

# DEFENSE



## **Defense • Homeland Security—Definition**

The Defense and Homeland Security cluster is comprised of industries that supply and support local and national security. Included are defense related research activities and the manufacturing of communications equipment, ammunition, military vehicles, and aircraft/aerospace components.

## **Missouri's Strengths**

### **Aircraft / Military Vehicle Manufacturing**

A major employing industry and exporter within this cluster manufactures vehicles used in military service and aerospace. Boeing is included in this group.

### **Ammunition**

Another major employer and exporter within this cluster are industries involved in the manufacturing of ammunition. Missouri manufactures small arms ammunition, explosives, and longer range ammunition. Companies such as Alliant Lake City Small Ammunitions Company are included in this group.

### **Advanced Defense Manufacturing**

Technology and research associated with advanced manufacturing are an integral part in developing vehicles, weapon systems, and search/detection devices often used in defense. Honeywell, La Barge, and United Technologies are a few companies involved in this activity.

### **Military Bases**

Our two main military bases, Fort Leonard Wood and Whiteman Air Force Base, have attracted a variety of private defense and aerospace companies to Missouri. The companies benefit from their proximity to these bases. National base relocations are not expected to affect the number of military personnel in the region over the long term. Therefore, businesses that supply these bases with equipment and services should remain stable.

## **Key Locations**

The largest employing areas in defense related industries are in St. Louis and Jackson counties. The highest growth areas are along I-70 and Howell, Christian, and Barry counties. Areas of high cluster concentration include Jackson, Linn, Chariton, and Wayne counties.

### **Factoid:**

- Whiteman Air Force Base is home to the B-2 Long Range Stealth Bomber.
- McDonnell Douglas built the Apollo, Mercury, and Gemini space capsules in St. Louis.
- Fort Leonard Wood was originally established in 1940 as a basic training site. Over 3 million service men and women have been trained at the site since its opening.
- Built in 1826, Jefferson Barracks is the oldest military post west of the Mississippi.



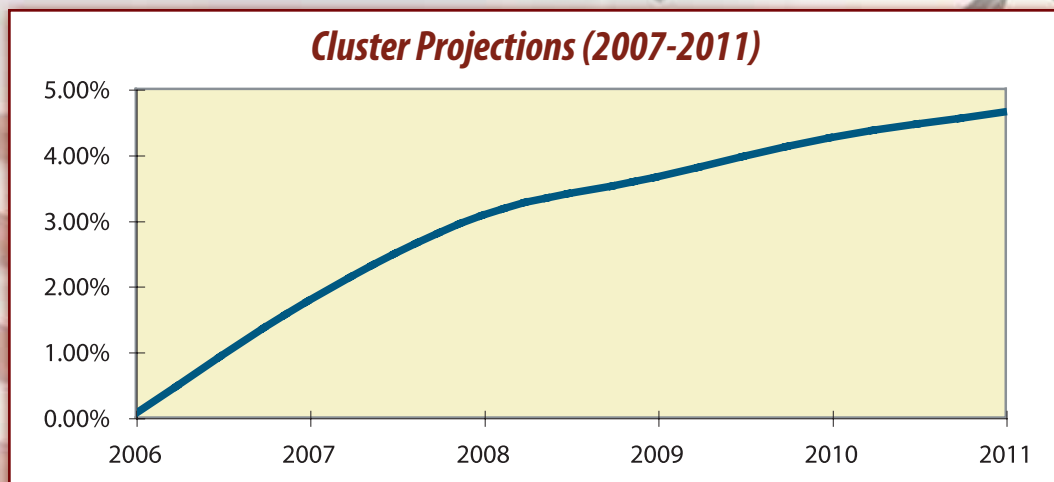
## What's Next for Defense • Homeland Security?

Missouri employment in defense and homeland security has shown a healthy increase since 2000, though it remains well short of 1990 levels. Two industries in particular – Small Arms Ammunition Manufacturing and Research & Development in the Physical Engineering and Life Sciences – have shown strong increases since 2000.

However, other manufacturing industries in the cluster have continued to see slow declines in employment. Consolidation of civilian employment at government military facilities has primarily resulted in net employment losses to the state; approximately two-thirds since 1990.

