



**TEXAS BROADBAND
DEVELOPMENT OFFICE**

Texas Broadband

Reeves County

March 2025

Technical Assistance Program Report



Texas Comptroller
of Public Accounts

Table of Contents

1	Executive Summary.....	4
2	Stakeholder Identification.....	10
2.1	<i>Stakeholder Identification.....</i>	10
2.1.1	Demographic Research.....	10
3	Outreach.....	16
3.1	<i>Outreach Strategy.....</i>	16
4	Gap Analysis and Community Needs Identification	20
4.1	<i>Needs and Gap Analysis</i>	20
4.2	<i>Needs Discovered from Stakeholder Engagement.....</i>	20
4.3	<i>The Determined Needs for Broadband in Reeves County, Texas.....</i>	21
4.4	<i>Evaluating the Potential Broadband Needs</i>	26
5	P3 Identification and Analysis.....	35
5.1	<i>Business Model Options</i>	35
5.1.1	Considerations for Business Model Selection and Partnership	35
5.1.2	Ownership and Operations Models.....	36
5.1.3	Accessory Models.....	38
5.1.4	Business Model Funding.....	40
5.1.5	Public-Private Partnerships (P3).....	42
5.1.6	Request for Proposal Preparation.....	43
5.2	<i>Reeves County Prospective Partnership Opportunities</i>	43
5.2.1	Potential Partners in Reeves County.....	43
6	Workforce Development.....	51
6.1	<i>Workforce Summary</i>	51
6.2	<i>Quantitative Analysis and Findings.....</i>	51
6.2.1	Definitions.....	52
6.2.2	Broadband Baseline Analysis	55
6.2.3	Broadband Pipeline Analysis.....	59
6.3	<i>Qualitative Analysis.....</i>	63
6.3.1	Community Assets	63
6.3.2	Stakeholder Engagement Findings	63
6.4	<i>Strategic Recommendations.....</i>	64
6.4.1	Collaboration.....	65
6.4.2	Alignment	65
6.4.3	Awareness.....	66

6.4.4	Diversification.....	66
6.4.5	Funding	66
7	Digital Opportunities Strategy and Needs Identification.....	68
7.1	<i>Digital Opportunity Background</i>	67
7.2	<i>An Ecosystem Approach</i>	68
7.3	<i>Digital Equity Act Funding</i>	69
7.3.1	Digital Equity Act Summary	69
7.4	<i>Texas Digital Opportunity Plan Summary</i>	69
7.5	<i>Broadband Funding</i>	70
7.5.1	Broadband, Equity, Access, and Deployment Program Summary	70
7.6	<i>Funding Opportunities Table</i>	70
7.7	<i>County-specific Digital Opportunities Planning</i>	72
7.7.1	Digital Opportunity Needs Assessment	72
7.8	<i>Digital Opportunity Strategy Planning</i>	76
7.9	<i>Recommendations</i>	76
8	Network Design Assessments.....	77
8.1	<i>Preliminary Network Design Assessments</i>	78
8.1.1	Primary Network Design Assessments.....	78
8.2	<i>Primary Preliminary Network Design Assessments</i>	81
8.3	<i>Cost Analysis of Assessments</i>	82
8.4	<i>Legal / Risk Analysis of Assessments</i>	82
8.5	<i>Research and Analysis on Comparable Networks</i>	83
8.6	<i>Network Design</i>	84
9	Appendices.....	84
9.1	<i>Recommended Organizations for Extended Outreach</i>	84
9.2	<i>Data Sources For Demographic and Census Related Information</i>	85
9.3	<i>Asset Mapping Sourcing</i>	86
9.4	<i>P3 – Request for Expression of Interest (RFEI)</i>	87
9.5	<i>Digital Opportunity Definitions</i>	92
9.6	<i>Digital Opportunity Roadmaps</i>	94

1 Executive Summary

Purpose: The Broadband Development Office (BDO) has established the Technical Assistance Program (TAP) to provide additional resources to communities that need help with broadband planning. TAP will aid local governments and communities by helping in identifying local broadband development opportunities and prepare for forthcoming state and federal funds.

All Texas counties that lack the necessary capacity for broadband planning were eligible to participate. Leaders of a county's Broadband Planning Committee (BPC), as verified by the committee's certification with the BDO, were eligible to apply. Thirty-two counties were accepted into the program and will have direct access to broadband planning and consulting services at no cost.

The BDO has contracted Cobb, Fendley and Associates to provide broadband planning and consulting services for TAP. These services are awarded at the county-level to augment local governments and communities' capacities to better prepare for local opportunities, including forthcoming state and federal funds.

This summary and report are on behalf of Reeves County, Texas. A kickoff between the project team and the county occurred in August 2024. This report was finalized in March 2025.

PLEASE NOTE: The National Broadband Serviceable Location Fabric is a common data set of all residential and business locations (or structures) in the U.S. where fixed broadband internet access service is or can be installed. Each location in the Fabric is called a Broadband Serviceable Location (BSL), and the definition of a BSL is determined by the Federal Communications Commission (FCC). The Fabric is the foundational location database that is being used across several government programs, including National Telecommunications and Information Administration's (NTIA) Broadband Equity Access and Deployment Program (BEAD), the FCC's Broadband Data Collection, National Broadband Maps, and more. CostQuest is the official contractor and provider of the National Serviceable Location Fabric data. Data used within this report was obtained from CostQuest and is Version 4 as of December 31, 2023. Version 4 data was the expected data source for the Texas BDO's BEAD Challenge Process at the time of writing this report. Please be aware that ISPs may have continued construction and implementation of new service locations since Version 4, and the data within may be outdated by the time this report finalizes. Please conduct continuing conversations with potential partners to see where changes may have been made.

Stakeholder Identification and Outreach

About: This service entails performing a deep analytical dive into a county's demographics to identify its unique needs and characteristics. It offers outreach services through the organizing and executing of stakeholder outreach events and strategies that provide inclusive opportunities for potential stakeholders. This service is considered foundational in the broadband expansion process.

Key Takeaways: Internet services are currently too expensive for residential communities. ISD internet services needs are largely served by partnering with Delcom/Region 18. Resound Networks has Rural Digital Opportunity Fund (RDOF) award areas in the county. This federal funding is expected to provide fixed wireless broadband service with an anticipated completion date in 2029. In September 2024, Reeves County filed a grant application in the NTIA Digital Equity Competitive Grant Program covering four locations including the Lindsay Addition colonia.

Recommendations: Reeves County should prioritize expanding affordable broadband access, particularly on the underserved north and east sides of Pecos and in smaller communities like Balmorhea, Saragosa,

Orla, Toyah, and Lindsay Addition. Around 20 percent of the population lacks sufficient service, with high internet costs posing a major barrier, especially given local incomes fall below the state average. The county prefers underground fiber due to oil and gas activity and high winds, and future TxDOT highway projects may offer joint trenching opportunities. Delcom and Kinetic Windstream are the main providers, with Delcom also supporting school internet needs. While the ISD is well-served, many residents, including those in temporary oilfield housing, still lack reliable service. A recent NTIA Digital Equity grant application and RDOF-funded wireless expansion by Resound Networks show progress, but long-term solutions will require strong public-private partnerships, affordability measures, and inclusive outreach for older adults, non-English speakers, and residents with disabilities. Despite efforts to contact all stakeholders, constraints related to time, and physical outreach limited the scope of our engagement we recommend extending outreach to a broader range of stakeholders (See Appendix 9.1) to facilitate ongoing dialogue and gather deeper insights.

Report Location:

- Section 2, [Stakeholder Identification](#)
- Section 3, [Outreach](#)
- Appendix 9.1, Recommended Organizations for Extended Outreach

Asset Mapping

About: This provides mapping services by locating identifiable broadband assets within the county. This collection of data begins with integrating data that may have been previously collected in local studies, followed by adding layers of available data identified by engaging with local strategic partners like regional Internet Service Providers (ISPs) and public institutions. An Asset Map locates any relevant and identifiable broadband infrastructure that may be a valuable resource in developing and executing a community's broadband goals.

Asset Mapping does not have its own report section, but is, however, included throughout the report, as needed. Any notable mapping takeaways or recommendations are within other sections of the report.

Report Location:

- Section 4, [Gap Analysis and Community Needs Identification](#)
- Appendix 9.3, Asset Mapping Sourcing

Gap Analysis and Community Needs Identification

About: This service provides an analytical approach to measuring the gaps between a county's existing infrastructure and local broadband goals. This includes identifying solutions for addressing issues with broadband access, as well as identifying current public policy standards and practices that can be implemented to promote local investment in broadband expansion.

Key Takeaways: There are various gaps that relate to affordability, adoption, access, rurality, and infrastructure readiness. Potential solutions will vary accordingly based on the various presented factors and the route the county takes moving forward. There are potential solutions presently in place in terms of serving the unserved or underserved through RDOF and BOOT I by Resound Networks. Additionally, Zayo has been awarded funds to build out 'middle-mile' infrastructure in the Reeves County area.

Recommendations: In terms of the specific areas of need seen within the county, as seen primarily within Exhibit 11 and Exhibit 22, Unserved Areas (Purple Squares): Locations lacking broadband service that meets minimum standards. The map shows 862 unserved BSLs, representing 65.8 percent of total unserved/underserved BSLs in Reeves County, in which 81 BSLs are expected to be covered by various

funding sources. Additionally, Underserved Areas (Green Squares): Regions with broadband access that do not fully meet connectivity needs. The map highlights 448 total underserved BSLs, which account for 34.2 percent of the total unserved/underserved BSLs in the county.

Report Location:

- Section 4, [Gap Analysis and Community Needs Identification](#)

Public Private Partnership (P3) Identification and Analysis

About: This service identifies potential opportunities for local public jurisdictions to establish formal partnerships with private providers. This includes evaluating all applicable business models that suit local broadband goals, identifying the potential risks involved and facilitating Requests for Proposals for partnering opportunities.

Key Takeaways: One entity does not have to own, operate, and maintain all five components (**Right Of Way (ROW), Middle-Mile Network Infrastructure, Last-Mile Network Infrastructure, Operation of the Infrastructure, Customer Service**) of a network – that is not usually the case. Typically, there are several participants from both the public and private side involved in the ownership and operations of these components. Once a broadband infrastructure opportunity has been identified, community leaders should begin to define their degree of desire in assuming responsibility financially and/or operationally within such a venture. If private sector partners could be involved, the public agency’s intentions are important to better tailor their outreach to the private sector via a formal channel such as a Request for Expressions of Interest (RFEI). There are five main components that can be delineated between a private and public partner that indicate level of responsibility. These include **Full Municipal Broadband, Publicly Owned, Privately Serviced, Hybrid Ownership, Private Developer Open Access, Full Private Broadband.**

Recommendations: Throughout the entire county, there is a wide variety of ISP coverage that makes it hard to define select prominent ISPs throughout the entire region. Should the county wish to pursue a P3 agreement, the county will need to understand of the unserved and underserved BSLs that are in relatively close proximity to the ISP, discuss if the ISP is interested in extending their network to serve the BSLs, determine what the ISP needs to extend their network (grant application support letters, assistance in permitting, etc.) to serve the identified BSLs, evaluate if the ISP request leads to the county requires the county to have some level of ownership or control in the network extension, and finally negotiate and formalize an agreement with the ISP. This could be in the form of a lease agreement (if the ISP is using County-owned conduit or spare fiber) or an ownership and revenue sharing agreement that is reviewed and approved by the county Attorney. In these types of arrangements, it is important to also define how operations and maintenance will be accomplished and paid for.

Please see Section 5.2.1 Potential Partners in Reeves County, for more detailed information.

Report Location:

- Section 5, [P3 Identification and Analysis](#)
- Appendix 9.4, P3 – Request for Expression of Interest (RFEI)

Workforce Development Strategy

About: This service identifies and engages with organizations that support the local development of broadband workforce solutions. It includes the development of strategies that aim to leverage workforce development opportunities with existing local resources and expertise.

Key Takeaways: The broadband workforce referenced throughout this report includes 43 occupations identified by the NTIA, Continuum Capital, and the Texas Digital Opportunity Plan. For this analysis, these 43 occupations have been grouped under three categories. These include 18 occupations within **Construction, Installation, and Support**, 10 occupations within Skilled Technicians, and 15 occupations within **Project Designers and Specialists**. All occupations have various education and work experience requirements. Reeves County has seen strong overall employment growth since 2013, increasing by 75 percent over 10 years. This trend is repeated in most of the broadband occupations. Most of the broadband occupations also had at least some jobs in the county in 2013. However, only 3 of the 10 **Skilled Technician** occupations had at least 10 jobs in 2013 (electricians, mobile heavy equipment mechanics-except engines and construction and building inspectors) and only 7 of the 15 **Project Designer and Specialist** occupations.

Recommendations: Recommendations for improving the broadband workforce in Reeves County center on five areas: **collaboration, alignment, awareness, diversification, and funding**. Collaborating with internet service providers to understand in-demand occupations, skills, and training credentials in real time is among the most important steps in building the broadband workforce. This real-time industry information would support the alignment of training curriculum with in-demand skills across workforce development entities, leading to industry-recognized credentials sought by local employers. Raising greater awareness and exposure to the quality career opportunities in the broadband industry is another essential broadband workforce development strategy. Increased awareness can also help to diversify talent pipelines and ensure broadband career pathways are accessible. Finally, identifying and pursuing public regional, state, and federal funding resources to scale and sustain broadband workforce development programs will be essential to any broadband workforce development strategy.

See Section 6.4 Strategic Recommendations, for more detailed information.

Report Location:

- Section 6, [Workforce Development](#)

Digital Opportunity Strategy and Needs Identification

About: This service looks beyond the accessibility of broadband by working to identify a county's gaps in the usability of the county's broadband services (i.e., the skills and technology necessary to operate them). It leverages stakeholder outreach and engagement as well as data collection methods to pinpoint a county's needs. Additionally, this service will identify actionable items that can be taken within the county in pursuit of achieving its broadband goals.

Key Takeaways: According to the FCC, three core pillars must be addressed to bridge the digital divide and achieve digital opportunity — **availability, affordability, and adoption**. It is recommended that counties develop a more robust digital opportunity plan to further identify digital inclusion gaps for addressing these needs. The digital opportunity plan can be developed at a regional level since the partnership between counties can solidify a networked system for residents to tap into. There are several programs for the county to consider applying for or partnering with on an application. These include the following programs administered through the Texas BDO, United States Department of Agriculture (USDA), and NTIA. There are a range of factors for consideration, including match requirements, eligible areas, partnership agreements and other key criteria.

These funding opportunities include: State Digital Equity Capacity Grant Program, Digital Equity Competitive Grant Program, Broadband Equity, Access, and Deployment (BEAD) Program, Texas Proposition 8: Broadband Infrastructure Fund Amendment, CDBG Colonia Fund – Construction, CDBG

Community Development Fund, USDA ReConnect (Future Rounds), USDA Distance and Telemedicine, USDA Community Facilities.

BEAD Grant Recommendations

- (1) Reeves County should participate in the BEAD challenge process in December 2024 in order to review the accuracy of locations and CAIs.
- (2) For the broader BEAD application, the county should partner with a local provider that has a strong track record infrastructure provision and customer service in the region to serve the eligible BEAD locations.

Digital Opportunity Recommendations

- (1) The county should adopt a Digital Opportunity Strategy to address adoption and affordability challenges specific to covered populations in the county.
- (2) The county or an eligible entity should apply for the Digital Equity Capacity Grant to fund digital adoption programs in the community. Some of the relevant eligible entity types in this county under this grant include: the county (political subdivision of state), not-for-profit entity, community anchor institution, or a partnership.
 - a) The county previously submitted an application for the Digital Equity Competitive Grant. This application could be expanded or resubmitted.
 - b) Specific entities the county should consider a partnership with for participation in the Texas Digital Equity Capacity Grant are the PEDC, Reeves County Library, and Odessa College – Pecos.
 - c) A regional application through the Permian Basin Regional Planning Commission or Region 18 ESC could also provide a path to expand digital adoption in Reeves County.

Colonia Area Specific Recommendation

- (1) The county should apply for the Colonia Fund - Construction to fund digital access infrastructure or facilities for the Lindsay Addition and Toyah colonias.
 - a. This Texas Department of Agriculture program is designed to primarily upgrade water and sewer infrastructure but joint trenching to install conduit or installation of a tower could assist with broadband deployment in these communities.

RDOF Coordination Recommendation

- (1) Engage with the provider building out RDOF areas in the county regarding the timeline for the buildout to better understand the deployment technology and buildout timeline.

Report Location:

- Section 7, [Digital Opportunities Strategy and Needs Identification](#)
- Appendix 9.5, Digital Opportunity Definitions
- Appendix 9.6, Digital Opportunity Roadmaps

Network Design Assessment

About: Also known as a High-Level Design, this service provides solutions that serve commercial, residential and public facilities where they are most needed, where gaps are identifiable and in a way that aligns with local broadband goals. This includes developing high-level network designs that provide

different idealized county solutions and providing continued guidance throughout the network development process.

Key Takeaways: Understanding the current landscape of middle- and last-mile providers in Reeves County is essential. Whatever direction the county takes regarding P3 will impact any Network Designs that occur. Each potential partner will have their own idea for how this should be done. However, for a general recommendation based on existing infrastructure and current pricing, within Appendix 9.5, Network Design Assessments the approximate fiber areas and applicable costing are shown.

Recommendations: The HLDs aim to connect all unserved and underserved BSLs within Reeves County. Additional connections, like those for community public access points (CPAs), could be included in a secondary design if necessary. Key factors influencing the project timeline include partnerships, network design definitions, contractor bidding, material shortages, and agreement terms.

The HLDs utilize buried fiber and GPON architecture with cabinets in each designated area to cost-effectively connect underserved addresses. Alternative solutions, like point-to-point connections, may be necessary for remote addresses, but costs are not included due to topography and distance variables. These HLDs serve as tools for discussions with P3 providers to explore options for BSLs and other areas of need. Please see Exhibit 51: HLD Areas for Reeves County for a visual representation of the areas of need.

Report Location:

Section 0,

- [Network Design Assessments](#)
- Appendix **Error! Reference source not found., Error! Reference source not found.**

2 Stakeholder Identification

2.1 Stakeholder Identification

The purpose of the stakeholder identification section is to perform a deep analytical dive into the county's demographics and identifying its unique needs and characteristics. Additionally, the team developed a robust contact list of key stakeholders based on demographic research. Key stakeholders included residents, businesses, government agencies, service providers, and community organizations. The stakeholders represented in this broadband study can address the diverse needs, concerns, and perspectives of those affected by, or invested in broadband expansion. Engaging stakeholders early in the process not only promotes inclusivity but also helps to leverage local knowledge and expertise, ensuring that the current state of broadband is accurately captured and proposed recommendations are practical and effective.

2.1.1 Demographic Research

Demographic research is a critical component of this study because it provides insight into the community's characteristics, needs, and behaviors. Understanding key demographic factors such as population density, age, income levels, and digital literacy inform where infrastructure investments are most needed and how broadband services can be effectively deployed. This data allows for a more targeted and equitable allocation of resources, ensuring underserved communities gain access to reliable internet services. Additionally, demographic insights guide future demand projections, enabling more strategic planning for scalable and sustainable broadband infrastructure development.

Population and People

The total population of Reeves County in 2020 was 14,022 people.¹ According to the 2022 American Community Survey (ACS) 5-year estimates, the median age in Reeves County was 35.4 years. Comparatively, the median age in Texas was 35.9 years. Additionally, 23.9 percent of the county is shown to be categorized as 65 Years and Older. Comparatively, 12.4 percent of the population in Texas is categorized as 65 Years and Older.² This suggests that the county has a significantly aging population, which could have implications for healthcare demand, retirement services, workforce availability, and school enrollment trends. Finally, when looking at population by age and sex, the largest group within the county is male, and 45 to 49 years old, as shown in Exhibit 1.

When looking at race and ethnicity in

Exhibit 2, the largest ethnic group in the county is Hispanic or Latino. The largest racial group is non-Hispanic White. Also, 62.5 percent of the county's population speaks a language other than English at home (

Exhibit 4). Around 38 percent of the county speaks English only. A large Hispanic or Latino population often correlates with a higher percentage of students who are English Language Learners (ELLs), especially in households where Spanish is the primary language. Educational institutions may need English as a Second Language (ESL) programs especially for parents or workforce members needing English proficiency for jobs, navigating public systems, or civic engagement. This statistic is also

¹ U.S. Census Bureau. (2020). RACE. Decennial Census, DEC Redistricting Data (PL 94-171), Table P1. Retrieved September 24, 2024, from <https://data.census.gov/table/DECENNIALPL2020.P1?g=050XX00US48043>.

² U.S. Census Bureau. (2022). ACS Demographic and Housing Estimates. American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05. Retrieved September 24, 2024, from <https://data.census.gov/table/ACSDP5Y2022.DP05?g=050XX00US48043>.

important when conceptualizing needs for workforce training and Spanish-language support systems to ensure comprehension and compliance — especially in the county’s main industries like ‘Agriculture, forestry, fishing and hunting, and mining,’ or ‘Educational services, and health care and social assistance.’³

Exhibit 3 shows educational attainment between 2012 and 2023 for age groups between 18 to 24 years, and 25 years and over. For the 18- to 24-year-old age group, there was a major improvement in educational attainment: significantly fewer young people had less than a high school education by 2023. Additionally, more than 47 percent of this group had at least some college education in 2023, up from just 16.2 percent in 2012. This shift likely reflects better access to postsecondary education, early college enrollment, or more emphasis on continuing education. The population 25 years and over age group shows cumulative effects of long-term educational trends for the county. In this age group, more adults achieved at least a high school education in 2023 (71.3 percent, up from 61 percent). However, the share with a bachelor’s or higher declined, which is unexpected given national trends—this could reflect local/regional differences, shifts in immigrant population, or economic pressures reducing degree completion. Growth is seen mainly in associate’s degrees and partial college experience, possibly pointing to more community college attendance or incomplete 4-year programs. Overall, there is a significant decrease in low educational attainment across all age groups and a clear upward mobility among 18- to 24-year-olds, indicating that younger generations are becoming more educated. Some concerns might be the decline in bachelor’s and graduate degree attainment in the 25 and older group, which may suggest barriers to completion of 4-year or advanced degrees and/or demographic shifts.

Reeves County has a moderate overall disability rate with around 11 percent of the population living with a disability (

Exhibit 5). When looking at the percentage of the population living with a disability, the disability rates skyrocket in the senior age groups, especially in the 75-year and older age range. Reeves County reports a higher disability rate than the state average, particularly among individuals aged 75 and older (63.3 percent compared to 52.0 percent statewide)⁴. Reeves County has a growing elderly population needing medical, mobility, and caregiver support. Additionally, elderly-focused services are a high priority: home health, physical therapy, senior centers, transportation assistance. The county should plan for aging-in place infrastructure as well as caregiver workforce development.

Exhibit 1: Reeves County Population Distribution

Age	Percent Male	Percent Female
Under 5 years	5.90%	7.70%
5 to 9 years	4.90%	5.80%
10 to 14 years	6.20%	11.80%
15 to 19 years	10.00%	6.60%
20 to 24 years	7.30%	8.10%
25 to 29 years	7.90%	5.50%
30 to 34 years	8.70%	7.30%
35 to 39 years	9.50%	6.80%

³ U.S. Census Bureau. (2019). SELECTED ECONOMIC CHARACTERISTICS. *American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP03*. Retrieved May 30, 2025, from https://data.census.gov/table/ACSDP5Y2019.DP03?g=040XX00US48_050XX00US48389&moe=false.

⁴ Office of the Texas Governor. (2024). *People with disabilities: A Texas profile*. <https://gov.texas.gov/>. <https://gov.texas.gov/uploads/files/organization/twic/Disabilities-Summary.pdf>

40 to 44 years	6.20%	4.80%
45 to 49 years	10.70%	5.00%
50 to 54 years	5.00%	5.00%
55 to 59 years	4.40%	5.60%
60 to 64 years	3.20%	4.30%
65 to 69 years	3.00%	3.80%
70 to 74 years	3.20%	4.30%
75 to 79 years	1.80%	2.30%
80 to 84 years	1.20%	1.40%
85 years and over	0.70%	3.90%

Source: U.S. Census Bureau, U.S. Department of Commerce. (2023). Age and Sex. American Community Survey, ACS 5-Year Estimates Subject Tables, Table S0101.

