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INFRASTRUCTURE CONSEQUENCES OF EXURB GROWTH IN TEXAS

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ABSTRACT

The housing phenomenon known as “exurbia” is accelerating, and with this growth comes new challenges for state and local governments. Exurbs are low-density neighborhoods in rural areas within commuting distance of major cities. These exurbs appeal to home buyers for several reasons: the areas are less crowded, offer better-rated schools, and boast more property and larger houses for lower prices than can be found in the suburbs or inner cities. As Texas’ exurb communities continue to grow at a rapid pace, it is important to understand the infrastructure consequences of such fast growth in rural areas, so policymakers can anticipate and respond to new challenges that may arise (or have already arisen).

In this report, I analyze three main types of infrastructure: social, physical, and environmental. Within these categories, I examine the ongoing effects of exurb growth on rural public schools (social infrastructure), transportation and commute patterns (physical infrastructure), and flood and water management plans in new neighborhoods (environmental infrastructure). Better understanding the effects of exurbia on these three infrastructure types and policy areas is important to inform state and local decision-making as Texas moves into the 2020s.

Key Messages:

- School districts in exurb areas are at risk of outgrowing their facilities due to explosive K-12 enrollment, and require additional flexible funding and resource channels.
- Significant growth in the number of commuters traveling from exurb counties into nearby Texas city centers makes rural roads an increasingly urgent target for TXDOT public-safety expenditures and improvements.
- Wetland loss, particularly in the Houston metropolitan area, has increased risk of flooding in the exurbs, and requires additional state funding to supplement local stormwater management projects and monitor development permits.

WHAT IS EXURBIA?

Exurbs are low-density neighborhoods located in rural fringe areas within commuting distance of major cities. In a study conducted by The Brookings Institution, researchers found in 2000 there were almost eleven million people opting to live in exurbs outside metropolitan areas. These areas, called “exurbia” (term coined by Auguste Spector in his 1955 book “The Exurbanites”), were growing at a much faster pace than the major cities to which they were connected (Berube et al., 2006). This trend is still ongoing today, as increasing numbers of white-collar, middle-income families are moving out of major cities and into the nearby exurbs.

Exurbia is composed of large numbers of homeowners and commuters. Many families who move to the exurbs are making a conscious trade-off between a shorter commute-time and lower-priced homes (Berube et al., 2006). Although the percentage of people who opt for the exurbs are a small percentage of the population of most cities, due to the rural nature of the areas that experience accelerating growth from exurb migration, it is an important phenomenon for state and local policymakers to understand. These areas experience special changes to their characteristics and qualities that impact state and local infrastructure, and this type of growth will continue to be relevant as increasing numbers of exurbs spring up outside major cities.

In the state of Texas, exurb growth and sprawl has occurred most notably in its four largest metropolitan areas: Dallas, Houston, Austin, and San Antonio. As of the Brookings study released in 2006, Texas already had the highest exurban population relative to its size. Examples of areas considered to be exurbs around Dallas include Frisco, Flower Mound, and Allen, while Houston’s exurbs include places such as Katy and Cleveland (Berube et al., 2006; Fulton, 2018). As both Dallas and Houston are major hubs in Texas and in the United States, housing prices in their urban and suburban areas have increased steadily over the past few decades. The amenities that attract families to the exurbs include lower housing prices (and larger pieces of property), better-rated schools, less traffic congestion, and lower crime rates than their urban and suburban counterparts (Berube et al., 2006). However,

with the influx of people in these previously rural areas, preserving these amenities becomes complex. In this report, I will examine three types of infrastructure that are affected by growth in the exurbs: social, physical, and environmental, while focusing on specific policy issues within each of these areas.

