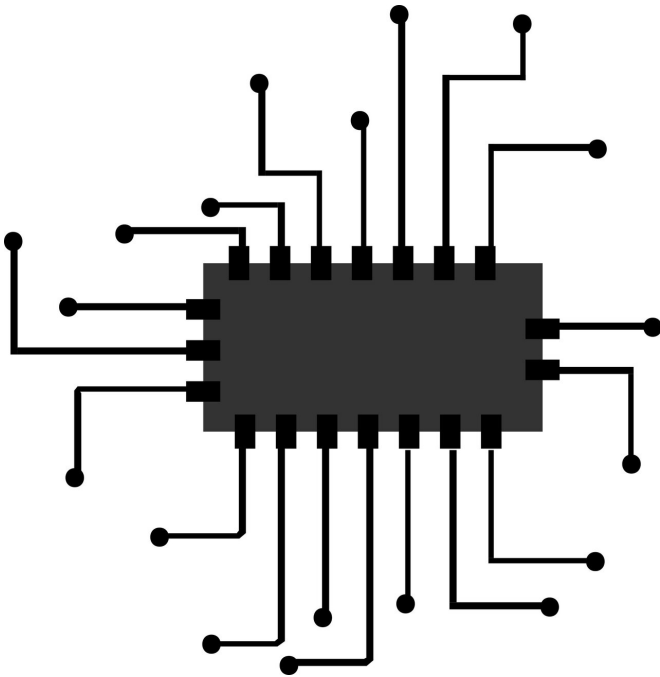


How a Texas town is making itself into the epicenter of the US semiconductor universe

6 July 2022, by Matthew Griffin and Maggie Eastland



Credit: CC0 Public Domain

In downtown Sherman, Texas, markers explain the city's past and restaurants and coffee shops boast about the historic buildings they call home.

Just 10 minutes down the road, Dallas-based Texas Instruments and Taiwanese-owned silicon wafer builder GlobalWafers plan to spend a combined \$35 billion on high-tech factories in the all-important semiconductor supply chain.

Founded in 1846, the city is named after a Texas Revolution hero who led one of the militias shouting the "Remember the Alamo" rallying cry. Almost two centuries later, residents still pass beneath an ancient sprawling Pecan Tree that shades the county courthouse and the former town square. They know their neighbors' names, professions and family trees. They visit shops,

restaurants and expansive antique stores in the city's preserved downtown.

But there's a new lifeblood of Sherman's economy.

No longer built around railroads or mail routes or cotton trades, it's now a high-tech town, largely bolstered by the jobs and investments provided by Texas Instruments, GlobalWafers and Apple supplier II-VI. As the city's tech sector expands, its population is growing, and new housing developments and businesses are popping up left and right.

"It's a little scary for us," said 37-year-old Sherman resident Lauren Sims. Still, she said, "It's a good scary."

Sherman, the bigger part of the 120,000-person Sherman-Denison metro area, is no stranger to change.

Its transformation into a key U.S. hub for [semiconductor manufacturing](#) is made possible by natural resources, infrastructure and savvy local leadership, but also by a business-friendly tradition dating back decades.

"It's in our DNA," said Kent Sharp, president of the Sherman Economic Development Corp., which helped land the GlobalWafers deal that'll bring the first facility of its kind to the U.S. in two decades.

Semiconductors, the tiny chips that power modern computers and other electronic devices, are at the heart of [city leaders'](#) plans. The city wants to be home to companies along all steps of the supply chain, from crafting [silicon wafers](#) to creating [circuit boards](#) for [consumer products](#).

Striking a deal

In 1990, the U.S. accounted for 37% of semiconductor production capacity. In 2020, that

number dropped to 12%, according to a study by Boston Consulting Group and the Semiconductor Industry Association.

During the coronavirus pandemic, supply chain issues in securing chips from overseas and record demand caused a shortage that persists today, prompting calls to bring more production to the U.S. The shortage has been exacerbated by continued lockdowns in China and ripple effects from the war in Ukraine.

Semiconductor supply chains are still vulnerable, and long-term demand is skyrocketing thanks to increasing digitization.

"Automobiles, vacuum cleaners, you name it, everything's running on chips these days," said Michael Savoie, professor of operations and supply chain management at the University of North Texas' Ryan College of Business. If semiconductor production in southeast Asia is disrupted, "you could cause a global catastrophe within the supply chain."

