

Transportation Policy Brief #2

Reshoring in Texas: Understanding the Phenomenon

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FOREWORD

The Lyndon B. Johnson School of Public Affairs at The University of Texas at Austin has established interdisciplinary research on policy problems as the core of its educational program. A major part of this program is the nine-month policy research project (PRP), in the course of which two or more faculty members from different disciplines direct the research of 10 to 20 graduate students of diverse backgrounds on a policy issue of concern to a government or nonprofit agency.

During the 2014–2015 academic year, the Texas Department of Transportation (TxDOT) supported a policy research project on manufacturing trends in Texas and Mexico, addressing six key policy issues. The project was a collaboration of the Center for Transportation Research (CTR) and the Lyndon B. Johnson School of Public Affairs at The University of Texas at Austin, and the Center for Economic Development and Research at the University of North Texas.

The research team interacted with TxDOT officials throughout the course of the academic year. Overall direction and guidance was provided by Mr. Marc Williams, Director of Planning for TxDOT. Mr. Williams participated in an October 10, 2014, workshop to determine the scope of the study. As a consequence, the following policy issues were selected for study:

1. Texas Manufacturing Competitiveness;
2. Reshoring in Texas;
3. Nearshoring in Mexico;
4. Inland Ports and Logistics Hubs;
5. Intra-Industry Trade; and
6. Implications of the Trans-Pacific Partnership on Transportation in Texas.

The findings of each policy issue are presented within the context of separate transportation policy briefs. This particular policy brief, “Implications of the Trans-Pacific Partnership on Transportation in Texas,” was researched and written by Dylan Roberts, Jennifer Huffman, and Robert “Beau” Dolan.

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EXECUTIVE SUMMARY

Reshoring, or the returning of offshored manufacturing to the United States, is a small component of the nation's manufacturing sector. Although it is difficult to accurately quantify, Texas is nonetheless competitive (as the most recent data reveal) among U.S. states for reshoring industries. Between 2007 and 2014, Texas ranked fifth among the 50 states (and the District of Columbia) in the aggregate number of jobs created through reshoring. There continues to be mixed opinions about the importance of reshoring among researchers and advocates. Some are decidedly pessimistic about reshoring's importance and the likelihood that it will be an ongoing trend. Alternately, there are others who believe the current state of reshoring reflects the beginning of a decades-long transition toward the practice.

A combination of factors contributes to a firm's decision to reshore a portion or the entirety of its operations. Wage growth in Asia, regulatory and financing issues, weak intellectual property laws, difficulties and costs related to managing a long supply chain, and environmental impacts are all factors that contribute to a growing disillusionment among many companies with offshore production. While offshore production continues to be the driving force of modern manufacturing (and still constitutes the bulk of its growth), these issues are leading to an increase in reshoring to the United States, as well as to nearshoring in Mexico. As global supply chains become increasingly complicated, businesses are electing to reshore manufacturing to serve markets throughout the Americas, shortening their product-to-market timelines, eliminating import duties, and lowering transportation costs.

The assessment of reshoring as an economically viable option should hinge on the concept of *total cost analysis*—incorporation of the full range of often-hidden costs into the estimated cost of production. These costs include customs duties and the loss of revenue from counterfeit goods in countries with weak intellectual property protection. With these factors considered, reshoring is often found to be a cost-effective option for companies.

A primary reason for Texas's competitiveness as a reshoring destination is its proximity to Mexico, which facilitates the efficiencies of cross-border manufacturing. Additionally, Texas's central geographic location within the United States, its low cost of energy, and a business-friendly investment climate help to enhance Texas's profile among potential locations for companies that are considering reshoring. Texas's major shortcoming is its labor supply gap; the state is routinely cited as having an inadequate number of skilled manufacturing workers.

Although significant data was collected for this policy on the reasons why companies prefer to reshore in Texas over other states, each case proved to have several unique factors, defying easy categorization. The differing sizes and needs of companies that have elected to reshore in Texas thus far make identifying patterns difficult. Proprietary needs often dictate the scale and scope of reshoring projects.

Most frequently, larger companies that elect to reshore do so with the intent of reshoring only parts of their production, not their entire production capacity. Although it is not common, reshoring projects can also end in failure, as the MotoX case in Fort Worth illustrated. Patterns for failure should be identified so that future occurrences can be prevented and so they do not threaten the integrity of the broader trend of reshoring.

Ultimately, reshoring has proven to be beneficial to the Texas economy, and policies should be implemented that encourage the practice. Investment in reshoring brings jobs and tax revenue to state and local governments, and its benefits extend to all types of manufacturing.

Lastly, the policy brief makes a number of recommendations to TxDOT can be used to enhance Texas's competitiveness in facilitating reshoring. The general theme is that better connectivity and access to different modes of freight will make Texas a far more desirable location and encourage the reshoring trend. Following is a summary of the recommendations:

- Continue to prioritize highways that serve as trade corridors.
- Support transportation connectivity within industry clusters. TxDOT's role in supporting these clusters is to facilitate their development by ensuring adequate transportation capacity (via any freight mode) and connectivity within and between clusters.
- Focus simultaneously on reshoring and nearshoring. Nearshoring is an equally, if not more economically, viable option for manufacturing and Mexico is making great strides in facilitating this trend. Continued attention to the nearshoring trend and long-term infrastructure planning to facilitate intra-industry trade are key to ensuring that Texas can benefit from its own reshoring, as well as nearshoring in Mexico.
- Use Texas's toll road system to more effectively manage freight congestion. Reduced tolls on SH-130 for commercial trucks would encourage drivers to avoid the bottlenecks of IH-35 during congested periods.
- Gather further data about reshoring and expand outreach. A more rigorous definition of reshoring, combined with standardized data shared across industry and government experts, would clarify and promote the concept of reshoring. Coordination between agencies and data analysis firms or institutes would do much to advance discussion and promote growth of this small but important trend in U.S. manufacturing.

INTRODUCTION

In recent years, the reshoring of manufacturing has occupied a prominent place in media reports and, as a result, its role in the U.S. economy has become better understood. Although many business and economic analysts still search for a rigorous definition of the concept of reshoring and data to substantiate it, its economic value to Texas has already become clear. With recent booms in shale oil production and automotive manufacturing along the Texas-Mexico border, many industries have elected to source their manufacturing capacity in Texas to service these newly growing industrial sectors, as well as other industries for which Texas is already well known, such as computers and electronics. The Texas Department of Transportation (TxDOT) plays an important role in helping reshored manufacturers receive raw and intermediate materials during production and then to move their final products to market. But, as this report demonstrates, there is more that TxDOT can do to increase the state's manufacturing capacity and its attractiveness to businesses that elect to base manufacturing operations in the state of Texas.