SOCIAL INFRASTRUCTURE (PUBLIC EDUCATION)

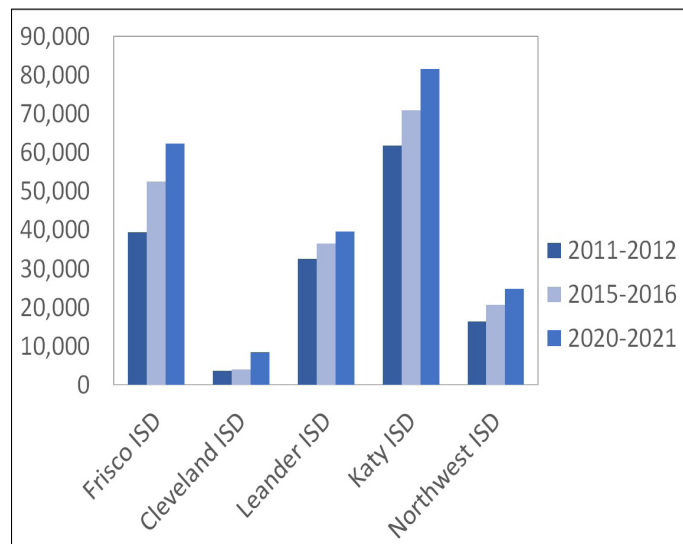
One of the aspects of exurb areas that is heavily influenced by rising population is public education. This is primarily due to funding, building capacity, and categorization. In a 2015 article for the *Peabody Journal of Education*, Greenough and Nelson argue that the National Center for Education Statistics (NCES) uses a definition of rural schools that is unable to fully encapsulate the diversity of schools that fall underneath that umbrella. The category of “rural schools” applies to everything from low-density exurbs around metropolitan areas to “bush villages” in Alaska that have no road access” (Greenough & Nelson, 2015). The NCES’s listed rural subtypes include Rural Fringe, Rural Distant, and Rural Remote. The subtype of Rural Fringe is typically where exurban schools fall, since they are categorized as less than or equal to five miles from a metropolitan area (NCES, 2021). The issue with this categorization is that Rural Fringe schools have funding needs that vary when compared to the other rural school types. While it is not uncommon for rural fringe schools to eventually be recategorized as urban, once the area grows in population sufficiently, the official classification codes often do not reflect the current population due to how rapidly it is growing. An example is in the Frisco Independent School District, north of Dallas, where GIS maps reveal multiple schools that are classified as Rural Fringe, but are located in the middle of new suburban developments, both housing and commercial (Greenough & Nelson, 2015).

Since schools in the rural fringe of metropolitan areas experience fast-paced growth in student enrollment numbers, the need for resources and new facilities shifts dramatically year by year. The families moving into the exurbs are largely white-collar and middle-class, and a common reason for their exodus from the inner city is access to better quality schools. Although the rise of

the suburbs in the latter half of the 20th century was due to the phenomenon of white flight, the growing exurb population in Texas is increasingly diverse, with Asian-American and Hispanic families making up a large portion of homebuyers in some exurb communities such as Katy (Kotkin, 2015). The diversity of Texas’s exurbs suggests that there are different variables at play in the growth of exurbs, including the significant increase of Texas’s population over the past ten years (FGSC, 2018). Increasing enrollment numbers, alongside high expectations regarding quality, and a more diverse student body leads to a variety of different funding needs for facilities, student support, and specialized student organizations.

The districts represented in Figure 1 all lie within exurbs near Dallas, Houston, or Austin. The Texas Education Agency (TEA) classifies fast-growing districts as any district that had at least 2,500 students enrolled in the previous year and expects a net increase of 3,500 students or more, or has a growth rate of at least 10% over the past five years (FGSC, 2018). However, this classification system does not capture districts that were already large before their numbers started to skyrocket. The average growth rate of Katy ISD over the past five years is technically only 2.76%, and yet that increase includes over 8,000 new students since 2016 in steady increments of about 2,000 students each year. In the case of Frisco ISD, the average growth rate over the past five years is 3.14%, with 7,000 new students added

Figure 1: K-12 Student Enrollment in Exurb Districts



Source: Texas Education Agency, 2011-2021.

during that time frame (TEA, 2021). Although most school districts in the exurbs show an upward spike in enrollment over the past decade, due to the variety in the size of exurbs, the impact of quickly increasing enrollment on school districts is not as immediately apparent in large districts as it is in small ones.

