth data gaps from various sources. The focus was on the two NAICS codes that traditionally define the A&D sector: 33641 and 334511. Growth rates were applied and we determined suitable weights for each state. Employment weights were used for codes 33641 and 334511 as a base for any further estimates in other codes.

Estimating A&D payroll and average wages

To gather A&D payroll wages, average annual state-by-state wage data was obtained for each sector NAICS code from BLS. Growth rates were applied and a weighting methodology was used to fill in intermittent gaps in data, thereby arriving at payroll and average wages.

Estimating A&D taxes

The federal, state, and local governments levy different types of taxes on A&D companies and their employees. Publicly available data was identified from the IRS and the Tax Foundation to arrive at estimates for the various taxes.

Federal taxes

The following types of federal taxes were included:

- Federal corporate income tax
- Social Security tax
- Medicare tax
- Federal Unemployment Tax Act (FUTA) tax
- Individual income tax

Estimating federal corporate income taxes

To calculate federal corporate income tax collections, total federal corporate income taxes paid after credits from the IRS for each four-digit NAICS code were used.

Tax data was scaled down using a suitable factor to estimate the taxes paid by A&D sector in six-digit NAICS codes. The tax figures obtained for each NAICS code were then added together to arrive at the total federal corporate income taxes paid by the A&D sector.

Estimating social security taxes

Each employer and US employee must pay Social Security taxes based on the amount of an employee's wages. An employee's contribution to Social Security is equal to 6.2 percent of gross wages received, subject to a ceiling amount that is adjusted annually for inflation, which the employer is required to withhold and remit to the IRS. The employer must make a corresponding and equal contribution to Social Security, subject to the same ceiling. We calculated the Social Security tax paid by employees and employers for all A&D NAICS codes and in all 50 states. The sum total of Social Security taxes paid by employees and employers equals the total Social Security taxes paid by the A&D sector in the US.

Estimating FUTA taxes

Under FUTA, employers are required to remit unemployment taxes equal to 6.2 percent of the first \$7,000 of wages paid during a calendar year to a covered employee. However, if a state has adopted an unemployment insurance (UI) program that meets federal guidelines, employers in that state can credit state UI taxes against up to 90 percent of their federal UI tax, on a dollar-

for-dollar basis. Thus, when a state UI program meets all the federal requirements, employers in the state pay a federal tax rate of 0.6 percent, plus state UI taxes.

In our calculations, we assumed that our AGD employment base earned at least \$7,000, and we estimated FUTA taxes accordingly. We then summed the FUTA tax collections from each NAICS code for each state to estimate the total FUTA taxes collected in a year.

Individual income taxes

Wages earned by the US employees working in the AGD sector are typically subject to federal individual income taxes. Each individual's federal income tax liability is unique and depends on the facts and circumstances of that individual's wages, filing status, number of dependents, other taxable income (e.g., spousal income, capital gains, interest), contributions to tax-deferred or pretax accounts (e.g., 401(k), pretax health insurance premiums), deductions, and applicable tax credits. For simplicity, we assumed that all employees avail a minimum tax exclusion of \$18,700, calculated after deducting the standard 2013 deduction and personal exemption from gross wages. In addition, we assumed a tax bracket of "married filing jointly" for the AGD employment base.

To calculate individual federal income taxes, average annual wages from the BLS were identified on a state-by-state basis. We then applied the relevant tax rates to these wages, after factoring in tax exclusions. We calculated individual federal income taxes for all AGD NAICS codes in all 50 states, thereby arriving at a total national figure.

State taxes

States apply varying tax rates on companies and individuals. The following types of taxes were considered for the scope of our study:

- State business income tax
- State individual income tax

Estimating state business income taxes

A company pays income-based taxes in each state based on the amount of the company's taxable income apportioned to that state. Different states use different

methodologies, but typically, there are three relevant factors affecting apportionment of income: gross receipts within the state versus overall gross receipts; value of company-owned property located within the state versus overall value of company-owned property; and payroll within the state versus overall payroll.

To estimate state business income taxes, we applied an algorithm to distribute net income to different states. We obtained net income by state for each NAICS code using a revenue-weighting approach, and we then applied the individual state tax rate on these net income figures.

Business income taxes are applied on the net income generated by industries categorized under different NAICS codes in each respective state. Gross receipts taxes are applied on revenue generated from those industries in the states in which such taxes are levied. Each state charges different tax rates on business income. Some states have a bracketed tax system with different tax rates for various levels of net income. We used the maximum tax rate applicable in each state for our analysis. The following states do not have business income tax, but they charge taxes on businesses under different names:

- Ohio charges a gross receipts tax, under the name "Commercial Activities Tax," of 0.26 percent on the revenue generated from the operations of companies.
- Texas charges a gross receipts tax, under the name "Margin Tax," in the range of 0.5–1.0 percent. We used a 1.0 percent tax rate in our analysis.
- Washington state charges a gross receipts tax, under the name "Business and Occupation Tax," in the range of 0.13–3.3 percent.
- Michigan business tax is applied to both business income and modified gross receipts in a manner that ties it to profits, and produces a minimum tax based on gross receipts.