Exhibit 2: Reeves County, Race and Ethnicity

Census Variables	Reeves County, Texas
Total:	14,748
Hispanic or Latino	12,510
Not Hispanic or Latino:	2,238
Population of one race:	2,155
White alone	1,697
Black or African American alone	224
American Indian and Alaska Native alone	27
Asian alone	165
Native Hawaiian and Other Pacific Islander alone	3
Some Other Race alone	39
Population of two or more races:	83

Source: U.S. Census Bureau. (2020). HISPANIC OR LATINO, AND NOT HISPANIC OR LATINO BY RACE. Decennial Census, DEC Demographic and Housing Characteristics, Table P9.

Exhibit 3: Age by Educational Attainment, Reeves County

Age by Educational Attainment	2012	2023
Population 18 to 24 years		
Less than high school graduate	38.60%	18.40%
High school graduate (includes equivalency)	45.20%	34.30%
Some college or associate's degree	15.30%	43.70%
Bachelor's degree or higher	0.90%	3.60%
Population 25 years and over		
Less than 9th grade	23.80%	15.10%
9th to 12th grade, no diploma	15.20%	13.60%
High school graduate (includes equivalency)	29.60%	40.10%
Some college, no degree	16.90%	18.80%
Associate's degree	2.90%	5.50%
Bachelor's degree	9.20%	5.60%
Graduate or professional degree	2.30%	1.20%
High school graduate or higher	61.00%	71.30%
Bachelor's degree or higher	11.60%	6.90%

Source: U.S. Census Bureau. (2012). EDUCATIONAL ATTAINMENT. American Community Survey, ACS 5-Year Estimates Subject Tables, Table S1501.

Exhibit 4: Languages Spoken at Home, Reeves County

Languages Spoken at Home	Percentage
Speak only English	37.50%
Speak a language other than English	62.50%
Spanish	62.20%
Other languages	0.30%

Source: U.S. Census Bureau, U.S. Department of Commerce. (2023). Language Spoken at Home. American Community Survey, ACS 5-Year Estimates Subject Tables, Table S1601.

Exhibit 5: Percent with a Disability Estimate, Reeves County

Census Variables	Total Estimate	With a Disability Estimate	Percent With a Disability Estimate
Total civilian noninstitutionalized population	12,207	1,328	10.90%
SEX			
Male	6,877	660	9.60%
Female	5,330	668	12.50%
RACE AND HISPANIC OR LATINO ORIGIN			
White alone	5,053	717	14.20%
Black or African American alone	25	2	8.00%
American Indian and Alaska Native alone	148	0	0.00%
Asian alone	50	0	0.00%
Native Hawaiian and Other Pacific Islander alone	2	0	0.00%
Some other race alone	4,146	365	8.80%
Two or more races	2,783	244	8.80%
White alone, not Hispanic or Latino	1,422	190	13.40%
Hispanic or Latino (of any race)	10,575	1,128	10.70%
AGE			
Under 5 years	878	9	1.00%
5 to 17 years	2,404	15	0.60%
18 to 34 years	3,196	222	6.90%
35 to 64 years	4,167	401	9.60%
65 to 74 years	903	264	29.20%
75 years and over	659	417	63.30%

Source: U.S. Census Variables, American Community Survey (ACS) 5-Year Estimates 2023

The following is a collection of the most recent data provided by the Texas Broadband Development Office's Digital Opportunity Plan⁵, the NTIA's Digital Equity Act Population Viewer⁶, and the American Census⁷. When looking at median household income, the county's median household income was nearly 10 percent lower than the state's median household income in 2020, yet the median cost per month for internet plans are about 25 percent higher than the statewide median cost (Exhibit 7). Furthermore, 4 percent less households in Reeves County had one or more devices with high-speed internet subscription, and 2 percent less households than the state in terms of share of households with a smartphone only and high-speed internet subscription, non-exclusive to the Covered Populations (Exhibit 8).

Exhibit 6: Covered Populations, Reeves County

Covered Populations	Texas	Reeves County
Veterans	6.1%	4.6%
Poverty	13.7%	21.0%
Individuals living with disabilities	12.7%	11.0%
With a Language Barrier	27.0%	46.4%
Racial or ethnic minorities	61.1%	77.7%
Age 65+	13.8%	12.4%
Incarcerated	0.7%	0.5%
Population in households lacking fixed broadband availability	7.2%	6.5%

Source: U.S. Census Bureau, 2022 American Community Survey 5-Year Estimates; United States Census Bureau. (2019). Digital Equity Act Population Viewer, Texas Digital Opportunity Hub

Exhibit 7: Household Income and Internet Costs, Reeves County

Geography Name	Median Income	Median Minimum Internet Plan Cost for the Geography
Reeves County	\$57,716	\$104/mo.
Texas	\$63,826	\$79/mo.

Source: Texas Digital Opportunity Survey (2023)

Exhibit 8: Share of Households with a Smartphone Only, Reeves County

⁵ Texas Digital Opportunity Hub. (n.d.). <https://www.digitalopportunityfortexas.com/interactivetdop>

⁶ US Census Bureau, National Telecommunications and Information Administration. (n.d.). Digital Equity Act Population Viewer. <https://mtgis-portal.geo.census.gov/arcgis/apps/webappviewer/index.html?id=c5e6cf675865464a90ff1573c5072b42>

⁷ Bureau, U. C. (2024, October 21). U.S. Census Bureau homepage. Census.gov. <https://www.census.gov/>

Geography Name	Type of Device and Internet Service	Households	Share of Households
Texas	One or more devices with High Speed Internet Subscription	8,936,897	87.28
Reeves County	One or more devices with High Speed Internet Subscription	3,424	83.16
Texas	Smartphone Only with High Speed Internet Subscription	1,302,444	12.72
Reeves County	Smartphone Only with High Speed Internet Subscription (10.7%)	524	10.7

Source: Texas Digital Opportunity Survey (2023)



3 Outreach

3.1 Outreach Strategy

The objective of the outreach strategy outlined in this report was to engage key stakeholders identified in Section 2 and facilitate a constructive dialogue with community members regarding broadband needs, priority areas, and their long-term vision for the community. The team engaged a diverse group of stakeholders, including local government entities, internet service providers, community organizations, and healthcare institutions, to gather critical insights into existing service gaps, challenges, and future expansion plans.

A well-executed outreach approach promotes collaboration, builds stakeholder support, and contributes to the development of a comprehensive and sustainable broadband plan that addresses the community's specific needs, while advancing digital opportunity and fostering economic growth.

During the process of the outreach, the stakeholder team took a two-pronged approach to engagement by first providing a questionnaire beforehand and then engaging in a discussion regarding their experience and needs with broadband services in the area. The contents of the questionnaire were developed with the intention of gaining a greater understanding of the current state of broadband and tailored to fit the public/private nature of the institution being interviewed.

Key Takeaways

- The county's greatest need is improved internet access for residential and small business users; expanded fiber is especially needed in the north and east sides of town.
 - 20 percent of the community is underserved
- Key broadband infrastructure is linked to the main providers, Kinetic/ Windstream and Delcom
- The county prefers running fiber underground, due to existing oil and gas infrastructure and high winds.
- Large oil and gas sector and workforce primarily residing in temporary housing encampments.
- Internet services are currently too expensive for residential communities.
- ISD internet services needs are largely served by partnering with Delcom/Region 18.
- Pecos City is a critical hub for the local economy. The communities of Balmorhea, Saragosa, and Orla also need attention as do the local colonias of Toyah and Lindsay Addition.
- TxDOT has proposed improvements to US 285 North from FM 1216 north of Pecos, Texas to 0.1 mile south of the New Mexico state line. This is broken into three different projects and is planned for construction in 2028.
- There is a desire to utilize the private sector ISPs to help build out and meet the demands (Delcom).
- Resound Networks has Rural Digital Opportunity Fund (RDOF) award areas in the county. This federal funding is expected to provide fixed wireless broadband service with an anticipated completion date in 2029.
- In September 2024, Reeves County filed a grant application in the NTIA Digital Equity Competitive Grant Program covering four locations including the Lindsay Addition colonia.

Stakeholders

Below is a list of stakeholders that were contacted for this study. The entities contacted for outreach range from public organizations or public servants, private entities, educational institutions, medical institutions, and internet service providers.

Exhibit 9: Reeves County Stakeholders

Type	Title/Position	Entity/ Organization	*Contact Made	Survey Complete/ Meeting Held
Govt.	County Judge	Reeves County	Y	N
Govt.	Commissioner, Pct.1	Reeves County	Y	N
Govt.	Commissioner, Pct. 2	Reeves County	Y	N
Govt.	Commissioner, Pct. 3	Reeves County	Y	N
Govt.	Commissioner, Pct. 4	Reeves County	Y	N
Govt.	County Clerk	Reeves County	Y	N
Co. Staff	IT Director	Reeves County	Y	Y
Co. Staff	Emergency Management Director	Reeves County	Y	Y
Co. Staff	County Engineer	Reeves County	Y	Y
Co. Staff	IT Director, Emergency Services Dist. 1 and2	Reeves County	Y	Y
Govt.	Mayor	City of Balmorhea	Y	N
Govt.	Alderman	City of Balmorhea	Y	N
Govt.	Alderman	City of Balmorhea	Y	N
Govt.	Alderman	City of Balmorhea	Y	N
Govt.	Alderman	City of Balmorhea	Y	N
Govt.	Alderman	City of Balmorhea	Y	N
City Staff	City Clerk	City of Balmorhea	N	N
Govt.	Mayor	Town of Pecos City	N	N
Govt.	Mayor Pro Tem/ Councilmember, Seat 4	Town of Pecos City	N	N
Govt.	Councilmember, Seat 1	Town of Pecos City	N	N
Govt.	Councilmember, Seat 2	Town of Pecos City	N	N
Govt.	Councilmember, Seat 3	Town of Pecos City	N	N
Govt.	Councilmember, Seat 5	Town of Pecos City	N	N
City Staff	City Manager	Town of Pecos City	Y	Y
City Staff	Asst. to City Manager	Town of Pecos City	Y	Y
City Staff	IT Director	Town of Pecos City	Y	Y
City Staff	Marketing and Communications Director	Town of Pecos City	Y	N
Govt.	Mayor	City of Toyah	N	N

Type	Title/Position	Entity/ Organization	*Contact Made	Survey Complete/ Meeting Held
Govt.	Mayor Pro Tem	City of Toyah	N	N
Govt.	Alderman	City of Toyah	N	N
Govt.	Alderman	City of Toyah	N	N
Govt.	Alderman	City of Toyah	N	N
Govt.	Executive Director	Pecos EDC	Y	Y
School	Superintendent	Balmorhea ISD	Y	N
School	Superintendent	Pecos-Barstow-Toyah ISD	Y	Y
School	Technology Director	Pecos-Barstow-Toyah ISD	N	N
School	Network/Cybersecurity Administrator	Pecos-Barstow-Toyah ISD	N	N
School	Director of Information Systems	Region 18 ESC	Y	Y
ISP	CEO/GM	Dell Telephone Cooperative/Delcom Inc.	Y	Y
ISP	GM/COO	Big Bend Telecom	Y	Y
ISP	Representative	Earthlink	N	N
ISP	State Government Affairs	Kinetic by Windstream	Y	Y
ISP	External Affairs	AT&T	Y	Y
ISP	Representative	T-Mobile	N	N
ISP	General Manager/COO	Big Bend Telecom	Y	Y
ISP	SVP Strategy and Government Affairs	Resound Networks	Y	Y
Public	Citizen	Citizen/BDO Committee Member	Y	Y

**Attempts were made to contact stakeholders via email and/or phone calls to participate in the questionnaire; some stakeholders or representatives answered/ responded, as indicated in the table above. All others did not respond to repeated contact efforts/ a contact could not be identified.*

Stakeholder Outreach Recommendations

Reeves County should prioritize expanding residential and small business broadband access, particularly on the north and east sides of Pecos where service gaps are most critical. Approximately 20 percent of the community remains underserved, with residents frequently citing the high cost of internet plans as a key barrier to adoption. Current monthly plan costs in the county are roughly 25 percent higher than the statewide median, while household incomes are nearly 10 percent lower, making affordability a central concern. County stakeholders expressed a preference for underground fiber deployment to avoid disruption to the oil and gas sector and to mitigate challenges from the area's high winds. This aligns with the presence of a large, transient oil and gas workforce living in temporary housing encampments, which presents both a logistical challenge and a critical opportunity for improved infrastructure planning.

The county's broadband landscape is anchored by Kinetic/ Windstream and Delcom, the latter of which also provides internet services to the Pecos-Barstow-Toyah Independent School District through Region 18. While educational institutions appear to be adequately served, broader household access lags behind. The city of Pecos remains the economic center of the county, but smaller communities such as Balmorhea, Saragosa, Orla, and the colonias of Toyah and Lindsay Addition are in need of dedicated

outreach and infrastructure investments. The county has taken initial steps to address this, including a September 2024 application for NTIA’s Digital Equity Competitive Grant Program covering four underserved areas.

Infrastructure planning should also account for upcoming transportation investments, particularly TxDOT’s proposed upgrades to US 285 North, which will connect Pecos to the New Mexico state line in a series of phased construction projects starting in 2028. Leveraging this corridor expansion to incorporate broadband conduit or joint trenching could reduce future deployment costs and improve regional connectivity. In addition, Resound Networks’ RDOF-funded efforts to provide fixed wireless broadband by 2029 could help fill in some service gaps, though timelines and service quality should be closely monitored.

Demographic data underscores the urgency of digital inclusion in Reeves County. A significant share of the population is over 65, and the county has a higher percentage of older adults than the Texas average. Educational attainment remains a concern, with a decline in high school graduation rates over the last decade, though the percentage of residents with some college or an associate’s degree has risen. Meanwhile, nearly two-thirds of residents speak a language other than English at home, and 11 percent live with a disability, further emphasizing the need for inclusive infrastructure and outreach strategies.

Public-private partnerships, especially with Delcom and other local ISPs, will be crucial in delivering cost-effective solutions tailored to Reeves County’s diverse population and geographic challenges. Strategic investments should target affordability, equitable access, and long-term resilience; focusing not only on where people live today, but also on where future growth and infrastructure overlap.

Despite efforts to contact all stakeholders, constraints related to time, and physical outreach limited the scope of our engagement, it is recommend to continue extending outreach to a broader range of stakeholders (See Appendix Section 9.1) to facilitate ongoing dialogue and gather deeper insights.

4 Gap Analysis and Community Needs Identification

4.1 Needs and Gap Analysis

In the current technology-driven environment, broadband infrastructure is no longer viewed as a luxury but a fundamental necessity for daily life. From educational resources and healthcare services to remote work and essential communication, having access to reliable and high-speed internet is critical. However, many communities continue to struggle with considerable gaps in broadband availability, affordability, and quality, limiting their ability to participate fully in the modern economy. To guarantee that broadband services are both accessible and capable of meeting the demands of today, it is imperative that infrastructure is constructed to be both durable and competitive, delivering affordable pricing and consistent coverage. In the absence of these qualities, service quality will suffer, resulting in poor connectivity, high costs, and limited choices, which can undermine digital opportunity.

Implementing a comprehensive needs and gaps analysis is crucial to tackling these challenges. By analyzing existing broadband coverage, capacity, costs, and stakeholder feedback, underserved areas and access hurdles can be identified. This analysis reveals inequities in service distribution and pinpoints where infrastructure investment is most critical to enhance performance and affordability. Furthermore, it offers stakeholders guidance on the necessary steps to bolster competition, lower prices, and ensures steady, high-quality broadband access for all. Without such an analysis, initiatives aimed at enhancing digital opportunity may fail to succeed, leaving at-risk populations disadvantaged.

PLEASE NOTE: The National Broadband Serviceable Location Fabric is a common data set of all residential and business locations (or structures) in the U.S. where fixed broadband internet access service is or can be installed. Each location in the Fabric is called a BSL, and the definition of a BSL is determined by the FCC. The Fabric is the foundational location database that is being used across several government programs, including the NTIA's BEAD program, the FCC's Broadband Data Collection, National Broadband Maps and more. CostQuest is the official contractor and provider of the National Serviceable Location Fabric data. Data used within this report was obtained from CostQuest and is Version 4 as of Dec. 31, 2023. Version 4 data was the expected data source for the Texas BDO's BEAD Challenge Process at the time of this writing. Please be aware that ISPs may have continued construction and implementation of new service locations since Version 4, and the data within may be outdated by the time this report finalizes. Please conduct continuing conversations with potential partners to see where changes may have been made.

4.2 Needs Discovered from Stakeholder Engagement

The following needs were identified through an intensive two-week engagement process that brought together local governments, businesses, broadband providers, and community members. This collaborative effort enabled a well-rounded understanding of the broadband challenges faced across Reeves County. By directly engaging with those most impacted, the process highlighted key issues related to infrastructure limitations, affordability concerns, and service quality disparities. This community-centered approach provided essential insights into the unique needs of different areas, ensuring that strategies to improve broadband services are both targeted and inclusive. The insights gathered will shape solutions that address the county's specific requirements, making broadband more accessible, equitable, and responsive to local priorities.

- Communities most in need of reliable broadband access include:
 - Victims of domestic violence and abuse
 - Communities of color
 - Disconnected youth

- Individuals with past criminal records
- Supplemental Nutrition Assistance Program (SNAP) recipients
- Texas Temporary Assistance for Needy Families (TANF) recipients
- Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) recipients
- Low- and moderate-income households
- Women
- Areas with limited or no broadband service:
 - Parks and Colonias areas are without adequate broadband infrastructure.
 - Colonias remains underserved, with broadband often priced out of reach.
- Challenges for families and students:
 - Some families lack broadband access at night, and students are hesitant to go to school parking lots for connectivity.
- Underserved areas in the county:
 - Saragosa, Barstow, and Green Acres are among the underserved areas, with additional parts of the district attendance zone also experiencing inadequate broadband access.

4.3 The Determined Needs for Broadband in Reeves County, Texas

Access

Broadband access in Reeves County is shaped by a combination of infrastructure challenges, urban-rural distribution, and the availability of broadband providers. Exhibit 14 indicates that Reeves County is predominantly rural, with concentrated clusters primarily in the city of Pecos. This distribution means that while some residents in Pecos may benefit from relatively better access, the majority of the county's rural population faces limited broadband options. The rural landscape complicates the deployment of broadband infrastructure, as providers face higher costs and logistical challenges in extending service across sparsely populated areas.

Exhibit 19 and Exhibit 20 reveal the presence of several fiber networks crossing through Reeves County, operated by providers such as Dell Telephone, Level 3, and Windstream. These long-haul networks are essential for connecting Reeves County to broader internet backbones, but they primarily serve as transit routes rather than local access points. This is due to long-haul fiber serving as the backbone of internet connectivity, transporting data between major cities, data centers, and network hubs. It's optimized for high-capacity, long-distance transmission rather than last-mile delivery. These networks typically use express routes with minimal breakouts to maintain speed and efficiency.

The metro fiber network, although present, is concentrated along major highways and within Pecos, leaving many rural areas without direct fiber connectivity. This limited fiber reach in rural areas creates a digital divide where only residents in denser communities have reliable access to high-speed fiber services, while rural populations remain underserved.

Exhibit 13 shows that provider availability varies widely across Reeves County. Areas in Pecos have access to multiple providers (4-8 in some locations), which may enable competitive pricing and better service options. In contrast, most rural areas are served by only 0-1 providers, which severely limits residents' broadband choices and can result in higher prices and lower service quality due to the lack of competition. This disparity in provider availability highlights the challenge rural residents face in accessing high-quality broadband, affecting their ability to utilize essential online services for education, healthcare, and economic activities.

These combined factors underscore the broadband access needs in Reeves County. The limited provider options in rural areas, coupled with the sparse metro and long-haul fiber networks, suggest a need for

targeted investment in broadband infrastructure. Expanding fiber networks to reach more rural areas and encouraging competition through government incentives or subsidies could significantly improve access. Addressing these needs is crucial to bridging the digital divide in Reeves County, ensuring that all residents, regardless of their location, have equitable access to high-speed internet.

Adoption

Broadband adoption in Reeves County faces notable challenges influenced by digital literacy, access to devices, and demographics. Exhibit 15 indicates that a significant percentage of households lack essential equipment like computers, smartphones, or tablets, with certain areas seeing as much as 40.2 percent of households without such devices. This absence of digital tools limits residents' ability to utilize available broadband services, even in areas where connectivity is technically accessible. For many residents, the cost of obtaining smart devices may add to financial barriers, hindering broader broadband adoption in the community.

Exhibit 18 reveals an additional factor influencing broadband adoption. Reeves County has areas with a relatively older population, particularly in regions where the median age reaches up to 42.8 years. Older populations may have lower digital literacy levels and a lower inclination to adopt new technologies, impacting their willingness or ability to use broadband services. In such demographics, targeted digital literacy programs could encourage broader adoption, helping older residents understand the value of online services in accessing healthcare, communication, and other essential resources.

Another critical aspect impacting broadband adoption is the availability of internet access at Broadband Serviceable Locations (BSLs). Exhibit 12 shows that 4.7 percent of locations in Reeves County lack connectivity, including 65.7 percent of residential and 34.3 percent of business locations. For these locations, broadband adoption is impossible without first establishing infrastructure, highlighting an infrastructural gap that needs to be addressed. Expanding broadband access to these unserved BSLs would lay the foundation for higher adoption rates, as residents and businesses would gain the opportunity to subscribe to internet services.

In summary, factors such as lack of smart devices, an older population, and limited infrastructure in specific areas contribute to lower broadband adoption rates in Reeves County. Addressing these challenges would require a multifaceted approach, including device assistance programs, digital literacy initiatives aimed at older residents, and targeted infrastructure expansion for unserved BSLs. Improving broadband adoption in Reeves County will ultimately support economic development, education, and healthcare access, creating a more connected and resilient community.

Affordability

In Reeves County, the affordability of broadband is influenced by multiple socio-economic factors highlighted in the attached maps. Exhibit 17 reveals that most areas of Reeves County have lower income levels, with a significant portion of the county having household incomes below the statewide average. Lower income levels can directly affect residents' ability to afford high-speed broadband services, making the cost a critical barrier to adoption. For lower-income households, the challenge of paying monthly subscription fees and associated equipment costs, such as routers or installation fees, may hinder access to essential online services for education, healthcare, and employment opportunities.

Exhibit 16 also contributes to affordability challenges. Larger households, which are more prevalent in Reeves County, might require higher-speed internet plans to support multiple users or devices simultaneously. This demand for higher bandwidth increases the cost of broadband for these families, which could disproportionately impact lower-income households within the county. The need for faster

connections to accommodate multiple users in a household means that affordable options may not be sufficient, pushing families towards more expensive plans that could strain already limited budgets.

Exhibit 13 sheds light on the availability of service options across Reeves County. The majority of the county shows limited provider options, with many areas only served by one or two providers. This lack of competition in broadband services can lead to higher prices, as residents have fewer options to choose from and may face monopolistic pricing structures. In contrast, areas with more providers typically benefit from competitive pricing, but such areas are scarce in Reeves County. Limited provider choices mean that residents often do not have the flexibility to select more affordable or customized plans, exacerbating affordability issues for those in underserved regions.

Finally, Exhibit 14 highlights that most of Reeves County is rural, with a more urbanized area primarily around Pecos. Rural areas generally face higher broadband costs due to the expenses associated with extending infrastructure to sparsely populated regions. This rural setting further increases broadband costs, which are often passed down to consumers. For Reeves County residents, the combination of lower household incomes, larger household sizes, limited provider options, and rural setting creates significant affordability barriers to accessing reliable broadband.