Cleveland, Texas, lies an hour's drive northeast of Houston in Liberty County and is classified as an exurb. Cleveland ISD has acquired only around 4,000 new students since 2016, but the district's average growth rate is 17.71% and total enrollment has doubled in the past five years (McNeel, 2021; TEA 2021). Cleveland ISD has struggled to meet new demands for resources and facilities. The district first attempted to address the issue by constructing new schools. Cleveland ISD secured approval from local voters to issue bonds to build several schools over the past five years, but the latest attempt to raise local property taxes to pay for more resources in the schools failed. Cleveland ISD Superintendent Chris Trotter then asked state legislators for supplemental funding and the flexibility to spend extra funding as needed. Legislators granted Cleveland a small increase in funding, but lawmakers also fast-tracked a charter school network in Cleveland without input from the community. Now, although there are more school facilities, the charters are attracting students away from Cleveland ISD schools, threatening overall funding as district enrollment declines (McNeel, 2021). As Cleveland becomes a new stage for charter-district conflict, district administrators have not been able to address the original resource and funding issue caused by skyrocketing student enrollment and exurb growth.

It is important to minimize the negative impacts of explosive exurb growth on these rural fringe districts by ensuring that there are flexible funding and resource channels available.

In addition, state agencies should be aware of the variety of schools included under the Rural Fringe subtype used by the NCES when analyzing data, and how rural fringe schools are closer in demographics and size to urban and suburban schools than they are to other rural schools (Greenough & Nelson, 2015). NCES demographic coding is not up to date for exurb areas that have experienced rapid expansion in recent years. Although state administrators try to monitor

fast-growing schools through the existing Fast Growth Schools system, many districts caught just outside of the necessary benchmarks for additional attention and funding will suffer if their resource needs are not addressed. The average elementary school size in Texas is 564 students, with the average high school enrolling 733 (TEA, 2021). Since enrollment in exurb schools is increasing by thousands each year, and new schools take at least a year to design and construct, districts will continue to outgrow their facilities.



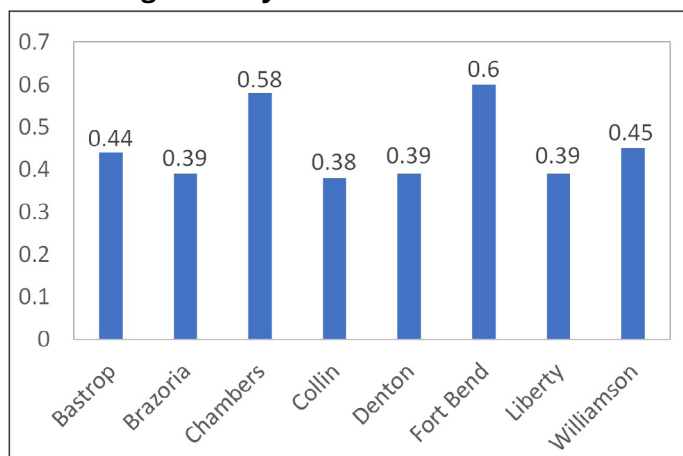
PHYSICAL INFRASTRUCTURE (TRANSPORTATION)

While exurb growth is impacting social infrastructure such as public education, it is also affecting the physical infrastructure of rural fringe areas. A critical aspect of physical infrastructure affected by exurb growth is transportation and safety. Texas has seen an increase in car accidents, including fatal collisions, within the past two years (Bolotnikova, 2021). While some analysts attribute a percentage of the rising number of accidents to drivers developing risky habits during the COVID-19 shutdowns when roads were less congested, that is not the only factor. It is also true that COVID-19 caused a spike in the number of families moving to the exurbs, leading to more commuters on the roads in general (Winck & Hoffower, 2021). Drivers commuting from the fringe into metropolitan areas such as Dallas-proper are impacted regularly by road conditions and safety. One distinctive aspect of exurbs is that they hold a larger percentage of commuters than the suburbs or urban neighborhoods. Exurbs also tend to be far enough away from their corresponding metropolitan areas that light rail or bus transportation options are unavailable. As the number of commuters between

exurbs and metropolitan areas rises, issues related to road maintenance, upkeep, and safety rise alongside. In Texas, exurbs outside of Dallas, Austin, and Houston require commuters to drive on county roads in order to reach the city. The American Consumer Survey from the United States Census Bureau tracks the percentage of any county's resident workforce that commutes into a different county for work. The commuter flow reports released in 2013 and 2015 show that counties housing exurb communities send a large percentage of their workforce into the nearest metropolitan area. For example, in Fort Bend County, 60% of the workforce commutes into Harris County (Houston); and Collin and Denton counties send almost 40% of their workforce into nearby Dallas and Tarrant (Dallas-Fort Worth) (United States Census Bureau, 2015).

