

Note: Companies mapped using the following NAICS codes and are indicative of capacity in these industries: **313230:** Nonwoven Fabric Mills; **325211:** Plastics Material and Resin Manufacturing; **335991:** Carbon and Graphite Product Manufacturing. NAICS codes used to identify North Carolina performance materials companies were geared toward the DoD's current advanced materials interest areas, primarily composites and nanomaterials. Companies on the list included those working with polymers, carbon products, and nonwovens, but not those in metals, metal fabrication, or traditional woven mills. While the total number of companies does not appear to be numerous, a comparison of states shows that North Carolina is third in the U.S. in the total number of companies within the NAICS codes used for performance materials.

RESET Support Activities

Definition: RESET encompasses maintenance, refurbishment, recapitalization, and supply activities to restore military operational units to a desired level of readiness for future missions. RESET thus includes vehicle component supply, vehicle manufacturing, and armaments—ground and mobility armor manufacturing and components supply. RESET also includes maintenance, repair, and parts replacement for aircraft, ground vehicles, munitions, communications and electronic equipment, and other equipment and supplies needed by the military.

Critical skills and education required by companies engaged in this market area include technicians skilled in aircraft and automotive parts repair; electrical, mechanical, chemical, and computer engineering; computer programming and operation; materials science; supply chain and logistics management.

Growth Potential: As a result of sustained military operations in Iraq and Afghanistan, the Army and Marine Corps predict annual RESET costs will continue to total \$13 billion for the Army and \$5 billion for the Marine Corps annually for as long as operations continue, and for two to three years thereafter.

Business and Industry Capacity: RTI identified at least 32 industries that comprise the RESET Support Activities market area and recommended eight critical industries for initial supply chain analysis in North Carolina:

- Other Motor Vehicle Electrical and Electronic Equipment Manufacturing
- Aircraft Engine and Engine Parts Manufacturing
- Other Aircraft Parts and Auxiliary Equipment Manufacturing
- Aircraft Manufacturing
- Guided Missiles and Space Vehicle Manufacturing
- Military Armored Vehicle, Tank, and Tank Component Manufacturing
- Light Truck and Utility Vehicle Manufacturing
- Other Ordnance and Accessories Manufacturing

The core industries associated with aircraft and aircraft parts manufacturing have experienced strong employment growth...

As of 2007, North Carolina had approximately 21,000 people working in these eight industries, and well-developed supply chains for several of them, including Aircraft Manufacturing and Other Aircraft Parts and Auxiliary Equipment Manufacturing. The core industries associated with aircraft and aircraft parts manufacturing have experienced strong employment growth, although these industries are far less concentrated in North Carolina than the national average. The Guided Missiles and Space Vehicle Manufacturing industry had no linkages in the state and, surprisingly, the Light Truck and Utility Vehicle Manufacturing had the second lowest linkage, indicating that trade and income is being sent out of state in this industry.

Military and Coast Guard installations in North Carolina, in partnership with the private sector, provide various levels of RESET support for the Army, Marine Corps, Navy, Coast Guard and National Guard. Fleet Readiness Center East (FRC East), a Navy depot located at Marine Corps Air Station (MCAS) Cherry Point, provides maintenance, repair, and overhaul services for multiple vertical lift aircraft platforms, including the MV-22 Osprey and in the future, the vertical lift version of the Joint Strike Fighter. FRC East employs over 4,000 civilians and active duty personnel, and is the largest single employer in North Carolina at a single location east of Interstate 95. The U.S. Coast Guard Aviation Center in Elizabeth City includes the Coast Guard's only aviation depot in the nation, and has resulted in strong partnerships with the private sector locally to support its mission. Leading contractors in this area include DRS Technologies, Sikorsky, and Lear Siegler Services. Lord Corporation, a company with global operations and headquartered in Cary, provides vibration, shock, and motion control solutions for rotary and fixed wing military aircraft. Outside of Camp Lejeune, OshKosh Trucks has a facility to repair trucks and other Marine Corps vehicles. At Fort Bragg, the Army Sustainment Command provides maintenance and repair support through partnerships with the private sector, including Lear Siegler Services, Stanley Associates, and ITT Industries.

In addition to supporting the ongoing mission of these facilities through workforce development and R&D partnerships, North Carolina may be positioned well to serve a critical need as troops start returning from Iraq in larger numbers. Given the number of America's operational forces based in North Carolina, the state should explore avenues to partner with in-state installations, as well as Army Forces Command, Army Materiel Command, and Marine Corps Logistics Command to address logistical and other challenges that will result from troops returning home.