Rurality

Reeves County, Texas, is predominantly rural, with the majority of its land area classified as rural according to the USDA Urban/Rural Indicator map. The rural nature of the county contributes to unique challenges in broadband infrastructure deployment. Sparse populations in rural areas make it less economically viable for internet service providers (ISPs) to invest in extensive network coverage, often leading to significant service gaps. The map indicates a limited urban area around Pecos, the county's main city, where broadband access is typically more readily available due to higher population density.

In Reeves County, there are 862 unserved Broadband Serviceable Locations (BSLs), which make up 65.8 percent of the total unserved and underserved BSLs in the county. Additionally, there are 448 underserved BSLs, representing 34.2 percent of the total. The high percentage of unserved and underserved BSLs underscores the broadband access disparity between urban and rural regions in the county. The scattered distribution of these BSLs across vast rural areas further complicates efforts to provide high-speed internet, as service providers face higher costs to cover these areas.

The presence of such a large number of unserved and underserved BSLs in rural regions highlights the critical need for targeted broadband infrastructure investment. Rural residents are often left without adequate connectivity, affecting access to essential services like telehealth, online education, and remote work opportunities. The rural topography and low population density make it challenging for ISPs to justify the cost of fiber-optic or other high-speed infrastructure without external support or incentives.

Addressing the broadband needs in Reeves County's rural areas will likely require innovative solutions, such as fixed wireless or satellite internet services, which are more cost-effective for low-density populations. Additionally, funding programs and incentives aimed at encouraging ISPs to expand services to these underserved locations are crucial. By increasing connectivity in these rural areas, Reeves County can enhance its residents' access to essential digital resources, reducing the digital divide and fostering economic growth in the region.

Exhibit 10: Unserved and Underserved Broadband Serviceable Locations, Reeves County, Texas

Level of Service	Locations
------------------	-----------

Unserved	862
Underserved	448

Topography

Reeves County's topography is characterized by its flat and open landscape, with stretches of desert and semi-arid terrain punctuated by the occasional hills and low-lying mountain ranges, especially toward the western part of the county. This open, largely unobstructed land is beneficial for long-distance fiber installations, allowing for relatively straightforward deployment across the county. However, the region's exposure to extreme weather conditions—such as high winds, intense sunlight, and occasional dust storms—poses challenges for above-ground infrastructure. Aerial fiber, which is strung along poles or other support structures, is more vulnerable to these elements, potentially leading to damage that requires frequent maintenance or repair. This environmental stress on infrastructure makes it crucial to consider more resilient solutions for long-term broadband connectivity.

Buried fiber offers several advantages in a region like Reeves County. By placing fiber underground, the network is protected from the harsh surface conditions that characterize the area, including high winds, intense UV exposure, and the risk of damage from dust storms. Underground fiber is also less prone to disruptions caused by physical impacts, such as falling tree limbs or vehicle collisions, which can affect aerial installations. Although the initial cost of burying fiber is often higher, the long-term benefits in terms of reliability and reduced maintenance can be substantial. Buried fiber infrastructure is particularly beneficial for areas with low population density, as it can ensure uninterrupted service over long distances, making it an ideal solution for Reeves County's rural and spread-out communities.

Demand Points of Need in Reeves County Texas

Exhibit 21 highlights several critical facilities with broadband needs, indicated in specific colors for clarity. These demand points include the hospital (1, green circle), local law enforcement agencies (2, blue circles), fire stations/EMS facilities (3, red circles), and Texas Colonias (2, green squares). These essential facilities are distributed across the county, with many located in areas classified as either unserved (purple squares) or underserved (green squares) for broadband. The location of these critical services within broadband-deficient areas emphasizes the need to expand reliable internet access, especially to support emergency response and healthcare in these rural and remote regions of the county.

The Texas Colonias, represented by green squares on the map, are communities – Toyah and Lindsay addition – with significant socioeconomic challenges and often limited infrastructure. The inclusion of these Colonias as demand points reflects their urgent need for broadband connectivity to enhance access to essential services like healthcare, education, and government support. The concentration of unserved areas surrounding these points further highlights the necessity of targeted broadband deployment to ensure these critical facilities and vulnerable communities have reliable internet access, thereby supporting day-to-day operations and improving the overall quality of life for residents in Reeves County.

Areas of Need in Reeves County, Texas

- Unserved Areas (Purple Squares):** These locations lack broadband service that meets minimum standards. The map indicates 781 unserved Broadband Serviceable Locations (BSLs), representing 64.8 percent of the total unserved/underserved BSLs in Reeves County. Targeting these unserved areas is crucial to ensuring that residents and businesses have access to essential online services.

- **Underserved Areas (Green Squares):** These regions have limited broadband access that does not fully meet the connectivity needs of the community. The map identifies 425 underserved BSLs, accounting for 35.2 percent of the total unserved/underserved BSLs in the county. Expanding broadband in these areas would improve the reliability and capacity of service, helping to fulfill the community's digital requirements.

Funding Opportunities under Enforceable Commitments

- **NTIA Middle Mile by Zayo (Indicated in Light Blue Areas):** The National Telecommunications and Information Administration (NTIA) awarded Zayo funding to develop middle-mile infrastructure in Reeves County. This investment enhances the broadband backbone network, improving potential connectivity to underserved areas.
- **NTIA Middle Mile Existing IRU by ENMR Telephone (Light Blue Areas):** ENMR Telephone holds an Indefeasible Right of Use (IRU) for middle-mile infrastructure, enhancing connectivity within Reeves County by reinforcing the broadband network and facilitating access to unserved and underserved regions.
- **RDOF Phase 1 by Resound Networks (Light Blue Areas):** The Rural Digital Opportunity Fund (RDOF) Phase 1 allocates funding to Resound Networks to deploy broadband infrastructure in unserved areas throughout Reeves County, focusing on bridging connectivity gaps and ensuring enhanced broadband coverage.
- **A-CAM by Big Bend Telephone (Light Blue Areas):** The Alternative Connect America Model (A-CAM) funding awarded to Big Bend Telephone supports infrastructure expansion in high-cost areas of Reeves County, aiming to reach residents and businesses in unserved locations with stable broadband access.

For further details on these funding opportunities, please refer to **Section 7: Digital Opportunity and Strategy**, which provides a comprehensive overview of each funding source and its projected impact on Reeves County's broadband infrastructure.



4.4 Evaluating the Potential Broadband Needs

Exhibit 11: Unserved and Underserved Broadband Serviceable Locations (BSL) in Reeves County, Texas

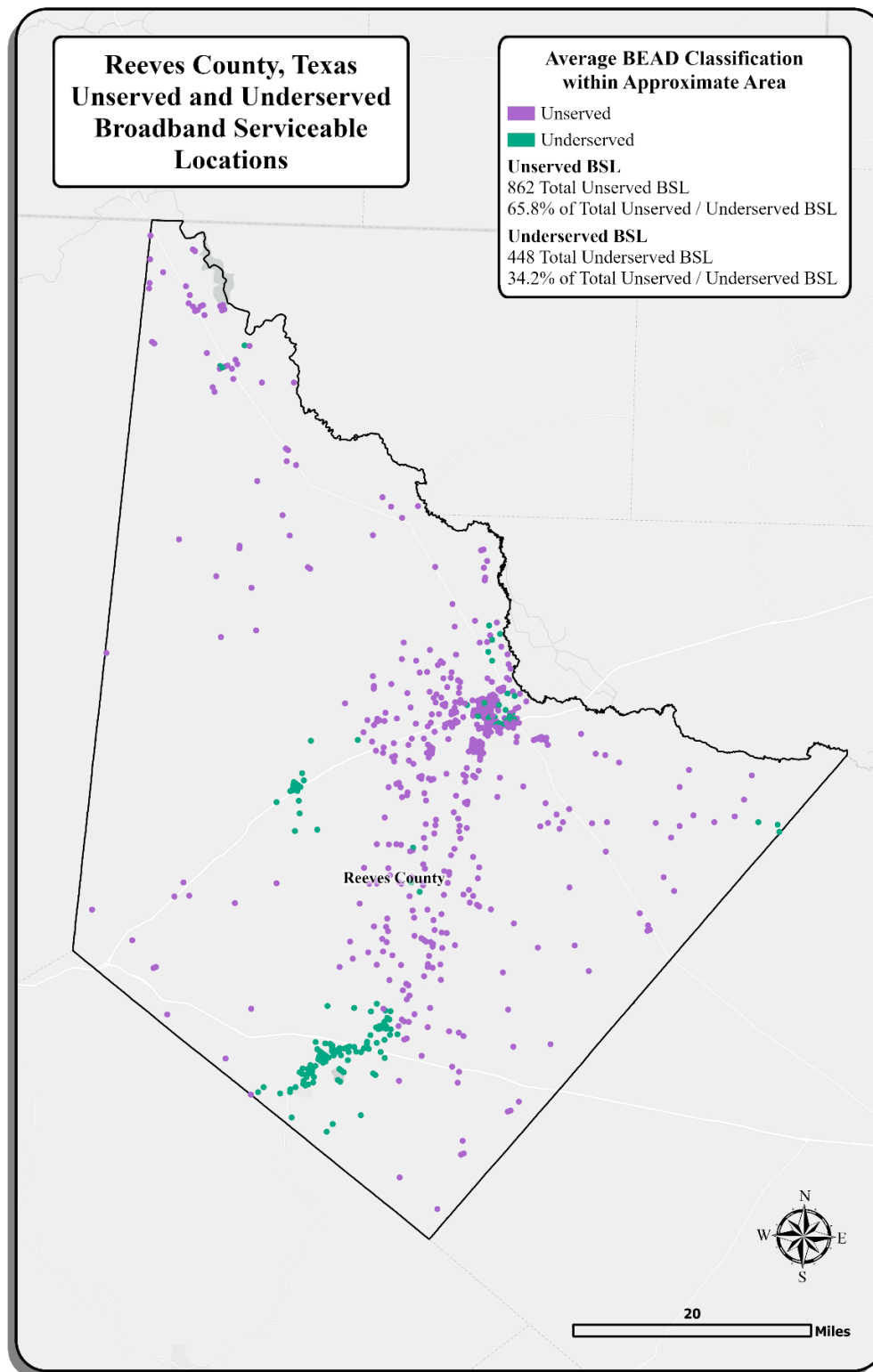


Exhibit 12: Unserved and Underserved Broadband Serviceable Locations (BSL) in Reeves County, Texas