Figure 2 shows commuting-workforce percentages for several counties surrounding Dallas, Austin, and Houston. Although these percentages are from the U.S. Census Bureau commuting flow report released in 2015, they remain within 1 to 2 points of the previous dataset that represented 2009-2013. Meanwhile, the same counties whose commuting patterns were measured in the survey have increased their workforce numbers by thousands since 2010. The largest leaps in workforce numbers come from Denton County, with a 38% increase in its workforce from 2010-2019, Fort Bend County, which has grown by 41%, and Williamson County, which has increased its workforce 41% (US Census Bureau, 2022). This large percentage change in workforce numbers, alongside the relative

Figure 2: Percent of Total Exurb County Workforce Commuting Into City Center



Source: United States Census Bureau, 2015.

steadiness of the percentage of commuters, indicates there are thousands of new commuters on the roads from these exurbs to the nearby metropolitan areas. Another statistic that shows the exurbs are growing and increasing the number of commuters on the roads to their metropolitan counterparts is the increased number of vehicles registered in exurb counties. In just six years (2015-2021), the Denton and Collin counties alone have seen an additional 211,580 vehicles registered (Texas Department of Motor Vehicles, 2021).

The rise of low-density neighborhoods in rural areas, filled with commuters, exacerbates concerns about road safety in the rural fringe. In an early study conducted in 2003, W. H. Lucy found that exurbs had significantly higher traffic fatalities compared to the inner city of the metropolitan areas with which they were associated. This study included both the inner cities, the suburbs, and the exurbs of Dallas and Houston. Much of the risk associated with commuting to and from exurb areas is because of the nature of the roadways: cars move quickly on two-lane rural highways, where all of the normal factors such as driver distraction, impairment, and human error are compounded by high speed limits and a lack of barriers between lanes (Lucy, 2003). Accidents in rural areas happen at lower frequency but with higher fatality rates, because the area is less accessible for emergency vehicles and it takes longer on low-traffic roads for single-car accidents to be discovered (McAndrews et al., 2016). The Texas Department of Transportation, as of the latest crash statistics published on their website in 2020, still categorizes all fatal car accidents under one of two subtypes: urban or rural (TXDOT, 2021). In a 2016 article published by McAndrews et al., the authors note that this categorization system of urban/rural used by TX DOT is outdated, due to the rise of low-density communities (exurbs) around the rural fringe of metropolitan areas. The focus on urban and rural areas does not allow for investigation of low-density settlement patterns and road safety in the exurbs (McAndrews et al., 2017).

McAndrews recommended studying road safety in Texas through the lens of regional development processes, rather than simple categories of urban and rural, which make assumptions about the characteristics of the residents in both areas. The exurbs are not going

anywhere. Rather, recent domestic migration patterns and urban sprawl demonstrate that the exurbs will continue to grow and become a major factor in state behavior and policymaking (Kotkin, 2015; Fulton, 2018). As low-density neighborhoods full of commuters continue to spring up outside of Texas metropolitan areas, it is of increasing importance for Texas policymakers to pay attention to road safety issues that grow as a result.

In the current ten-year plan from TXDOT, the agency has allocated 16.7% of its total funding toward projects in rural districts, alongside 47.7% going toward metro districts. It is likely that both of these funding channels will contribute to improving road safety for commuters traveling between their counties of residence and Texas metropolitan areas. This is great news for rural road safety in Texas, especially with the approval and addition of the “Safer By Design” tool developed by TXDOT and the Texas A&M Transportation Institute (TTI). This tool includes a comprehensive guide to assessing safety characteristics of rural highways, and it is intended to be utilized by roadway designers for new and improvement projects (Roadway Safety Foundation, 2021). TXDOT is now requiring the use of the “Safer By Design” tool for all non-interstate rural projects, and the department intends to eventually extend its required use to all other roadways (RSF, 2021). This tool, alongside TXDOT’s Road to Zero goal of zero fatalities on Texas roads by the year 2050 and the new level of funding allocated to rural and metropolitan road improvements signal that policymakers are taking substantive action that will benefit and protect commuters traveling from the Texas exurbs.

