



CONNECTING
TEXAS
FORESTS

Beyond Homes: Connected Forests Will Grow the East Texas Economy

POLICY BRIEF



Policy Brief Contents

1. Executive Overview
2. The Forest Economy of East Texas
3. The Lumber and Wood Products Supply Chain
4. Broadband's Potential for Forested Areas
5. Farm-to-Market Broadband
6. New Industry and Employment
7. Policy and Legislative Implications

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EXECUTIVE SUMMARY

East Texas means forests. With 54% of the region forested, wood related industries and forest-related tourism rank upon the top economic drivers of the local counties. Legislation has recently passed in both the Texas Legislature and the United States Congress to ensure that reliable and affordable broadband can reach all underserved communities. To date, most broadband initiatives in Texas have failed when it comes to increasing deployment and adoption of affordable high speed broadband services in rural and remote communities across the state. In the past, federal legislative and executive agency intent has faced barriers at the state level in Texas. Broadband coverage maps currently measure broadband service available to residential households. The maps do not evaluate the lack of coverage on farmlands or forested areas, both of which are critical segments of the rural economy. Thus, federal funding for broadband deployment and adoption has prioritized residential areas, anchor institutions, and commercial businesses.

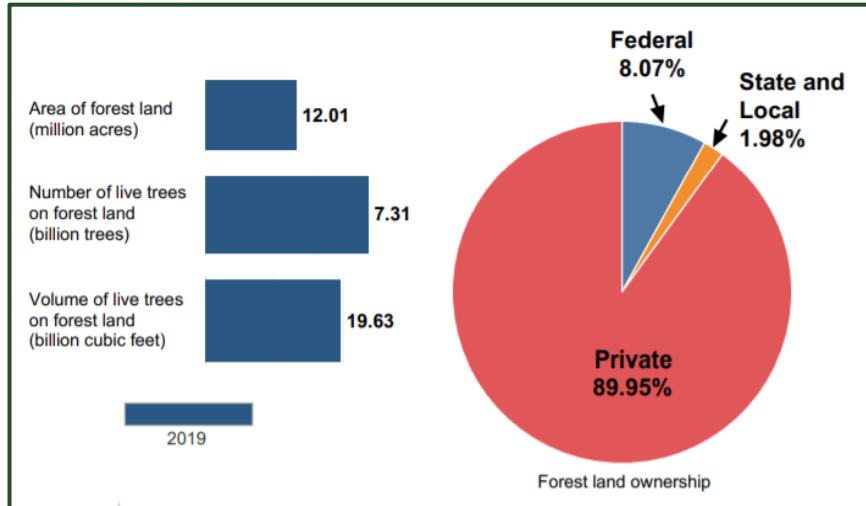
Residential broadband is vital to the survival of rural communities. However, where low concentrations of residents and businesses live and work in forested lands, including state and national forests or harvested timberlands, funding formulas built around populations served and a direct return on investment miss the mark. Revising broadband grant and subsidy formulas and eligibility criteria to support network deployment and adoption in **tilled and timbered** acreage is needed.



- Rural counties in east Texas have an estimated **12 million acres** of forest land while the population is less than **2 million**. In essence, there are 6 acres of forests for each resident.
- The current business models used in Texas to evaluate broadband need are based upon households to be served in each area and the cost per household for service.
- The “return on investment” for broadband to forested areas is best “found in monitoring forest growth through smart pest management, drone planting, and connected fire prevention technologies.”ⁱ A yearly value of \$17 per acre would provide a benefit of 2 billion dollars over a 10-year period.
- Current FCC subsidy mechanisms do not reflect the true cost of serving rural low-income communities both in Texas and nationally. Most rural areas are experiencing significant outmigration and job loss due to the lack of affordable high-speed connectivity.

The Forest Economy of East Texas

The forested areas of East Texas provide timber, attract tourism, and protect the ecology of a large swath of Texas. Covering more than twelve million acres, East Texas forests essentially include all the timber for the state and generate more than \$6.5 billion in annual revenues. As one of the top five manufacturing employers in most East Texas counties, wood-based industries directly employ more than 20 thousand individuals and create jobs for 10 thousand more.ⁱⁱ The top five timber producing counties in the state are in Deep East Texas, including:



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- Jasper
- Newton
- Polk
- San Augustine, and
- Tyler.