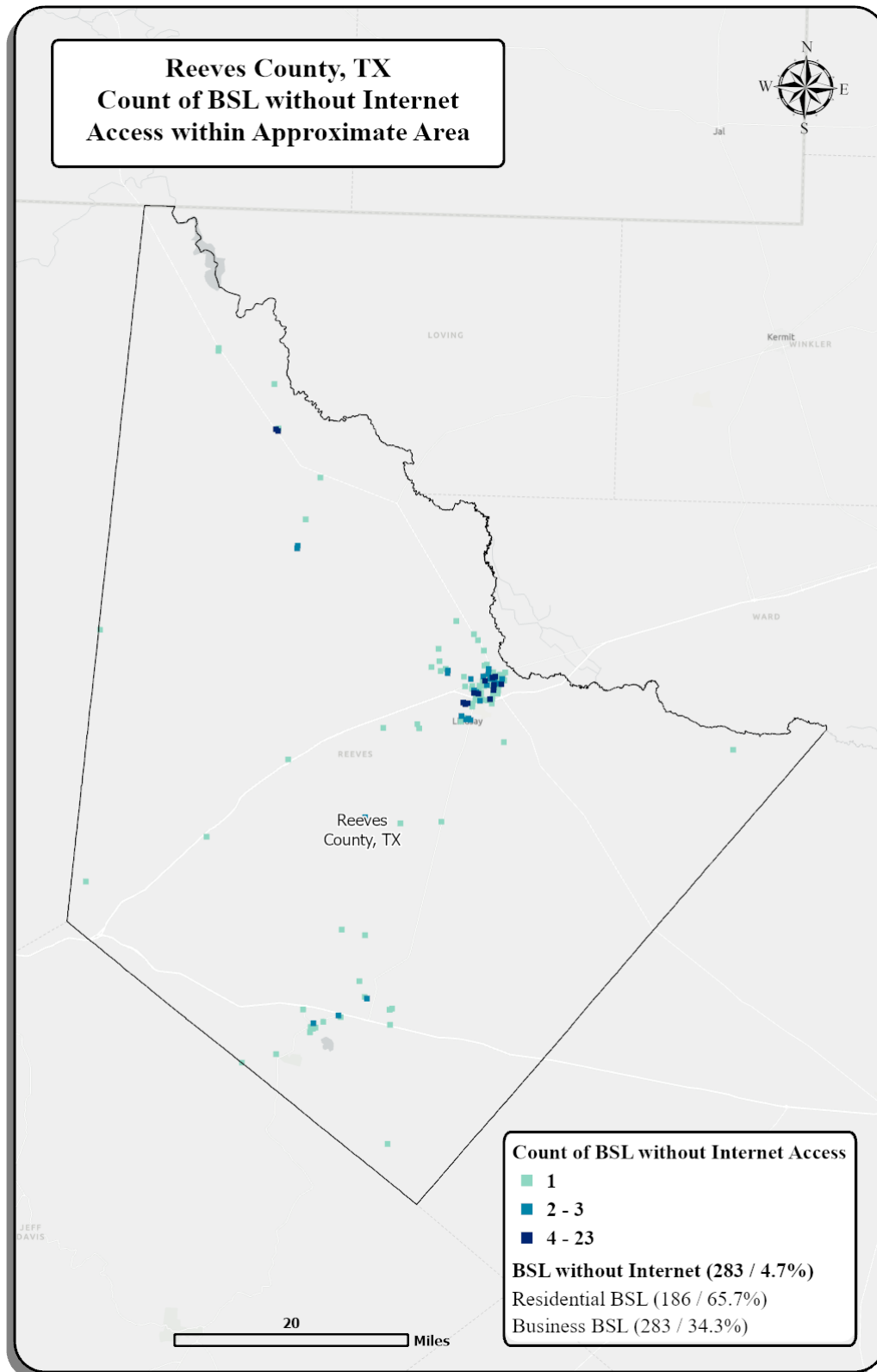


Exhibit 13: Average Number of Broadband Providers within Reeves County, Texas

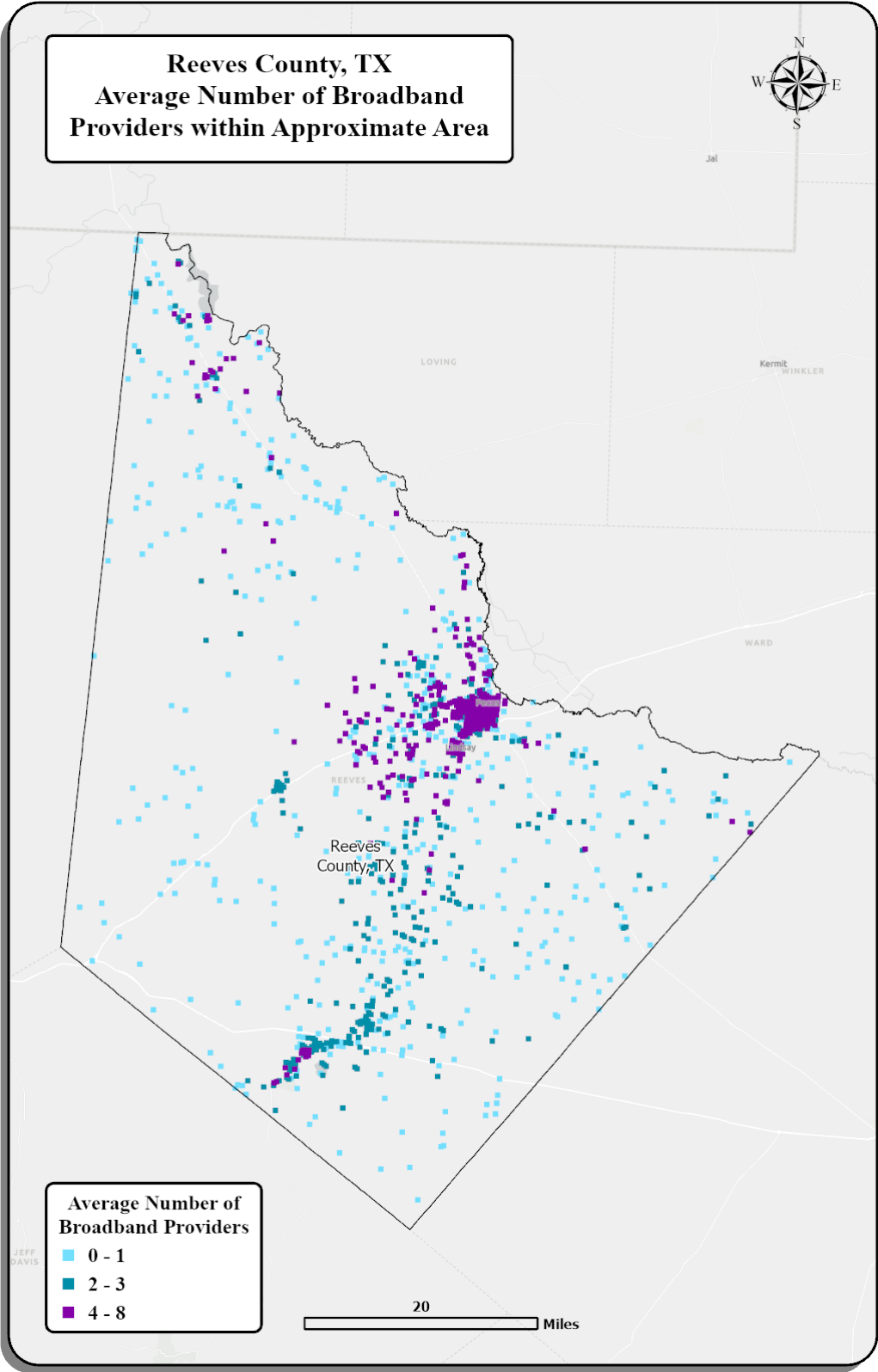


Exhibit 14: Urban and Rural Areas in Reeves County, Texas

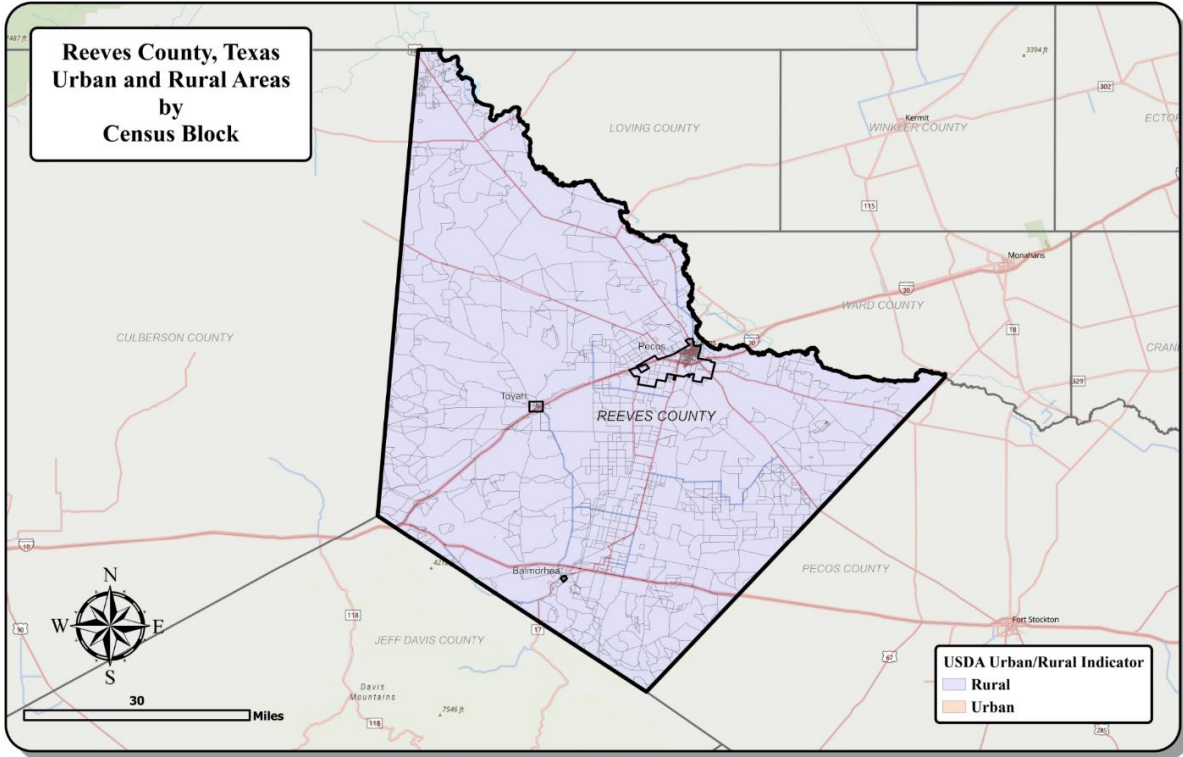


Exhibit 15: Percent of Households Without Smart Devices in Reeves County, Texas

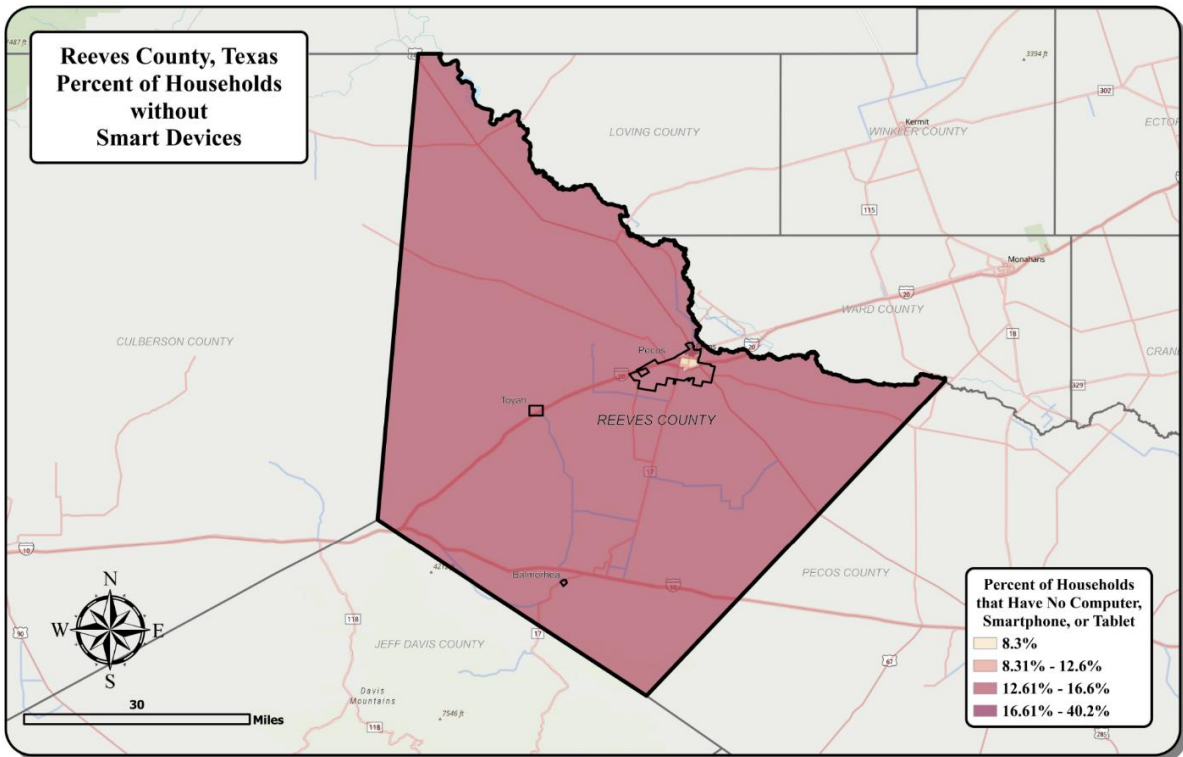


Exhibit 16: Average Household Size, Reeves County, Texas

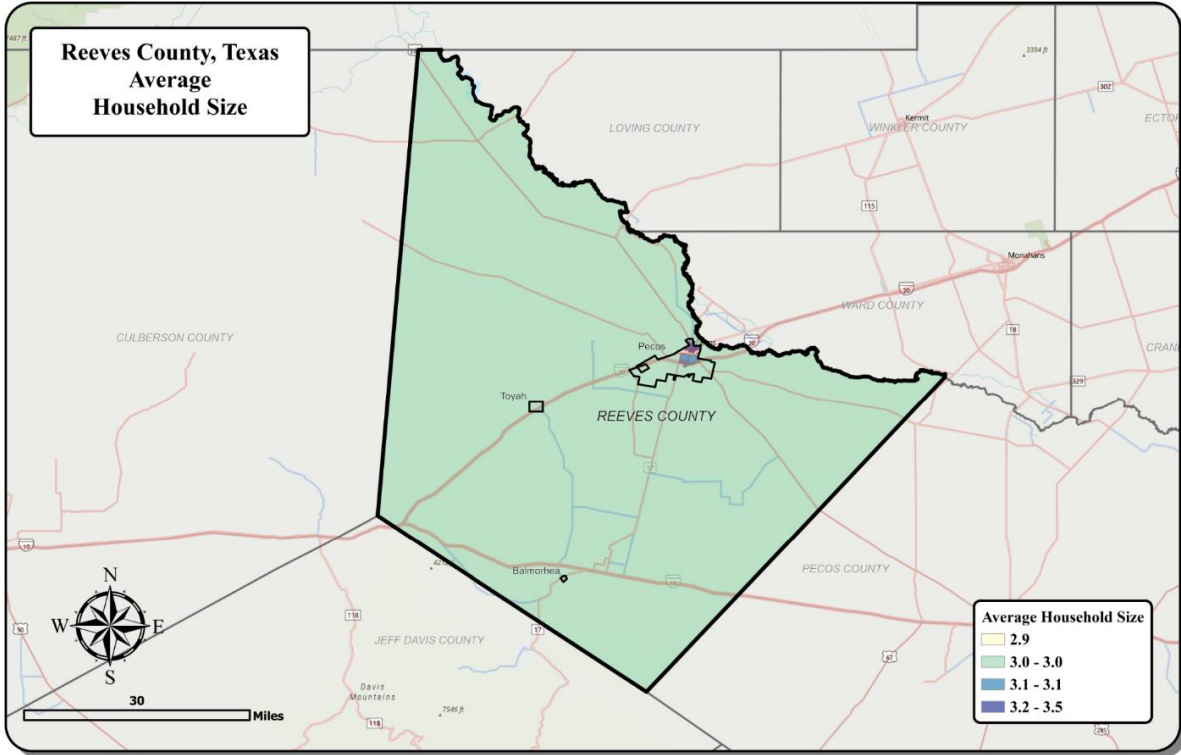


Exhibit 17: Median Household Income, Reeves County, Texas

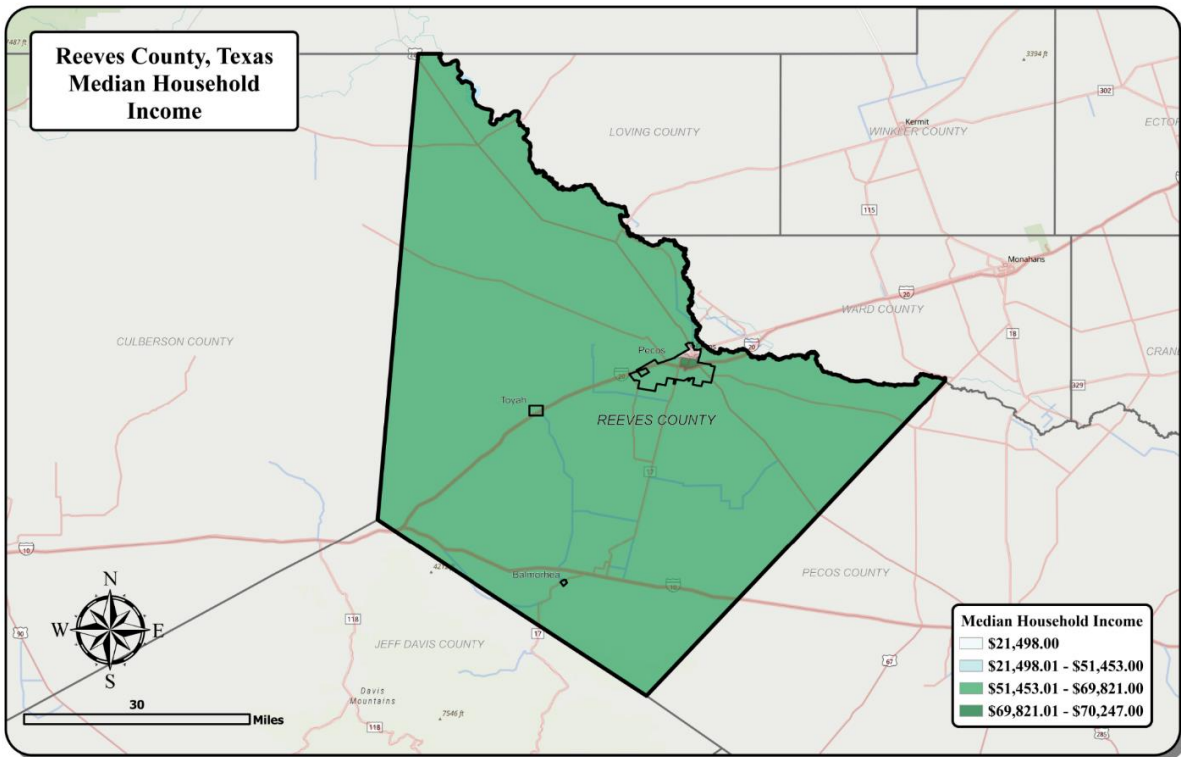
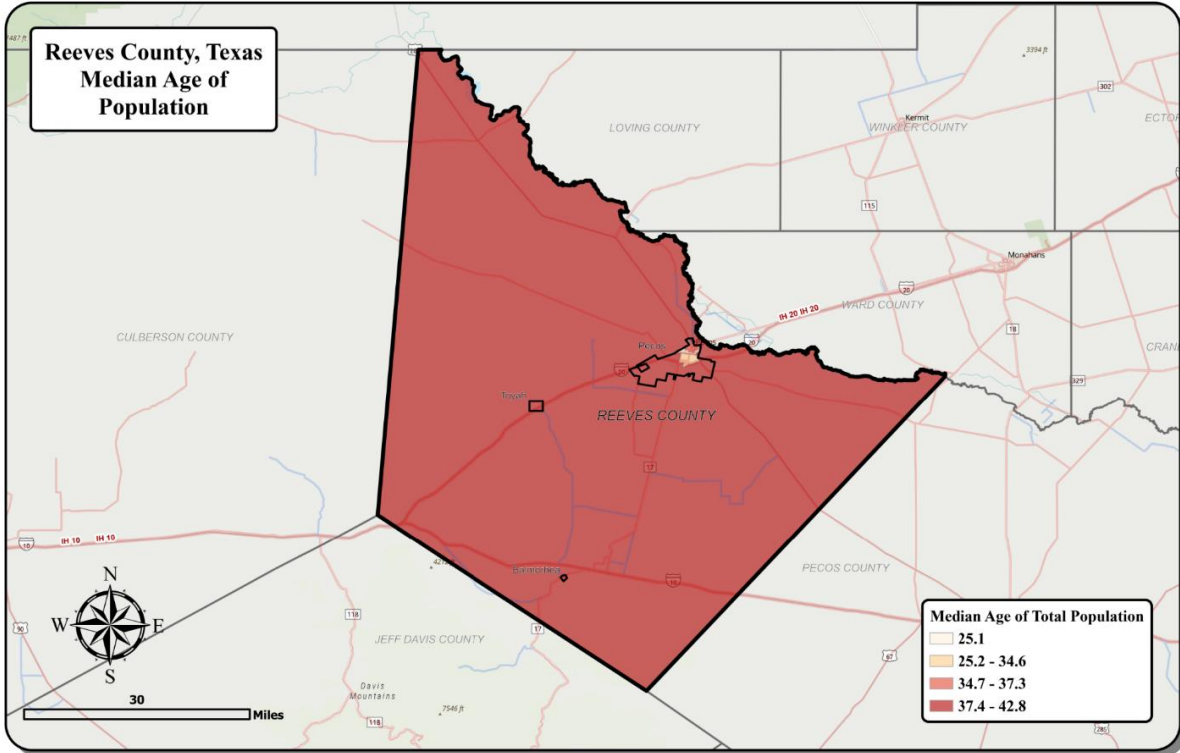


Exhibit 18: Median Age of Population in Reeves County, Texas



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Exhibit 19: Metro Network Fiber in Reeves County, Texas

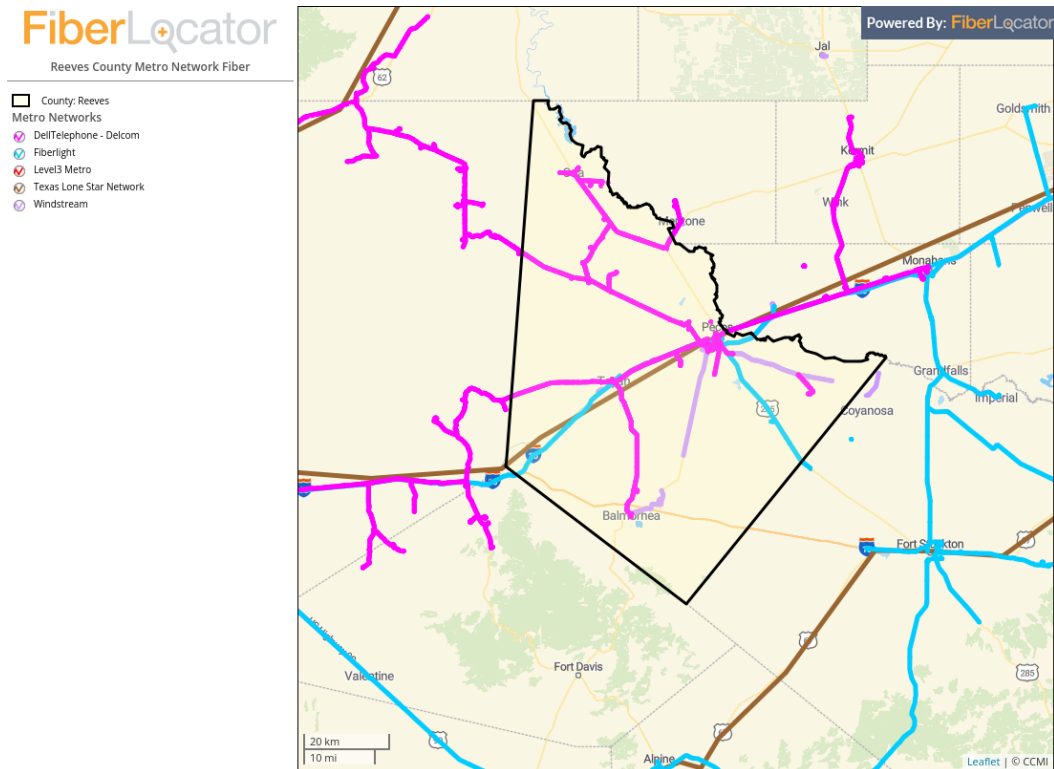


Exhibit 20: Long Haul Fiber in Reeves County, Texas

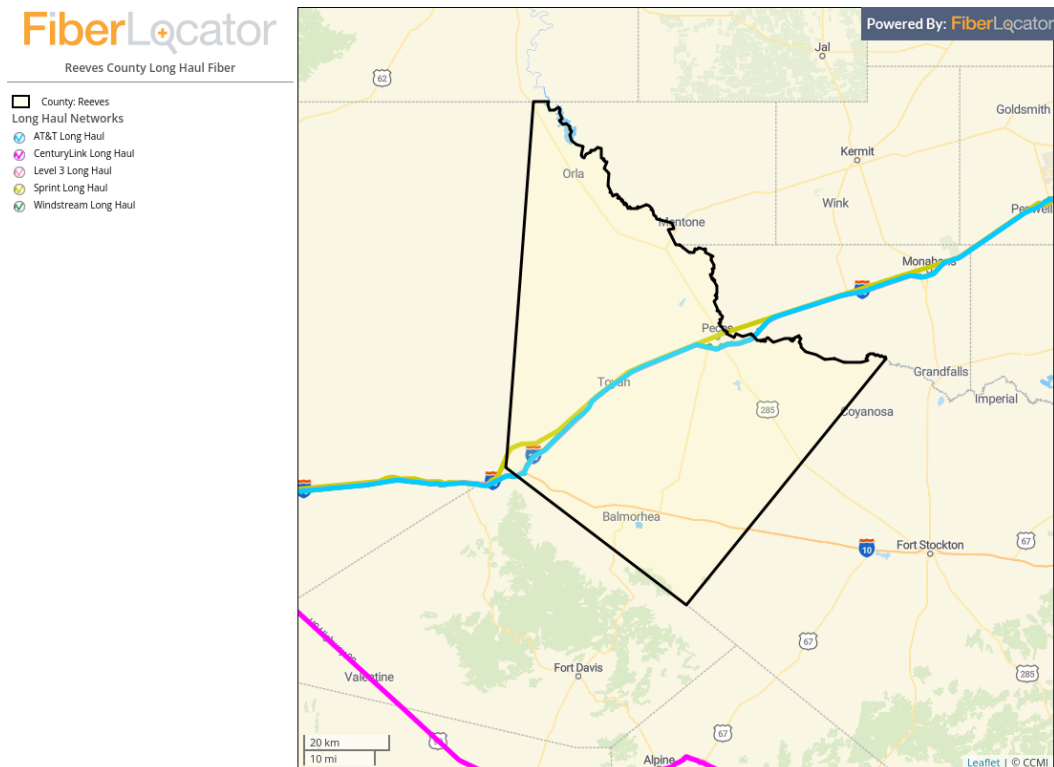


Exhibit 21: Demand Points of Need in Reeves County Texas

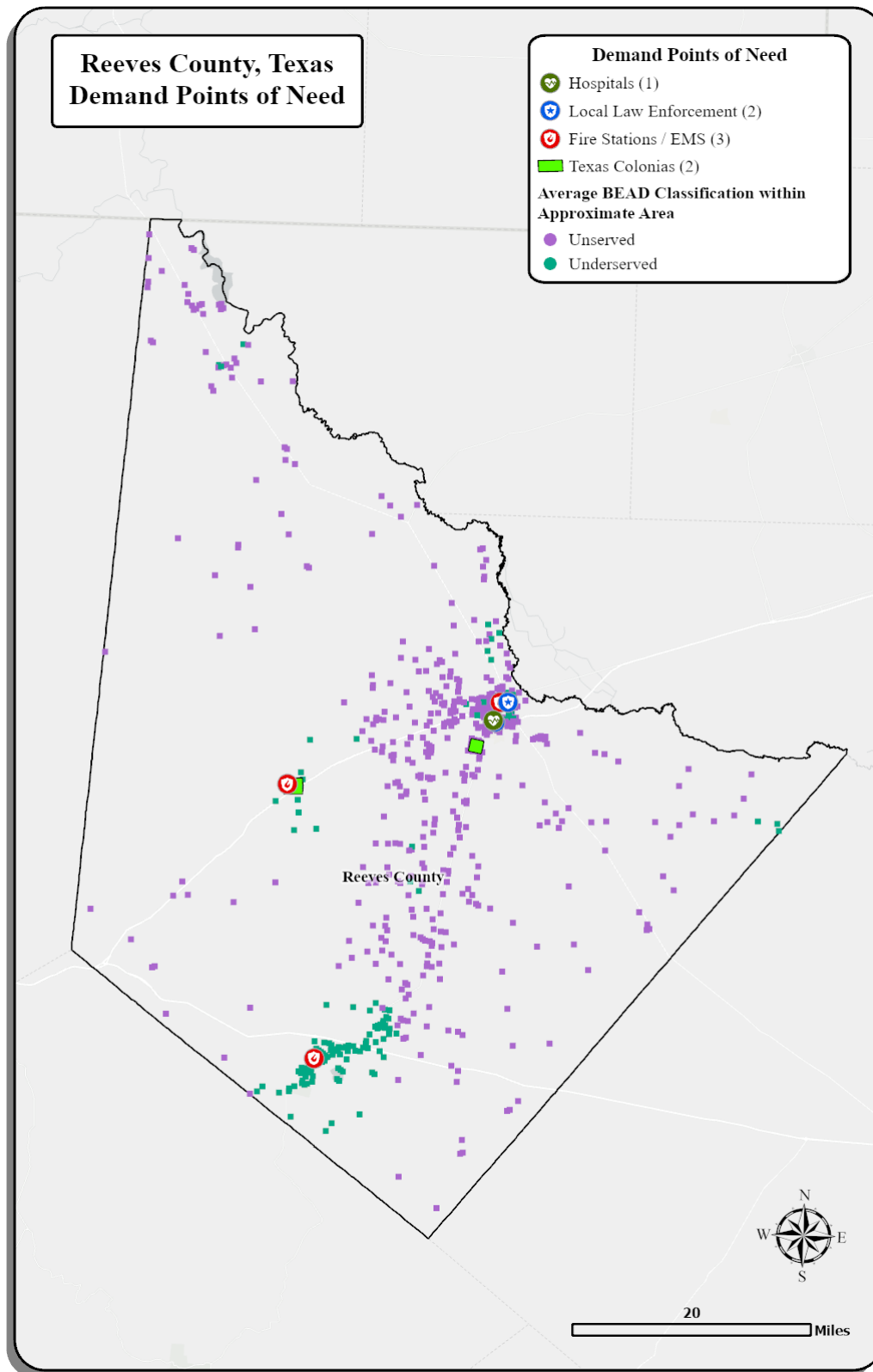
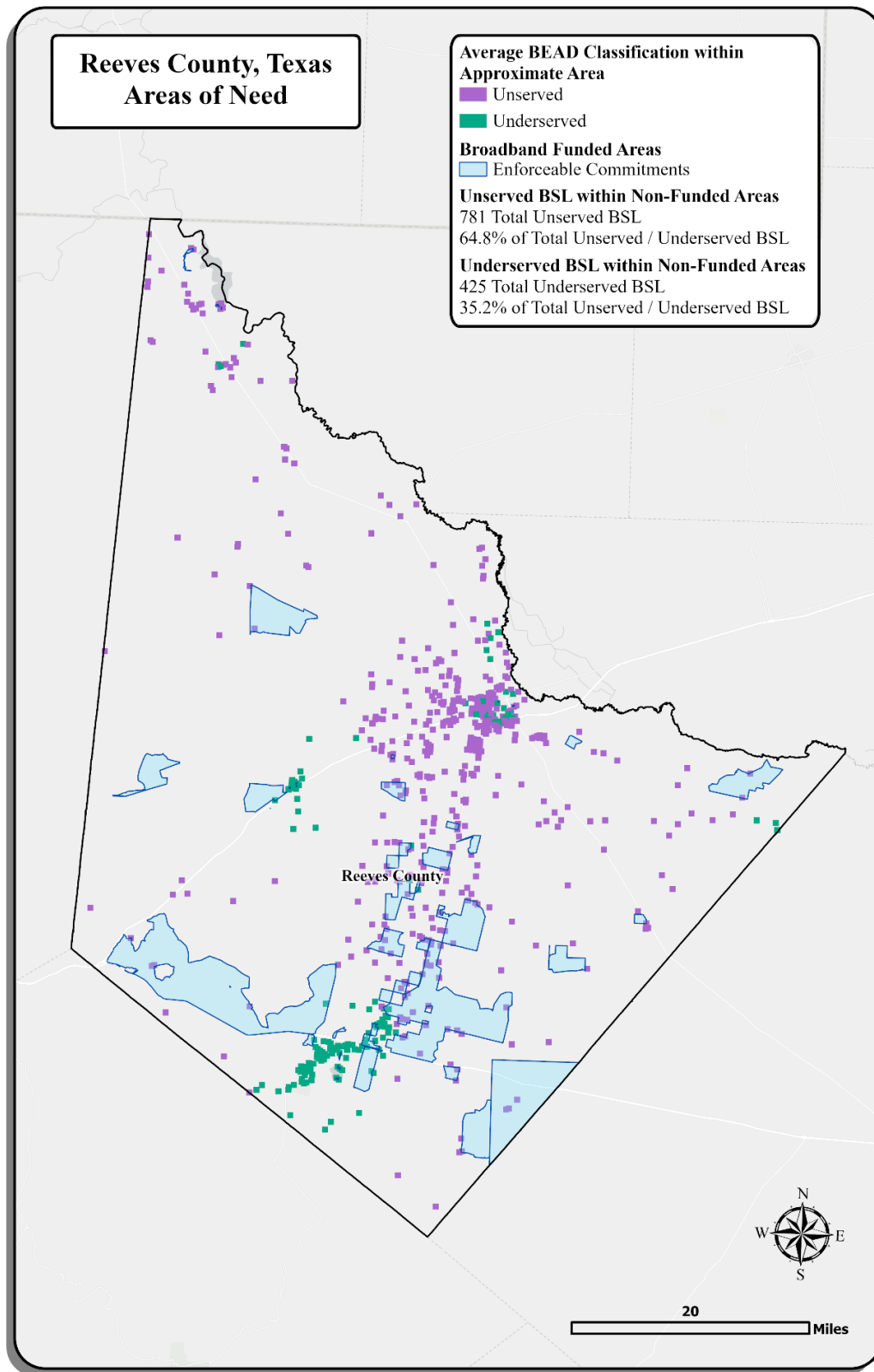


Exhibit 22: Areas of Need in Reeves County, Texas



5 P3 Identification and Analysis

This service identifies opportunities and options for local public jurisdictions to establish formal partnerships with private providers. The research will outline the process to identify and develop P3 opportunities (public private partnerships) while detailing the respective comparative advantages from both these public and private arrangements. Possible P3 benefits can include operational capacity, more complete coverage and lower construction and service costs for the Community. Potential risks to the Community from the identified P3 opportunities will be outlined alongside advantages resulting from the identified potential P3s. Preparation for the facilitation of Requests for Proposals for partnering opportunities will also be included. An additional result of this process is to help the BDO reach a goal of 99 percent coverage of unserved BSLs through coordinating P3 relationships throughout each County.

5.1 *Business Model Options*

5.1.1 **Considerations for Business Model Selection and Partnership**

Improving broadband often entails building, operating, and maintaining new infrastructure to provide a better end-user experience. While private Internet Service providers (ISPs) play a role in the deployment of most broadband infrastructure improvement projects, public agencies are also involved in the process. To better gauge the level of participation in the improvement process of broadband infrastructure, it is important to understand what is available to public agencies.

Models have been developed to help local governments understand the opportunities and risks associated with the different ways in which they can participate. The information in this section will outline the process to identify and determine what role leadership thinks is best for Reeves County.

When ISPs are part of the building and/or operating and maintaining broadband infrastructure, the relationship is generally referred to as a Public-Private Partnership (P3). These partnerships between county governments and private entities can take a wide range of forms. It is helpful to think of these variations as a spectrum where one extreme is a fully publicly owned utility model and the other is a hands-off approach that allows the private sector to invest and expand at their own discretion. Even in the latter, the public agency is still involved, such as providing and approving building permits. The sweet spot for most communities falls somewhere in the middle, particularly if grants are needed for the improvements.

As one moves along the continuum from the fully public side over to the other end of the fully private end, the share of responsibility in the complexity of the model shifts. When assessing the degree of governmental participation, the municipal broadband utility model ranks highest for complexity and involvement. Texas law includes some barriers and restrictions on the utility model (Texas Utility Code § 54.201), however, it is important to note that these restrictions do not prevent local governments from forming a P3 and are a viable option.