It is expected that 2000-2006 trends in cluster employment will continue into the future, with most growth on the service-providing side, and goods-producing employment stable or declining. Research and development now has a strong employment base in Missouri, and should continue to grow. Although with Boeing announcing the likely termination of the C-17 transport aircraft program in 2008, aircraft manufacturing is likely to show the largest decrease among the cluster's component industries. The one goods-producing industry that has shown strong employment growth, ammunition manufacturing, has traditionally depended on contract awards, and the strong increases in the first part of the decade reflect new contracts. Because of capacity limitations, it is doubtful that employment in the industry will expand very much beyond 2006 levels.

Some consolidation may continue at Department of Defense offices in the St. Louis and Kansas City areas, but it is likely that the large-scale cutbacks of the 1990s are a thing of the past. The state's two major military facilities, Fort Leonard Wood and Whiteman Air Force Base, host high-priority military operations. They should show stable-to-increasing employment levels for the remainder of the decade and beyond. In addition, Jefferson Barracks in St. Louis, one of the oldest of its kind, is expected to add personnel and construct a new barracks by 2008.



**Cluster Statistics**

- Number of Businesses (2006) ..... 348
- Number of Jobs (2006) ..... 16,922
- Percent of Total Missouri Jobs (2006) ..... 0.74%
- Average Annual Wages (2005) ..... \$77,935
- Location Quotient (2006) ..... 0.78
- Percent Change from 2001 Location Quotient ..... 38.25%
- Net Percent Change in Jobs (2001-2006) ..... 42.2%
  
- Total Change in Jobs (2001-2006) ..... 5,024  
*Employment Change from 2001 attributed to:*
  - National Factors ..... 305
  - Industry Factors ..... 180
  - Missouri's Competitiveness ..... 4,538

**Top Five Industries**

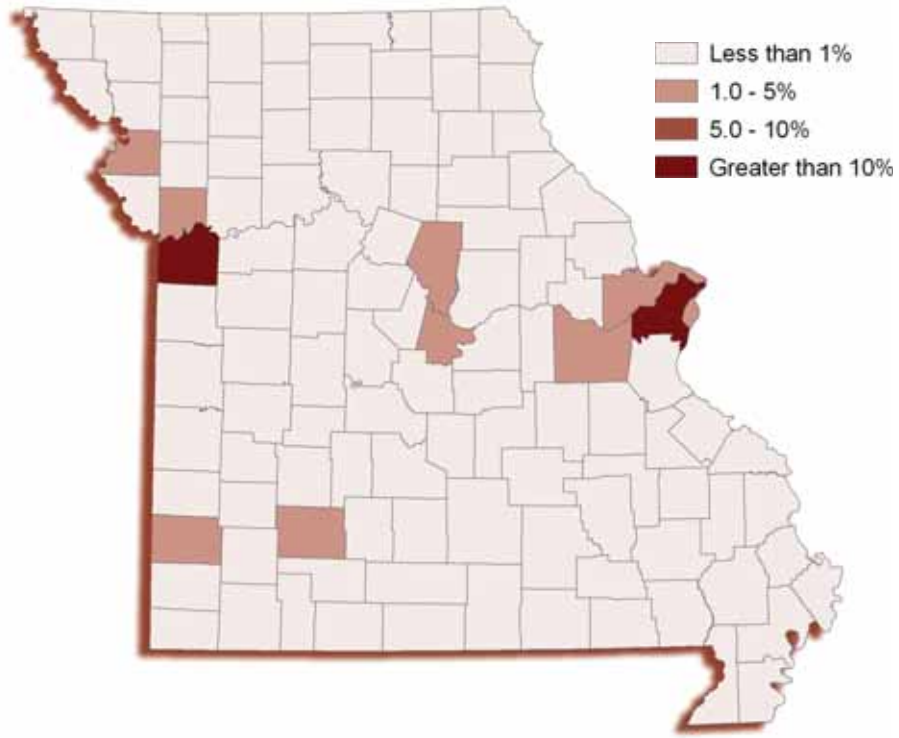
- Physical, engineering and biological research
- Ammunition, except small arms, manufacturing
- Small arms ammunition manufacturing
- Fabricated structural metal manufacturing
- Surgical appliance and supplies manufacturing

