

Aviation Maintenance Industry Employment and Economic Impact

Prepared For:



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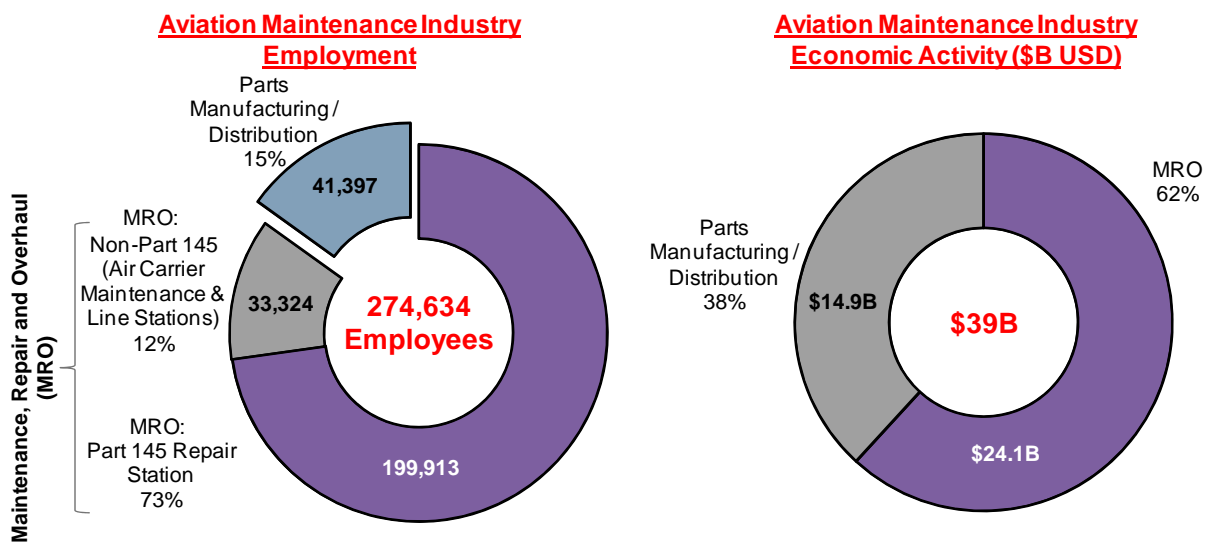
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1. INTRODUCTION

The U.S. civil aviation maintenance industry employs over 274,000 people and generates \$39B in economic activity (*Figure 1.1*). Maintenance, repair and overhaul (MRO) accounts for 85% of the industry’s total employment in the United States with 233,237 employees; within the industry, repair stations certificated by the Federal Aviation Administration (FAA) under 14 Code of Federal Regulations (CFR) part 145, are the largest employers with nearly 200,000 employees.

The remaining 33,300 are employed with non-part 145 firms (e.g., air carriers and line stations). MRO generates over 60% of the industry’s economic activity or \$24.1B. Service parts manufacturing and distribution account for the remaining 15% of employment with 41,397 employees. Although only accounting for 15% of the total employment, service parts and distribution accounts for 38% of the total economic activity or \$14.9B.