Decisions regarding public involvement are often based on costs, financial and/or bond limitations, staff capacity, and political will. Understanding these distinctions and how they fit the county can help leadership make a knowledgeable choice on which direction to pursue, should it become advantageous to enter into a P3 for broadband improvements.

5.1.2 Ownership and Operations Models

To better understand the options Reeves County must explore for broadband infrastructure improvement, it is helpful to define the components of a network. A broadband network can be summarized into five basic components which one party or the other must be responsible for building and/or maintaining. These are as follows:

- (1) **Right Of Way (ROW)**—This is the physical real estate where the network must be built.
- (2) **Middle Mile Network Infrastructure**—This is the arterial portion of networks that brings internet traffic from last-mile networks to connect to the internet via interconnection facilities called Points of Presence or internet exchanges.
- (3) **Last-Mile Network Infrastructure**—This is the capillary portion of a network that distributes internet connectivity to homes and businesses in the community from the provider(s).
- (4) **Operation of the Infrastructure**—This refers to the activities associated with running a commercial network, inclusive of monitoring network traffic, responding to outages, maintaining the equipment, providing services, and the cable plant that enables the network to function and connect to the internet.
- (5) **Customer Service**—This refers to the activities associated with connecting customers to the network, troubleshooting and addressing any issues the end-user may experience with the service, billing for the service, and collecting/processing payment.

One entity does not have to own, operate, and maintain all five components of a network – that is not usually the case. Typically, there are several participants from both the public and private side involved in the ownership and operations of these components. Moreover, one agency does not have to own and operate the infrastructure – for example, many communities’ own infrastructure but contract out the operations.

Once a broadband infrastructure opportunity has been identified, community leaders should begin to define their degree of desire in assuming responsibility financially and/or operationally within such a venture. If private sector partners could be involved, the public agency’s intentions are important to better tailor their outreach to the private sector via a formal channel such as a Request for Expressions of Interest (RFEI).

The matrix below Exhibit 23 outlines how responsibility for these five components can be delineated between a private and public partner. Within the table, the columns represent each component described above, while the rows consist of the following five broad categories of P3 structures commonly implemented. These are:

- (1) **Full Municipal Broadband**— Texas municipalities and counties who consider this model will need to fully understand the State’s barriers. As a frame of reference for funding, full municipal models rely on the revenue from the network to cover building and operational costs. These are often through Revenue Bonds as opposed to General Obligation Bonds, where the revenue pays back all the incurred costs and produces additional revenue. However, a full feasibility study is usually required by financing institutions to determine if the network can sustain itself and repay the debt over time.
- (2) **Publicly Owned, Privately Serviced**—this model can be thought of as a workaround for communities with the political will to construct their own infrastructure, but who do not have the full resources to operate the network. In these networks, the responsibility for funding and building a network is shouldered by the public entity, for example via bond issuance. However, a private company is contracted to operate the infrastructure and provide customer service.
- (3) **Hybrid Ownership**—in this model, both the public and private entities contribute capital to build a network, with the public entity building middle-mile infrastructure and the private entity

building last-mile infrastructure. This model has the benefit of making it easier from a technical standpoint for a community to partner with more than one last-mile builder/provider but is also attractive to a private partner for eliminating their cost to build middle-mile to reach the neighborhoods in need of service.

- (4) **Private Developer Open Access**—this is an attractive model for communities because it limits the investment they must make into building network infrastructure. It also helps ensure a consumer-friendly environment wherein customers of the network have access to more than one option in service providers. However, for this to be financially feasible for both the private developer who builds the network and enterprises providing services, certain metrics must be met, which vary from company to company. In general, this model tends to require both a higher density of potential customers per road mile, as well as a higher overall number of customers. Remote, sparsely populated communities may not find this model feasible to implement.
- (5) **Full Private Broadband**—this is the most hands-off approach model for a public agency as the contribution to a partnership by a public entity consists only of ROW policies that are “friendly” to broadband deployments. Examples include expedited permitting processes and Dig Once ordinances requiring the placement of empty conduit usable for future network deployments.

Exhibit 23: Request for Expressions of Interest Matrix

	Own ROW/Utility Infrastructure	Own Middle Mile	Own Last Mile	Operate Infrastructure	Service Customer
Full Municipal Broadband	Public Entity (City or Utility)	Public Entity (City or Utility)	Public Entity (City or Utility)	Public Entity (City or Utility)	Public Entity (City or Utility)
Publicly Owned, Privately Serviced	Public Entity (City or Utility)	Public Entity (City or Utility)	Public Entity (City or Utility)	Public Entity	Service Provider(s)
				Service Provider(s)	
Hybrid Ownership	Public Entity (City or Utility)	Public Entity (City or Utility)	Service Provider(s)	Service Provider(s)	Service Provider(s)
Private Developer Open Access	Public Entity (City or Utility)	Private Developer	Private Developer	Private Developer	Multiple Service Providers
Full Private Broadband	Public Entity (City or Utility)	Service Provider(s)	Service Provider(s)	Service Provider(s)	Service Provider(s)

5.1.3 Accessory Models

In relatively rural and sparsely populated counties, such as Reeves County, it is often the case that the publicly owned, privately serviced and the hybrid ownership P3 models are both politically and financially challenging. Even if financial modeling shows a reasonable return on investment through Irrefutable Right of Use (IRU) agreements with private providers, proposing a bond initiative or using tax dollars might not be the most politically viable option for the community and its leaders. Fortunately, should this be the case, communities within Reeves County are not without recourse should they choose to pursue a full private broadband model. So-called Accessory Models, which leverage the community's inherent control of the ROW and need for internal connectivity, can still make a positive impact via a Dig Once ordinance.

Accessory Model Overview

In addition to the need to facilitate improved broadband deployments, local governments are also recognizing the need to implement public policy initiatives that are designed to improve the quality of street cut repairs as well as encourage joint use of facilities. Strategies used by these agencies generally fall into three categories: incentives, fees, and regulations. Examples of incentive-based policies include providing financial incentives for:⁸

- (1) Using trenchless technology where technically suitable and requiring justification for not using trenchless technology should the agency deem it suitable.
- (2) Performing higher quality pavement cut repairs or making smaller and/or less damaging cuts.
- (3) Coordinating with other utility companies to share trenches or underground resources.

Examples of fee-based policies include:

- (1) Assessing appropriate fees for pavement degradation.
- (2) Assessing appropriate permit fees.
- (3) Implementing a lane rental fee to encourage utility companies to restore traffic as quickly as possible.
- (4) Requiring a deposit prior to beginning work to protect against poor quality repairs.
- (5) Assessing penalties within a specified period for non-compliance or for failed repairs.

Examples of regulation-based policies include those that do not require fees nor provide incentives but place requirements on the contractor regarding quality of work and restrictions on when and where trenching can be done. Examples of this type include:

- (1) Establishing moratorium periods that restrict trenching in new and newly resurfaced pavements for a specified time.
- (2) Requiring the pavement repair to encompass a larger area than simply the area of the trench.
- (3) Enhancing inspections and enforcement of specification requirements.
- (4) Requiring agency-owned utilities to meet repair quality standards and all other policies established for private utility companies.

⁸ "Pavement Utility Cuts." (2018 April 19). Federal Highway Administration (FHWA). Retrieved May 25, 2019, from <https://www.fhwa.dot.gov/utilities/utilitycuts/man01.cfm>

Dig Once Ordinances

Reeves County is within its authority to preserve the physical integrity of its streets and highways, control the orderly flow of vehicles and pedestrians, and manage the gas, electric, water, cable, broadband, telephone, and other facilities that crisscross its streets and public ROW. In addition, the county can focus on efficiently using public ROW for a variety of infrastructure and utilities to provide public services; advance their goal of increasing opportunities for access to traffic control, communication, and broadband services; limit the frequency of street closures and the cutting of public streets; and reduce road degradation caused by repeated boring and trenching of public ROW.

The County can start to require all street construction permit applications involving directional boring or open trenching within a public ROW to include the co-location and installation of conduit owned by the entity⁹ simultaneously with the applicant's street construction activity. This is commonly known as a "Dig Once" or a co-location policy. Timely placement of empty broadband conduit, which is conduit for fiber-optic cables that support broadband or, where appropriate, wireless facilities for broadband service, can dramatically reduce costs. The National Broadband Plan noted that "the cost of running a strand of fiber through an existing conduit is 3-4 times cheaper than constructing a new aerial build."¹⁰ By saving costs, providers may be able to speed up network upgrades, thereby expediting better end-user experience.

The cost of building or upgrading a network in areas where streets need to be dug up is substantially higher than the cost of building or upgrading a network where there is sufficient empty space in the conduit that was placed with foresight years earlier. As such, a co-location/Dig Once policy is important because it gives the jurisdiction the ability to create assets, or "broadband currency", which are a key driver of enhanced broadband and can be a valuable contribution to a P3 agreement with a private service provider. More importantly, it is a very low-cost path to create assets that can drive appealing outcomes. If it is done well, it can allow the county to maintain control of its own broadband destiny.

A co-location or Dig Once policy is "a broadband deployment policy focused on increasing coordination between government agencies and utility companies to decrease the frequency of highway or street excavation." These policies aim to facilitate joint trenching cost savings and ensure that broadband infrastructure improvements are considered alongside other infrastructure and public works projects. To this end, these policies encourage or require that every infrastructure project includes notification and facilitation of opportunities to lower the costs of broadband infrastructure investment. Localities can add connectivity standards to their building codes, ensuring that new constructions are equipped with broadband access.

There are three main benefits to Dig Once policies and they are as followed:

- (1) Lowering costs of infrastructure deployment when completed in conjunction with other infrastructure improvements.
- (2) Promoting and facilitating integration of broadband infrastructure as part of local and regional economic development initiatives.
- (3) Providing a meaningful contribution to future P3 agreements with private providers, potentially lowering their cost to deploy fiber optic network plant by a substantial amount.

⁹ "These ordinances can also be structured to allow the county to determine during the permitting process whether the placement of empty conduit is to its advantage or not instead of a blanket requirement. They can also be written to require that the entity seeking a permit place the conduit on the county's behalf and at the county's expense, making the conduit into broadband currency the county can then leverage in later P3 negotiations

¹⁰ 3 "Collocation Conduit Installation". (2016 September). Connected Nation. Retrieved October 21, 2021, from <http://www.connectmycommunity.org/wp-content/uploads/2016/09/Local-Policy-Guide.pdf>

The Federal Highway Administration has listed several best practices for Dig Once policies, noting that Dig Once practices have been “recognized by state and local stakeholders as sensible solutions to expedite the deployment of fiber along main routes when implemented as part of a cooperative planning process.”¹¹

Middle Mile “Broadband Currency”

If the county has or plans to install any broadband infrastructure, this can be used to attract ISPs to the county. Examples of how this may be beneficial include:

- If the county or member cities decide to build a fiber ring for internal connectivity of their facilities, extra capacity can be built, which could be offered to an ISP (for a lease rate that could reduce their deployment costs).
- Requiring the addition of empty conduit/duct banks to Capital Improvement Projects (CIPs), new developments, road, bridge, and sidewalk builds, is a cost-effective way of creating infrastructure that can be used in the future by ISPs to dramatically lower deployment cost per household passed.
- Utilizing Dig Once policies can develop an inventory of conduit that can also be offered to ISPs to provide a more affordable way to deploy broadband improvement infrastructure (this could be via a lease arrangement).

Exhibit 24: Accessory Model Table

Accessory Model	Benefits	Drawbacks	Investment
Ordinance and/or Policy (e.g. Dig Once)	Quick and easy to put in place with long term benefits over many years	Can take a very long time to bear fruit	No financial investment, simply one in political capital to implement a new policy/ordinance
Broadband Currency	An effective way to entice private sector investment by reducing deployment costs for ISPs entering the market	Requires the expenditure of funds. While effective, and quicker than a pure policy approach, it is not a quick fix either	Some financial investment is needed to implement this approach as it requires the construction of physical infrastructure
Combined Ordinance and/or Policy with Broadband Currency	This approach has the combined strengths of both above accessory models, with both a long-term outlook and more immediate benefits	Requires the expenditure of funds. While effective, and quicker than a pure policy approach, it is not a quick fix either	Some financial investment is needed to implement this approach as it requires the construction of physical infrastructure

5.1.4 Business Model Funding

There are multiple avenues available to local governments when it comes to funding a network deployment and/or contributing to a P3 for improved broadband. As outlined in the previous section, the simplest and lowest risk option is to purely enact policies and put ordinances in place that reduce the deployment costs for broadband infrastructure while also protecting the integrity of the community’s

¹¹ <https://www.fhwa.dot.gov/policy/otps/successprac.pdf>

ROW. While cost-effective, this approach will not provide the county with much control over how long it will take for improved broadband to be realized by the end-user.

Should the political will exist to ensure a greater degree of control by pursuing a publicly owned privately-serviced or hybrid ownership model, there are a handful of potential funding avenues to evaluate. Before deciding on this front, however, best practices indicate that robust financial modeling should be performed in conjunction with an engineering analysis to determine accurate project cost both in terms of Capex and Opex. Once financial feasibility and payback periods are confirmed, here are the funding avenues to explore:

Federal and State Grants

Programs like the Broadband Equity Access and Deployment (BEAD) within the Infrastructure Investment and Jobs Act, the American Rescue Plan Act (ARPA), Community Development Block Grant (CDBG), and the USDA's Reconnect Loan and Grant Program provide significant funding for broadband projects. However, time is of the essence with this approach as ARPA funds must be encumbered by December 31st, 2024, and spent by December 31st, 2026, and a BEAD strategy must be pursued in collaboration with a private partner who would apply for the funds with the county's support. More information on funding opportunities is included in Section 8.

Tax Increment Financing (TIF)

Tax Increment Financing (TIF) is a funding mechanism that municipalities use to stimulate economic development and infrastructure projects, including those for municipal broadband. TIF works by designating a specific area, known as a Tax Increment District (TID), where the expected increase in property tax revenues from future development is used to finance current improvements. Essentially, the projected growth in tax revenue serves as collateral to fund the upfront costs of the project. This model is particularly useful for projects that might not attract immediate private investment but are expected to generate significant economic benefits over time.

When applied to municipal broadband projects, TIFs can help cover the substantial initial costs of building the necessary infrastructure. By leveraging future tax increments, cities can invest in broadband networks that provide high-speed internet access to underserved areas, while fostering digital inclusion and economic growth. This approach not only enhances connectivity but also attracts businesses and residents, ultimately increasing the tax base and ensuring the long-term sustainability of the investment.

General Obligation Bonds and Revenue Bonds

General obligation bonds (GO bonds) are another common method for municipalities to fund various public projects, including those for municipal broadband. These bonds are backed by the full faith and credit of the issuing municipality, meaning they are secured by the municipality's taxing power. When a municipality issues GO bonds, it pledges to repay the bondholders through general taxation, which can include property taxes, sales taxes, or other forms of municipal revenue. This makes GO bonds a relatively secure investment, as the repayment is not dependent on the success of the project itself. For municipal broadband, GO bonds can provide the necessary capital to build out the infrastructure, ensuring that the community has access to high-speed internet.

On the other hand, revenue bonds are repaid through the revenues generated by the projects they finance. In the case of municipal broadband, this means that the bonds would be repaid using the income generated from the broadband services provided to residents and businesses. This type of bond is considered riskier than GO bonds because the repayment depends on the project's ability to generate sufficient revenue. However, revenue bonds can be an attractive option for funding municipal broadband

as they do not rely on general taxation. They can also be structured to align with the expected cash flows from the broadband services, or in the case of P3 networks, by the lease fees paid by the private partner to use the infrastructure (see below). By using revenue bonds, municipalities can finance broadband projects without increasing the tax burden on their residents, making it a politically feasible option for expanding digital infrastructure.

Leasing Infrastructure

Leasing agreements can be used to finance the procurement and construction of broadband infrastructure. This approach is not a stand-alone means of funding a network deployment, but rather the revenue backstop used to prove financial viability when pursuing loans and/or revenue bonds. Leasing rates should consider funding necessary to supplement the construction of the network but should not be high enough to deter providers from entering agreements.

5.1.5 Public-Private Partnerships (P3)

In section 5.2.2 of this report, five partnership models are described at a high level. Four of these five are distinct approaches to partnerships, while the fifth is essentially fully passive and leaves broadband improvement completely in the hands of the private sector. In this section, 5.2.5, these four partnership models are elaborated on in slightly more nuanced detail.

Open Access

Traditionally, broadband networks are operated by a single entity, and customers connected to that network are limited to receiving service only from that single entity. In this paradigm, which is by far the most common in the US, customers that have access to more than one wireline service provider live in homes which are passed by more than one physical network, each owned and operated by different companies. Since broadband network infrastructure is expensive to build, this generally means that once one or two providers are serving a given community, it is difficult for new entrants to justify overbuilding that community, which leads to complacent providers and stagnation of service improvements.

By contrast, in the Open Access model, the wireline network infrastructure is owned and maintained by a neutral, non-internet service provider entity, who allows multiple ISPs to utilize the network to deliver service via software defined networking. This paradigm benefits the customers the most but also allows ISPs to expand their service footprints without the risky and expensive investment of capital to build their own networks. Additionally, this model is of particular interest in the State of Texas, where municipalities and counties are prohibited by law from offering broadband service as a utility. The objection to local government beginning to compete with established private sector enterprises by selling broadband service to residents is understandable. But, in building and operating open access infrastructure, the local government is not competing with private enterprise, but rather enabling private sector enterprises to compete with one another in such a way as to benefit the community's residents, while also inhibiting de facto monopolies.

Open access networks are typically either built by municipalities or infrastructure companies who solicit ISPs to lease space on their networks. The goal is, typically, to facilitate competition by lowering the costs of deployment, while paying for the infrastructure through leases to the participating providers.

Private Ownership with Public Equity

Costs for deployment can be prohibitive for ISPs. As for-profit entities, it is logical for them to put their limited expansion capital into markets where the ratio of potential customers to dollars spent is more favorable to them. Unfortunately, this tends to mean that less densely populated areas rarely see investment from either incumbent providers or new competitors to the marketplace. In order to serve

these communities, it is therefore fairly common for ISPs to seek subsidies to lower their costs. Sometimes this can be done through grants, other times ISPs seek public funding. ISPs often need a faster return on investment (ROI) than communities do.

When considering public investment in networks, it is important to refer to the considerations in the Ownership and Operations model section above. If public money is being used, there should be some form of commensurate ownership and/or return.

This should also be a consideration when public assets are being considered (ROW, land, ring fiber, conduit, etc.). If the public is contributing any asset related to the infrastructure, ownership or ROI should be discussed and incorporated.

Publicly Owned with Private Provider Lease

A return for any municipal assets being used can be done through leases and, depending on the costs and terms, can be cheaper than the costs ISPs would have to construct their own infrastructure. Public agencies often focus on a longer return on investment than private companies, so this model can be successful for the municipality and the ISP.

Revenue Sharing

It is common in the broadband industry for ISPs to offer revenue sharing. Revenue sharing can be based on ROW use, municipal-owned infrastructure used (if not in a lease agreement), etc. This is most often based on a percentage of their revenue after their initial deployment costs. The values can vary greatly, so it is important to understand the ISP's formula clearly. Depending on the projections, this has sometimes been a good source of ongoing revenue.

5.1.6 Request for Proposal Preparation

A Request for Expressions of Interest (RFEI) is a procurement document used to gather information from potential vendors or partners about their interest and capabilities in a specific project or service. It helps organizations assess market availability and vendor capabilities before proceeding with formal procurement processes.

To review the RFEI template, please refer to the appendices section.

5.2 Reeves County Prospective Partnership Opportunities

To assist the county in navigating potential partners and what they could offer, our project team obtained FCC data on the companies already operating in the area and additionally compiled a list of potential entrants to the market who serve similar and proximal communities to those in Reeves County. We then made outreach efforts to them to gauge their interest in entering into a P3 with the county. What follows in section 6.2 of this report is a summary of those efforts, including contact information for the various entities we spoke with and/or attempted to reach.

5.2.1 Potential Partners in Reeves County

It is helpful to divide potential P3 partners into two broad categories: last-mile providers and middle-mile/long haul service providers. In some cases, there is overlap between the two, but generally speaking, this is an effective approach to capture all relevant providers impacting and capable of impacting the project area.

A helpful analogy to understand the difference between these two categories, and to appreciate their interdependence upon one another, is that of the circulatory system in the human body. A long haul and/or middle-mile network is analogous to the arteries that bring oxygenated blood from the lungs to the

arms and legs, while the last-mile network is the capillaries that deliver the oxygen to the individual cells of the body.

In a broadband network, the last-mile portion is necessary to reach the households and businesses who need the service, while the middle and long-haul portion is necessary to connect the last-mile portion to the rest of the internet. This connection is done via an internet exchange, also known as a point of presence or carrier hotel, which are almost always situated in large cities. The graphic below illustrates these three network layers: long haul to interconnect cities, middle-mile to extend that connectivity to communities, and last-mile to connect to each home.

Exhibit 25: Broadband Network Infrastructure Layers



From a partnership perspective, a community jurisdiction having an agreement of some kind with a long-haul provider can reduce the costs for a last-mile provider to deliver service to that community, while the presence of a last-mile provider can help a middle-mile provider justify their investment to extend their network into underserved areas.

"Broadband" is available to all broadband serviceable locations (BSLs) in Reeves County. However, only 92 percent of households have an internet subscription, indicating adoption challenge that is likely economic in nature (33.3 percent poverty rate). While the entire County could be considered "served", most of this coverage is from fixed wireless. This technology is known to suffer from frequent service outages and fluctuations in available download and upload speeds, making it an unreliable service delivery medium when compared with the gold standard of fiber to the home. Unfortunately, fiber is only available to a fraction of the BSLs in Reeves County due to the limited service offered by available providers.

Below are tables with middle-mile/long haul service providers and last-mile providers with contact information for their representatives. Included is a table which shows which ISPs have a service footprint in Reeves County, what technology they use to deliver their service, and how many BSLs their networks reach in the county. Note that if a single provider offers service via more than one delivery technology,

each of those technologies are given their own row in the table. We have tried to reach out to these service providers, with mixed success, and the county should also reach out to them for future discussions. Notably, we include not only all ISPs who currently operate either wireline or fixed wireless networks in the county, but also others whose footprints are near Reeves County, or who are potentially interested in expanding into the county.

Exhibit 26: Middle Mile Providers with Operations in, or near, Reeves County

Provider	Contact	Email
FiberLight	Matt Leach	matt.leach@fiberlight.com
Zayo	ZeeAnn Kane	zeeann.kane@zayo.com
Plateau/ENMR Telephone Cooperative	Tom Phelps (CEO)	tphelps@plateautel.com
Texas Windstream, Inc.	Mike Hunsucker	45hristo.hunsucker@windstream.com
Lumen	Jeff Mirasola	Jeff.Mirasola@lumen.com
AT&T	Carlos A Martinez	cm3441@att.com
Arelion	Dariusz Solowiej	
Arelion	Johan Ottosson	
Flō Networks	Rodrigo Fernandez	

Exhibit 27: Last Mile Provider with Operations in Reeves County

Provider	Contact	Email or Phone Number
AMA TechTel Communication	n/a	806-322-2222
Delcom	Joel Muniz	joel@delltelco.com
Optimum	n/a	855-267-8468
Resound Networks	Tyson Curtis	Tyson@resoundnetworks.com
Resound Networks	Bryan Waldrip	Bryan@resoundnetworks.com
Resound Networks	Jordan Pruett	jordan.pruett@resoundnetworks.com
T-Mobile	Christopher Walker	45hristopher.walker@t-mobile.com
Windstream	n/a	512-463-7800 (Option 4)
Verizon	n/a	866-928-1939

Exhibit 28: Last Mile Offerings Within Reeves County

Provider	Service Delivery Technology	# of BSLS in Footprint
Resound Networks	Unlicensed Fixed Wireless	6,294
Delcom	Unlicensed Fixed Wireless	6,180
Windstream	Copper	5,741
Optimum	Cable	4,484
Verizon	Licensed Fixed Wireless	2,507
T-Mobile	Licensed Fixed Wireless	1,200
AMA TechTel Communications	Licensed Fixed Wireless	709
Windstream	Fiber	601
Delcom	Fiber	260

Exhibit 29: Last Mile Providers without Operations in Reeves County

Provider	Contact	Email
Highline	David Shipley	David.shipley@highlinefast.com
BTexas Fiber	Rene Gonzalez	Rgonzalez@lit-fiber.com
Underline (open access operator)	Jaime Espinosa	Jespinosa@underline.com
Strata	Jon Bingham	Jbingham@stratanetworks.com
Rise Broadband	Jeff Kohler	Jkohler@risebroadband.com
Ezee Fiber	Matt Marino	Matthew.marino@ezeefiber.com
Consolidated (CCI)	Kevin Kastor	k.kastor@consolidated.com

The maps below indicate the download rate from the FCC within Reeves County. The second map highlights which ISP is providing services to each location within the county. Additionally, this information provides valuable insights into the current infrastructure and potential areas for improvement to ensure better connectivity for all County residents. By analyzing these maps, stakeholders can make informed decisions to address current service gaps and promote a more connected community.