For Taiwan-based GlobalWafers and its GlobiTech subsidiary, supply chain issues mean high demand and an impetus to add capacity through a \$5 billion expansion in Sherman.

"We and our peer competitors have been sold out, especially on advanced products (300-millimeter) where the supply will remain tight possibly through year 2024, which is the timing of new expansions," GlobiTech president Mark England said in an email.

Before semiconductors can roll off the line and into cars, consumer electronics and industrial machinery, fabrication plants start with a silicon wafer—a large, mirrorlike sheet of ultrathin silicon that yields thousands of chips.

The new GlobalWafers plant will craft those wafers, in addition to being capable of applying a crystalline coating. GlobiTech's existing facilities will receive some of the raw wafers and apply that coating.

GlobalWafers' expansion will be a long-term investment. Samples will begin making their way to customers in the second half of 2024 and mass

production—starting at 350,000 wafers a month—will begin in 2025.

The site could eventually ramp up to 2.4 million wafers produced a month, England said.

"It will be our expansion vehicle for the next 40 years," he said.

Stiff competition

GlobiTech and city leaders weren't certain Sherman would win the project, especially since construction costs in the U.S. are three times more expensive than overseas. Sites in Ohio and South Korea were also being considered and all three locations offered big economic incentives.

"It's like dating," England joked, with competing cities putting their best foot forward.

Winning the faceoff required collaboration between the Sherman Economic Development Corp., four local taxing bodies and state government—as well as a promise of future federal incentives. The economic development agency was "the point of the spear," City Manager Robby Hefton said, organizing different groups during negotiations with companies like GlobiTech.

The economic development agency offered \$20 million in cash payments and the sale of over \$14.4 million in land for \$1 an acre. The Texas Enterprise Fund contributed a \$15 million grant.

The city, Grayson County and Grayson College chipped in [tax incentives](#), and the city offered a discount on water bills. Though it needs school board approval, the company should also receive a break on taxes paid to the local school district.

While Ohio had a 100% tax abatement deal ready to go in a week, efforts in Texas took months of negotiation between taxing entities. Each Sherman negotiator could have busted the deal with just one hangup.

Luckily for the city, GlobiTech and its president have strong Sherman roots.

"We've been working with the city for over 20 years, and we know everyone," said England, a Sherman native.

Sherman had several other advantages.

GlobiTech's existing management team can oversee the new plant, which is helpful because the wafer production process involves trade secrets. The city has an ample supply of workers, land, power and other utilities, boasting some of the best water access in Texas thanks to Lake Texoma, one of the few reservoirs in the state that's at full capacity.

The GlobalWafers project will be eligible for incentives under the CHIPS Act approved in January 2021, but Congress still needs to provide \$52 billion in funding for subsidies to spur domestic semiconductor investment. For GlobalWafers, that funding is essential.

Intel has said it may delay or reduce its plans to build a \$20 billion chip plant in Ohio depending on what happens with the bill, and England said GlobalWafers could scale back plans in Sherman or move its new production overseas if the money doesn't come through.

"We're in the same boat with Intel," England said. "We don't feel secure about the decision until the concrete dries."

Dealmakers are anxious to see the bill funded before Congress recesses in August, and city leaders have talked to elected officials about its importance. But there is debate over whether \$52 billion is enough to bring more of the nearly \$500 billion semiconductor industry to the U.S., thereby decreasing supply chain vulnerability.

"With the CHIPS Act, it may be an uphill battle: Is it enough to provide \$52 billion to the industry? Absolutely not. It's just a start," Bloomberg semiconductor analyst Paula Penkal said.

A legacy of encouraging industry

After wafers come off the assembly line, companies use them as the base for microchips. In the United

States, that's where companies like Texas Instruments come in.

Sherman has been home to manufacturers for more than a century, but the modern-day city's efforts—including the high-tech manufacturing push that brought Texas Instruments to the city—have their roots in a group active in the middle of the 20th century called the Young Turks.

Led by local business leaders and named for an Ottoman revolutionary group, the Young Turks pooled money to attract businesses to Sherman.