Figure 1.1
2008 US Civil MRO Market – Employment and Economic Activity



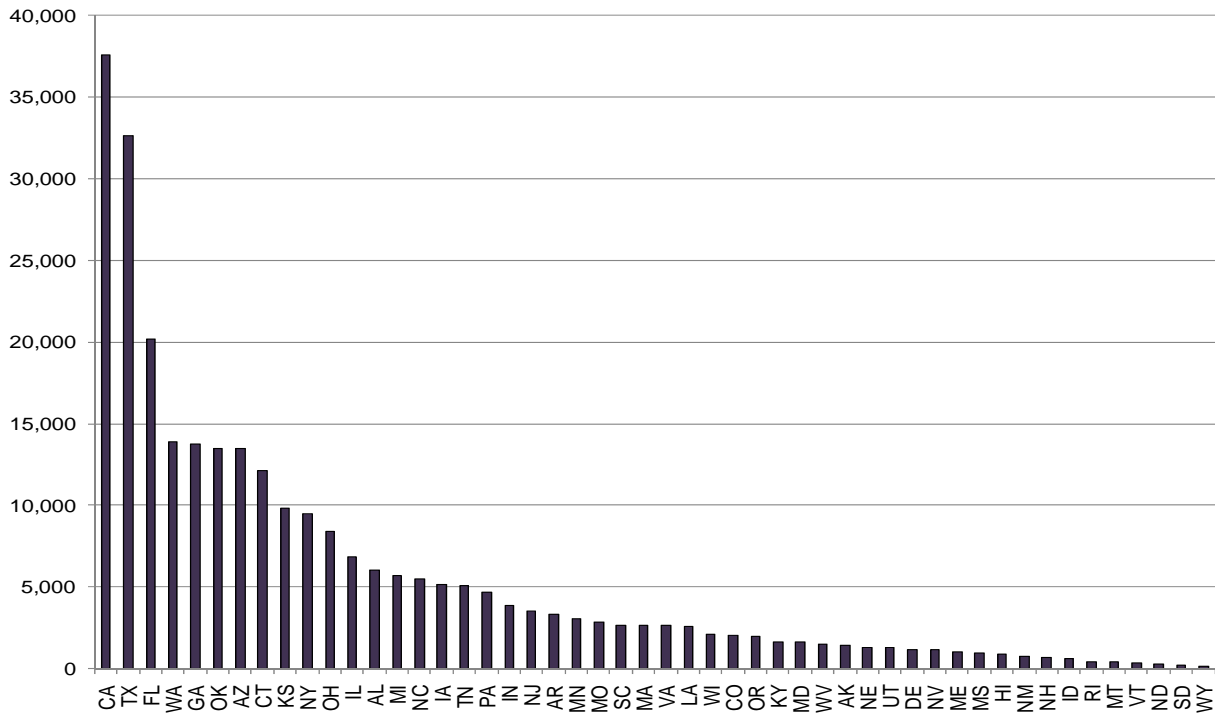
Source: AeroStrategy, FAA Air Agency Data, Company 10K, World Aviation Directory

At the state level, AeroStrategy estimates that California, Texas and Florida represent nearly a third of U.S. civil aviation maintenance employment with an estimated 90,430 employees (*Figure 1.2*); the top ten states represent nearly two-thirds of the industry’s total employment in the United States.

California and Texas generate the most aviation maintenance economic activity followed by Arizona, Florida, Washington and Connecticut; together, these six states account for over half of the industry’s total economic footprint (*Figure 1.3*).

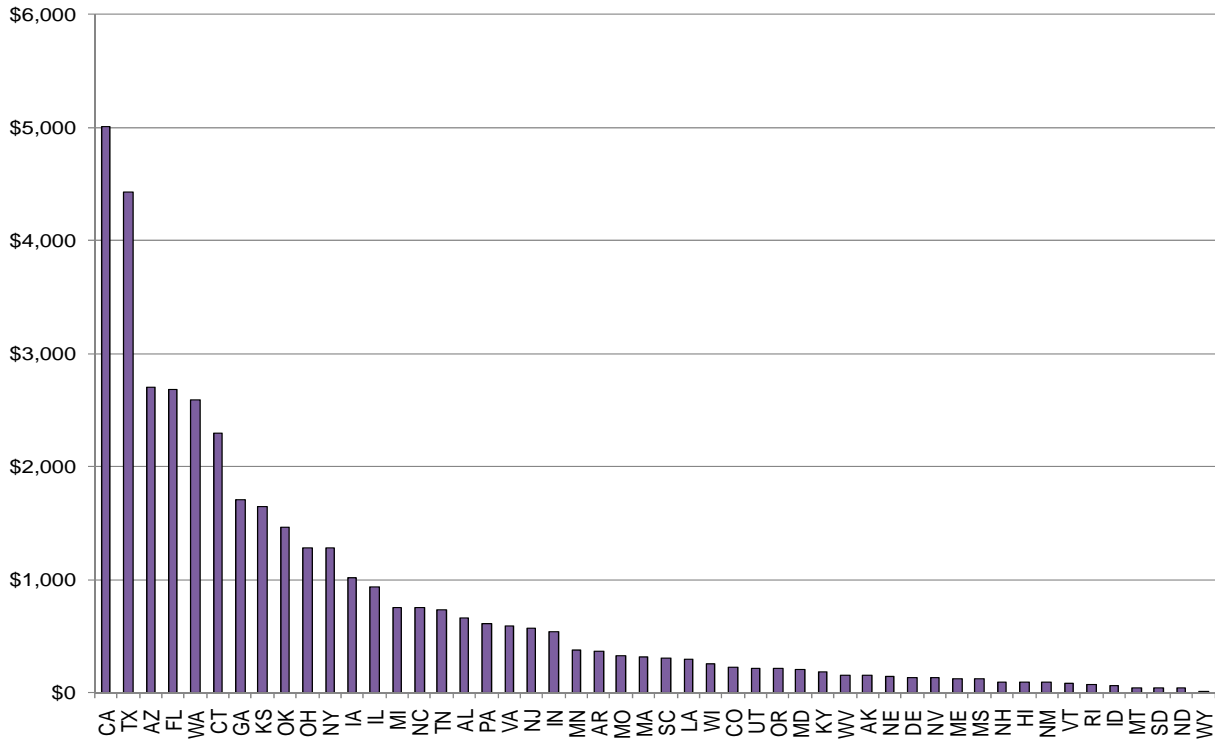
Table 1.1 presents the detailed employment and economic impact at the state level.