RESHORING: IN SEARCH OF A WORKING DEFINITION

The term “reshoring” is a buzzword that has gained considerable popularity of late. It is thrown about rather loosely among business media outlets. As a result, its definition can be ambiguous. For clarity's sake, reshoring can be understood in this report as the process by which companies repatriate manufacturing and services to the United States. As an illustration, one can imagine a U.S.-based company that produced electronic goods in China, Bangladesh, or elsewhere. The reshoring of manufacturing begins when that company decides to relocate its manufacturing operation to the United States or when it chooses not to relocate its domestic manufacturing to an offshore site. Tangible, non-hypothetical examples of this type of activity—by companies like Apple, Caterpillar, and Wal-Mart—have led headlines in recent years with their plans to expand U.S. sourcing of their supply chains. This definition, it should be noted, not only includes the return of U.S. manufacturing that was once outsourced to Asia. Our definition of reshoring also includes placing planned expansions of manufacturing capacity in the United States, when putting that manufacturing abroad was a viable choice. Finally, it should be noted that some data collected for this policy brief included foreign direct investment (FDI) in the U.S. manufacturing sector, but our definition does not include FDI comprehensively.

Adding detail to the rudimentary definition of reshoring employed here, a basic typology exists that will clarify our data collection approach, as well as that of the Reshoring Initiative, an organization that assists U.S. companies in returning manufacturing to the U.S. The cases analyzed herein fall under three distinct but related categories: (1) *reshoring*, which, in its “purest” sense is understood as the return of manufacturing to the United States from a previous, different country of manufacture; (2) *transplant*, which entails foreign companies deciding to move, or create, manufacturing capacity in the U.S., and (3) *kept from offshoring*, indicating that a company opted to manufacture in the United States despite options to move this capacity elsewhere. This typology helps to paint a larger

picture of how and why companies are electing to manufacture in the U.S., and it helps us to better understand what types of support can be lent to encourage such decisions.

MEASURING A PHENOMENON: IS RESHORING OCCURRING?

In 2011, the Boston Consulting Group released its report titled *Made in America Again: Why Manufacturing Will Return to the U.S.*, which placed reshoring at the forefront of discussions on manufacturing trends within the business community. The report forecasted that, within five years, the manufacturing cost advantage that China has long held over the United States would shrink to negligible levels, making manufacturing in the United States more cost-effective than any time in recent decades.¹ A competitive manufacturing environment in the United States, so the thinking went, would precipitate a wave of returning (or added) manufacturing capacity to U.S. shores.

To be sure, Chinese labor costs have risen, as have (until very recently) all-important fuel costs, and the distance between Asian shores and the U.S. market has not, in any literal way, decreased. As a result, U.S. manufacturing has experienced a very modest expansion since 2009 and reshoring has occurred at a significant enough scale and pace to be the subject of considerable conversation within the business community.² Initial notable “success stories” precipitated a wave of research on the topic and analysts have paid close attention to reshoring trends in recent years.

Put succinctly, reshoring *is* happening. With that understood, however, some important caveats should be made: (1) Although reshoring is occurring in the U.S., the data point to it having only minimal impact on the overall growth in U.S. manufacturing to date. (2) It is worth noting that although there have been some examples of high-profile corporations participating in reshoring, the number of companies electing to do so remains small, even negligible, when placed in context of overall U.S. manufacturing trends. (3) Among the states benefitting the most from the reshoring trend, according to the Reshoring Initiative’s data, Texas ranks fifth for bringing reshoring companies and jobs home.

HOW RESHORING BENEFITS THE U.S. ECONOMY

Reshoring is a positive for the U.S. economy for many reasons. As the economy continues to move past the 2008–2009 recession, new manufacturing employment has helped to lower the unemployment rate and create thousands of high-quality jobs. The increased tax revenue from these activities can have an impact on state and local governments that can lead to more improvements within the state.

Decreasing the U.S. trade deficit is one major reason reshoring is positive for the country as a whole. Benefits of a reduced trade deficit include new job creation, lowering of the

¹ Sirkin et al., “Made in America, Again: Why Manufacturing Will Return to the U.S.”

² Simchi-Levi, “U.S. Re-Shoring: A Turning Point.”

unemployment rate, shrinking of the federal budget deficit, and increasing the U.S. GDP.³ The reshoring discussion often focuses solely on the supply side, or reasons why reshoring is good for the producer. However, the wider impacts must also be considered. A product manufactured in the United States will obviously either be consumed domestically or exported. Reshoring manufacturing and then exporting the output directly contributes to reducing the U.S. trade deficit. Domestic consumption serves to replace a good that was likely imported previously, also reducing this deficit. Between these options, reducing imports and focusing on domestic production for domestic consumption is the most competitive option, as U.S. companies are 30 to 50 percent more price-competitive in domestic markets than for exports.⁴

Reduction of the U.S. trade deficit is not a small consideration, as the deficit for January 2015 was \$41.8 billion and grew from \$476.4 to \$505 billion between 2013 and 2014. The trade deficit with China alone was \$29.3 billion in January 2015.⁵ Many domestic manufacturers are concerned that China is manipulating its currency to keep its export prices artificially low to maintain a favorable balance of trade, which makes it substantially more difficult for U.S. manufacturers to be competitive.⁶

Ultimately, reshoring keeps the jobs and the profits of manufacturing within the U.S. economy and shifts this balance of power in favor of the United States. The decrease in trade deficit (as a result of increased exports) will contribute to job growth, the lowering of the federal budget deficit, and an increase in GDP. All of these things are clearly crucial to continued economic growth within the United States.

REASONS TO RESHORE

For the last several decades, the prominent manufacturing mantra has been “offshore.” Cheap labor, weak regulations, and lower operating costs are often taken for granted as a product of outsourcing manufacturing, typically to Asia. In the past, the direct benefits of offshoring seemed to be clear and the evidence so compelling that conventional wisdom created an established association between efficient production and manufacturing abroad became almost implicit.⁷ Over time, as this trend played out, the cost savings have not always been as clear as they initially appeared. Political and economic changes abroad have also altered this analysis. The most commonly cited factors involved for reshoring are as follows:

1. Wage and currency changes;
2. Quality, warranty, and rework;
3. Delivery;
4. Freight cost;

³ Scott et al., “Reducing U.S. Trade Deficits Will Generate a Manufacturing-based Recovery for the United States and Ohio.”

⁴ Moser, “Reshoring Recommendations for the Federal Government.”

⁵ United States Census Bureau, “Foreign Trade.”

⁶ Censky, “What Is Currency Manipulation, Anyway?”

⁷ Moser, “Reshoring Recommendations for the Federal Government.”