96.6% of  
Cluster Jobs

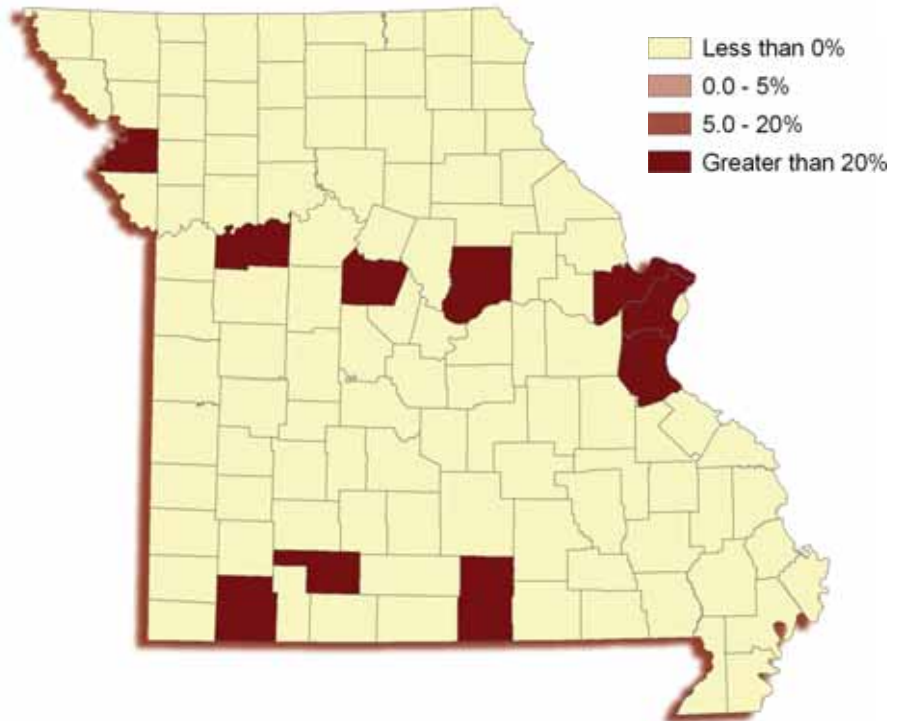
**Targeted Occupations with Projected Growth and Current Wage**

<i>12% of Cluster Occupations</i>	<i>Current Wage</i>	<i>Projected Growth 2004–2014</i>
Computer Software Engineers	\$74,330	34.40%
Medical Scientists	\$59,910	30.00%
Business Operations Specialists	\$52,310	15.80%
Industrial Engineers	\$69,160	10.40%
Structural Metal Fabricators and Fitters	\$31,400	5.30%

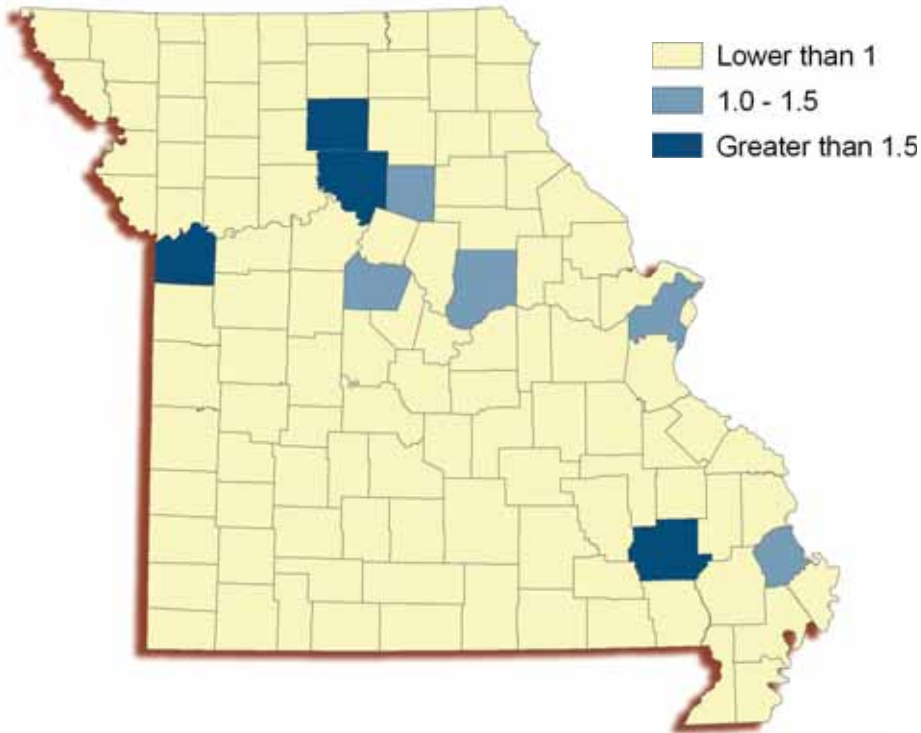
**Employment Percentage by County (2006)**