Exhibit 30: FCC Download Rate Within Reeves County

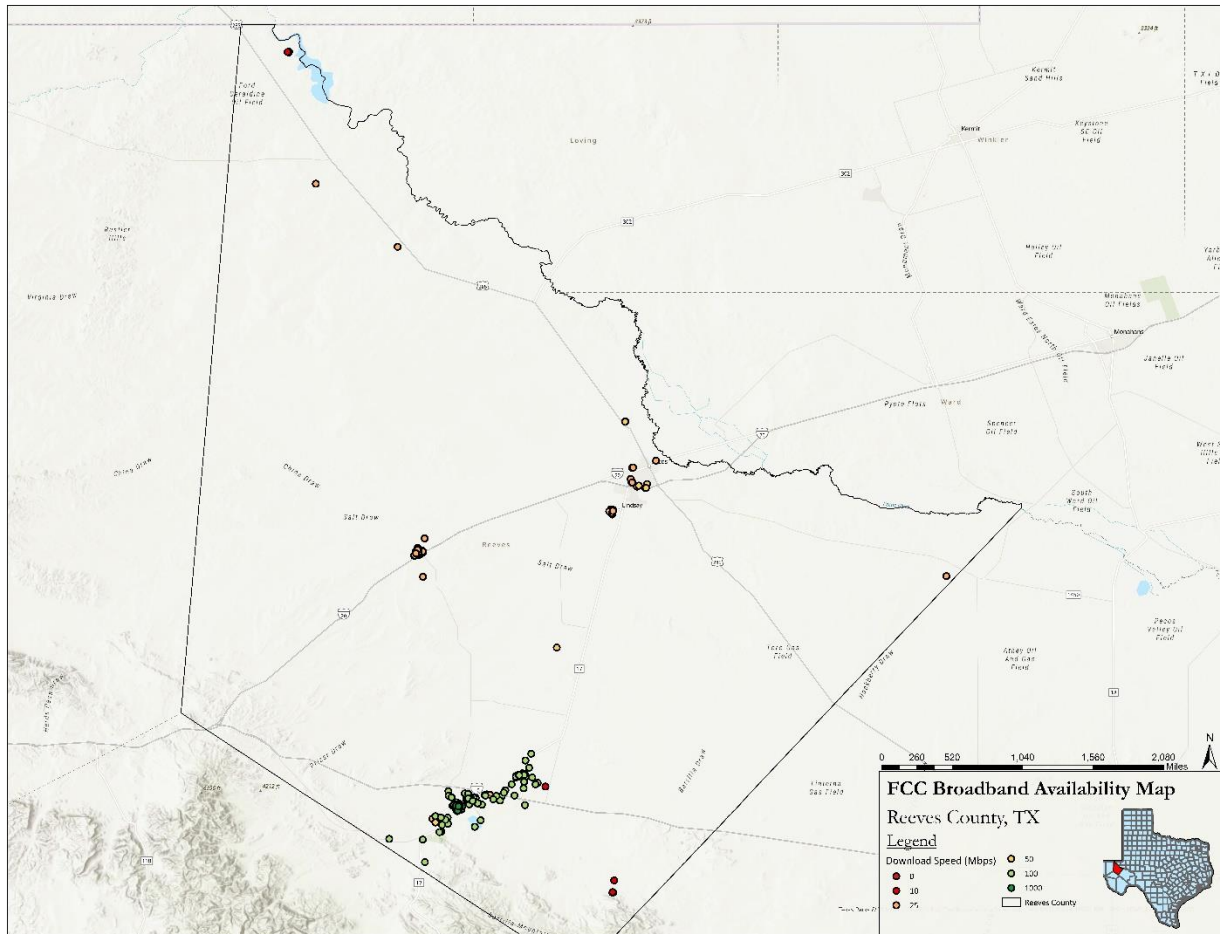
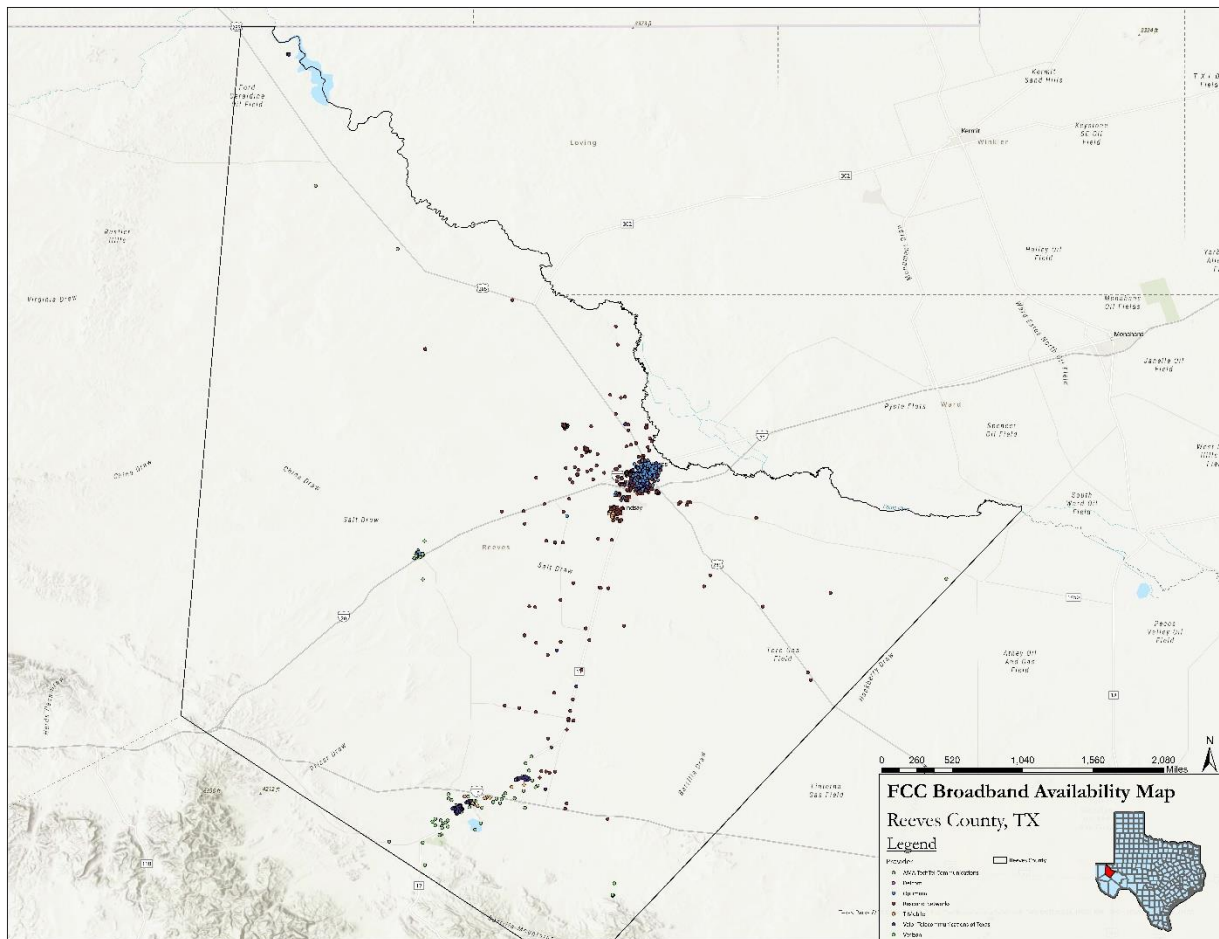


Exhibit 31: ISP's Providing Services to Each Location within Reeves County



Meetings were held with several middle-mile and last-mile ISPs throughout the course of this project. Willingness to respond to questions varied greatly among each ISP as confidential information could not be shared with the team. For those ISPs who could provide insight to the questions, the team learned valuable information for the county. For instance, FiberLight has not contractually been involved in a P3 agreement, but they have been conducting similar projects with schools in Amarillo, Texas. In addition, they are willing to help foster a partnership with one of their last-mile providers as they are not in the business of doing residential last-mile themselves.

Similarly, Windstream had been involved in three separate P3 projects for rural regions. While their focus is on staying within their footprint, Windstream would like to be the one to provide last-mile services. Zayo is also available in the county with a lot of their long-haul network typically being from a Tier 1 city to another Tier 1 City. While they aren't a last-mile carrier, Zayo is supporting their partners in BEAD applications by being a co-applicant. In the case of VTX1/TISD, they have a middle-mile partner within the county. They are only able to provide services within their boundaries, but they offer services to 52 counties in Texas.

LCRA does not have infrastructure in Reeves County. At this time, they are a wholesale power transmission and generation organization with customers who are utilities and service providers looking to build last-mile networks. The County should try to keep apprised of LCRA network development in the area should services expand/upgrade to include Reeves residents. Additional information has been summarized in the table below for ISPs with networks in Reeves County.

Exhibit 32: ISP Network Summaries within Reeves County

	FiberLight	Windstream	Zayo	Dell Telephone	Big Bend Telecom
Do you have middle-mile in Reeves County?	Yes.	Yes.	Yes.	Yes.	Yes.
Is your middle-mile conduit, fiber or both or another technology (fixed wireless, etc.)?	Fiber.	Yes.	Yes.	Yes.	Yes.
If fiber, is it aerial or buried?	Most likely buried.	Combination of aerial and buried.	Buried.	Buried.	Buried.
Is there any redundancy in the network?	Yes as they have redundant rings. All their core networks are built redundant.	They believe so, but this needs to be confirmed.	Yes, but it varies based on the end user's needs.	Yes.	Yes.
Are you constructing new middle-mile in or near Reeves County?	They do not know of anything being built out right now.	No.	Not at the moment.	Not at the moment.	Not at the moment. Segment running to Midland area data center is newer
Do you provide enterprise, school, or government services?	They provide services to all three entities.	They provide services to all three entities.	They provide services to all three entities.	They provide services to all three entities.	They provide services to all three entities.
Are you involved in any public-private partnerships for rural or underserved	Not contractually in a P3, but they are involved in a regional ESC in Amarillo, Texas.	Yes – 1 is underway and 2 have been completed (Andrews, Texas and Strathmore, Texas)	Yes – they have a partnership with the State of Nevada.	Yes – and open to partnering locally/regionally	Yes – and open to partnering locally/regionally

	FiberLight	Windstream	Zayo	Dell Telephone	Big Bend Telecom
area expansion?					
Are there volume-based discounts for larger or long-term agreements?	Yes, but the financials of the project must be assessed.	They believe so, but this needs to be confirmed.	Yes, this is usually built into their rate cards.	Yes, but depends on the project	Yes, but the financials of the project must be assessed.
Are you open to partnership for last-mile (if not able to supply last-mile yourself)?	Yes, they are always open to it if it makes sense. They only provide last-mile to their enterprises and school districts. They do not do residential units and not usually small businesses.	Yes. If somebody wants last mile, they want to be the providers who supply it and not the ones who sell the infrastructure for somebody else to compete with them.	Yes, they are absolutely open to partnership. They are not a residential last-mile provider, but will provide last-mile services for critical institutions and enterprises.	Yes. Already a provider in Reeves County.	Not a major last-mile provider in Reeves County

If after completing all the steps above Reeves County still has questions on next steps, they should feel free to contact the Texas Broadband Development Office for assistance. Should the county wish to pursue a P3 agreement with any of the ISPs listed below, the county will need to:

- Utilize the information in this report to have a clear understanding of the unserved and underserved BSLs that are in relatively proximity to the ISP.
- Talk with the ISP contact listed above.
- Discuss if the ISP is interested in extending their network to serve the BSLs.
- Determine what the ISP needs to extend their network (Grant application support letters, assistance in permitting, etc.) to serve the identified BSLs.
- Based on the needs of the ISP, evaluate if the ISP request leads to the county requires the county to have some level of ownership or control in the network extension. For example, if the ISP requires additional funding (or use of County owned conduit or use of extra County owned fiber) from the county and the county is willing to provide that, the county will likely want to have some ownership, control or remuneration in the assets deployed in exchange for its investment.
- If the county does provide any investment in the network extension, the county will want to negotiate and formalize an agreement with the ISP (please refer to the business model section of this report). This could be in the form of a lease agreement (if the ISP is using County-owned conduit or spare fiber) or an ownership and revenue sharing agreement that is reviewed and approved by the county Attorney. In these types of arrangements, it is important to also define how operations and maintenance will be accomplished and paid for.

6 Workforce Development

This chapter presents both a quantitative and a qualitative analysis of broadband workforce conditions in Reeves County and a high-level overview of the framework of recommendations. The analysis and recommendations examine the county's labor force in the context of its regional planning area, identify the workforce development structures needed for broadband improvement, and suggest next steps to close any gaps that are found.

6.1 *Workforce Summary*

Despite a thriving housing market and increasing property taxes, Reeves County continues to face significant poverty, particularly in colonias and underserved areas. The county currently has limited job offerings in broadband-related occupations, with 22 of the 43 broadband occupations representing 10 or more jobs in the county. While broadband jobs in the region often require little to no postsecondary education, they do require extensive training and experience. Accessing this necessary training can be challenging for Reeves County residents since training partners are dispersed across the Permian Basin Regional Planning Commission (RPC) region and are often concentrated on the oil and gas sector.

Despite challenges to residents gaining the certifications, training, and experience needed to be qualified for broadband occupations, there are opportunities to leverage existing Reeves County assets. For example, local school districts can scale up existing and create new career and technical education (CTE) programs that are relevant to linking students to broadband career opportunities. Similarly, area industry partners like Delcom can partner with school districts and post-secondary training partners to ensure there is adequate training of their future workforce pipeline. Employers can also broaden and diversify their workforce by building awareness among underserved populations and addressing common barriers to employment.

For example, just south of the Permian Basin region in the Borderplex region, Big Bend Telephone Cooperative offers an apprenticeship program which equips the residents who participate with the skills needed for careers in broadband installation, network management, and telecommunications infrastructure maintenance. Employer partnerships like this can be leveraged to engage more residents in broadband career pathways and increase the workforce pool in the region.

Building Reeves County's broadband workforce means there must be active coordination between regional partners and leaders to understand the landscape and pool resources to meet workforce needs. Broadband service providers must be at the community table sharing their current and future workforce demands. Education partners from K-12, post-secondary, and technical training programs must collaborate with employers to establish and scale training programs to provide the supply of workers to meet the future workforce demand. Regional partners and training providers should engage with industry associations to develop the most up to date curriculum. Furthermore, accessing the workforce funding needed to bolster these countywide initiatives will require collaboration among workforce, education, regional, and employer partners.

6.2 *Quantitative Analysis and Findings*

The following section provides a quantitative analysis of the broadband workforce in Reeves County and surrounding region. In addition to definitions, it includes a baseline analysis of the identified broadband

occupations (employment trends, earnings, and demographics) and a pipeline analysis reflecting the demand for and supply of this workforce in the region.¹²

6.2.1 Definitions

This chapter relies on the following definitions which detail how the broadband workforce is defined, the federal standard used to classify occupations, and the geographies used for analysis.

6.2.1.1 Broadband Occupation Categories

The broadband workforce referenced throughout this report includes 43 occupations identified by the National Telecommunications and Information Administration (NTIA), Continuum Capital, and the Texas Digital Opportunity Plan.¹³ These occupations are grouped into three categories based on required education levels.¹⁴ Exhibit 33, Exhibit 34, and Exhibit 35 show the national distribution of the workforce in each occupation by broadband occupation category and by educational level.

- **Construction, Installation, and Support.** This segment of the broadband workforce is comprised of 18 occupations where workers tend to need a high school diploma or less.
- **Skilled Technicians.** This category encompasses 10 occupations where workers tend to need more education than a high school diploma, but less than a bachelor's degree.
- **Project Designers and Specialists.** The 15 occupations grouped under this category tend to require a bachelor's degree or higher.

6.2.1.2 Standard Occupational Classification System

The analyzed occupations are classified in accordance with the Standard Occupational Classification (SOC) system that is used by federal agencies to classify workers into occupational categories for statistical purposes.¹⁵

6.2.1.3 Geographies Used

The baseline and pipeline analyses rely on broadband workforce data by county and region. When available, county-level trends are highlighted. In many cases, however, a regional scope is preferable to gain a better understanding of the workforce landscape and its challenges because workers may commute across county lines to job sites and employers. The regions used in this series of reports are Texas councils of governments (or equivalents),¹⁶ which are collections of neighboring counties that have a shared economic and political interest. Texas councils of governments (COGs) served as stakeholders in this project and will continue to be critical to the implementation of any workforce recommendations. Reeves County is part of the Permian Basin Regional Planning Commission (RPC), which also includes Andrews, Borden, Crane, Dawson, Ector, Gaines, Glasscock, Howard, Loving, Martin, Midland, Pecos, Terrell, Upton, Ward, and Winkler Counties.

¹² All employment, earnings, and demographic data are sourced from the US Bureau of Labor Statistics via Lightcast 2024.3—QCEW Employees, Non-QCEW Employees, and Self-Employed.

¹³ *Internet for All: Workforce Planning Guide: Guidance for BEAD Program Eligible Entities*. US Department of Commerce, National Telecommunications and Information Administration (NTIA); *Broadband Market Workforce Needs: Research Summary*. 2024. Continuum Capital on behalf of the Fiber Broadband Association and Power and Communication Contractors Association; *Texas Digital Opportunity Plan, Appendix K: Building the Broadband Industry Workforce and Supporting Digital Skills for Texans*. 2024. Texas Broadband Development Office, Texas Comptroller of Public Accounts.

¹⁴ Typical education required estimated by the US Department of Labor (DOL), Employment and Training Administration (ETA), Occupational Information Network (O*NET) version 29.

¹⁵ Visit the US Bureau of Labor Statistics [Standard Occupational Classification page](#) to learn more.

¹⁶ For more information on Texas COG regions, visit the [Texas Association of Regional Councils](#).



Exhibit 33: Distribution of Broadband Occupations by Category and Typical Educational Requirements Nationally: Construction, Installation, and Support Occupations

SOC Code	Occupation Name/Description	High School (HS) or Less	More than HS, Less than 4-Year	Bachelor's or Higher
43-2021	Telephone Operators	97.8%	2.2%	0.0%
47-5022	Excavating, Loading Machine, and Dragline Operators, Surface Mining	94.3%	5.7%	0.0%
47-5023	Earth Drillers, Except Oil and Gas	87.8%	12.2%	0.0%
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	87.7%	8.3%	4.0%
47-2073	Operating Engineers and Other Construction Operators	83.1%	16.9%	0.0%
47-3013	Helpers—Electricians	81.5%	17.2%	1.3%
51-2098	Miscellaneous Assemblers and Fabricators	80.8%	13.9%	5.3%
53-3032	Heavy and Tractor-Trailer Truck Drivers	80.2%	19.8%	0.0%
51-4121	Welders, Cutters, Solderers, and Brazers	74.4%	24.7%	0.9%
49-9052	Telecommunications Line Installers and Repairers	72.7%	27.3%	0.0%
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	69.8%	30.2%	0.0%
49-9051	Electrical Power-Line Installers and Repairers	68.4%	28.8%	2.8%
47-2061	Construction Laborers	67.4%	32.6%	0.0%
51-2028	Electrical, Electronic, and Electrotechnical Assemblers	66.4%	33.3%	0.3%
49-1011	First-Line Supervisors—Mechanics and Installers	57.2%	33.2%	9.6%
47-1011	First-Line Supervisors—Construction Trades	57.2%	34.4%	8.4%
43-4051	Customer Service Representatives	54.8%	31.0%	14.2%
49-2022	Telecommunications Equipment Installers and Repairers	43.1%	39.5%	17.4%

Exhibit 34: Distribution of Broadband Occupations by Category and Typical Educational Requirements Nationally: Skilled Technicians

SOC Code	Occupation Name/ Description	High School (HS) or Less	More than HS, Less than 4-Year	Bachelor's or Higher
39-1022	First-Line Supervisors–Personal Service Workers	18.0%	71.7%	10.4%
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	32.3%	67.7%	0.0%
47-2111	Electricians	32.9%	65.8%	1.3%
17-3011	Architectural and Civil Drafters	15.6%	57.1%	27.3%
17-3019	Drafters, All Other	15.6%	57.1%	27.3%
17-3031	Surveying and Mapping Technicians	15.6%	57.1%	27.3%
49-2021	Radio, Cellular, and Tower Equipment Installers and Repairers	34.9%	55.4%	9.8%
17-3012	Electrical and Electronics Drafters	6.1%	51.4%	42.5%
17-3029	Engineering Technologists and Technicians, Except Drafters, All Other	37.0%	44.8%	18.2%
47-4011	Construction and Building Inspectors	38.7%	39.2%	22.1%

Exhibit 35: Distribution of Broadband Occupations by Category and Typical Educational Requirements Nationally: Project Designers and Specialists

SOC Code	Occupation Name/ Description	High School (HS) or Less	More than HS, Less than 4-Year	Bachelor's or Higher
17-2051	Civil Engineers	0.0%	3.0%	97.0%
19-5011	Occupational Health and Safety Specialists	0.0%	8.7%	91.3%
11-9021	Construction Managers	5.0%	5.0%	90.0%
17-2071	Electrical Engineers	0.0%	11.0%	89.0%
13-1051	Cost Estimators	4.6%	9.1%	86.4%
17-2072	Electronics Engineers, Except Computer	2.8%	12.0%	85.2%
13-1199	Business Operations Specialists, All Other	8.9%	17.6%	73.5%
15-1252	Software Developers	3.5%	29.8%	66.7%
15-1244	Network and Computer Systems Administrators	0.0%	37.5%	62.5%
13-1082	Project Management Specialists	17.5%	21.7%	60.7%
11-9179	Personal Service Managers, All Other	6.7%	33.0%	60.2%
19-5012	Occupational Health and Safety Technicians	9.5%	33.3%	57.1%
15-1241	Computer Network Architects	4.9%	41.2%	53.9%
15-1253	Software Quality Assurance Analysts and Testers	2.9%	44.1%	52.9%

SOC Code	Occupation Name/ Description	High School (HS) or Less	More than HS, Less than 4-Year	Bachelor's or Higher
41-3091	Sales Representatives of Services	25.6%	29.9%	44.6%

6.2.2 Broadband Baseline Analysis

The baseline analysis examines historical, existing, and projected employment by occupation across the broadband workforce categories. This approach establishes a foundational understanding of the labor market for each of the three broadband workforce categories to identify occupations that are well-supplied and growing and those that have few jobs or are declining. Additionally, occupational earnings and demographics are reviewed in the context of regional and benchmark trends at the state and national levels.

6.2.2.1 Permian Basin Regional Planning Commission Region

This section looks at the baseline analysis for the three broadband workforce categories for the Permian Basin RPC region. Exhibit 36, Exhibit 37, and Exhibit 38 include the total jobs in 2023, percentage change from 2013, and median earnings for each of the 43 occupations.