5. Travel cost/time or local on-site audit;
6. Inventory;
7. Intellectual property loss or risk;
8. Total cost;
9. Communications; and
10. Image or brand (attaining the “made in the USA” label).⁸

The dynamics of producing in foreign locations are shifting, so much in fact that many companies are no longer finding it economical to produce abroad. Some companies have reached a tipping point where it is no longer cost-effective to produce abroad, particularly in Asia, due to many factors, including increasing labor costs, increasing transportation costs, regulatory irregularity, unavailability of credit, unreliable supply chain activity, and the shale gas advances that have made energy cheaper in the United States.⁹ Additionally, revising the total cost analysis to account for the full range of opportunity costs reveals for many companies that offshore production is not as profitable as previously thought.

TOTAL COST OF OWNERSHIP

Establishing the total cost of ownership (TCO) involves examining the complete cost of production rather than just wage rates and landed cost. These often-hidden costs could be anything from customs duties to more frequent shipment delays. Reshoring Initiative estimates that if all manufacturing companies calculated the TCO, 25% of offshored production would return to the United States.³

A major benefit to reshoring is that little external incentive is required in most cases. The TCO, for many companies, demonstrates that it is in their best interest to reshore production—which means U.S. citizens and policymakers don’t need to fund costly incentives to get the production back. In summary, the incentive is already there.³

LABOR COSTS

Labor costs are increasing, particularly in China, where they have risen 15 to 20 percent per year.¹⁰ Rising labor costs represent one of the greatest potential tipping points, once the other factors within total cost analysis are fully considered. The 2012 study by the Boston Consulting Group predicted that wages in China and the U.S. would converge by 2015 (once labor productivity is taken into account), though it is not yet known how close the wage differential has become to date.¹¹ Labor costs are one of the primary reasons for outsourcing in the first place, so this is a fundamental shift in the production equation. Additionally, company owners and managers also cite that U.S. workers are more efficient than Chinese workers, further tipping the scale.¹¹

⁸ Ibid.

⁹ “How Real is Reshoring?”

¹⁰ Douglas, “Cross Border Trade: Made in Mexico,”

¹¹ BCG, “Made in the USA, Again: Manufacturing Is Expected to Return to America as China’s Rising Labor Costs Erase Most Savings from Offshoring.”

SUPPLY CHAIN

The benefits of a shorter supply chain are numerous, and for many companies the weight of this factor is increasing, especially as producing in China is becoming more problematic and less profitable in other ways. The benefits of shortening the supply chain include the ability to get products to stores faster, having more control over production, managing problems better, and reacting more efficiently to changes in demand. If a defect is found in a product arriving from Asia for sale to U.S. markets, the next defective shipment is likely already on its way, making such mistakes costly. Also, demand for a product may decrease substantially while there are still large quantities of product en route to U.S. stores from Asia. Producing domestically allows better quality control and management of inventory.

REGULATORY AND FINANCING ISSUES

Another issue specifically noted by companies producing in China is intellectual property theft. Mechanisms for protecting intellectual property are weaker or virtually non-existent in China. This can cause substantial losses to companies once the profits lost to counterfeiting as well as the defection of customers dissatisfied with fake, inferior products are considered. This risk was cited as a major reason for reshoring by Farouk Systems, a company that produces hair products, which include the well-known Chi Flat Iron. Farouk Systems was losing \$6 million each year from fighting counterfeit products and there was no real mechanism to combat the problem in China.¹² As a result, Farouk Systems chose to expand production facilities in Texas rather than expand their production in Asia.

ENVIRONMENTAL IMPACT

Another consideration is environmental impact. The carbon footprint of a company shipping product overseas is vastly higher than that of a reshored company. Additionally, if China were to adopt modern environmental and safety standards, the cost of operating there would increase dramatically.¹³

EVALUATION OF TEXAS AS A RESHORING DESTINATION

Texas is uniquely situated to reap the benefits of nearshoring in Mexico, as well as providing a favorable climate for reshoring relative to many other states. Close proximity to Mexico is ideal for firms that can benefit from cross-border manufacturing processes. Texas's vast system of highways and central location are extremely well-suited for distribution. These factors, combined with a favorable climate for investment and its status as a right-to-work state, make Texas extremely competitive within the U.S. for reshoring.

¹² Perry, "Reshoring Example: Houston-Based Farouk Systems."

¹³ Moser, "Reshoring Recommendations for the Federal Government."

PROXIMITY

The general factor of proximity weighs into the decision process of reshoring to the United States. Even something as simple as producing in regions with common time zones to the market eases production constraints. Many consumers prefer U.S. branding as well, creating incentive to produce “Made in America” products.

Proximity to Mexico is a strength specifically for Texas manufacturing. Texas’s physical location and vast network of highways makes it an attractive place to locate, especially for industries that carry freight throughout the United States as well as Mexico. Mexico’s manufacturing sector is growing rapidly, a major consideration for sectors such as the automobile industry which makes use of intra-industry trade.

Trade with Mexico, specifically, is being affected by rail improvements. In May 2014, BNSF partnered with the Mexican railroad Ferromex and began servicing U.S.-Mexico routes through a new system involving a steel wheel interchange, which allows direct interchange of intermodal units rather than having a truck as an intermediary. Many auto industry inputs are hauled on this line.¹⁴ With this development, NAFTA countries all use the same rail gauge, creating the largest system of interconnected rail in the world. In fact, BNSF’s total rail volume has more than doubled since NAFTA implementation.¹² Rail can provide a much faster way to move through customs than trucking, where border crossing wait times can be very long.¹⁵

ENERGY

The rise of oil prices has been a concern for companies shipping product internationally. Now, the shale gas revolution has greatly decreased the cost of natural gas in the United States. Optimistic estimates peg potential manufacturing job creation from lower domestic energy prices at 1 million new jobs, particularly from petrochemical company relocation (including companies such as Dow Chemical and Vallourec).¹⁶

CHALLENGES TO MANUFACTURING IN TEXAS

While the benefits to reshoring for a manufacturer appear significant, it is important to emphasize that for many and perhaps a majority of companies, reshoring production that is already established in Asia is not an economical option. This is likely due to many factors inherent to relocating, but external challenges within the state of Texas represent a disincentive to reshoring in the state. Many companies are therefore choosing what is defined for Texas as “nearshoring.” Producing in Mexico allows close proximity to U.S. markets while avoiding high U.S. corporate taxes and taking advantage of the low-cost (but

¹⁴ “BNSF Crosses the Border.”

¹⁵ Ibid.

¹⁶ “Coming Home.”

productive) Mexican labor. In fact, by the end of 2015, Mexico's wages are projected to be 30 percent lower than China when adjusted for productivity.¹⁷

Additional factors limit the attractiveness of Texas as a destination for reshoring. The labor supply is one major factor. Despite the rising wages in Asia, the cost of labor is still much higher in the United States than in many other countries. Although Texas's labor is cheap by U.S. standards (when productivity levels are taken into account), even cheaper labor is available right across the Mexican border. However, there can be key incentives to using the higher cost labor. Aside from the advantages to domestic production already mentioned, a high-quality, highly trained, and reliable workforce presents a major advantage. However, Texas's labor force still lacks a sufficient number of highly skilled manufacturing workers. In locations such as Central Texas, companies have cited their inability to find workers who can pass a drug test as a barrier to investing in the area.¹⁸ Companies must be able to depend on the availability of a high-quality workforce to take advantage of reshoring, so this is a critical issue for Texas when competing with other states for investment.