Estimation of state individual income taxes

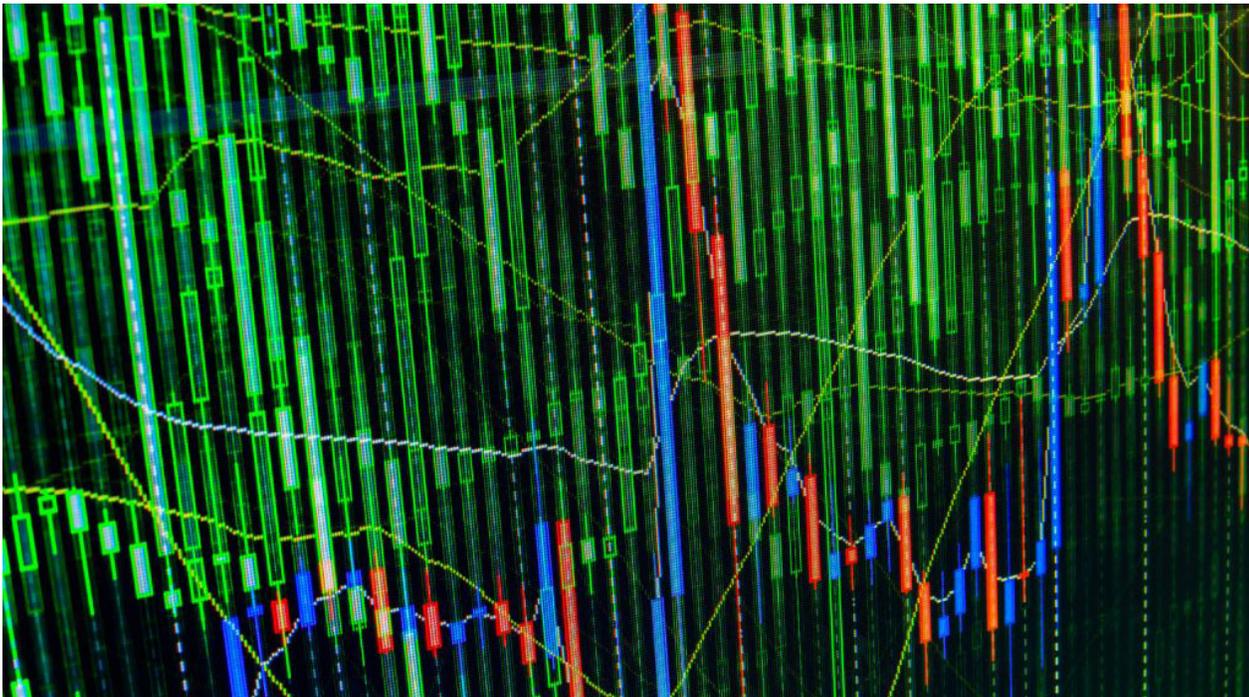
Employees are subject to state income taxes within the states in which they perform services, as well as in the states in which they reside, if different, and are subject to certain exemptions, exclusions, and available credits. There are several types of tax exemptions available to employees that are not included in the scope of the A&D sector.

We calculated state individual income taxes using an effective tax rate per state, as well as A&D employment and annual average wages per NAICS code in each state. The sum of the individual income tax collections from all states and NAICS codes provides the total state individual income taxes collected.

Estimating direct and indirect economic impacts

We used the Regional Input-Output Modeling System (RIMS II) multiplier data provided by the BEA to conduct the impact assessment. We used Type II direct-effect employment multipliers to quantify the direct and indirect

impact of A&D employment in the US. Direct impacts measure total expenditures on goods and services, including wages and salaries, used in the production of goods and services within the A&D sector. Indirect impacts refer to the purchases of goods and services by suppliers to the A&D sector that are then used in the production of goods and services within the A&D sector. Indirect impacts, therefore, measure the magnitude of the A&D sector's interactions with other businesses that supply it with necessary materials and services; which then lead to the indirect demand for goods and services from other industries. The employment multiplier of 2.36 referred to in the study is a "direct-effect" multiplier, and it accounts for primary- and secondary-effect employment associated with the A&D sector. It does not contemplate "final demand" employment or work associated with tertiary-effect employment developed well beyond the direct effect of the A&D sector's employment base.



Frequently asked questions

How does the study scope compare and contrast with what usually has been defined as “Aerospace and Defense”?

The scope of the current study includes establishments engaged in aerospace products and parts manufacturing (NAICS code 33641), search and navigation equipment (NAICS code 334511) as well as establishments engaged in manufacturing and providing services related to military land vehicles (NAICS code 336992), military ships and water based vehicles (NAICS code 336611), arms used by the military (NAICS code 332994 and 332995), ammunitions used by the military (NAICS codes 332992 and 332993), defense broadcast and wireless communications equipment (NAICS code 334220) and other services purchased by the armed forces (several NAICS codes pertaining to industries providing services to the A&D sector).

Why do citations of job losses and gains in this study differ from those cited in corporate 10-K filings?