Cited from: USDA Forest Service. 2020. Forests of Texas, 2019. Resource Update FS-263. Asheville, NC: U.S. Department of Agriculture, Forest Service. 2p.
<https://doi.org/10.2737/FS-RU-263>

The forests of East Texas supply the natural resources that become building materials and supplies, and engineered wood products such as plywood and veneers, as well as the raw materials for papermills and biofuels refineries.

East Texas timber is essential to wood production statewide, representing more than 97% of the state's output. Texas A&M and the U.S. Forest Service estimated the 2021 impact of the forest sector on the statewide economy at over \$20 billion, providing nearly 70 thousand jobs and creating a payroll of \$4.3 billion.ⁱⁱⁱ

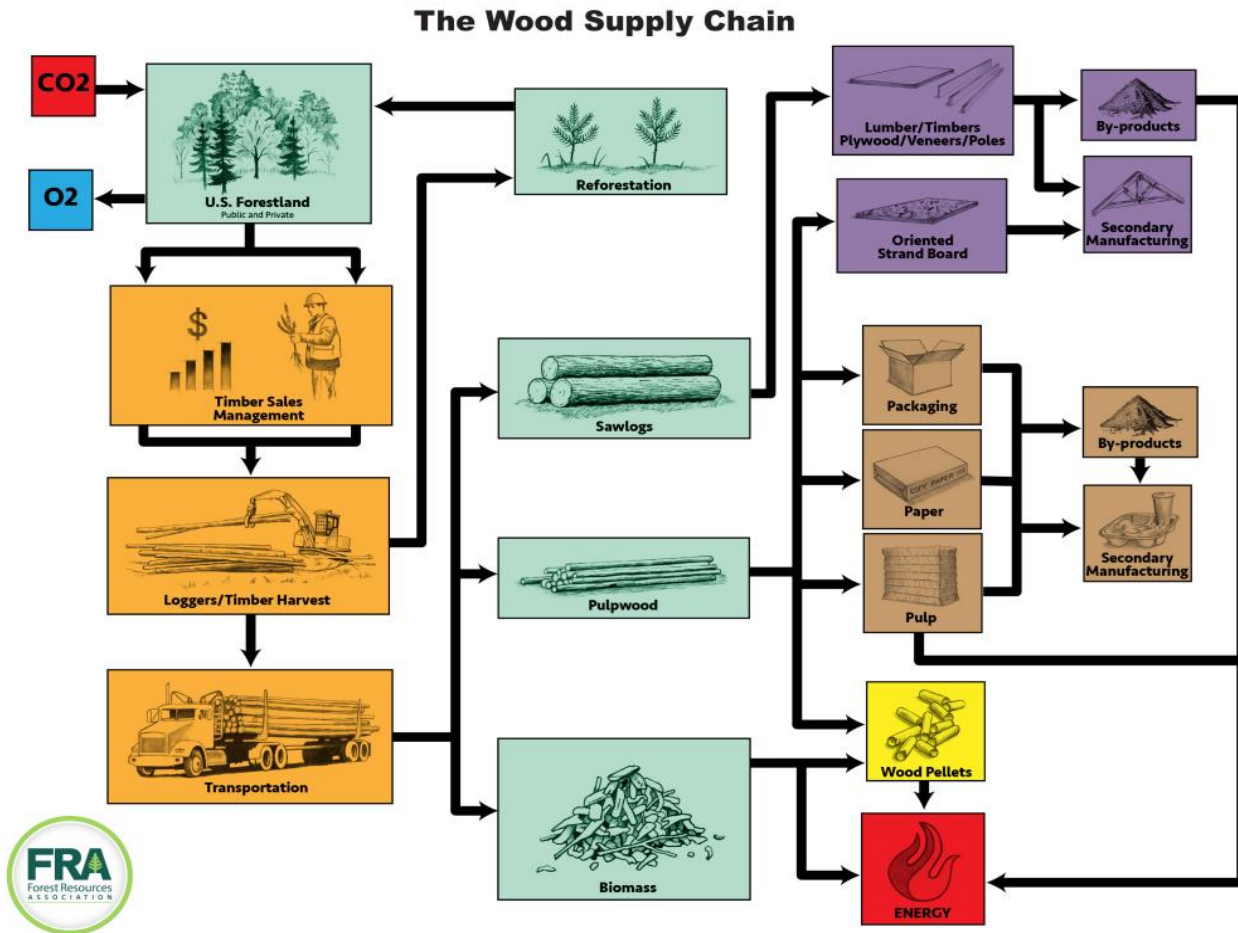
Lumber and Wood Products' Supply Chain

The forest industry is built around an integrated supply chain with interconnected segments such as logistics, supply chain management, soil and forest maintenance, and ecological planning. The process of moving timber from the forest to the products that benefit everyone starts when the tree is cut. Tractors (called "skidders" drag the trees from the woods where they are loaded onto trucks or trains to take to a lumber mill. At various mills, the wood may be converted to lumber for building, paper products, wood-derived products, or into biofuels for electricity or diesel.