RESHORING'S COSTS AND BENEFITS

In summary, while the reasons to consider reshoring are numerous and compelling, the challenges are major barriers that inhibit companies from reshoring on a large scale. Furthermore, the enormous size and scale of markets in Asia is a reason alone why a multinational company would not fully withdraw from the region. Therefore, reshoring may mean producing for U.S. consumption domestically and maintaining facilities in Asia as well. Proponents of reshoring maintain that true cost analysis would render this action worthwhile when the often-overlooked costs of offshore production are all totaled. While this may be true, the likelihood of a massive, large-scale reshoring movement in the next decade is unlikely. The more important focus will be for state and local governments and affiliated agencies to create viable options for the small to mid-scale companies that are actively reshoring or considering reshoring in the near future through incentivizing investment, maintaining high-quality infrastructure, training a skilled manufacturing workforce, and continuing to advertise and promote reshoring.

WHAT RESHORING MEANS TO TEXAS: ASSESSING THE SCALE AND SCOPE

From a policy perspective, it is important that the scale of reshoring in Texas be placed in context. First, in terms of the number of reshored jobs, Texas places fifth among the 50 states and the District of Columbia (see Figure 1). Second, in aggregate, reshoring has accounted for a small-to-modest portion of the state's manufacturing and job growth over the last five years. Thus, when viewed as part of the larger reshoring phenomenon in the United States, Texas does quite well, largely because of its favorable legislative and regulatory environment. However, despite this favorable position among its peers, the positive gains made in reshoring should be understood as minimal, in a relative scale, and

¹⁷ "How Real is Reshoring?" J.P. Morgan.

¹⁸ Copelin, "State Could Face Shortage of Skilled Trade Workers, Experts Say."

should be viewed with an eye toward improvement. Reshoring gains need to increase before it becomes an established norm of business in the state, and there are steps that could be taken to increase the pace of reshoring. Reshoring in Texas can be viewed as a project, rather than a *fait accompli*, and transportation infrastructure can play a key role spurring its growth.

RESHORING IN THE UNITED STATES: TEXAS IN CONTEXT

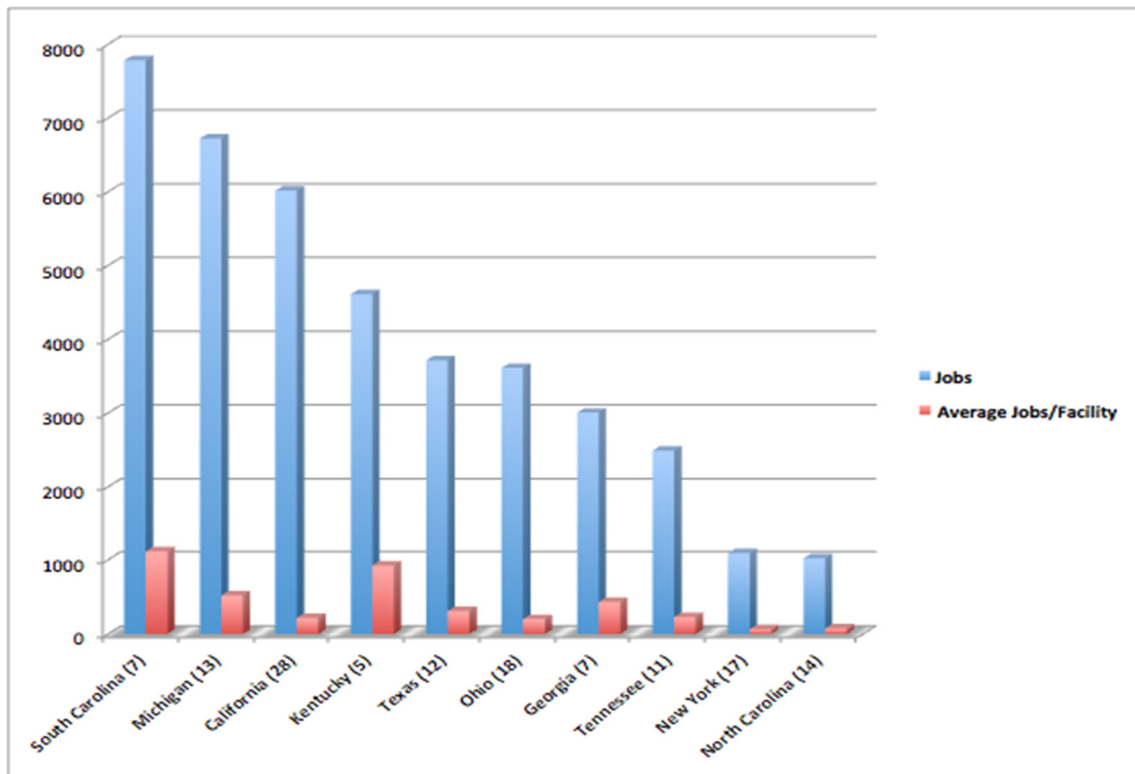
According to the consulting firm A.T. Kearney, there were just 64 cases of reshoring in the United States in 2011. However, since then, rising labor costs in China and lower energy costs (due to the shale oil boom) have propelled reshoring to new levels; A.T. Kearney's data indicate at least 300 reshoring projects in the United States in 2014.¹⁹ While reshoring numbers are showing significant growth, it is important to keep the available data in perspective. According to the Reshoring Initiative, the numbers should be understood as the beginning of a long-term trend that could take decades to balance out the manufacturing jobs that have been sent to Asia in the previous decades. Neither the Reshoring Initiative nor other analysts claim that this process is set to fully take place in the short term, but rather that the reshoring events observed so far are the building blocks of a likely decades-long process.

Although clear data on reshoring can be difficult to come by, not least because of its myriad and ambiguous definitions, what data are available suggest that for the moment the reshoring trend constitutes a small, potentially important, part of the manufacturing recovery in the years following the global economic crisis of 2008-2009. In any case, the topic has been followed with great interest from organizations like the Reshoring Initiative and the Massachusetts Institute of Technology's Forum for Supply Chain Innovation, to major business consulting and intelligence firms like A.T. Kearney, the Boston Consulting Group, and J.P. Morgan. The most comprehensive and recent study of reshoring's impact on the United States' economy, conducted by A.T. Kearney, shows a reversal in the rosier, upward trends of years past, with reshoring posting a year-over-year decline from 2013 as growth in offshoring outstrips reshoring manufacturing. Despite the growing pessimism concerning reshoring at the national level, Texas has proven a capable and willing competitor for reshoring businesses, and, with the right mix of policy and infrastructure, can play a significant role in the future growth of reshoring.