Figure 1.2
2008 US Employment Ranking By State (Employees)



Source: AeroStrategy, FAA Air Agency Data, Company 10K, World Aviation Directory

Figure 1.3
2008 US Economic Activity Ranking By State (\$M USD)



Source: AeroStrategy, World Aviation Directory, One Source

Table 1.1
Aviation Maintenance Industry Employment and Economic Impact By State

State	Aviation Maintenance Industry Employment			Aviation Maintenance Industry Economic Activity (\$M USD)	
	Maintenance, Repair and Overhaul (MRO)		Total Employment (MRO plus Parts Manufacturing/ Distribution)	MRO	Total Economic Activity (MRO plus Parts Manufacturing/ Distribution)
	FAA-Certificated Repair Station	Air Carrier (Base and Line Maintenance)			
AK	518	912	1,435	\$147.9	\$149.6
AL	5,836	112	6,046	\$615.2	\$656.5
AR	3,254	22	3,351	\$338.8	\$363.8
AZ	5,849	2,227	13,445	\$835.3	\$2,700.0
CA	30,670	2,709	37,566	\$3,452.5	\$5,004.6
CO	1,340	614	2,008	\$202.1	\$220.1
CT	7,503	89	12,109	\$785.3	\$2,290.9
DE	1,122	0	1,170	\$116.1	\$132.1
FL	16,658	1,659	20,191	\$1,894.6	\$2,683.9
GA	11,173	1,414	13,741	\$1,301.9	\$1,704.9
HI	140	718	863	\$88.7	\$90.4
IA	3,003	68	5,156	\$317.6	\$1,019.3
ID	471	103	593	\$59.4	\$65.7
IL	4,121	1,810	6,833	\$613.5	\$937.5
IN	3,127	180	3,888	\$342.0	\$535.7
KS	7,029	98	9,792	\$737.2	\$1,647.2
KY	709	904	1,657	\$166.8	\$181.5
LA	2,354	127	2,589	\$256.6	\$292.6
MA	1,740	746	2,659	\$257.1	\$314.8
MD	1,338	128	1,622	\$151.6	\$203.6
ME	884	25	984	\$94.0	\$119.0
MI	4,322	705	5,676	\$520.0	\$749.6
MN	2,235	561	3,054	\$289.2	\$375.2
MO	2,349	367	2,852	\$280.9	\$326.3
MS	838	45	964	\$91.3	\$118.3
MT	363	14	393	\$39.0	\$44.3
NC	3,601	1,131	5,504	\$489.4	\$746.8
ND	187	17	261	\$21.1	\$40.1
NE	1,205	69	1,311	\$131.8	\$144.1
NH	554	34	690	\$60.8	\$94.8
NJ	2,593	196	3,522	\$288.5	\$564.3
NM	604	67	729	\$69.4	\$88.7
NV	671	384	1,122	\$109.1	\$131.5
NY	6,112	2,260	9,462	\$865.9	\$1,275.1
OH	4,710	1,885	8,382	\$682.1	\$1,277.8
OK	13,090	99	13,485	\$1,364.2	\$1,462.8
OR	1,508	435	1,978	\$201.0	\$212.6
PA	2,904	1,219	4,661	\$426.5	\$605.8
RI	294	0	402	\$30.4	\$66.4
SC	2,358	185	2,661	\$263.0	\$302.4
SD	66	24	188	\$9.3	\$42.0
TN	2,049	2,520	5,109	\$472.6	\$734.1
TX	25,057	4,523	32,673	\$3,059.5	\$4,430.0
UT	338	722	1,301	\$109.6	\$215.0
VA	1,287	108	2,635	\$144.3	\$588.5
VT	169	22	363	\$19.8	\$77.1
WA	8,353	841	13,898	\$951.0	\$2,585.6
WI	1,728	212	2,085	\$200.7	\$249.0
WV	1,448	0	1,470	\$149.8	\$157.1
WY	81	14	105	\$9.8	\$13.2
Total	199,913	33,324	274,634	\$24,124	\$39,032