Finally, opportunities for RESET should also be viewed in terms of the need for new technologies and products where the state has the greatest strength, e.g. performance materials and vehicle supply chain—and target out-of-state original equipment manufacturers (OEMs), as well as emerging procurements that align with these strengths. Industry interviews underscored the opportunity to target OEMs given that many supply replacement parts for RESET. For example, in addition to a handful of major composites suppliers to defense vehicle manufacturers, North Carolina has several businesses that produce wheeled vehicles or components for vehicles for government use, including Lord Corporation, Force Protection, American Growler, Carolina Growler, and Indigen Armor. Given the close proximity to large deployment installations, there are strong potential savings to DoD through reduced logistics and transport costs that would result from serving RESET needs through North Carolina resources.

Potential Crossover Area: The state's motorsports industry represents an opportunity to identify potential linkages to the military and defense industry original equipment manufacturers that supply wheeled vehicles and personnel equipment. Several motorsports companies have provided products and technologies for the military and defense industry to provide rapid

and cost-effective solutions to operational challenges to wheeled vehicles. In many cases, the desired technology or equipment already exists in the motorsports community. Examples of technologies and products that were developed for the motorsports industry and later applied to defense vehicles include suspension systems for mine rollers and vehicles, rapid refueling/repair procedures, windshield tear-offs for helicopters, and seating protection infrastructure. Additional opportunities for crossover application include restraints, communications systems and synergies between clothing and performance textiles. The Foundation is presently working to increase these linkages between DoD and the state's motorsports cluster.

Higher Education Capacity: Significant university and community college capacity exists to support a variety of RESET activities, ranging from technicians trained in reverse engineering of obsolete parts for aircraft to engineers who develop high performance materials and technologies used by wheeled vehicle defense companies. Over 3,000 engineering students graduate from seven UNC campuses annually, many of whom contribute to the RESET workforce in North Carolina. Several UNC campuses also offer Master, MBA and certificate programs in Project Management and Supply Chain Management, training students in the skills necessary to coordinate globally distributed RESET efforts.

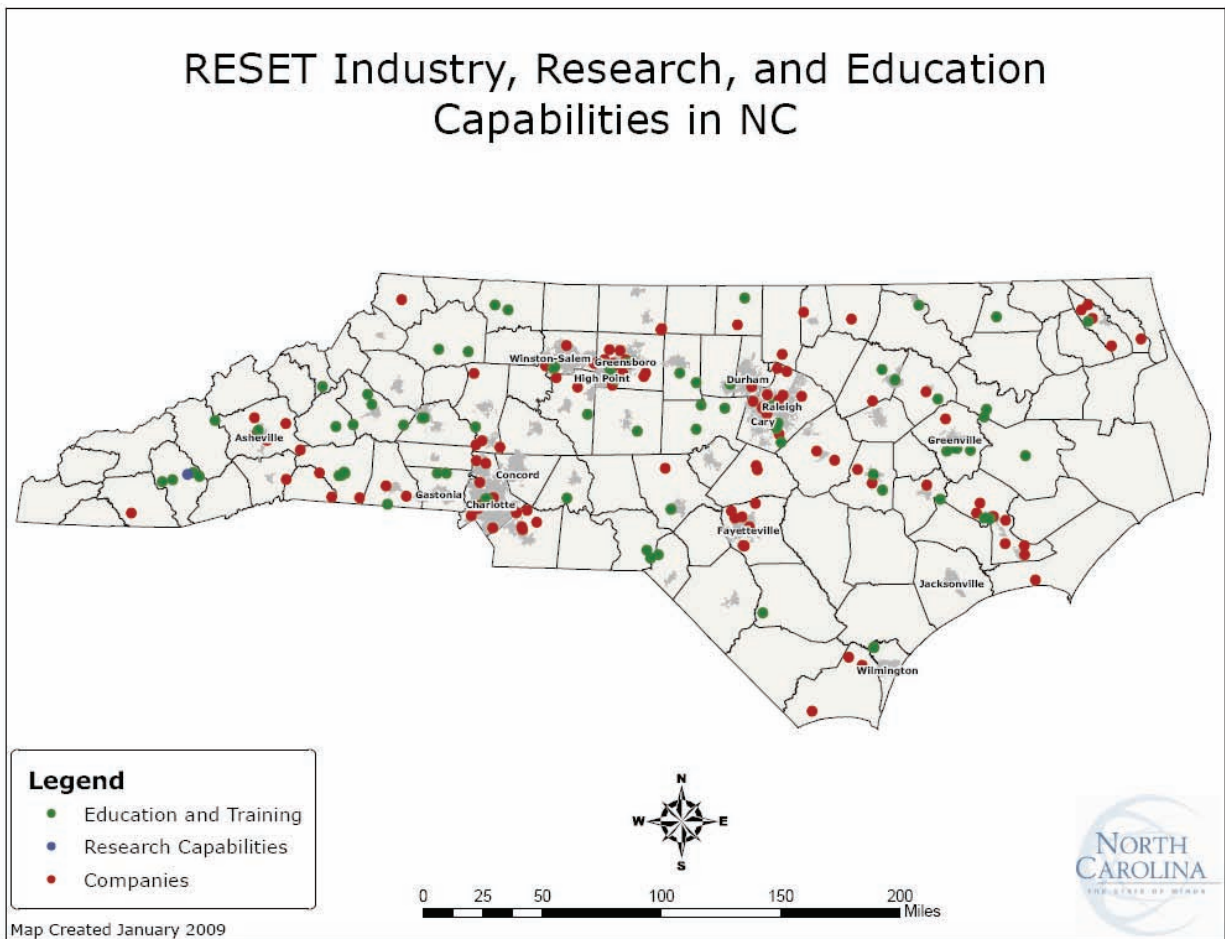
Further, the state has multiple R&D programs that support new technologies and supply products for defense wheeled vehicles. Examples include the Motorsports Engineering program and the Center for Precision Metrology at UNC-C, and the Integrated Manufacturing Systems Engineering Institute at NCSU. As discussed earlier, NC A&T SU and NCSU have ongoing collaborations with in-state military installations and throughout DoD related to reverse engineering and the development of performance materials, both of which have strong application to RESET. The Industrial Engineering Department at NC A&T SU also supports logistics requirements for the Army and multiple Depots.