"I would hear stories about them flying off to the East Coast and wining and dining the IBM executives before IBM came here, and Johnson & Johnson," the son of one of the Young Turks said in a video commemorating the Sherman economic development agency's 25th anniversary.

That business-friendly spirit guided Sherman as it carved out a place as a high-tech hub. The city created an industrial district on land the Young Turks raised money to buy. Leaders in the 1980s worked to secure the water supply, according to Hefton.

The results? Texas Instruments, IBM and Johnson & Johnson opened plants in Sherman in the middle of the century. GlobiTech began operations in 2001. II-VI's factory opened in 2018, producing parts for the Apple iPhone.

Last year, Sherman won the \$30 billion Texas Instruments expansion that will be the crown jewel of the city's manufacturing sector and secure its place in the middle of the semiconductor supply chain. Like GlobalWafers, TI got big tax incentives to pick Sherman.

It's been over half a century since the heyday of the Young Turks. Still, Sharp cites the Turks as inspiration.

"We're trying to emulate what those guys did back then," the economic development corporation president said.

Sherman's roots as a small city have helped it grow

into a tech hub, said Tyson Bennett, superintendent up, too. of the Sherman Independent School District. He pointed to the relationships among local leaders, which make it easier to work together to attract companies.

"We live and work with folks, we're friends with folks, we go to church with folks. We're all about benefiting our community," he said.

'Complete semiconductor ecosystem'

Three steps of the semiconductor supply chain will soon be concentrated in Sherman: making the wafers, applying the coating and transforming those wafers into semiconductor chips. This clustering is characteristic of the [semiconductor industry](#).

"Suppliers will set up shop in the area to be closer to the chip producer, so that you have more direct access both logistically, for easier cheaper delivery and for better collaboration," analyst Penkal said.

Vertical integration—the phrase industry leaders use to describe that clustering—is Sherman's goal.

"We envision the complete semiconductor ecosystem developing with chip manufacturers, and starting materials," England said in an email. "It should completely change the landscape of Sherman."

Sharp said the next step is attracting companies that make circuit boards for consumer products in the growing number of industries that rely on chip technology: laptops, phones, cars, microwaves, electric toothbrushes and more.

In response, the city's population could double over the next five to 10 years, Hefton said.

"Part of the challenge is ... how do you keep [Sherman's] heritage and legacy kind of authentic in the face of all this other growth?" he said.

Residents want the city to thrive and like the amenities growth brings, said Sims, who grew up in Sherman and raised two children there. At the same time, she said home values have risen in Sherman in recent years. Property taxes have gone

Compared to 2021, the median house price in Sherman increased 31.2% this May, hitting \$305,000. The city released a plan for 8,000 new homes before the GlobiTech announcement. Sherman also ranks second in the U.S. for the most overpriced housing market, signaling prices could be on their way down soon.

Evan Martin, a realtor who works for Real Broker LLC in Sherman, said the city experienced an "extreme shortage of inventory" in the first part of this year, sometimes resulting in 10 or more offers on a home in its first few days on the market. Martin also noticed an influx of out-of-state buyers.

A 12-year resident of Sherman, Martin knows a [growing population](#) leads to other issues.

"No longer does it take five minutes to get anywhere in Sherman," he said. "It's definitely grown, but there is still that small-town feeling. It's what makes living here so enjoyable."

Hefton pointed out that as property values increase, revenue from industry helps the city keep tax and utility rates low.

Right now, Sherman's entire property tax base is about \$4.5 billion, wrote community and support services manager Nate Strauch in an email. Even after tax breaks, the taxable value of just the first phase of the TI project is between \$150 million and \$280 million, and each of the four phases of the GlobalWafers project will have a taxable value of \$40 million to \$60 million, he wrote.

Each of the taxing bodies will get its own slice of the pie. City leaders want to invest in parks, infrastructure, police and firefighters. The school district will get a big chunk of money to finance new buildings through debt.

Bennett also said the school district wants to set up partnerships with high-tech firms to expand vocational training and STEM opportunities.

In addition to public revenue, the tech industry brings new businesses and amenities, Bennett

said. But it's more than that: People who grow up in Sherman don't have to choose between living there or pursuing career opportunities elsewhere.

"I love my kids," Bennett said. "And I want them to stay here close to me and raise the family and have kids [so] my grandkids aren't three hours from here."

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