As Figure 1 shows, Texas has been at the forefront of competition for reshored businesses since 2007, repatriating at least 3,712 jobs as of August 31, 2014.

¹⁹ Richard A. McCormack. "A.T. Kearney: Economic Data Does Not Support the Manufacturing Reshoring Story."

Figure 1. Jobs Reshored by State, 2007-2014



Source: The Reshoring Initiative Data 2007-2014.

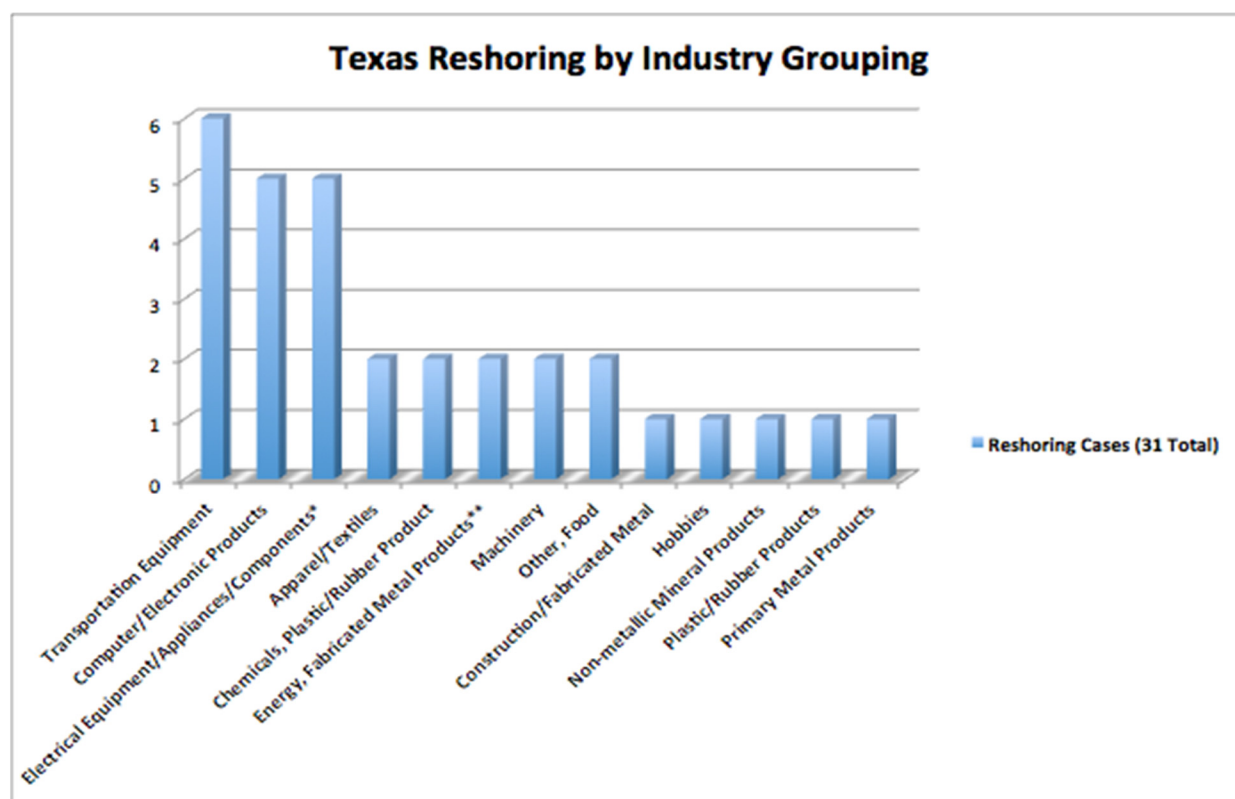
RESHORING IN TEXAS: WHAT DOES IT LOOK LIKE?

To understand reshoring in Texas, it is important to know which industries, not just companies, have taken advantage of the practice. This information can provide insight into where Texas's manufacturing capability is strongest and in which industries it could be better developed. Additionally, this information can shed light on the new ways in which reshoring manifests in Texas and help identify new trends that any prospective policy analyst or policymaker should anticipate. This section presents a snapshot of Texas's existing and potential strengths for attracting new manufacturing.

First we must mention an important note on methodology: as is highlighted elsewhere in this report, specific data on reshoring is difficult to collect and assess. As a result, this report made generous use of the Reshoring Initiative's case library and aimed to collect case data from between January 1, 2007, and September 1, 2014. Although some data might include planned reshoring jobs and manufacturing facility relocations that extend beyond the September 1, 2014 time frame, a high percentage of these cases fall within the period of analysis. Moreover, total employment tallies vary slightly between the data provided by the Reshoring Initiative and our own tabulations; these discrepancies can be attributed to differing interpretations of identical information or assessments of available data, but the differences are negligible and do not change the overall picture of reshoring in Texas.

The crux of this section rests on two specific categorical breakdowns: industrial and geographical. The available data suggest that, in the analyzed time period, a preponderance of the reshoring cases in Texas occurred across three distinct, but sometimes related, industries. These industries are, in order of prevalence transportation equipment; computer and electronic products; and electrical equipment, appliances, and/or components (see Figure 2). Those three industrial sectors alone comprised slightly more than half (16 of 31) of the reshoring cases that occurred in Texas (see Figure 3). Geographically, the data show that among Texas cities, Houston has been the predominant site, as it hosts seven reshored manufacturers. Overall, the state's Gulf Coast region performs best, as area cities benefit from the prevalence of chemical and oil industrial infrastructure and increased demand for those products has surged in recent years.