6.2.2.1.1 Construction, Installation, and Support

Most **Construction, Installation, and Support** occupations grew between 2013 and 2023 at rates at or above state and national rates for the same occupation. However, three occupations (telecom equipment installers and repairers at negative 2.1 percent, electrician helpers at negative 36.2 percent, and earth drillers-except oil and gas at negative 83.2 percent) are the exception to this trend where the number of jobs in the region was lower in 2023 than in 2013.

Over this same time period at the national level, telecom equipment installers and repairers saw a negative percent change of 22.8 percent, electrician helpers saw a positive percent change of 10.1 percent, and earth drillers-except oil and gas saw a negative percent change of 2.9 percent. These national trends are quite different than what the Permian Basin experienced. Because these occupations are not exclusive to the broadband industry and include other industries, the percent change in these jobs could be related to the fluctuation of other industries, such as oil and gas.

The key telecommunication and electrical installer and repairer occupations tend to earn more than the overall regional earnings levels across the board (i.e., the median earning for each of these is higher than the regional median earnings). However, this is not the case for the highest earners (average or below average earnings at the 75th and 90th percentiles). Earnings are especially high for lower management (supervisors) occupations in this category, who tend to earn substantially more across the board. The relatively high pay for supervisors and for occupations at the top end of the distribution of earnings may be, in part, due to the high concentration of oil and gas industry in this region, which tends to offer high compensation. Many of the occupations in this category (excluding the supervisors) tend to be held by younger workers, both compared to the region overall and to the same occupations across the state and the US.

6.2.2.1.2 Skilled Technicians

Employment trends for the **Skilled Technicians** category are similar to the **Construction, Installation, and Support** category, where most have grown at or above state and national rates. Two exceptions are architectural and civil drafters and radio tower equipment installers and repairers, which saw stagnant or declining employment between 2013 and 2023.

Engineering technicians, electrical and electronics drafters, and other drafting occupations tend to pay better than the region overall at all earning levels. These two drafting occupations also tend to be held by

younger workers, both compared to the region overall and to state and national levels for the same occupation.

6.2.2.1.3 Project Designers and Specialists

Most **Project Designers and Specialists** and specialist occupations tended to grow faster or at a similar pace to the state and nation over the 2013 to 2023 period. Three exceptions to this trend are network and computer systems administrators, computer network architects, and electronics engineers (except computers), all of which declined from 2013 to 2023. The occupations in this category generally tended to pay better than the region overall, except for personal service managers.

Exhibit 36: Baseline Analysis for Broadband Occupations in the Permian Basin RPC Region: Construction, Installation, and Support Occupations

SOC Code	Occupation Name/Description	Total Jobs 2023	Percent change from 2013	Median Earnings
53-3032	Heavy and Tractor-Trailer Truck Drivers	11,810	37.50%	\$52,798
47-1011	First-Line Supervisors, Construction and Extraction	5,142	64.50%	\$74,892
47-2061	Construction Laborers	4,654	64.30%	\$37,418
53-7062	Laborers and Material Movers, Hand	4,081	33.10%	\$37,523
43-4051	Customer Service Representatives	2,762	63.60%	\$37,322
47-2073	Construction Equipment Operators	2,473	59.40%	\$50,259
49-1011	First-Line Supervisors of Mechanics and Repairers	2,298	>100.0%	\$78,744
51-4121	Welders, Cutters, Solderers, and Brazers	2,187	9.10%	\$55,968
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	1,807	50.00%	\$47,492
51-2098	Miscellaneous Assemblers and Fabricators	1,003	38.70%	\$42,244
49-9051	Electrical Power-Line Installers and Repairers	949	>100.0%	\$62,797
49-2022	Telecom Equipment Installers and Repairers	302	-2.10%	\$53,855
47-5022	Excavating and Loading Machine Operators, Surface	266	36.90%	\$50,037
49-9052	Telecommunications Line Installers and Repairers	247	35.10%	\$59,402
51-2028	Electrical, Electronic, and Electromechanical Assemblers	220	>100.0%	\$44,235
47-3013	Helpers--Electricians	212	-36.20%	\$44,960
47-5023	Earth Drillers, Except Oil and Gas	48	-83.20%	\$52,994
43-2021	Telephone Operators	<10	—	—

Exhibit 37: Baseline Analysis for Broadband Occupations in the Permian Basin RPC Region: Skilled Technicians

SOC Code	Occupation Name/Description	Total Jobs 2023	Percent change from 2013	Median Earnings
47-2111	Electricians	2,561	49.00%	\$57,903

49-3042	Mobile Heavy Equipment Mechanics, Except Engines	1,446	91.50%	\$59,962
47-4011	Construction and Building Inspectors	295	>100.0%	\$58,492
17-3031	Surveying and Mapping Technicians	271	19.70%	\$51,565
17-3029	Engineering Technicians, Except Drafters, All Other	253	41.20%	\$71,619
39-1022	First-Line Supervisors of Personal Service Workers	187	68.40%	\$39,965
17-3011	Architectural and Civil Drafters	174	-10.20%	\$55,874
17-3019	Drafters, All Other	45	>100.0%	\$55,330
17-3012	Electrical and Electronics Drafters	44	55.60%	\$91,953
49-2021	Radio Tower Equipment Installers and Repairers	10	-74.60%	\$46,825

Exhibit 38: Baseline Analysis for Broadband Occupations in the Permian Basin RPC Region: Project Designers and Specialists

SOC Code	Occupation Name/Description	Total Jobs 2023	Percent change from 2013	Median Earnings
41-3091	Sales Reps, Miscellaneous Services	2,632	63.40%	\$81,994
11-9021	Construction Managers	1,619	90.80%	\$99,780
13-1082	Project Management Specialists	1,357	>100.0%	\$94,003
13-1199	Business Operations Specialists, All Other	939	>100.0%	\$78,221
19-5011	Occupational Health and Safety Specialists	845	94.70%	\$82,405
15-1252	Software Developers	534	>100.0%	\$117,261
17-2051	Civil Engineers	483	85.00%	\$82,035
13-1051	Cost Estimators	396	36.50%	\$73,158
15-1244	Network and Computer Systems Administrators	314	-2.70%	\$87,932
17-2071	Electrical Engineers	276	23.80%	\$103,911
19-5012	Occupational Health and Safety Technicians	175	53.20%	\$55,352
15-1241	Computer Network Architects	98	-2.70%	\$120,123
15-1253	Software Quality Assurance Analysts and Testers	75	>100.0%	\$102,470
17-2072	Electronics Engineers, Except Computer	61	-38.00%	\$117,401
11-9179	Personal Service Managers, All Other	29	>100.0%	\$22,027

6.2.2.2 Reeves County

Reeves County has seen strong overall employment growth since 2013, increasing by 75 percent over 10 years. This trend is repeated in most of the broadband occupations.

Most of the broadband occupations also had at least some jobs in the county in 2013, as seen in Exhibit 39, Exhibit 40, and



Exhibit 41. However, only 3 of the 10 **Skilled Technician** occupations had at least 10 jobs in 2013 (electricians, mobile heavy equipment mechanics-except engines and construction and building inspectors) and only 7 of the 15 **Project Designer and Specialist** occupations.

Exhibit 39: Reeves County Broadband Workforce Occupations with at least 10 jobs in 2023: Construction, Installation, and Support Occupations

SOC Code	Occupation Name/Description	Total Jobs 2023	Percent change from 2013	Median Earnings
53-3032	Heavy and Tractor-Trailer Truck Drivers	534	>100.0%	\$54,587
47-2061	Construction Laborers	248	>100.0%	\$39,696
47-1011	First-Line Supervisors, Construction and Extraction	174	>100.0%	\$70,855
47-2073	Construction Equipment Operators	139	>100.0%	\$52,216
53-7062	Laborers and Material Movers, Hand	125	>100.0%	\$38,953
49-1011	First-Line Supervisors of Mechanics and Repairers	64	>100.0%	\$78,692
43-4051	Customer Service Representatives	58	>100.0%	\$37,134
51-4121	Welders, Cutters, Solderers, and Brazers	46	>100.0%	\$50,810
49-9051	Electrical Power-Line Installers and Repairers	34	78.70%	\$69,322
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	32	>100.0%	\$53,560
47-5022	Excavating and Loading Machine Operators, Surface	18	>100.0%	\$51,097
49-2022	Telecom Equipment Installers and Repairers	11	>100.0%	\$68,917

Exhibit 40: Reeves County Broadband Workforce Occupations with at least 10 jobs in 2023: Skilled Technicians

SOC Code	Occupation Name/Description	Total Jobs 2023	Percent change from 2013	Median Earnings
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	44	>100.0%	\$59,731
47-4011	Construction and Building Inspectors	17	>100.0%	\$67,852

Exhibit 41: Reeves County Broadband Workforce Occupations with at least 10 jobs in 2023: Project Designers and Specialists

SOC Code	Occupation Name/ Description	Total Jobs 2023	Percent change from 2013	Median Earnings
41-3091	Sales Reps, Miscellaneous Services	59	>100.0%	\$71,864
11-9021	Construction Managers	48	>100.0%	\$97,728
13-1082	Project Management Specialists	33	>100.0%	\$95,730
13-1199	Business Operations Specialists, All Other	19	-12.80%	\$84,566
19-5011	Occupational Health and Safety Specialists	18	>100.0%	\$84,260
17-2051	Civil Engineers	14	>100.0%	\$73,694
13-1051	Cost Estimators	10	>100.0%	\$76,559

6.2.3 Broadband Pipeline Analysis

This section analyzes the demand and supply of the broadband pipeline based on the 43 defined broadband occupations.

6.2.3.1 Demand Alignment

Demand for the broadband workforce is estimated by reviewing regional job postings for occupations within each category over a five-year period. To exclude demand from industry sectors not related to broadband deployment and maintenance, these job postings are from employers that fall into the broad construction, utilities, and information sectors.¹⁷

6.2.3.1.1 Construction, Installation, and Support

The 10 most in-demand occupations in the **Construction, Installation, and Support** category over the last five years accounted for 94 percent of the 2,784 job postings in this category in the region Exhibit 42. Though many of the occupations in this category have relatively high turnover rates, this region has a higher overall turnover rate (6.5 percent) compared to the state (5.5 percent) or nation (5.4 percent) due, in part, to the concentration of oil and gas industry in the area, which tends to be highly cyclical.

Other factors that impact retention are workforce barriers such as access to affordable childcare, housing, and transportation, all of which become increasingly sparser in less urban regions. Therefore, it is critical that as ISPs develop training programs with K-12, higher education, and training partners they also learn about the common barriers to employment regionally from their education and workforce partners and collaborate to develop a retention toolkit in order to retain high-skilled employees.

More than 98 percent of job postings for **Construction, Installation, and Support** that listed education requirements requested only a high school diploma or GED education, which is consistent with the expected required education levels that define this category.

Machinery, construction, power tool operations, heavy equipment, electrical transformers, and high voltage are some of the most-requested specialized skills in this category. Journeyman Lineman and OSHA certifications were also frequently requested.

Exhibit 42: In-Demand Occupations in Construction, Installation and Support in the Permian Basin RPC Region

¹⁷ All job postings demand data are sourced from Lightcast 2024.3—QCEW Employees, Non-QCEW Employees, and Self-Employed.

SOC Code	Occupation Name/Description	Job Postings	Percent of Total	Turnover Rate
53-3032	Heavy and Tractor-Trailer Truck Drivers	409	14.70%	6.50%
47-2073	Construction Equipment Operators	381	13.70%	7.20%
49-9051	Electrical Power-Line Installers and Repairers	352	12.60%	7.50%
47-2061	Construction Laborers	307	11.00%	6.60%
53-7062	Laborers and Material Movers, Hand	245	8.80%	8.80%
47-1011	First-Line Supervisors, Construction and Extraction	244	8.80%	5.90%
49-2022	Telecom Equipment Installers and Repairers	242	8.70%	5.50%
49-9052	Telecommunications Line Installers and Repairers	173	6.20%	7.00%
49-1011	First-Line Supervisors of Mechanics and Repairers	144	5.20%	5.30%
43-4051	Customer Service Representatives	122	4.40%	7.60%

6.2.3.1.2 Skilled Technicians

Electricians were the most in-demand occupation in this category by far, accounting for more than 40 percent of the 505 **Skilled Technicians** job postings over the last five years. Electricians were followed by mobile heavy equipment mechanics, engineering technicians, and construction and building inspectors, which collectively accounted for 89 percent of all job postings in the category.

Only about one-half of **Skilled Technicians** job postings listed an education requirement, and those that did tended to only request a high school diploma or GED. However, more than 70 percent of occupations that listed experience requested between 2 and 6 years of relevant work experience. Considering that 40 percent of the job postings were for electricians—an occupation that trains through apprenticeships instead of traditional education paths—and the relatively high experience requirements, it is likely that these **Skilled Technicians** occupations require more training than the **Construction, Installation, and Support** category, though that training may not result in traditional education credentials.

Electrical wiring and systems, heavy equipment and machinery, and blueprinting were among the most in-demand specialized skills for **Skilled Technicians** occupations, along with journeyman electrician and OSHA certifications.

Exhibit 43: In-Demand Skilled Technician Occupations in the Permian Basin RPC Region

SOC Code	Occupation Name/Description	Job Postings	Percent of Total	Turnover Rate
47-2111	Electricians	205	40.60%	6.10%
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	85	16.80%	4.70%
17-3029	Engineering Technicians, Except Drafters, All Other	82	16.20%	5.00%
47-4011	Construction and Building Inspectors	79	15.60%	7.30%
17-3031	Surveying and Mapping Technicians	23	4.60%	7.90%

6.2.3.1.3 Project Designers and Specialists

The top seven most in-demand occupations account for more than 88 percent of the 1,209 **Project Designers and Specialists** job postings (Exhibit 44). Nearly all of these are associated construction management and engineering services. While there was some demand for computer service occupations (i.e., software developers, computer network architects, network and computer systems admins.), these accounted for less than five percent of job posting demand over the five-year period. The occupations in this category tended to have average or below-average turnover rates, suggesting that the jobholders tend to stay with their employer about the same or even longer than the average job.

More than 45 percent of **Project Designers and Specialists** job postings that listed education requirements requested a bachelor's degree or higher, and more than half (54 percent) asked for at least four years of relevant work experience among those that listed experience requirements. These requests are consistent with the high education credentials that are typically expected of these occupations.

Verizon Communications and AST Space Mobile, a satellite-based broadband company, are among the major employers who posted for the most jobs in this category, together accounting for more than 12 percent of job postings over the five-year period.

The most in-demand specialized skills among **Project Designers and Specialists** job postings includes project management, subcontracting, construction management, and OSHA compliance—all indicative of the concentration in construction and engineering management roles in this category.

Exhibit 44: In-Demand Project Designers and Specialists Occupations in the Permian Basin RPC Region

SOC Code	Occupation Name/Description	Job Postings	Percent of Total	Turnover Rate
11-9021	Construction Managers	289	23.90%	3.90%
41-3091	Sales Reps, Miscellaneous Services	229	18.90%	6.80%
13-1082	Project Management Specialists	187	15.50%	4.90%
19-5012	Occupational Health and Safety Technicians	153	12.70%	7.90%
17-2051	Civil Engineers	96	7.90%	4.00%
19-5011	Occupational Health and Safety Specialists	72	6.00%	6.80%
13-1051	Cost Estimators	41	3.40%	6.80%
15-1241	Computer Network Architects	36	3.00%	2.80%
17-2071	Electrical Engineers	33	2.70%	2.90%
15-1244	Network and Computer Systems Administrators	20	1.70%	2.90%

6.2.3.2 Supply Alignment

Regional supply of the broadband workforce is measured by a combination of accredited program completions, active apprenticeships, and available high school career and technical education programs. Though the relationship between educational pathways and occupations is not one-to-one, the reviewed programs give a sense of the supply of workers with credentials and skills relevant to the broadband

workforce. Occupations with a limited or declining supply of talent in the region are especially important to consider in preparation for the needs of future broadband development.¹⁸

6.2.3.2.1 Construction, Installation, and Support

There were less than 150 completions related to construction supervisors in the region in 2023. Howard College has been the main source of these programs over the last 10 years, though interest has declined from 2021 when there were more than 400 completions. Odessa College has had related programs in the past, but more recently conferred more completions in programs oriented towards mechanic and installer supervisory roles instead of construction trades. There were also construction management and inspection CTE programs in Big Spring and Fort Stockton Independent School Districts (ISDs) that generated some interest among high schoolers which could help generate supply for these occupations in the long-term. Many ISDs in the region have welding CTE programs—they are especially popular in Big Spring and Ector County. Though there was not high demand for welders in the broadband job postings analysis, these, too, could generate interest in the field and contribute to long-term supply.

Both Odessa College and Midland College have consistently conferred completions in programs related to mechanic and installer supervisory roles and electrical, electronic, and electromechanical assemblers, though these were not as in-demand based on the job postings of broadband-oriented sectors over the last five years.

Midland College has consistently offered a system and networking management program that has gained popularity since 2021, conferring more than 500 awards in 2023. This could help drive a supply of telecommunications equipment installers and repairers in the region.

Construction, Installation, and Support occupation apprenticeships in the region are mostly concentrated in telecommunications line installers and repairers and electrical power-line installers and repairers. In 2023 there were more than 150 active apprentices in these two occupations living in the region. There were also nearly an additional 70 apprentices who trained in the region in 2023, but these apprentices live elsewhere and may not contribute to the regional talent supply.

6.2.3.2.2 Skilled Technicians

Programs related to mechanic and installer supervisory roles and electrical, electronic, and electromechanical assemblers also can apply to engineering technologists and technicians and radio, cellular, and tower equipment installers and repairers. Midland College, Odessa College, Howard College, and the University of Texas Permian Basin (UT Permian Basin) all have related programs that have consistently conferred around 1,000 awards annual over the last 10 years. This includes programs training electrical and electronics equipment installation and repair technicians, electromechanical engineering technicians, industrial electronics technicians, and industrial technicians.

The number of active electrician apprentices in the region is very low with less than 20 active in 2023. There were more (30), though still few, electrician apprentices who trained in the region but lived elsewhere in 2023. Though there are also two electrical CTE programs in Big Spring and Fort Stockton ISDs, these combined with the active apprentices show a stark contrast between supply and demand for qualified electricians in the region.

¹⁸ Accredited program completion data are sourced from the National Center for Education Statistics (NCES), Integrated Postsecondary Education Data System (IPEDS) via Lightcast 2024.3—QCEW Employees, Non-QCEW Employees, and Self-Employed. Data on apprenticeships are sourced from the US Department of Labor, Registered Apprenticeship Partners Information Database System (RAPIDS). Data on CTE programs are sourced from the Texas Education Agency (TEA).

6.2.3.2.3 Project Designers and Specialists

Odessa College offers an occupational safety and health technician program that awarded 650 completions in 2023. This contributes to the supply of occupational health and safety technicians and Specialists, two in-demand **Project Designers and Specialists** occupations, though the number of completions has varied from year to year (between 500 and 1,000 over the 10-year period).

Odessa College, Midland College, and Howard College offer some general engineering and pre-engineering programs that have had some success with more than 270 completions together in 2023. While these may contribute to the supply of civil and electrical engineers in the long-term, they are not specialized programs that would directly increase the number of candidates for these positions. UT Permian Basin also offered an electrical and electronics engineering program that saw more than 120 completions in 2023, which may grow to provide a greater supply of electrical engineers.

6.3 Qualitative Analysis

The qualitative analysis includes a collection of community workforce development assets found in the county and across the region. This section also includes findings from stakeholder engagement conducted with regional partners and broadband providers in the county.

6.3.1 Community Assets

While Reeves County has access to ample funds due to the oil and gas industry regionally, there are few existing efforts to build the broadband workforce. Reeves County is part of the larger Permian Basin RPC region which has a number of assets that can be leveraged to implement strategies related to building the broadband workforce. Assets are grouped and listed in Exhibit 45. Regional planning groups, including the council of government and workforce development board were identified through online research. Postsecondary institutions and K-12 institutions were identified through online research, the Integrated Postsecondary Education Data System, and the Texas Education Agency. The alignment of training efforts between these institutions and industry employers is critical to building the broadband workforce pipeline in the county.

Exhibit 45: Regional and County Workforce Development Assets

Category	Assets
Regional Planning Groups	Permian Basin Regional Planning Commission, Workforce Solutions Permian Basin
Postsecondary Institutions	Odessa College, Midland College, Howard College, Southwest College for the Deaf, The University of Texas Permian Basin, Kaplan College-Midland
K-12 Institutions	County school districts: Balmorhea ISD and Pecos-Barstow-Toyah ISD

6.3.2 Stakeholder Engagement Findings

Stakeholder engagement conducted with regional partners and broadband providers in the county led to several takeaways that informed the recommendations in 6.4. Interviews were conducted with Workforce Solutions Permian Basin, Permian Basin Regional Planning Commission, FiberLight, Windstream, and Zayo. Interviews addressed the following areas for the county and greater region: hiring needs, education and training, employment barriers, and awareness.

6.3.2.1 Hiring Needs

Stakeholders were asked to share their hiring practices and to identify broadband jobs that are hardest to fill regionally.

- Companies mentioned attempting to hire locally where they can and tracking hires from underserved communities such as veterans, women, and minorities. However, since West Texas is such an expansive region, employers more often look for regional hires that can cover a larger area, rather than local hires.
- Companies mentioned that difficulty filling jobs is often not specific to the role they are filling but rather to the geography for the job, implying that more isolated areas are difficult to hire qualified workforce to serve that area.
- Companies discussed the generational challenge around recruiting workers for construction jobs and roles that require being outside and getting dirty.

6.3.2.2 Education and Training

Stakeholders shared their knowledge about education and training providers offering broadband career training courses or certificates regionally.

- Companies shared that they often train their employees internally, partially due to the dearth of training options and providers found regionally.
- Companies do not currently work with local schools or training providers but are eager to have the conversation about how they can engage more with schools to build their future workforce pipeline.
- Education and training providers in the region like Odessa College, Midland College, and Howard College have some related programming but do not offer specialized broadband career tracks.

6.3.2.3 Employment Barriers

Stakeholders discussed the most common barriers residents face when seeking employment.

- Housing is an ongoing problem, as it is everywhere, making it hard for workers to find affordable places to live near job sites.
- Transportation is another issue, as limited public transit means many workers must travel long distances, which can be a struggle without reliable vehicles. While areas of the county are traversable by bike or pedestrian, it is dangerous, making it challenging to access community assets.

6.3.2.4 Awareness

Stakeholders were asked to share suggestions on how to build awareness around broadband career opportunities across the county.

- Awareness can be promoted through conducting community outreach and career fairs, so residents and job seekers are aware of the career opportunities within the sector.
- Connecting employers with training providers and developing more training programs within the school districts and among postsecondary partners would increase awareness of high-demand career opportunities in the broadband sector.
- There are several community spaces that are ripe for developing a diverse broadband workforce. Spaces include Jolene's House, community spaces in colonias, Bessie Haynes Recreation Center, and Balmorhea Community Center.

6.4 Strategic Recommendations

Recommendations for improving the broadband workforce in Reeves County center on five areas: collaboration, alignment, awareness, diversification and funding.



6.4.1 Collaboration

Collaborate with internet service providers to understand in-demand occupations, skills, and training credentials in real time.

- Engage with ISPs and other regional employers with IT workforce needs regularly through an Employer Advisory Council with shared commitment to building and diversifying the broadband workforce, meeting industry demands, and driving learning and training opportunities.
- Identify what employers currently need and what they anticipate needing for workforce demand and understand their experience recruiting in the past in other service areas and how they plan to meet their workforce needs locally in the future.
- Validate the data for workforce needs by occupation, skillsets, timing, and training requirements.
- Build strong collaborations regionally and locally between ISPs, such as Delcom, and workforce development partners and training providers. Regional collaboration leads to coordination, rather than competition, with peer communities in the region ensuring all partners are working together to solve workforce challenges and provide training (working with COGs, workforce development boards, county judges, community colleges, school districts).