Wood primarily consists of three elements – hydrogen, oxygen, and carbon. Through the process of photosynthesis, wood growth pulls excess CO₂ (Carbon Dioxide) from the atmosphere, returning oxygen to the environment and depositing carbon into the wood and paper products created.^{iv} By sustaining forests through responsible management, then putting wood into construction, carbon is removed from the climate altering cycle.

Broadband’s Potential for Forested Areas

Technology is critical to every component of the timber supply chain. Whether cutting production time and costs, eliminating hazards, deterring theft, reducing environmental hazards, or improving the delivery process, internet access combined with new “Internet of Things (IoT) technologies create efficiencies to increase revenue, bolster environmental protections, and improve access to our forests for visitors and outdoor enthusiasts.




* The Texas Forestry Association is a member of the Forest Resources Association and National Alliance of Forest Owners

Professional foresters rely on broadband access in the field to perform jobs that often depend upon precision-based solutions and equipment. Geospatial tools are needed by harvesters to evaluate everything from soil health to timber inventory. Silviculture practices for controlling the growth composition, health, and quality of forests to meet diverse needs can significantly vary on different soil types and stand types or ages. Millions of dollars are invested in these geospatial tools which could work remotely in the forest using handheld field computers. Yet, currently, the level of broadband coverage in wooded areas is minimal, forcing foresters to use


paper maps and notebooks of spreadsheets or, at best, a small, incomplete download of data on a field device for vital investment and environmental decisions. Additional benefits and efficiencies can be derived from heads-up spatial data of roads, property ownership, and satellite imagery for emergency management personnel responding to wildfires, floods, or other disasters.

Sample Internet Applications for Foresters




Texas Forest Carbon Clock
A widget that displays the real-time tons of carbon captured from the atmosphere and stored in Texas forests.

Landowner Tools




My Tree ID Mobile App
My Tree ID helps identify tree species based on leaves, flowers, seed, bark or location using a key, descriptions, and full-color images.

Landowner Tools




Forest Ecosystem Values
This application provides estimated economic values for certain ecosystem services and benefits provided by forests.

Forest Products




Timber Supply Analysis
The Timber Supply Analysis application provides estimates of timberland area and standing timber, growth, and removals within a user-defined area in the U.S. South.

Forest Products




Trees Count Mobile App
Trees Count allows users to map trees in communities and characterize with informative attributes. Inventories can be transferred across devices.

Forest Management, Community Forestry



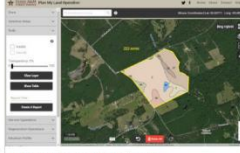
TreeMD
This app will help you find the root of your tree's problem. It will help you search by species or symptoms and filter by types of pests, or search pest records, list of symptoms and affected trees.

Landowner Tools




Map My Property
Map My Property provides landowners and other interested users a quick and simple tool for making a map of their property that can be shared with others.

Landowner Tools




Plan My Land Operation
This app allows users to map their project area, identify sensitive areas, determine operational characteristics of mapped soil types and calculate the watershed area.

Landowner Tools



Forestry Herbicide Prescriptions
This app is the tool for finding the best silvicultural herbicide prescription to match your need.

Forest Management, Landowner Tools



Forest Drought
The Forest Drought application allows users to explore past, current, and future drought conditions on Texas forestland.