Figure 2. Reshored Industries in Texas

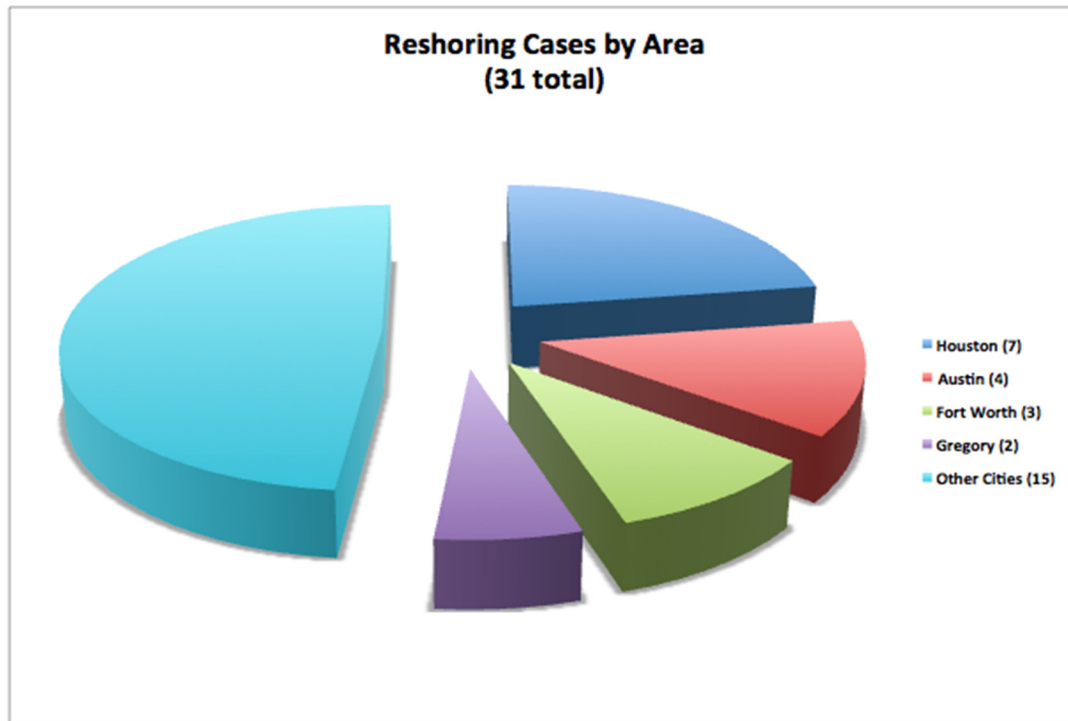


Source: The Reshoring Initiative Database 2014.

Notes: * signifies the inclusion of the failed case of MotoX, explained in greater detail elsewhere in this study.

** indicates the same foreign company offering production contracts to two separate U.S. manufacturers.

Figure 3. Texas Reshoring by Industry and Location



Source: The Reshoring Initiative Database 2014.

Transportation equipment represented six cases of reshoring among the 31 in our data set. It should be noted that recent and significant growth in Mexico's automobile and automotive components manufacturing—in terms of raw numbers and in capacity—is not accounted for here. However, it can be inferred that this expansion will further propel growth in Texas and enhance its performance as an automobile and components producer, particularly as cross-border, intra-industry clusters appear to be proliferating. Furthermore, the transportation industry has proven to be an important performer in terms of aggregate jobs numbers. Automotive (and closely related) manufacturing growth in Texas accounted for at least 3,150 of the more than 12,000 jobs accrued by the state of Texas through reshoring. It is noteworthy that, unlike the energy and chemicals industries, there is no clear geographic preponderance displayed among automotive (transportation) reshoring cases, and this represents promising potential for growth around the state.

That the computer and electronic products sector performed so strongly among reshorers should come as no surprise to those already familiar with Texas's industrial landscape. However, contrary to reputation, Austin displayed no clear dominance in wooing reshorers within its premier industrial sector at the outset. Readers should be cautioned, however, that one of the cases included in these data is that of Motorola and Flextronics' failed MotoX experiment (more on this topic, later in the briefing); and, when accounting for this failure, Austin represents two of the four remaining examples of reshored computer-related manufacturing (notably Apple and Samsung). Including the failed MotoX reshore, the computer and electronics industry was responsible for the creation of at least 4,000 jobs—slightly less than one-third of total reshoring job creation in the time period analyzed.

The third dominant industrial sector, electrical equipment/appliances/components, also displayed no clear geographical bias; however, unlike the other two major reshoring performers, it did register four of its five cases as reshored from China (admittedly, for lack of appropriate data to assess this factor with computer and electronic product, which also seemed to reshore predominantly from China). The available data indicate a manufacturing capacity that created roughly 1,600 jobs and is capable of, at least in limited scale, competing with that of China within this industry in both the Gulf region and along the Interstate 35 (IH-35) corridor between Austin and the Dallas/Fort Worth Metroplex.

Concluding the industrial and geographical breakdown, the data show that there are some other noteworthy trends worth taking into account. First, it appears that all, or nearly all, of the reshoring activity analyzed here took place near, or east of, IH-35, which correlates strongly to where the bulk of Texas's population resides. Second, and perhaps more importantly, the countries from which Texas was most successful in luring manufacturing capacity during this seven-year period were China (10 cases), Mexico (4 cases), and Japan (3 cases). Finally, among the types of reshoring accounted for in our data (*Kept from Offshoring*, *Reshoring*, and *Transplant*), Transplant cases had the strongest showing, accounting for 14 of the 31 cases examined. Reshoring totaled 10 cases and the Kept from Offshoring category registered seven cases, suggesting room for favorable policies and industry group encouragement to persuade businesses to stay in Texas and expand their existing manufacturing capabilities.

Figure 2 helps to contextualize the scope of Texas reshoring. As the complexities of global supply chains begin to burden companies, many are opting to leave their Asian operations intact as logistics hubs for their eastern hemisphere markets while electing to reshore to the United States and Mexico to create hubs for markets throughout the Americas. Some analysts view reshoring as a perceptible shift among business preferences toward regional supply chains, eschewing complicated global supply chains that slow the product-to-market timeline.

PROFILES OF RESHORED COMPANIES IN TEXAS

As noted earlier, as of August 2014, Texas had reshored the fifth-most number of reshoring jobs per state, with even conservative estimates counting 12 companies creating 3,712 new jobs. The actual figure is likely even higher, given the economic growth in the past six months. While these numbers provide a broad overview of the scope of reshoring in Texas, it is important to take a closer look at the companies that have been through their transition, the products they produce, and other pertinent information that will help to understand the trend within Texas's borders. Each profile will follow a general format. There will be a short explanation of the company as a whole, the product, the market, its headquarters, and other information. Then the history of its reshoring will be summarized, followed by a brief analysis of what can be gained from this particular case.

CATERPILLAR: VICTORIA, TEXAS

Caterpillar is a Peoria, Illinois-based, multi-billion dollar, global manufacturing giant that produces construction and mining equipment, diesel and natural gas engines, industrial gas turbines, and diesel-electric locomotives.²⁰ It would be difficult to find a construction site in the United States where its equipment is not being used. According to a U.S. Securities and Exchange Commission report, the company has 125,341 employees, which is likely to have grown over the previous few years as the global economy has recovered.



Hydraulic excavators can vary greatly in size and even the smallest one can weigh one ton, while the largest ones built by Caterpillar weigh more than a thousand tons. Previously, Caterpillar's excavators were produced in Akashi, Japan, but high shipping costs led the company to move the production of excavators destined for markets in North America and Latin America back to the United States. Caterpillar chose the South Texas city of Victoria to build a \$200 million, one million square-foot manufacturing facility that provided 225 new positions outright, with

the potential for 800 new jobs, if fully built out.²¹ The city of Victoria's proximity to the border makes it relatively easy to import components from Mexico or to export finished products. Victoria also has a shallow-draft port that can handle bulk materials on barge and a regional airport directly across from the plant. All of these factors, combined with a relatively low-cost labor force, made the region a strong draw for Caterpillar.