As traffic fatalities rise in the state of Texas, with a large percentage occurring in rural fringe and exurban areas, policymakers in the legislature and administrators within the Department of Transportation must continue to target rural roads with public-safety expenditures for improvements, alongside the use of the “Safer By Design” tool.

ENVIRONMENTAL INFRASTRUCTURE (FLOOD MANAGEMENT)

A third type of infrastructure affected by exurb growth is environmental. Flood and stormwater management

is increasingly important as the Texas population grows and the exurbs expand. As previously discussed, low-density communities have sprung up around Texas metropolitan areas rapidly. Due to the demand for low-cost housing in these exurb areas, master-planned communities are drawn, contracted, and built quickly—often without consideration for the environmental impact on the terrain surrounding them.



In 2001, Patrick Gallagher wrote about the environmental impacts of urban sprawl, and noted that one potentially dangerous effect is that paved areas are not designed to absorb and filter precipitation and stormwater in the same way the natural sediment does. When pavement takes over areas, as it does with master-planned communities and exurban sprawl, stormwater has nowhere to go safely and causes flooding (including toxins and litter) to end up in surface waters (Gallagher, 2001). In the same article, Gallagher pointed out that floodplains act as “natural diversion and retention structures for flood waters” (p. 221) and that the development of residential and commercial areas on floodplains enhances the danger and severity of flooding (Gallagher, 2001).

While Gallagher’s warnings regarding the environmental impacts of sprawl were published in 2001, recent events have shown his analysis is accurate. In Texas, although the impacts of exurb growth on flooding and water management are visible across the state, the effects can be seen particularly severely in the Houston area due to its position on the Gulf Coast and the freshwater wetlands that surround it. A study conducted by researchers with Texas A&M’s AgriLife Extension in 2012 found that the Greater Houston

Metro Area (using data from eight counties) had lost 5.5% of its freshwater wetlands between the years 1992 and 2010 (Jacob et al., 2012). The loss of this significant portion of wetlands has multiple impacts, one of the more severe of which is increased flooding. While Harris County has lost the largest portion of its wetlands at 29.1%, other counties with significant lost percentages include Fort Bend, Galveston, Liberty, and Montgomery (Jacob et al., 2012). Henry Grabar's 2017 Slate article on the effects of Hurricane Harvey on the city of Houston and surrounding areas shows how exurban sprawl has compounded the flooding problems the region already faced. The water that used to sink into the soil is now conducted through gutters and ditches in neighborhoods built on floodplains and has nowhere immediate to go (Grabar, 2017). In exurban areas around Houston, developers are required to provide "detention ponds" to catch stormwater, in order to combat the effects of developing the surrounding wetlands. However, an investigation by the U.S. Army Corps of Engineers found that a large number (more than half) of the developers who had been issued permits contingent on those detention ponds were not in compliance (Grabar, 2017).

Since Hurricane Harvey, local officials in Houston have tried to combat the effects of exurban sprawl on stormwater management with stricter limits on development in areas that are designated as flood-prone and \$2.5 billion in Harris County bonds for flood resilience projects. The city of Houston has also voted to require any development on floodplains to be built above the water level that would occur during a 500-year storm (Snyder, 2018). As Houston has experienced higher volumes of major storms over the past couple of decades, it remains to be seen how the city's new zoning and development regulations will help combat the negative impacts of exurban sprawl on the Harris County floodplains.

In nearby Fort Bend County (home to exurbs such as Katy and Sugar Land), local government has struggled to fund projects intended to improve flood management. After Hurricane Harvey, residents approved an \$83 million flood bond to start implementing changes to their stormwater infrastructure. Local officials hoped that this flood bond would be supplemented by federal grants to reach the required amount of funding;

however, the county's bids for federal grants have not been approved, leaving approximately 40% of the county's flood bond projects on hold indefinitely (Aebi, 2021; DeGrood, 2021). In a follow-up research study to the 2012 report released by AgriLife, multiple agencies worked together to analyze a sample of wetland mitigation permits approved in the Houston-Galveston area, where developers were expected to provide numbers that correlated with the amount of wetland loss that would occur due to their project, so the county could be compensated under the Clean Water Act (Texas Coastal Watershed Program, 2017). The agencies found that much of the regional development was occurring outside of the 100-year floodplain covered by the compensatory permit process under the Clean Water Act, and thus was not being regulated to the same extent. Permits for development of these areas falls primarily to local government entities, which often do not have the funds to oversee or implement accountability mechanisms for developers (TCWP, 2017).

