



Old R.J. Reynolds warehouses in Winston-Salem have found new life as Wake Forest University's BioTech Place.



PIEDMONT TRIAD TRANSFORMATION

The region looks beyond tobacco, textiles and furniture to rebuild an economy using science, advanced manufacturing and logistics.

If there's a single person who embodies the history of the Piedmont Triad region, Phil Shugart might be the guy. Shugart is the president of Carolina Liquid Chemistries Corp., which is in the modern laboratories and offices of Wake Forest University's BioTech Place at Piedmont Triad Research Park in Winston-Salem. His business develops and markets chemical analyzers and reagents — compounds that promote reactions — for medical testing. It also sells small medical-testing machines

known as bench-top laboratories, which consist of a chemistry, hematology and immunochemistry analyzer, for doctors' offices, as well as larger testing machinery for hospitals.

Nearly a century ago, Shugart's grandfather and father were involved in a very different kind of business at the same place. "It was the 1920s, my father was a boy, and he described waking up before dawn to hitch up the horses and drive a wagon full of tobacco from Yadkinville to this very building. It would

take them about 12 hours to go 25 miles." He smiles and points down. "They would sleep overnight near where the horses were stabled, maybe even with the horses. And then they would auction off the tobacco in the morning and head back home."

The three generations of Shugarts personify the story of the Piedmont Triad's economic transformation. Early in the 20th century, Shugart's grandfather was one of thousands of North Carolina tobacco farmers who earned a good living and even sent their kids to college on the money earned from even a few acres of tobacco. Those days are gone. In the last 30 years, two of the Piedmont Triad's largest industries — textiles and tobacco — have grown much smaller, and a third, furniture, has taken a big hit. With the loss of 90,000 jobs over the last 10 years, some believe that the region was already in a downturn before the Great Recession hit in 2008.

That's one of the reasons civic and economic-development leaders in Winston-Salem and the Triad supported turning former R.J. Reynolds Tobacco Co. buildings into a scientific-research park in the early 1990s. It's been a dramatic evolution for Shugart's building, once a tobacco warehouse known as "91 Turkish" for the type of tobacco it housed. Where men in Wrangler overalls once hefted big bundles of tobacco, scientists in white lab coats now work on ground-breaking science in modern, airy offices.

"We've had to change our economy," says Allen Joines, mayor of Winston-Salem and president of the Winston-Salem Alliance. During the last decade, he's worked with the private, government and education sectors to develop Piedmont Triad Research Park, turning it into one of the largest urban research parks in the country, potentially supporting 30,000 jobs.

That new economy is increasingly diversified, with the Triad also establish-



B/E Aerospace Inc.

BE Aerospace, with operations in Winston-Salem, is part of a growing aviation cluster.



FedEx selected Piedmont Triad International Airport for its Mid-Atlantic hub.



Caterpillar Inc.

Caterpillar executives Steve Wunning and Rusty Davis with N.C. Deputy Commerce Secretary Dale Carroll, right, at the November opening of Caterpillar's new axle plant in Winston-Salem.

ing itself as a player in aviation maintenance, manufacturing and distribution. Memphis, Tenn.-based FedEx Corp. has been flying packages in and out of Piedmont Triad International Airport since building a hub there in 1999. BE Aerospace Inc. — an aircraft maintenance, repair and overhaul company based in Wellington, Fla., with operations at the Winston-Salem airport — recently won an \$800 million contract with Seattle-based Boeing Co. TIMCO Aviation Services Inc. — the nation's largest privately held aircraft maintenance, repair and overhaul business — has headquarters at PTI.

Honda Aircraft Co., which established its headquarters at PTI in 2007, is pursuing Federal Aviation Administration certification and pilot training for its new line of small jets. The aircraft can be seen flying over Piedmont as it goes through the final tests for approval. "When it was time to put the aircraft into production and to choose a location for our global headquarters, PTI was the best choice considering several factors," says Michimasa Fujino, president and

chief executive of Honda Aircraft. "The airport supports innovation, the regional leadership supports business, and the Triad is a wonderful place for our associates and their families to live and work."