Hydraulic excavators are necessary for any construction operation and are a key part of Caterpillar's business model. However, it is important to understand that, as is the case with many large companies, the opening of a U.S. facility did not come with the closure of a facility in Asia. That is to say, the reshoring of these industries to the United States will bring home production destined to the U.S. market, but the company will continue to manufacture at offshore locations to serve its international base of customers, particularly in China. Understanding these strategies within the current trend of reshoring will provide a better roadmap for attracting future jobs back to the United States.

²⁰ United States Security and Exchange Commission "Caterpillar: Form 10-K."

²¹ Great Manufacturing Stories. "Caterpillar: Reshoring to America."

MOTOROLA MOBILITY (GOOGLE): FORT WORTH, TEXAS

When it was originally announced, the Motorola Mobility plant in Fort Worth was among the most promising stories of reshoring. With almost 4,000 jobs, it provided a significant boost to the Fort Worth economy. The Motorola Mobility plant was opened to manufacture the Moto X, a smart phone that used the Android operating system. It was also an attempt by Google to get a further foothold on the emerging “smart phone” industry. Although the product was well received, it failed to compete with the established brands that had already claimed the market.

The plant that was refitted for this reshoring venture cost Motorola \$25 million to refurbish and, at its peak, created 3,800 jobs in the Fort Worth area. Immediately following the purchase of the plant, Motorola’s management was very open as to why they chose to reshore the facility to Fort Worth. They cited that clusters were hugely important and having engineers nearby provided more versatility and ease of production.²² Additionally, Motorola mentioned the declining relative wage of U.S. workers in comparison to the Chinese, as well as proximity to market and supplier facilities in Mexico.²³ While the venture ultimately failed, the problem did not appear to be the result of reshoring, but misjudging the market and the workforce.

Despite the plants’ untimely closing, there are some lessons that can be learned from this example, particularly because of the willingness of the company’s management to speak openly about their reasons for reshoring. Motorola’s efforts provided concrete proof of the managers’ desires during the site selection process, which included the ability to develop an industry cluster, easily ship to high-profile locations, and access to a skilled workforce.

One major lesson learned from this example was the difficulty Motorola had hiring workers for the initial phase of production. Out of 6,500 applicants, only 2,500 individuals were qualified to work in the factory. Researchers at the Brookings Institution have identified this problem as “a lack of familiarity with modern precision equipment.”²⁴ This problem can be addressed with better access to training, but, if ignored, can leave Texas at a comparative disadvantage to other locations that provide workforce training. Having a workforce prepared to handle the demands of a major technology plant is one of the biggest draws that a region can have when companies make siting decisions.

PRUF LED: ROBINSON, TEXAS

While reshoring is often associated with major corporations, there are also opportunities for smaller manufacturers. One example of a small manufacturer that has relocated an offshore facility to Texas is Pruf LED, a corporation that manufactures a variety of light-emitting diode (LED) products. The company supplies lights for corporate giants like Mars

²² Schnurman, “While U.S. Lags Behind, ‘Reshoring’ Is Real in Fort Worth.”

²³ Ibid.

²⁴ Muro, “Reshoring: Strong Regions Will Determine Where, How.”

and Coca-Cola, while also providing lights for small private schools and businesses.²⁵ Originally based in Waco, Texas, the firm had manufactured its products in China until 2012. It then moved its manufacturing plant to a location just outside of Waco in Robinson, Texas.

The motivation for the company's move, as was publicly stated by the Pruf LED CEO, was a desire to help the local economy. While altruistic behaviors are not always common among U.S. corporations, it demonstrates there can be other motivations to reshoring than simply addressing the bottom line. It is likely, though, that this smaller company was also drawn back to Texas to serve a large client base that is nearby and growing.



Source: Google Maps

INDEVCO: LONGVIEW, TEXAS

Indevco produces “paper, plastic and corrugated packaging for agricultural, beverage, construction, catering, processed food, dairy, industrial, paramedical and pharmaceutical, chemical and petrochemical, soap and detergent, tissue and hygiene converting, tissue making, and promotional markets.”²⁶ The first important distinction for this company is that it is not from East Asia, but Lebanon. A second distinction is that the new facility may be more appropriately referred to as transplanting, or sometimes referred to as just onshoring, since the company had no previous foothold within the United States, and it chose to locate its plant in Texas rather than China, Mexico, Indonesia, or other similar locations. The last distinction is that Indevco provides anecdotal evidence that reshoring continues in the United States and is still ongoing. The deal to locate the plant in East Texas was formed in coordination with the Longview Economic Development Corporation. Indevco will transform a former plastics plant that is already located in the area into a modern facility, committing \$13.2 million to the retooling process.²⁷

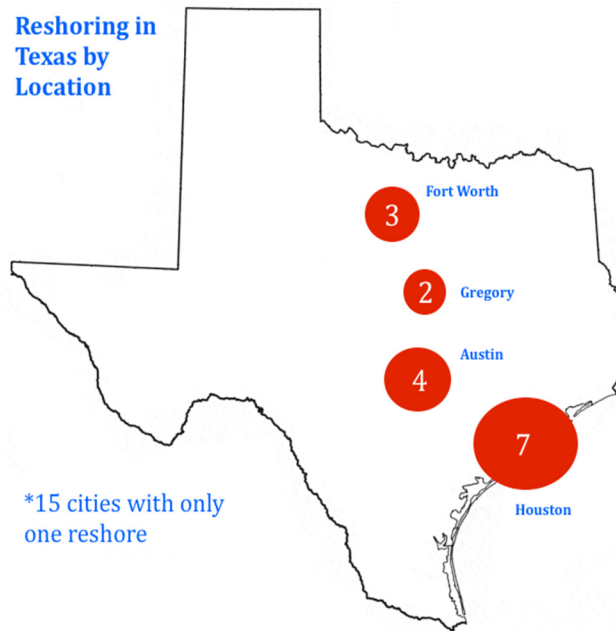
For a broader look at Texas reshoring, see Figure 4, showing areas with major reshoring activity.

²⁵ McCarthy, “Local Company to Move Manufacturing Jobs from China to Central Texas.”

²⁶ INDEVCO, “About Us.”

²⁷ Toloken, “Indevco Sets up US Plastics Factory - Plastics News.”

**Figure 4. Overview of Major Reshoring Destinations
(Number of Reshored Operations Shown in Red Circles)**



Source: By authors based on research data.