**Employment Change by County (2001-2006)**



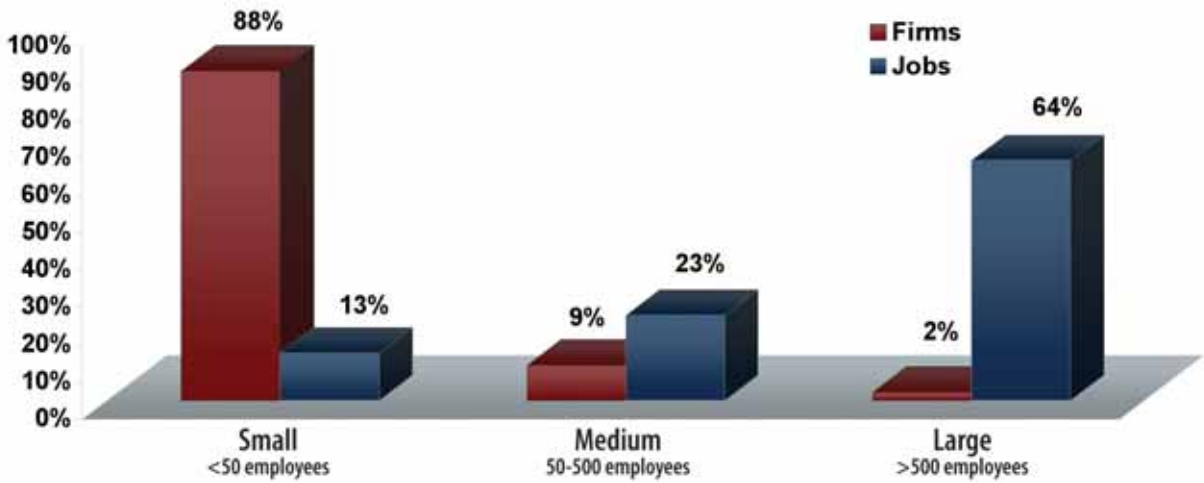
**Location Quotient by County (2006)**



**Top Industries by 2006 Location Quotient (LQ) with Change from 2001 LQ**

NAICS	Industry	2006 LQ	Percent Change
332992	Small arms ammunition manufacturing	11.31	58.91%
332993	Ammunition, except small arms, manufacturing	7.35	3.80%
325920	Explosives manufacturing	2.43	-3.20%
332312	Fabricated structural metal manufacturing	0.89	0.97%
541710	Physical, engineering and biological research	0.85	59.68%

**Distribution of Firms and Jobs by Firm Size (2006)**



**NAICS industries included in targeted cluster**

325920	Explosives Manufacturing
332312	Fabricated Structural Metal Manufacturing
332992	Small Arms Ammunition Manufacturing
332993	Ammunition (except Small Arms) Manufacturing
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument
336414	Guided Missile and Space Vehicle Manufacturing
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing
336992	Military Armored Vehicle, Tank, and Tank Component Manufacturing
339113	Surgical and Medical Instrument Manufacturing
541710	Research and Development in the Physical, Engineering, and Life Sciences

**One of a Kind:**

***The University of Missouri Technology Park at Fort Leonard Wood***

The University of Missouri Technology Park at Fort Leonard Wood is located in Pulaski County, Missouri on the Army base of Fort Leonard Wood. The park is the first technology park in the country located on an active military base. It is part of a collaborative funding effort between University of Missouri Systems and Missouri Technology Corporation (*an affiliate of the Missouri Department of Economic Development*).

Development of the park calls for the construction of 17 buildings on 62 acres of land. To date two of the buildings have been built. Tenants of the existing buildings include: 21st Century Systems, Concurrent Technologies Corporation, Titan Corporation,

The University of Missouri Rolla, Lincoln University, Anteon, the Fort Leonard Wood Regional Commerce and Growth Association, and the United States Army.

The belief held by the technology park's founders is that the environment of the park is unique because it allows for interaction and collaboration between the federal military, academic institutions (namely the University of Missouri at Rolla and the University of Missouri system), and the private sector. All three entities are heavily involved in research and development of new technologies and interaction between the three enabled by the physical space of the technology park can lead to productive collaborations for all parties.