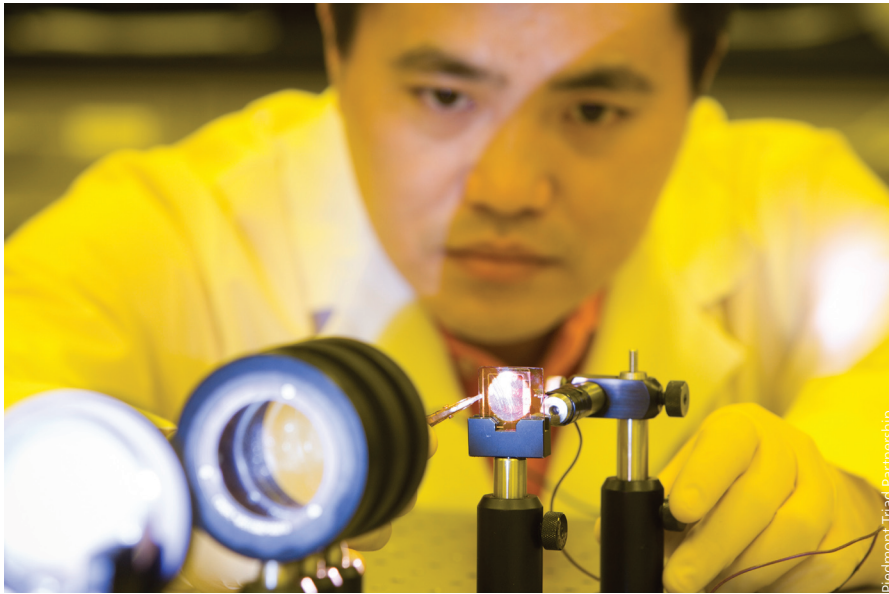
Other aviation businesses cite the local education system, with both community and four-year colleges training workers in aviation, engineering and manufacturing. Kip Blakely, vice president of industry and government affairs at TIMCO, cites the company's relationship with Guilford Technical Community College as a key reason for continuing to expand in the Triad. "Education is at the forefront. If the workforce is not trained and ready, GTCC can get them there. The workforce is the region's strongest asset. They have a history of working with things here in the Piedmont Triad."

Today, those things range from nanotechnology to airplanes, buses and truck axles the size of a car. The opening in November of Peoria, Ill.-based Caterpillar Inc.'s 1 million-square-foot axle plant in Winston-Salem was one of many ribbons cut in the Piedmont Triad

over the last year or so. "In addition to the great quality of life for our employees here in the Triad and the rest of North Carolina, the relationship with Forsyth Technical Community College is a big part of our decision to locate here," says Rusty Davis, the plant's operations manager. "Our partnership is going to be mutually beneficial for the long term."

The new generation of advanced-manufacturing jobs such as those at Caterpillar and TIMCO offers good salaries and ongoing skills training. These jobs are a far cry from the repetitive manual labor carried out on the dusty floors of yesterday's factories. Looking at the gleaming floor of the Caterpillar plant at its opening last year, one new employee commented, "People think of manufacturing as a dirty job, but you could eat off these floors, and if you come back in six months, you still could." Both urban and rural areas of the Triad see advanced manufacturing as a big part of their long-term economic futures. Among the advanced manufacturers that have expanded, moved or returned to the Triad are the Chinese computer-maker Lenovo Group Ltd., Arcadia, Wisc.-based Ashley Furniture Industries Inc., Asheboro-based Carolina Precision Plastics LLC, Asheboro-based PEMMCO Manufacturing Inc., Farmington, Mich.-based Henniges Automotive Holdings Inc. and Burlington-based Burlington Technologies Inc.

Economic developers say the growth proves that a regional plan to attract companies through an alliance of private, public and educational investment is paying off. Prompted by the loss of more than 40% of the region's manufacturing jobs, institutions of higher education coordinated with the private sector to quickly transform the workforce. "We consider an investment in training programs to be an investment in the people of North Carolina," says David Powell, president and CEO of



The new Joint School for Nanotechnology and Nanoengineering is in Greensboro.

Piedmont Triad Partnership. "And make no mistake, we invest for our own benefit. Well-trained, well-paid residents generate more tax revenue, alleviate

public burdens and raise the overall well-being of a community." Customized, job-specific educational programs at all of the Triad's community col-

leges, from Alamance to Yadkin counties, are nationally recognized. "Manufacturing is an area where this region shines," says Terry Bralley, executive director of the Davie County Economic Development Commission. "We've been down, but we were never out of the race. Now, we seem to be gaining ground with regular positive jobs announcements."

He credits multiagency collaboration for Ashley Furniture's decision to build an \$80 million manufacturing and distribution facility in Advance, creating an anticipated 550 jobs over the next five years. The furniture industry and agencies including N.C. Department of Commerce and Piedmont Triad Partnership played important roles in attracting Ashley, Bralley says. Todd Wanek, president and CEO of Ashley, cites the state's "strong manufacturing tradition" as a factor in



Piedmont Triad Research Park is home to the Wake Forest Institute for Regenerative Medicine.

the company's decision to invest in the Piedmont Triad region.

Another legacy of that tradition, specifically textile and tobacco manufacturing, is the robust road and rail system.

It wasn't long after the days when Shugart's father and grandfather drove that wagon into Winston-Salem to auction their tobacco crop that trucking became a booming local business.

Roads, highways and tracks were laid to ship cigarettes and clothing to the rest of the country and around the world. Indeed, Greensboro was nicknamed the Gate City after railroad lines converging there turned the city into an East Coast transportation hub.