This list shows examples of reshored companies and their locations, with employment estimates in parentheses:

- Caterpillar—Victoria (225);
- Pruf LED—Robinson (12);
- Siro Group USA—Seguin (200);²⁸
- Kone—Allen (80);²⁹
- Motorola—Fort Worth (closed);
- Indevco—Longview (18);
- Mitsubishi Caterpillar Forklift —Houston (N/A);³⁰
- Tianjin Pipe—Gregory (500);³¹
- Guidedpoint Systems—Houston (N/A);³² and
- Apple—Austin (2,000).³³

²⁸ Packard, "Siro Group USA LLC to Bring Their Facility and Hundreds of Jobs to Seguin."

²⁹ Brown, "Kone Expanding New Allen Operations with Manufacturing."

³⁰ Reshoring Initiative, "Mitsubishi Moves Manufacturing to Houston."

³¹ Wiseman, "China Expands Investment In U.S., Creates Jobs."

³² Area Development, "Guidedpoint Systems Brings Product Manufacturing Back to U.S. at Houston, Texas Facility."

³³ Van Agtmael, "Made in the U.S.A. (Again)."

POLICY RECOMMENDATIONS

Thus far, this report has established several points. First, there seems to be a reshoring trend in the United States and Texas. Furthermore, there seems to be a single strategy for governments to promote the growth of these reshored entities and to further attract more manufacturing back to Texas. While this initiative must be worked on throughout all facets of Texas government, the main focus here is on recommendations that TxDOT can use to enhance Texas's competitiveness in facilitating reshoring. The general theme is that better connectivity and access to different modes of freight will make Texas a far more desirable location and encourage the reshoring trend.

Continue to prioritize highways that serve as trade corridors. It is recommended that TxDOT continue prioritizing the maintenance and, if necessary, expansion of highways along major trade corridors. Keeping these corridors in excellent physical and operating condition is imperative to maintaining Texas's strategic advantage as a location for manufacturing and to attract firms that are considering relocating to the state.

Support transportation connectivity within industry clusters. Industry clusters are the development of interconnected firms and manufacturers within a geographic region. This interconnected web of companies creates a symbiotic relationship for all involved. Manufacturers must often acquire inputs from suppliers and intermediate goods for just-in-time manufacturing that requires an efficient transportation network. State and local governments benefit from the presence of these clusters due to the industries' tax generation and job creation. The cluster is sustained by the desire of other corporations to join the cluster and, hopefully, reap the benefits.

Texas recognized the need to promote clusters and created the Texas Industry Cluster Initiative in 2005. The state has promoted the growth of clusters in these specific areas:

- Advanced Technologies and Manufacturing;
- Aerospace and Defense;
- Biotechnology and Life Sciences;
- Information and Computer Technology; and
- Petroleum Refining and Chemical Products Energy.³⁴

TxDOT's role in supporting these clusters is to facilitate their development by ensuring adequate transportation capacity (via any freight mode) and connectivity within and between clusters. As seen in Figure 4, there is a plethora of industry within the state, east of I-35. Companies will inherently want to move in these potential cluster regions. TxDOT can help facilitate this growth by maintaining adequate roadway capacity between the industries that the state has targeted for the development of these clusters. Additionally, increased access to rail within and between these clusters could be even more helpful than the roads because of the short distance and the high quantity of potential trade. As with many of the recommendations made in this section, TxDOT has a role in the development

³⁴ Texas Workforce Commission, "Texas Industry Cluster Initiative."

of clusters, but it will take a coordinated effort with local governments to promote their growth.

Consider promoting development in less densely populated areas of the state. To date, most instances of reshoring that have occurred in Texas have been in cities along or east of IH-35, with many fewer projects west of IH-35. While less densely populated regions of the state require higher transportation inputs, they also offer cheap land, proximity to energy, and possibly untapped labor. TxDOT's continued development of strategic transportation infrastructure throughout West Texas will help promote local economic development in the region. One example of a strategy that could be explored is a direct rail line connecting El Paso, Midland, Lubbock, and Amarillo. Another example is enhanced connectivity of roads or rail between these cities and the major cities of the east of the IH-35 corridor, where many of the clusters and business centers already are and continue to develop.

Focus simultaneously on reshoring and nearshoring. Nearshoring, or the act of bringing production to countries that are geographically closer to U.S. markets, can be a cost-effective way to maximize the benefits of close physical proximity to U.S. markets while avoiding costly U.S. labor. Nearshoring is an equally, if not more economically, viable option for manufacturing and Mexico is making great strides in facilitating this trend. Cooperation and communication with Mexico's policy makers and relevant businesses are crucial for maximizing the opportunity for mutual benefit, particularly in the realm of intra-industry trade. Within the auto industry, intra-industry trade is growing rapidly between Texas and Mexico (see Policy Brief #5, "Intra-Industry Trade"). Continued attention to the trend and long-term infrastructure planning to facilitate intra-industry trade are key to ensuring that Texas can benefit from its own reshoring, as well as nearshoring in Mexico.

Use Texas's toll road system to more effectively manage freight congestion. Reduced tolls on SH-130 for commercial trucks would encourage drivers to avoid the bottlenecks of IH-35 during congested periods. The high volume of trucks on the busiest portions of IH-35, even during rush hour, indicates that SH-130 is not fully utilized. For this reason, we support subsidizing tolls for commercial trucks to incentivize commercial trucks' increased use of SH-130, to promote more efficient trade, as well as make IH-35 safer and reduce traffic congestion.

Gather further data about reshoring and expand outreach. The research team recommends continuing research on reshoring in Texas and reaching out to actors in the clustering/warehousing sectors within areas where reshoring (and nearshoring) has been successful, as well as major data-producing governmental agencies and university institutes. A more rigorous definition and data collection standard shared across industry and government experts would help better understand and promote the concept of reshoring. Coordination between agencies and data analysis firms or institutes would do much to advance discussion and promote growth of this small but important trend in U.S. manufacturing.

Reshoring is a fledgling practice and only exists as long as companies continue to expand and bring manufacturing closer to markets in the Western Hemisphere. There is a certain value in continued research of this topic, but it must be done to identify the changing trends and desires of businesses that seek to reshore or are considering doing so. Additionally, this research must answer important questions about how TxDOT should proceed. The question of whether reshoring is a zero-sum game, especially with regard to Mexico, should be explored further. Does any loss for Texas necessarily constitute gains for Mexico, or is the inverse true? Answering questions like these can and should dictate how TxDOT proceeds in planning and implementing in the future.

Direct communication between TxDOT and firms considering or actively pursuing reshoring could be crucial to promoting and influencing businesses to locate in Texas. Formalized communication and outreach along these lines will inform TxDOT on how it could adjust its policies, as it responds to what businesses cite as potential inducements for relocation. Additionally, TxDOT may be able to recognize the potential for hubs or industrial parks in advance, with continued communication. Creating a committee or a dedicated outreach team to facilitate and promote this communication could be instrumental in promoting and securing reshoring manufacturers for the state of Texas in the long run.

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