Forest Management, Landowner Tools

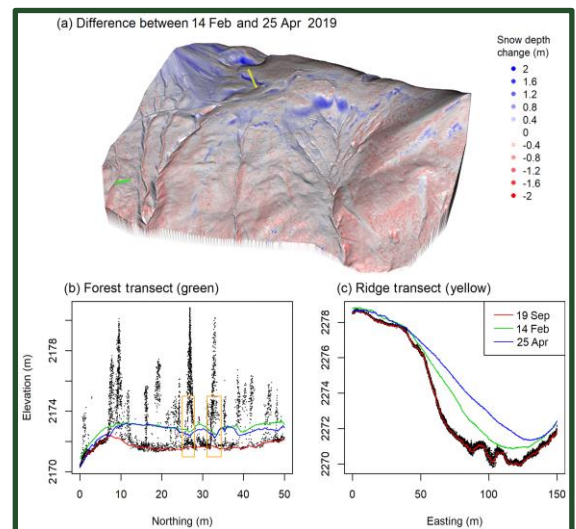
Source: Texas Forest Information Portal (<https://texasforestinfo.tamu.edu>)

The growth of Texas' forests requires: 1) water and nutrients, 2) land, 3) disease and insect management, 4) fire management, and 5) sunlight. Recent innovations in IoT applications can provide tools to evaluate and manage forests wherever broadband is available. Information collection and



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diagnoses that recently required an advanced arborist on site can be conducted using a phone or other handheld tools. Where broadband is available, tasks that in the past may have taken weeks with significant costs to conduct can be completed with an almost immediate response. Using **precision agriculture technologies**, cost reductions, increased production and the empowerment of local property owners can add to the value of these lands at a level of \$12 to \$40 per acre or more. With 12,000,000 acres of timberland, this alone can



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increase the total value of the sector by \$144M to \$480M annually or between \$1.4B and \$4.8B over a decade.^v

The addition of remotely internet-controlled drones and cameras to the mix extends the benefit. Infrared fire, flood, and other monitoring by fixed cameras, aerial drones, and IoT gauges can add set alarms for excess smoke and pollutants, extreme water flow, excess animal movement, and more. Floodgates, voltage controls, and other devices can be switched remotely for fire and flood mitigation. LiDaR (Light Detecting and Ranging) sensors can even pierce through the trees and under the soil for information.

Forests likewise provide a significant **carbon offset** that is beneficial to the environment. A growing tree will pull three or more tons of carbon from the air during its life cycle. When harvested wood is converted to building products or paper, the carbon is contained within the material, assuring longer carbon removal and reducing the carbon dioxide in the atmosphere.^{vi}

Response times for search and rescue missions in wooded areas can also be decreased with the availability of adequate broadband.



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9-1-1 responses need immediate communication, still unavailable in many forests. Remote emergencies can be allayed by tele-

providers, remote viewing of an emergency site, and even drone-delivered resources.

New Industry and Employment

As consideration of a new wood-based industrial site was underway in East Texas, competition with an alternative site outside of the state came down to one issue – access to broadband. At stake was the potential for millions of dollars of local production and the potential for several hundred new jobs. The verdict is still in the air. Connectivity has become essential for nearly all economic development.

How to Steal a Load of Lumber

During a harvesting operation, trees are brought to a central location referred to as a logging deck. Those trees are merchandized into several different products and prepared for transportation. A fleet of log trucks rotate through the products, hauling them to their respective mills.

While not as common as fifty years ago, industrious villains have devised ways to take and transport stolen trees. A dishonest driver, acting alone or in concert with others, delivers the logs to a different mill or under a separate contract intended for another timber landowner. As the dishonest driver arrives at a forest product manufacturing facility, a fraudulent bill-of-sale is produced and accepted by an unsuspecting receiving clerk and subsequently, the price for that wood is paid to the wrong entity. As a result, foresters are hit with hundreds of thousands of dollars in lost timber and hauling revenue.

Current technology can deter such fraud. Using a digital bill-of-sale showing a real-time geographical marker from the timberland owner's property, this type of theft becomes nearly impossible. As the digital bill-of-sale is scanned on arrival at the manufacturing facility, the load is linked to the correct contract with correct payment to the providers assured. Using remote cameras where each load can be reconciled to a manual load log and mill receipt is another anti-theft process, most useful when the images can be viewed live from a remote monitor. To date, however, the broadband coverage is likely not in place to generate a digital bill of sale at most logging sites.

At the same time, broadband access can open the door to opportunity and employment in Texas' forested areas. The most forested counties of East Texas have now experienced two decades of outmigration as their industries moved to more connected urban areas and educated youth remained with or relocated to connected locations with more opportunity.

However, rural experiences across the country have demonstrated that broadband can bring both industries and people home.