More than half of the nation's population and most of its major markets are within a 650-mile radius. Interstates 40, 73, 74, 77 and 85 cross the region. Last year, Gov. Beverly Perdue announced expedited funding and construction on the last legs of the Greensboro Urban Loop (I-840) and funding for the first section of the Winston-Salem Beltway (I-274), with construction scheduled to begin in 2014. In addition to the two urban loop projects, construction continues on I-73 and I-74, which will serve as important connectors between the Midwest and Southeast. Recent logistics-based



expansions in and relocations to the region include New York-based Ralph Lauren Corp., Greensboro-based Solstas Lab Partners LLC and Honda Aircraft, joining companies such as Atlanta-based United Parcel Service Inc., Hoffman Estates, Ill.-based Kmart Corp., Winston-Salem-based Hanes-brands Inc. and Cincinnati-based Procter & Gamble Co.

The education sector also has partnered with private industry to develop resources and workforce-development programs for the logistics sector. The N.C. Center for Global Logistics is a consortium of educational resources provided by community colleges in Davidson, Randolph and Forsyth counties and managed from Guilford Tech. The center is "good for the entire Piedmont Triad region because it enhances an ongoing collaboration between the business community and higher education," Guilford Tech President Randy Parker says. "No organizations are better suited to do this than the four partnering community colleges that have been nationally recognized for their workforce-development standards."

Adds Greensboro Mayor Robbie Perkins: "If a region doesn't evolve, it will lose out. We are at a point now in the Triad where we have very motivated leaders across the region, whether urban, rural or in between. We are transforming our economy, and we are bringing the workforce along with us."

Meanwhile, the region's life-sciences sector is turning tobacco warehouses and factories into modern, open scientific spaces at Piedmont Triad Research Park, home of Wake Forest Institute for Regenerative Medicine. Anthony Atala, a pediatric urology surgeon, founded the institute after growing tired of seeing children die or live difficult lives due to a lack of transplant organs. On a tour of the labs, Benjamin Harrison, a faculty member, describes how the institute has regener-

ated organs such as bladders, skin and ears. A heart valve in a beaker beats in a pulsing rhythm to test different levels of pressure. A drawer holds the scaffolding for an ear, a model that looks like white plastic but is actually made of human cells. The groundbreaking work is the fruit of collaboration among medical, engineering and biological scientists.

BioTech Place not only offers its tenants the latest laboratory space but also provides scientific equipment and researchers for hire. Carolina Chemistries is taking advantage of every feature, making use of an instrument known as a mass spectrometer and the researchers who operate it, Shugart says. "It would be a financial burden to attain that equipment on our own, so it's a great benefit to be able to use it here."

Another center for scientific innovation in the Triad is the Gateway University Research Park in eastern Greensboro. Gateway houses the new Joint School for Nanotechnology and Nanoengineering, a collaboration between UNC Greensboro and N.C. A&T State University. Based on the theory that the best science comes through working across specialties, both Piedmont Triad Research Park and Gateway University Research Park are designed to encourage collaboration in common areas. "We put the professors and grad-student offices on opposite sides of the building from the labs so that they would be forced to leave their labs to mix and mingle with the other researchers," says James Ryan, founding dean of the joint nanotechnology school. The collaborative design is already paying off for Shugart's company. "As a result of simply meeting researchers in the hallway and striking up a conversation, we are currently developing two new products that will be submitted to the [Food and Drug Administration] later this year."

With success on the scientific-research front, Triad leaders are turning their focus to what Piedmont Triad

Partnership's Powell calls game-changing projects that can create tens of thousands of direct and indirect jobs. "Leaders throughout the region have put past intraregion competition to rest, and we are working together as a unified force for the good of the whole," he says. "This shift in attitude and strategy is especially important in attracting a game-changer. We want to focus our resources on key areas."

Given that North Carolina is the only Southeastern state without a major auto plant, the first project is development of a shovel-ready megasite to compete for an advanced auto-manufacturing plant. Economist Donald Jud, a professor at UNC Greensboro's Bryan School of Business, estimates that a midsize auto plant would create roughly 9,000 jobs, including 2,000 at the plant, and inject billions of dollars into the local economy. Land for the speculative site has been purchased, with investment committed from state, local and regional groups.

The other game-changer is the planned \$350 million in improvements to Piedmont Triad International Airport, including a dozen infrastructure upgrades over the next decade and expansion of the airport property by more than 300 acres. New taxiways, grading projects and airfield improvements will allow the airport to accommodate more aviation and logistics tenants, joining the companies that employ about 4,000 there, such as Honda Aircraft and TIMCO. "We understand that \$350 million is a lot of money to invest, but we cannot afford to think small if we hope to create the jobs this community needs," says Kevin Baker, the airport's executive director. "The payoff for this investment can be measured, and the potential return is substantial — 18,000 jobs and more than \$3 billion in economic impact. For the unemployed and underemployed in this community, that's a very positive equation." ■