The North Carolina Community College System has multiple programs at campuses across the state that can support RESET workforce and other requirements, including aviation maintenance programs at both Craven Community College and Guilford Technical Community College, an aircraft technician program at the College of the Albemarle, and programs related to performance materials mentioned above.

Finally, the Institute for Defense and Business, based in Chapel Hill and affiliated with the UNC System, manages the Depot & Arsenal Executive Leadership Program and the Center of Excellence in Logistics and Technology for the Army Materiel Command. These executive development programs are utilized by senior level military and civilian personnel throughout the DoD.

Snapshot: RESET Industry Cluster Analysis

Core Industry	Employment (2007)	Empl. Growth (since 1992)	Avg. Annual Wage (2007)	Value Added LQ (2006)	Employment LQ (2007)
Other Motor Vehicle Electrical and Electronic Equipment Manufacturing	17,181	5%	\$44,743	0.86	0.92
Aircraft Engine and Engine Parts Manufacturing	2,319	68%	\$85,072	0.99	0.9
Other Aircraft Parts and Auxiliary Equipment Manufacturing	527	32.40%	\$86,774	0.31	0.18
Aircraft Manufacturing	459	1047%	\$61,587	0.05	0.07
Guided Missiles and Space Vehicle Manufacturing	0	0%	NA	NA	NA
Military Armored Vehicle, Tank, and Tank Component Manufacturing	*	NA	NA	0.003	0.55
Light Truck and Utility Vehicle Manufacturing	524	-38.6%	\$44,876	0.04	0.09
Other Ordnance and Accessories Manufacturing	165	27%	NA	0.37	0.35



Note: Companies mapped using the following NAICS codes and are indicative of capacity: **336412:** Aircraft Engine and Engine Parts Manufacturing; **336413:** Other Aircraft Parts and Auxiliary Equipment Manufacturing; **336322:** Other Motor Vehicle Electrical and Electrical Equipment Manufacturing; **336411:** Aircraft Manufacturing; **336414:** Guided Missile and Space Vehicle Manufacturing; **336992:** Military Armored Vehicle, Tank, and Tank Component Manufacturing; **332995:** Other Ordnance and Accessories Manufacturing.

Emerging Market Areas

Overall: Unmanned Systems and Fuel and Power Sources can be considered “emerging” market areas in North Carolina. While certain sub-sectors of Unmanned Systems (i.e., aerial) are dominated by other U.S. states and companies, North Carolina has potential to grow certain segments, including the areas where the state has strengths under C4ISR, and unmanned boats and ground vehicles in particular.

Fuel and Power Sources is a priority focus area for the federal government and numerous states, including North Carolina, are competing heavily to invest and become a leader in this industry. The DoD and each of its military services have either recently established or are currently establishing task forces and leadership personnel to develop strategic plans related to alternative energy. This focus applies to both warfighter technology and military installations. This is an area where North Carolina has significant R&D capacity but not as much industry capacity, although it is growing in niche areas of alternative energy.