Forestry, Transportation, and Warehousing investments have the potential to impact rural Texas communities with thousands of jobs and billions in GDP growth over the next 10 years. Tourist and recreational opportunities are enhanced by internet service, assuring that campsites and vacation homes can stay connected. Small town restaurants and cottage industries can cap their services with online sales, while attracting spenders to the communities. With internet, remote education and work-from-home becomes a reality for current residents and for those ready to get "back to the country" from larger urban areas. Medical facilities can likewise expand, as physician assistants and nurse practitioners can integrate remote support with their general medical skills to support an area.

The alternative is a continuing decline in many of our rural counties with an outflow of opportunities and population.

Farm-to-Market Broadband

The challenge of moving wood products to the market center around transportation and communication. In the 1940's, Texas and other states garnered the first part of this equation with the creation of a farm-to-market road system, supplementing state funds with federal monies to create new highways to timber and farmlands to deliver crops to market. Population alone couldn't justify the expenditures but the wartime need for feeding the country and wood products led to an annual allocation for roads with the first officially designated FM 1 connecting a Deep East Texas sawmill to a distributor in Pineland Texas.

Transportation and warehousing were identified in a 2019 Deep East Texas study as the greatest economic beneficiary sector within the region from expanded

broadband.^{vii} Connecting logging trucks to potential loads, negotiating rates, identifying the closest buyers and best routes, then tracking inventory is now dependent upon broadband. Cellphones alone have increased productivity by providing real-time communication between loading sites, haulers, mills and consumers.

What's the Cost of a Trip to the Woods?

What's the cost of not having internet service in the forest? Deploying an arborist to inspect a disease or pest outbreak or to examine water paths prior to harvesting may be billed at two or more hours travel each way and one to four hours onsite. Sample collection data then must be delivered to a lab or to a regional site with sufficient bandwidth to transfer the data, images, and video. Arborists costs of \$75 or more per hour and transportation costs of \$250 per trip is not unusual. Since the arborist will likely need two to five additional observations following feedback, a \$700 trip can easily escalate to a \$2500 observation. Enabling immediate communication from the field, broadband could eliminate the need for multiple visits and, perhaps, even use precision agricultural tools without a professional to collect the base data and apply treatments.

Multiply the costs by one visit per year to every 1000 acres and the annual cost reaches \$15M to \$30M for 12,000,000 acres of east Texas forest.

With internet access, digital tools for telemetrics can control and document inventory with bills of sale and delivery throughout transport, reducing fraudulent costs and diversions.

A **farm and forest to market broadband** approach is needed now more than ever to ensure our farmland and timberland have a sustainable pathway into the future. Federal and state broadband mapping and the corresponding funding are not supporting the digital connections needed by these sectors. Policy changes that amend the focus on awarding funds based on “households served” and “costs per household” to include forested and agricultural lands is necessary for a state economy dependent on agricultural and timber sales. In addition to penalizing the most rural population, the formulas ignore the potential for growth and productivity by the forestlands. To serve the forests and farms, program eligibility should also include scoring criteria based on levels of **tilled and timbered acreage**, environmental impact, including carbon offsets, and natural resource management with the awarding of additional points.

Realizing that the existing criteria for funding roads would never reach rural locations, the legislators establishing the farm-to-market road program also designated substantial funding for their program separate from the existing allocations. In today’s inflation adjusted dollars, approximately \$200 Million was allocated annually for funding along with a one-cent per gallon (ten-cents today) tax for rural road construction.^{viii} A designated rural fund may also be a part of the solution for broadband.

A Turning Point

Texas is now at a turning point as both officials and private citizens seek to assure connectivity to the entire state. The impact of the recent pandemic has likewise made the demand for affordable, universal broadband access more apparent than ever. During the 2021 Legislative Session, broadband legislation passed both the Texas House and Senate with bipartisan support. East Texas Senator Robert Nichols, the sponsor of the bill described the urgency in this manner: “Children cannot learn, employees can’t work, businesses can’t run, and access to healthcare is severely limited without broadband.”^{ix}

As the citizens of Texas are dependent on internet technology for continued growth, so are our forests. Texas families cannot succeed locally or globally without the necessary funds and policies that enable rural forested areas to receive universal broadband coverage.

Rural Texas communities struggle every day with little or no connectivity. Forests and their associated industries are critical to the state economy. Low population and large undeveloped tracts within the forests can skew the metrics for broadband implementation and distribution in the region while the industry itself is becoming more reliant on internet-based applications for normal operations.

As funding decisions are being made to expand broadband services, the significant, and currently discounted, economic benefits of connecting forested acreage must be a critical consideration for the maintenance and growth of this large industrial sector.^x

Endnotes

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