Source: AeroStrategy, FAA Air Agency Data, Company 10K, World Aviation Directory

2. METHODOLOGY

2.1. Employment

Employment can be segmented into three primary groups: MRO, service parts, and distribution.

- **MRO**—The employment to support the maintenance, preventive maintenance and alteration of aircraft, including airframe heavy maintenance, engine overhaul, component maintenance and line maintenance. Employment includes technicians as well as employees engaged in sales, general and administrative (SG&A) activities.
- **Service Parts**—There are three primary sources for service parts: Original equipment manufacturers (OEM), part manufacturer approval (PMA) holders and hardware manufacturers. Employment includes employees engaged in distribution, administrative and manufacturing activities.
- **Distribution**—Distributors are a common intermediary between service parts suppliers and MRO facilities. Employment includes employees supporting distribution center operations as well as SG&A activities.

The main source of employment for the MRO industry is part 145 repair stations. Repair station employment estimates are based in part on 2009 federal government data¹. These facilities account for approximately 80% of the total MRO employment, but do not capture employment from non-part 145 activities such as captive airline airframe heavy maintenance or line maintenance where the airlines do not have a part 145 certificate.

To capture and identify the 20% of employment represented by non-part 145 firms, maintenance employment and base locations are identified for the top 35 airlines in the United States, which account for 90% of fleet and line maintenance spending. Employment data for non-part 145 firms are allocated based on the following assumptions:

- 80% of line maintenance/base maintenance personnel are at hub or key airports;
- 20% are at tertiary line stations; and,
- For low cost carriers (e.g., Southwest) which fly point-to-point, 40% of line maintenance personnel are at tertiary line stations.

Sources of data for the non-Part 145 analysis include company 10K filings, WATS Database and general internet search.

For the remaining airlines that represent 10% of the fleet, it is assumed that line maintenance employment is at tertiary line stations. Allocation of employment for line maintenance personnel is based on airport movement by state; airport movement data is based on a report by ACI-NA².

Footnote:

¹ FAA Air Agency Data, March 8, 2009

² Airports Council International - North America, 2008

Service parts employment is estimated by identifying the key commercial manufacturers and associated employment by state using data from the World Aerospace Database; the results are then aggregated to reflect the pro-rata employment contribution by state. Overall, U.S. service parts suppliers generate \$11.6B in revenue.

AeroStrategy research suggests that for every \$1M in service parts revenue, a company typically employs three people (2.5 manufacturing plus 0.5 administrative). Overall, Aerostrategy estimates that there are 34,743 employees to support \$11.6B in service parts revenue in the United States; these 34,743 employees are allocated based on the pro-rata employment contribution by state developed previously.

Finally, distribution employment is based on employment data from World Aerospace Database for United States-based distributors and re-distributors.

2.2. Economic Activity

Economic activity by state is developed by multiplying the employment at the state level by the following revenue per employee assumptions (*Table 2.1*):

**Table 2.1
Revenue per Employee Assumptions**

MRO	Service Parts	Distribution
\$103K/employee	\$333K/employee	\$500K/employee

Source: AeroStrategy, Interviews