One example of collaboration which has already come out of the technology park is the foundation and future funding of a geospatial intelligence laboratory at the Columbia campus of the University of Missouri system. The result of the collaboration has potential to be a multi-million dollar project funded by the federal government on the University of Missouri campus.

In order to promote collaborative efforts such as the one mentioned above, the Leonard Wood Institute was founded in 2004. Its mission is to "enable and manage collaborative efforts to assist in developing ...highly integrated research and development" to support operations of the Department of Defense. The goal of the Leonard Wood Institute is to enable the evolution of research projects in Department of Defense programs and research centers. The Leonard Wood Institute also hopes to help organizations with which it works to leverage funding through federal revenue, licensing income from intellectual property, ownership in business spin-offs, and an increased number of implementation contracts resulting from funded research.



## Definition of Terms

### Location Quotient

Location Quotient (LQ) measures the employment concentration of an industry within a specified area relative to the nation as a whole. It is calculated by dividing the region's industry employment share by the nation's industry employment share. A LQ of 1.00 or greater means that there is a higher concentration in the region for an industry than exists nationally. The Location Quotient is a quick guide to understanding key industries within an area, especially when coupled with employment growth trends that shift-share analysis can reveal.

<b>What Does the Location Quotient (LQ) Mean?</b>		
	<b>Low Employment Growth</b>	<b>High Employment Growth</b>
<b>High LQ</b>	<b>Important industries that may require attention</b>	<b>Important growth industries</b>
<b>Low LQ</b>	<b>Industries with lower potential for local economy</b>	<b>Potential emerging industries</b>

Statewide Location Quotients are provided by cluster in the summary section and in each cluster and sub-cluster section. Top industry and county Location Quotients are included in each cluster and sub-cluster section.

### Shift Share Analysis

Shift Share analysis measures employment changes in an industry, cluster, or regional industry mix. It breaks out employment changes into three components: National Share (NS), Industry Mix (IM), and Regional Shift (RS).

**National Share (NS)**—is the share of regional employment changes attributed to factors in the national economy.

**Industry Mix (IM)**—identifies local industry employment changes attributed to national industry employment changes.

**Regional Shift (RS)**—identifies a region's lagging or leading industries. This is also considered a measure of a region's competitiveness.

The shift share analysis is provided in the summary section and in each cluster and sub-cluster section under the heading Cluster Statistics.

## Summary of Clusters

	Agribusiness	Automotive	Defense Homeland Security	Energy	Finance	Information Technology	Life Sciences	Transportation Logistics	All Clusters
Employer Units (2006)	3,040	258	348	696	9,769	2,345	1,034	12,468	29,349
Employment (2006)	88,645	36,223	16,922	20,275	132,036	38,604	31,295	175,064	519,316
Average Employment per Establishment (2006)	29	140	49	29	14	16	30	14	18
Percent of Total Missouri Jobs (2006)	3.86%	1.58%	0.74%	0.88%	5.75%	1.68%	1.36%	7.62%	22.62%
Average Annual Wages (2005)	\$39,605	\$54,167	\$77,935	\$58,053	\$52,206	\$70,938	\$66,505	\$43,374	\$51,285
Location Quotient (2006)	1.19	1.65	0.78	1.29	1.04	0.79	0.91	1.05	1.06
Percent Change from 2001 Location Quotient	5.25%	3.91%	38.25%	-1.91%	-2.34%	8.69%	11.95%	0.11%	1.22%
Projected Employment Change (2011)	1.03%	-1.43%	4.61%	1.72%	0.12%	9.25%	11.41%	3.81%	2.88%
Percentage of Firms with less than 50 Employees	91%	66%	88%	93%	92%	93%	91%	94%	93%
Net Percentage Change in Jobs (2001-2006)	-8.9%	-12.2%	42.2%	-17.6%	1.4%	10.8%	17.4%	0.3%	-3.40%
Employment Change in Jobs (2001-2006) Total Change	-8,654	-5,051	5,024	-4,320	1,798	3,760	4,629	446	-18,482
Employment Change from 2001 attributed to National Factors	2,498	1,059	305	631	3,343	894	685	4,482	13,805
Employment Change from 2001 attributed to Industry Factors	-14,590	-7,066	180	-4,315	3,204	195	932	-2,178	-32,559
Employment Change from 2001 attributed to Missouri's Competitiveness	3,438	956	4,538	-637	-4,749	2,670	3,013	-1,858	272

Note: Some industries are in more than one cluster, so the sum of individual clusters will not equal the total for all clusters.