Since the report found that county-level decision-makers are often tasked with assessing and approving permits and monitoring subsequent impacts of wetland loss, it is crucial that local governments gain the necessary tools and funding to implement on-the-ground inspections of the mitigated wetlands, and consistent monitoring of permits and the actual wetland loss occurring.

One potential revenue stream that could benefit local flood management projects is the recently approved Flood Infrastructure Fund (FIF), budgeted by the state and overseen by the Texas Water Development Board (TWDB). In 2019, the Texas Legislature gave the TWDB an expanded role in flood infrastructure that included a \$793 million transfer from the state's Economic Stabilization fund (TWDB, 2021). These funds are available to local flood management projects in the form of loans and grants, depending on eligibility criteria such as project type and funds already raised. Local governments across the state that have already received committed funds from FIF include many rural districts, as well as exurb neighborhoods surrounding San Antonio, Austin, and Dallas, and the greater Houston area (TWDB, 2021). The FIF has the potential to greatly benefit the planning and implementation of flood management projects in Texas exurbs, although

additional funding may be needed for the consistent oversight of developers and assessing wetland loss. As these projects proceed, gaps in funding due to criteria set by the TWDB or outside circumstances will become clearer, and can then be addressed.

RECOMMENDATIONS AND WRAP-UP

The three policy areas discussed in this report are of mounting importance as exurb growth continues to affect Texas metropolitan areas such as Dallas, Houston, and Austin. Policymakers in education must consider the rapidly changing size and demographics of exurban schools in the rural fringe and consult with local districts regarding their unique resource needs. As Cleveland ISD shows, one-size-fits-all policies for resource allocation do not work efficiently for rapidly expanding exurbs. While exurbs such as Liberty County have passed bonds to finance new schools, the funding available locally cannot keep up with the skyrocketing enrollment in Cleveland ISD. It is imperative that the Texas State Legislature target fast-growing schools with additional funding, but with more flexibility in eligibility criteria so that districts of all sizes can benefit. Any additional funding approved for fast-growing schools should come with few or no strings attached, so that local administrators can make specific funding decisions that make the most sense for the schools in their communities.

Outdated categorization affects both education and transportation safety policy, leading to even more questions about how to best serve exurban communities in these areas. One thing in particular is clear—the number of commuters on the roads from Texas exurbs to their metropolitan counterparts has grown by tens of thousands over the past decade, and that number will continue to grow. As traffic fatalities rise in the state of Texas, with a large percentage occurring in rural fringe and exurban areas, policymakers in the Legislature and administrators with the Department of Transportation must continue to target rural roads with public-safety funds for improvements, alongside the use of the “Safer By Design” tool recently approved. Increasing the safety of Texas roadways is of paramount importance for the protection of exurb commuters and rural residents.

Flood management in the greater Houston metro area and in other exurbs across the state will continue to be a large issue as climate change causes an increase in the frequency and severity of storms on the Gulf Coast, and it is particularly important that local policymakers monitor exurb development and hold development companies accountable to both old and new zoning and building requirements for floodplains. Local officials in the greater Houston metro area should impose strict fines on developers who fail to construct detention ponds for stormwater on new developments, as a stiffer incentive for them to follow the already existing rule. In addition, Texas legislators should continue to monitor and further finance the Flood Infrastructure Fund being currently implemented by TWDB, since federal grants from FEMA and other entities have continually fallen through and the state has an obligation to ensure the implementation of flood management projects across the state, in order to prevent excessive flooding in the future.

It is critical to understand how exurb growth affects the state of Texas, if communities and local governments are going to adapt to these new patterns of development. At least three forms of infrastructure are complicated by rapid exurb growth. Because Texans are choosing to move into the exurbs in record numbers, it is crucial that state and local policymakers understand the unique features of the exurbs and how their infrastructure is impacted by the changing demographics and population growth. In order to keep Texas economically stable and improve the quality of life for its residents, its social, physical, and environmental infrastructure must be improved and maintained. physical, and environmental infrastructure must be improved and maintained.



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The Texas Lyceum

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