The job losses and gains cited in corporate 10-K filings are at overall company level and may include non-A&D businesses. This study took into consideration only those job losses and gains that are related to the A&D businesses.

If one was to add up the revenues and employees of A&D companies as disclosed in their annual reports, would the numbers in the study be the same?

Yes, the numbers could reconcile if only the A&D business related revenue and employee data are included from the companies’ annual reports as well as financial presentations.

Why was BLS data used instead of using only the audited company reported data?

The company reported data largely provides national level annual statistics. State level data is not available from the company reports. Therefore, we used company reported data as well as BLS data as our main sources for the numbers published in this study.

Does this study data differ with data from other financial databases? If so, why?

The numbers from the study may not reconcile completely with data from other financial databases that include data for companies classified as A&D, even though some may have non-A&D businesses. Some companies are classified as A&D in other databases but may have large portions of their business that are not in the A&D sector. This study excludes data belonging to the non-A&D parts of such companies.

Do the commercial aerospace employee and revenue numbers include the air transportation sector?

The air transportation sector, which includes airlines, was not part of the scope of the study and is therefore not included in the commercial employee and revenue numbers. The companies that design and manufacture aircraft, as well as their suppliers, are included.

Are government agencies considered in this report?

Data for government agencies are not included in the scope of the current study because these organizations only have public sector employees.

Sources

- 1 Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, and the US Census Bureau
- 2 Deloitte analysis based on data from Bloomberg (accessed on 18 January 2016), company annual reports and 10-K statements
- 3 Ibid
- 4 Deloitte Touche Tohmatsu Limited (DTTL) Global Consumer & Industrial Products Industry group analysis of the data from the Office of the Under Secretary of Defense (Comptroller) in the United States, accessed in November 2015 <http://comptroller.defense.gov>
- 5 Deloitte analysis based on data from Bloomberg (accessed on 18 January 2016), company annual reports and 10-K statements
- 6 Deloitte analysis based on data from company annual reports, the US Census Bureau, and the Bureau of Labor Statistics
- 7 Deloitte analysis based on data from the US Bureau of Economic Analysis' RIMS II multipliers <https://www.bea.gov/regional/rims/rimsii>
- 8 Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, company annual reports, and the US Bureau of Economic Analysis
- 9 Ibid
- 10 Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, and the US Census Bureau
- 11 Ibid
- 12 Ibid
- 13 Deloitte analysis based on data from company annual reports and 10-K statements
- 14 Ibid
- 15 Deloitte analysis based on data from the Bureau of Labor Statistics, the US Census Bureau, company annual reports and 10-K statements, and S&P Compustat
- 16 Ibid
- 17 Ibid
- 18 Deloitte analysis based on data from the US Bureau of Economic Analysis' RIMS II multipliers <https://www.bea.gov/regional/rims/rimsii>
- 19 Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, company annual reports, and the US Bureau of Economic Analysis
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- 23 Deloitte analysis based on data from the Bureau of Labor Statistics, the US Office of Personnel Management, the US Census Bureau, and the US Bureau of Economic Analysis
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Endnotes

- 1 NAICS codes considered for services are 511140, 511199, 517110, 518210, 541310, 541330, 541511, 541512, 541513, 541519, 541618, 541620, 541710, 561110, 561210, 561612, 561720, 561730, 561990, and 562910. NAICS codes considered for manufacturing are 332992, 332993, 332994, 332995, 334220, 334511, 33641, 336611, and 336992.
- 2 Civilian employees working for the DoD, other defense agencies, the FAA, and NASA comprise the group of A&D-skilled workers described in this report. The group does not include anyone in uniform. Civilians working for military departments, such as Naval Sea Systems Command, Air Force Material Command, Army Material Command, and DARPA, are included in this segment.
- 3 Comparative sector analysis was performed by evaluating the metric for the following sectors:
 - Health care comprises sectors falling under NAICS codes 3391 (medical equipment and supplies manufacturing), 621 (ambulatory health care services), 622 (hospitals), and 623 (nursing and residential care facilities)
 - Chemicals comprises sectors falling under NAICS codes 325 (chemical manufacturing) and 326 (plastics and rubber products manufacturing)
 - Food and beverages comprises sectors falling under NAICS codes 311 (food manufacturing) and 312 (beverage and tobacco product manufacturing)
 - IT comprises industries falling under NAICS codes 334 (computer and electronic product manufacturing), 516 (Internet publishing and broadcast), and 518 (Internet service providers, Web search portals, and data processing services)
 - Automobiles comprise sectors falling under NAICS codes 3361 (motor vehicle manufacturing), 3362 (motor vehicle body and trailer manufacturing), and 3363 (motor vehicle parts manufacturing)
 - Machinery manufacturing comprises sectors falling under NAICS code 333 (machinery manufacturing)
 - Primary metal manufacturing comprises sectors falling under NAICS code 331 (primary metals manufacturing)

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Acknowledgements

Thank you to Aijaz Hussain, A&D Sector Research Leader at the Deloitte Center for Industry Insights, for his significant contribution toward the research, analysis, and writing of this report.

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