

FUTURE PROOFING



Future proofing is the process of anticipating potential effects of future events, specifically changes in technology and demographics, and designing systems that are flexible and adaptable to change without the need for major upgrading. Technological innovation is difficult to plan for and raises questions for economic development professional planners and policy makers to investigate. The region's economy is based in the energy industry, which recently experienced an unanticipated upsurge in domestic oil and natural gas production and refining due to development of fracking technology. A major component of the regional energy industry is refining oil into gasoline, the majority of which is used in transportation. How the oil and gas sector, and the region's larger economy, will be affected by the coming electrification of automobiles is a question that needs to be considered by business leaders and policy makers.

Mobility technology is rapidly changing, with the trends of driverless cars, ridesharing, and electrification converging to transform the transportation landscape.⁸ The region's

development and physical form has been dominated by the automobile; currently, when developing offices, nearly half of the developed space is dedicated to vehicle parking.⁹ Architects are designing parking structures that can easily be transformed into other building types, in anticipation that we will no longer have automobiles sitting idle in the garages all day. Policy makers and governments will need to coordinate with technology developers to deploy the infrastructure needed for automation of vehicles.

There is an ongoing political debate on whether climate change is caused by human activities. What is undisputed is that there is an increasing number of extreme weather events in the United States including heat waves, droughts, heavy downpours, floods, and hurricanes.¹⁰ If this trend continues, we can anticipate that droughts, hurricanes, and floods will be more frequent occurrences in the region. This necessitates an increase in the number of droughts and storms the region needs to be prepared for.

Best Practices for Future Proofing

Workforce Development and Demographic Change

Smart Mobility Technology

Utility Hardening

FUTURE PROOFING: BEST PRACTICES

As the region grows, demographics continue to change, which will in turn shape the region's economy. The Baby Boom generation is beginning to age out of the workplace, while the Millennial generation's (the largest in the nation's history) economic prospects have diminished in comparison with prior generations. Millennial net wealth is half as much as Baby Boomers when they were young adults; wages have also declined 20 percent for today's young workers.¹¹ While the population has shifted to a slightly older makeup, the region has the largest percentage of population under 18 years of age of any metropolitan area.¹² The region has grown significantly more diverse since 1990, with increases in the Asian and Hispanic proportions of the population. Responding to these demographic shifts is crucial in preparing for the economy of the future and key to responding to downturns in the economy.

The region needs to improve its rate of educational attainment if it is to retain a competitive workforce.

Among the 20 largest metropolitan areas in the U.S., Houston ranks 19th in educational attainment.¹³ The fastest-growing segment of the workforce is also the least educated. As the *The Kinder Houston Area Survey* notes:

"In today's high-tech, knowledge-based, global economy, some form of post-secondary education—a minimum of one or two years in a community college after high school—is virtually a prerequisite for landing a decent job. Given these new realities, it is sobering to realize, as a recent study has found, that of all the eighth graders in Houston area schools in the year 2004, only 68% actually graduated from high school and just 21% had obtained any kind of post-secondary certificate or degree by 2015, 11 years later."¹⁴

If the region is to be economically resilient, it needs to change these trends to respond to the increasing demand for skilled blue-collar labor.



Brazosport College provides training for students and partner industry through a variety of programs and classes. The campus is also home to a full-scale PET (Polyethylene terephthalate, a general-purpose plastic) Plant training facility for hands-on instruction and continuing education.

Photo by Brazosport College

FUTURE PROOFING: BEST PRACTICES

Workforce Development and Demographic Change:

Brazosport College

Brazoria County is a nexus for chemical production, largely centered in the southern portion of the county, known as Brazosport. Brazosport's petrochemical industry has experienced rapid growth in the past decade, with \$28 billion in capital investments and 3,500 new permanent jobs.¹⁵ In addition to the demand for new employees, the industry is expecting a 50% turnover in the next 10 years as the Baby Boom generation begins to retire from the workforce.¹⁶ Brazosport College is proactively meeting the demand for a skilled workforce through Brazosport College's Center for Business and Industry. Brazosport College has a traditional student population of 4,000, but serves 20,000-25,000 students per year, largely through Center for Business and Industry. The Center offers courses specifically tailored industry needs in terms of timing and outcomes. In addition to training, the Center provides consulting, meeting facilitation, and grant resources to help industries meet their needs. The Center offers practical knowledge using its own Process Equipment Trainer; allowing new recruits to train on the same equipment they will be using in the field, without the high risk. The Center remains responsive to industry needs through industry involvement of its advisory council, composed of petrochemical industry professionals, that assists with career talks, curriculum development, and high school recruitment.

Smart Mobility Technology:

The City of Frisco

Transportation technology and infrastructure is undergoing a significant transformation with the innovations in electrification, shared transportation, and automation. Frisco, in the Dallas-Fort Worth metropolitan area, was awarded a \$300,000 grant from the Texas Department of Transportation to implement an adaptive signal control pilot program. The technology allows signal controllers to adjust intersection signal timing instantaneously based on traffic volume and other parameters put in place by city staff. The program is expected to improve the overall signal control network by reacting to traffic conditions immediately. The system is expected to be installed at several signaled intersections by the end of the year and will be tested for 12 months. The technology will provide a wealth of data on the current usage of the city's transportation network. This technology is a sign of the future of automotive and transportation technology. Frisco is building the initial infrastructure needed for automated transportation, allowing automobiles and a network of active sensors embedded in the transportation infrastructure to communicate. What the future holds for automated vehicles is still undetermined, but as the technology continues to develop, the region will need to be prepared if it is to remain competitive.

Utility Hardening:

The City of Liberty

The vulnerability of the City of Liberty's municipal utility grid was exposed after the windstorms experienced during Hurricane Ike in 2008. The City of Liberty's electrical grid was not unique in the damage it experienced; Hurricane Ike knocked out power in pockets throughout the region for weeks at a time. A major electrical user in Liberty is a pipe fabricator, which uses approximately the same amount of electricity as all the city's residential customers. Liberty continued to experience brownouts affecting the fabricator's operations. Liberty invested \$4 million to harden its electrical grid to enhance its resilience. The City surveyed the grid for vulnerabilities, identifying faulty poles and insulators, and switches that needed to be raised, and has been systematically addressing its weaknesses. This has enhanced the City's ability to provide consistent service and made Liberty more resilient to future extreme weather events, as well as more attractive as a location for manufacturers interested in relocating to Liberty.