6.4.2 Alignment

Align training curriculum between workforce development entities and in-demand skills that lead to industry-recognized credentials by employers.

- Ensure area school districts have access to county-level and regional broadband workforce data to inform the development of career and technical education programming (CTE).
 - Establish broadband related CTE programs, such as an electrical program, and scale up existing programs like the welding CTE program at Pecos-Barstow-Toyah ISD. Create a specific broadband career track for the most in-demand broadband occupations so students understand how these CTE programs connect to specific sector jobs.
 - Recruit students from related local CTE programs to consider careers in broadband.
 - Launch internship and pre-apprenticeship programs to prepare young individuals to enter and succeed in registered apprenticeship programs in the broadband field. Partner with Delcom to launch such programs locally with students in Reeves County.
 - Invite area ISPs to participate in local and regional training program courses to share more about their companies and offer students practical advice.
- Partner with post-secondary education providers to create technical and higher education programs of study that feed into broadband careers.
 - Consider developing and scaling up telecommunications components at institutions like Odessa College, Howard College, and Midland College, in order to quickly train broadband professionals.
 - Create bridges between CTE, training providers, and higher education institution programs for stackable credentials.
 - Connect students from local and regional training programs with local and regional broadband providers to connect students to job placement opportunities in real time.
- Understand the local and regional landscape of industry-led certifications and the avenues for pursuing those private educational training program opportunities.
 - Partner with industry associations, like NTCA, to establish a process to evaluate progress and ensure that all local and regional broadband training programs have the flexibility to adapt to meet the current needs of the broadband sector by measuring 1) program completion/graduation, 2) credential attainment, 3) job placement, 4) wage level, and 5) job retention.

- Develop programming to target adult workers interested in upskilling, reskilling, or advancing with in the broadband profession.
 - Identify local, regional, and national partners who can help establish training and apprenticeship programs, including internet service providers, industry associations, technical and community colleges, and state and local workforce development agencies. Partners should include local providers like Delcom, FiberLight, Windstream, and Zayo.
 - Ensure apprenticeship programs are part of a clearly articulated professional pipeline that allows for continued employment and growth. Partner with Delcom to launch such programs locally with residents in Reeves County.
 - Offer continuing education opportunities like professional development courses, workshops, and webinars to meet the future changing skills the workforce will need.
- Incorporate soft skill training into curriculum in order to ensure job seekers are competitive for employment opportunities and advancement.

6.4.3 Awareness

Raise greater awareness and exposure to the quality career opportunities in the broadband industry.

- Launch public awareness campaigns that inform residents about the local career-oriented job opportunities linked to broadband expansion and the workforce development avenues to access those high-demand jobs.
- Invite parents, families, teachers, and school counselors to participate in events that help expose young people to careers in broadband, including externship opportunities with local ISPs for local educators.
- Target adult learners who are looking to upskill or reskill (e.g., integrated education and training models that allow workers to build basic skills like ESL in the context of learning a technical skill).
- Collaborate with trusted community organizations to reach individuals who may face barriers to participation in the broadband workforce, such as rural or isolated residents who have challenges accessing training or underrepresented groups.

6.4.4 Diversification

Diversify talent pipelines and ensure broadband career pathways are accessible.

- Actively recruit underrepresented groups such as women and people of color.
- Utilize community spaces, like Jolene's House, Bessie Haynes Recreation Center, Balmorhea Community Center, and community spaces in colonias to train a diverse broadband workforce, targeting women and minority learners.
- Target veterans whose technical skills can be retrained for broadband and offer transitional programming and training.
- Adopt a detailed prescreening application process for students interested in broadband workforce development training to identify any barriers to training completion (such as childcare, transportation, or housing) and offer wraparound supports accordingly.
- Partner with broadband providers to offer mobile training opportunities for job seekers with transportation challenges.

6.4.5 Funding

Identify and pursue public regional, state, and federal funding resources to scale and sustain broadband workforce development programs.

- Utilize state funding opportunities like the Jobs and Education for Texans (JET) Grant Program which allows CTE programs to utilize up-to-date equipment in the classroom, better preparing students for real work environments.
- Apply for the Skills Development Fund which helps businesses train and retrain workers through partnerships with public community or technical colleges, workforce boards, or the Texas AandM Extension Service.
- Foster collaboration between workforce development boards and Type A or Type B economic development corporations for training through the High Demand Job Training Grant Program.
- Seek funding through the Lone Star Workforce of the Future Fund which provides public community or technical colleges and nonprofit organizations with up to \$250,000 to help train workers in high-demand occupations.
- Ensure area training providers have applied for the eligible training provider list through the Texas Workforce Commission to access Workforce Innovation and Opportunity Act (WIOA) funds for eligible students.

7 Digital Opportunities Strategy and Needs Identification

7.1 Texas Digital Opportunity Plan Summary

In March of 2024, the NTIA accepted the Texas Digital Opportunity Plan (TDOP)—the shaping of this report focused strongly on unserved and underserved populations across the state. According to the US Census Bureau, Texas ranks 32 out of 50 for internet adoption.¹⁴ To bridge the digital divide, the TDOP’s purpose seeks to navigate non-infrastructure related digital opportunity investments and provide insight and strategies to deploy Capacity Grant funds from the NTIA over the next five years (See Section 8.1.1 on the Digital Equity Act). The BDO disseminated surveys, organized a statewide listening tour, and convened working groups and task forces. The insights gained from these engagement efforts significantly influenced the development of the TDOP’s goals and strategies. The TDOP’s vision for *digital opportunity* is stated as such,

‘Improve quality of life and promote economic growth by enabling fast, reliable and affordable broadband connectivity for all residents and businesses of Texas, promoting universal broadband adoption and providing access to digital skills development.’¹⁵

The report encompasses the state policy priorities and efforts in various areas including economic and workforce development, education, health, and business. To track these outcomes, they use the NTIA’s categories of measurable objectives:

- (1) the availability of, and affordability of access to, fixed and wireless broadband technology;
- (2) the online accessibility and inclusivity of public resources and services;
- (3) digital literacy;
- (4) awareness of, and the use of, measures to secure the online privacy of, and cybersecurity with respect to, an individual; and
- (5) the availability and affordability of consumer devices and technical support for those devices.

The TDOP is also designed to reach people who have historically faced barriers in terms of digital opportunity. The Digital Equity Act of 2021 refers to these groups as ‘Covered Populations,’ and outlines a certain percentage of grant funds to be distributed to these Covered Populations in proportion to the total number of individuals. These population groups include veterans, immigrants, low-income households, and others—almost 86 percent of the state of Texas falls within one of the Covered Populations, with the largest category within the Covered Populations being Racial/Ethnic Minorities (58.1 percent).

7.2 An Ecosystem Approach

The framework for understanding digital opportunity is multifaceted and encompasses the interconnected systems of technology, policies, institutions, resources, and communities that create opportunities for every participant to leverage broadband for growth, innovation, and inclusion. Ecosystems encourage collaboration and help drive economic development, enhance education, and promote inclusion. The term ‘digital opportunity ecosystems’ as defined by the National Telecommunications and Information Administration (NTIA) states--

‘A digital opportunity ecosystem is a combination of programs and policies that meets a geographic community’s unique and diverse needs. Coordinating entities work together in an ecosystem to address all aspects of digital divide, including affordable broadband, devices, and skill.’⁵

With an ecosystem approach, multiple organizations and/or informal groups are relied on to assimilate new users into digital adoption and share resources, social norms, practices, and support related to using these technologies.⁶

According to the Federal Communications Commission (FCC)⁷, three core pillars must be addressed to bridge the digital divide and achieve digital opportunity — availability, affordability, and adoption.⁸

- **Availability:** Is there sufficient infrastructure and coverage to deliver reliable, high-speed wired or wireless broadband service and technology tools for learning?
- **Affordability:** Can learners and families/caregivers pay for the total cost of maintaining reliable, high-speed broadband service and technology tools for learning?
- **Adoption:** Do learners and families/caregivers have the information, support, and skill to obtain regular, adequate access to reliable, high-speed broadband service and technology tools for learning?

The Office of Minority Broadband Initiative’s FY2023 Annual Report states that a part of expanding access to broadband (as a part of the initiative’s authorizing legislation) means collaborating with anchor institutions and their stakeholders to achieve digital opportunity within the anchor community. ‘Anchor institutions, specifically Institutions of Higher Education (IHEs), are force-multipliers for expanding broadband access, building partnerships, and leading communities toward economic growth and community vitality (U.S. Department of Housing and Urban Development, 2013).’⁹ Additionally, the TDOP’s primary strategies to address the needs and barriers of unserved/underserved emphasize partnering with and funding statewide organizations and funding local partners. Investment and collaboration with existing community anchor institutions and public-private partnerships is one of the best strategies for bridging the digital divide.

It is recommended to use the Technical Assistance Program Report as a supplement to develop a more robust digital opportunity plan. The methodology should be customized to align with the specific characteristics of the region and the community’s definition of success. While quantitative insights can be derived from data and coverage maps, incorporating multiple qualitative data sources may be necessary to fully understand local needs. Tailored strategies should be applied based on the unique requirements and context of each community. The overarching objective of digital equity is to ensure access to high-speed broadband, technology devices, IT support, and digital literacy education, with a focus on inclusivity.

7.3 *Digital Equity Act Funding*

7.3.1 **Digital Equity Act Summary**

The Digital Equity Act (DEA) requires the National Telecommunications and Information Administration (NTIA) to establish grant programs for promoting digital equity, supporting digital inclusion activities, and building capacity for state-led efforts to increase adoption of broadband by their residents.¹² The Digital Equity Act provides \$2.75 billion to establish three grant programs that promote digital equity and inclusion. The following programs listed aim to ensure that all people and communities have the skills, technology, and capacity needed to reap the full benefits of our digital economy.¹³

- **State Digital Equity Capacity Grant Program:** A \$1.44 billion formula grant program to make distributions to states based on their populations, demographics, and availability and adoption of broadband.
 - On May 9, 2025, states and territories were notified by the federal government on its decision to terminate the State Digital Equity Capacity Grant Program (SDECGP), a component of the Infrastructure Investment and Jobs Act passed in 2021. This decision

affects Texas' allocation of \$55.6 million through the SDECGP earmarked for implementing programs aligned with the Texas Digital Opportunity Plan.

- In absence of these federal funds, the BDO will leverage the state's Broadband Infrastructure Fund to design programs and support initiatives that will ensure all Texans have access to affordable broadband and devices as well as the essential digital literacy skills needed to fully participate in the modern economy.¹⁹
- **Digital Equity Competitive Grant Program:** A \$1.25 billion grant program supporting efforts to achieve digital equity, promote digital inclusion, and stimulate adoption of broadband.
- **State Digital Equity Planning Grant Program:** A \$60M formula grant program for states, territories and tribal governments to develop digital equity plans.

7.4 Broadband Funding

7.4.1 Broadband, Equity, Access, and Deployment Program Summary

Funded by the Bipartisan Infrastructure Law, BEAD is a federal grant program that aims to get all Americans online by funding partnerships between states or territories, communities, and stakeholders to build infrastructure where we need it to and increase adoption of high-speed internet. BEAD prioritizes **unserved** locations that have no internet access or that only have access under 25/3 Mbps and **underserved** locations that only have access under 100/20 Mbps.¹⁶

Congress split BEAD funding into three formula-based allocations: minimum, high-cost, and remaining funds. The minimum allocation to states, Washington, D.C., and Puerto Rico will be \$100 million each; other U.S. territories will receive minimum allocations of \$25 million. On June 26, 2023, the NTIA announced Texas' allocation totaling \$3.3 billion in federal funding for the BEAD Program.¹⁷ This is the largest broadband funding opportunity. Eligible BEAD Subgrantees include co-ops, nonprofits, public private partnerships, private companies, utilities, public utility districts, or local government.

The Texas BDO's BEAD Challenge Process begins in December 2024 and the application process will open in 2025. The project area unit for each application will utilize census tracts for the project design.

7.5 Funding Opportunities Table

There are several programs for the county to consider applying for or partnering with on an application. These include the following programs administered through the Texas BDO, United States Department of Agriculture (USDA), and NTIA. There are a range of factors for consideration, including match requirements, eligible areas, partnership agreements, and other key criteria, which would impact which funding source(s) should be applied for and leveraged collectively to bring as much funding to the Region as possible.

Exhibit 46: Funding Opportunities Table

Grant Program	Funding Agency	Description	Timeline	Total Allocation
State Digital Equity Capacity Grant Program	National Telecommunications and Information Administration (NTIA)	States to implement plans and promote digital inclusion; additionally, the program funds an	Winter 2024 – April 2025	Texas' tentative award allocation is \$55.6 million.

¹⁹ Texas Comptroller of Public Accounts. (n.d.). *Outreach: News and events*. Texas Broadband Development Office. <https://comptroller.texas.gov/programs/broadband/outreach/news.php>

Grant Program	Funding Agency	Description	Timeline	Total Allocation
		annual grant program for five years.		
Digital Equity Competitive Grant Program	National Telecommunications and Information Administration (NTIA)	Awards will focus on addressing the needs of the Covered Populations not met by the Capacity Grant Program and will strive for a diverse pool of recipients.	Fall 2024	\$1.25 billion
Broadband Equity, Access, And Deployment (BEAD) Program	National Telecommunications and Information Administration (NTIA)	Through state allocation and planning, this program intends to expand high-speed internet access by funding planning, infrastructure deployment and adoption programs.	2025 Challenge Process: December 3-17, 2024	\$42.5 billion under IJA. Texas was allocated \$3.3 billion. State BDO call for projects in Summer 2024. NTIA approval of State plan anticipated spring 2025.
Texas Proposition 8: Broadband Infrastructure Fund Amendment	State of Texas, administered by the Texas Comptroller	HB 9 created the Texas Broadband Infrastructure Fund (BIF) administered by the comptroller. Funds in the BIF only used for expanding broadband and telecommunications across the state	November 2023 (Approved by Texas Voters)	\$1.5 billion funding multiple BDO programs
CDBG Colonia Fund - Construction	Texas Department of Agriculture	Primarily for water, sewer, and housing rehabilitation. However, 49 percent of funds could be used for broadband infrastructure (conduit joint trench, towers, etc.)	December 9, 2024	\$1 million per county with qualifying colonias
CDBG Community Development Fund	Texas Department of Agriculture	Funds prioritized regional activities in non-entitlement areas of Texas. Open to units of local government.	December 9, 2024	\$750,000 maximum award per application
USDA ReConnect (Future Rounds)	United States Department of Agriculture	Offers loans, grants, and loan-grant combinations to facilitate broadband deployment in areas of rural America that currently do not have	ReConnect Round 6 TBA	Available funding varies based on loans and grants.



Grant Program	Funding Agency	Description	Timeline	Total Allocation
		sufficient access to broadband.		
USDA Distance and Telemedicine	United States Department of Agriculture	Helps rural communities use advanced telecommunications technology to connect to each other, overcoming the effects of remoteness and low population density.	Future Rounds TBA	Agency estimates that approximately \$60 million will be available for Fiscal Year 2024.
USDA Community Facilities	United States Department of Agriculture	Provides affordable funding to develop ‘essential community facilities’ in rural areas. Includes telemedicine, distance learning.	Open Year Round	\$50 million

7.6 County-specific Digital Opportunities Planning

7.6.1 Digital Opportunity Needs Assessment

Reeves County has several community anchor institutions which may serve as a critical broadband related resource to its residents. As broadband remains a critical utility for modern day living, the county should keep remain aware of these institutions and their programs as future broadband opportunities may be beneficial to the community.

- **Reeves County Senior Center**
 - The Senior Center is focused on enhancing the lives of residents 60 years and older through education, social, recreational, health, and fitness programs. It is their mission to enrich these senior citizens' lives and to support their independence.
- **Pecos Economic Development Corporation**
 - The Corporation is focused on developing business and industry to allow the area to grow and prosper, while preserving the ideals of the community.
- **Housing Authority of Balmorhea**
 - Public Housing Authorities provides housing for individuals both in need of a safe as well as respectable standard of living. Qualifications are based on income, the number of dependents, and whether an individual is elderly and/or disabled.
- **Odessa College – Pecos Center**
 - Odessa College offers free GED classes, several health career programs, continuing education courses, free workforce training for small businesses, and various certification courses, including professional development.
- **Balmorhea Independent School District**
 - At Balmorhea High School, students can use computer programming languages as a substitute for the graduation requirement of 2 credits for classes in the same language other than English.
- **Pecos-Barstow-Toyah Independent School District**
 - The Pecos-Barstow-Toyah ISD provides elementary students with new Chromebook tablets, while high school students receive laptops for educational use.

- **Reeves County Library**

- The County Library provides patrons with the option to access public computers and to check out mobile Wi-Fi hotspots for seven days at a time. The American Heart Association is also providing the technology needed to conduct telehealth appointments in the library.

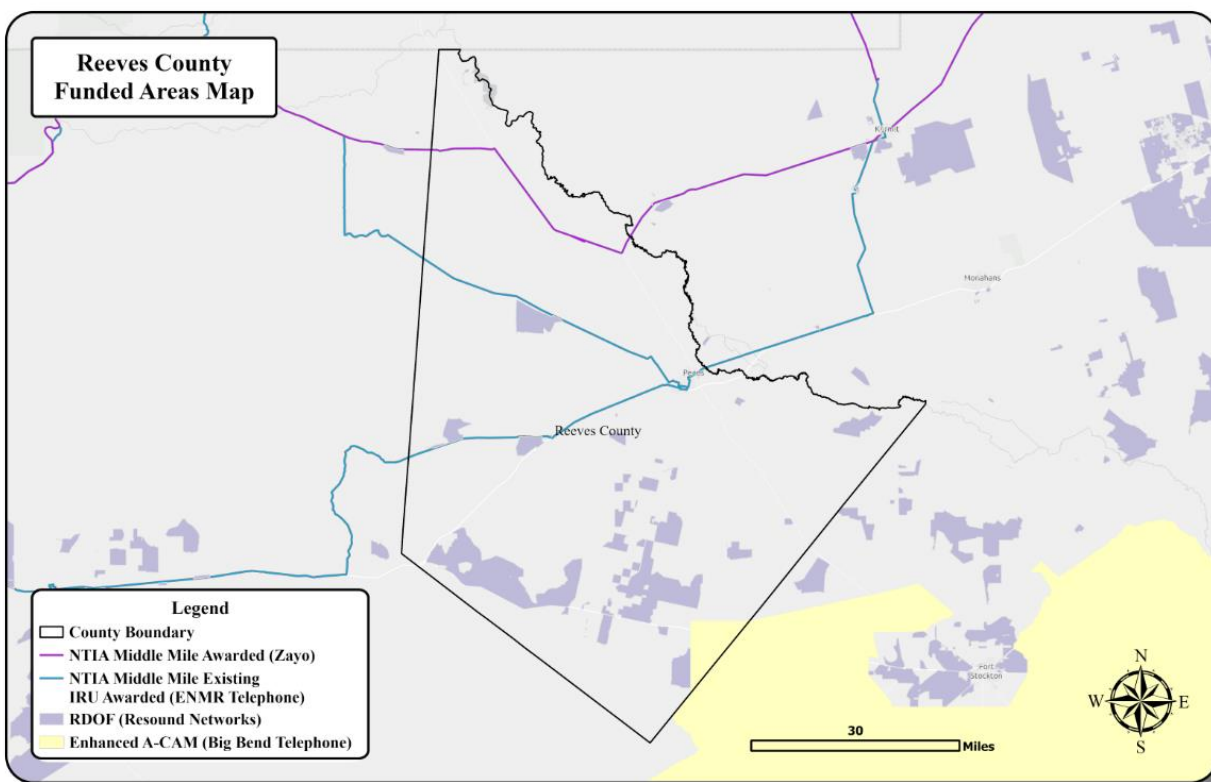


Exhibit 47: Reeves County, Covered Populations

Covered Populations	Texas	Reeves County
Veterans	6.1%	4.6%
Poverty	13.7%	21.0%
Individuals living with disabilities	12.7%	11.0%
With a Language Barrier	27.0%	46.4%
Racial or ethnic minorities	61.1%	77.7%
Age 65+	13.8%	12.4%
Incarcerated	0.7%	0.5%
Population in households lacking fixed broadband availability	7.2%	6.5%

Source: U.S. Census Bureau, 2022 American Community Survey 5-Year Estimates; United States Census Bureau. (2019). Digital Equity Act Population Viewer, Texas Digital Opportunity Hub

Exhibit 48: Reeves County Funded Areas Map



FCC RDOF - The last-mile funding is primarily from the Rural Digital Opportunity Fund (RDOF). The FCC ran a competitive reverse auction ending in 2020 that awarded \$9.2 billion to 180 winning bidders. In Reeves County, the primary winning bidder was Resound with 69 awarded census blocks across the county but mainly in the southern portion. These RDOF award areas primarily follow I-10 on the northern side and run up US-17 to cover the communities of Verhalen, Collier, and areas around Saragosa. RDOF

also covers portions of Toyah and two blocks within the city of Pecos. The timeline for expected completion of Resound's RDOF award buildout is 2029.

NTIA BEAD - In terms of broadband funding eligibility, there are 1206 BEAD eligible locations in Reeves County, 781 are unserved and 425 are underserved. The RDOF areas will be ineligible for BEAD funding.

NTIA Middle Mile - Beyond last-mile, two different projects funded by the NTIA Enabling Middle Mile grant program run through Reeves County. This includes one segment of a new 649-mile underground middle-mile fiber route built by Zayo stretching from Dallas to El Paso. Per the award, the "network has been designed to include access points that can serve 236 community anchor institutions. Additionally, a partner will construct nine 180-foot-tall towers along the proposed route. Each tower can host up to 4 wireless Internet Services Providers (ISPs) that can provide both mobile and fixed 5G wireless broadband service." This project was awarded \$55.13 million by the NTIA to support a total project cost of \$91.88 million. The segment in Reeves County enters the county along CR 30 out of Mentone in Loving County, runs west along US 285 and leaves the county via FM 652 West near Orla.

Additionally, ENMR Telephone Cooperative, also known as Plateau, received \$49.86 million in funding from the NTIA to enhance existing network infrastructure via alternate paths, increasing resiliency and bandwidth with upgrades and new fiber routes. The project includes "construction of five new fiber segments, one of which completes a fiber ring linking Kermit, Texas to Jal, New Mexico in the southern edge of the middle-mile network." In Reeves County, this segments run directly through Pecos where the middle-mile splits to run along west FM 2119 and along I-20 through Toyah where it leaves the county along W County Rd.

The stakeholder and outreach strategy portions of this report (Task 1 and Task 2) gathered insight into the county's existing broadband and social infrastructure. During the outreach process, stakeholders were consulted regarding existing digital opportunity programs/resources available to the residents of the county.

Key Takeaways

- Reeves County, like many rural areas in Texas, faces significant challenges when it comes to digital equity and access. With a large portion of its population considered economically disadvantaged, the county's resources for digital skills training and technological infrastructure are limited. In the city of Pecos and the county seat, there are currently no digital service plans or comprehensive initiatives aimed at improving digital equity.
- Despite these challenges, there are some limited efforts, particularly in the education sector, to address the digital divide and provide necessary technology to students. The local school district in Reeves County operates as a 1-to-1 district, meaning that each student is provided with a digital device to support their education. While elementary students (grades K-5) are not allowed to take laptops home, students in grades 6 through 12 can bring their devices home to complete assignments and further their learning outside of school hours. The district has distributed over 4,000 Chromebooks to students, covering the approximate 75 percent of the student population coming from economically disadvantaged backgrounds. To further support students' connectivity needs, the district has proposed installing internet in local parks for greater flexibility to complete schoolwork.
- However, despite the distribution of devices, there are no formal digital literacy or skills training programs in place within the county. This presents a challenge, especially for families and individuals outside the school system who may struggle with navigating technology. The County

library plays a small but important role by providing access to digital devices and informal assistance to those in need, but its impact is limited by a lack of structured programs.

- Overall, while Reeves County has made strides in providing devices to students, there is still much work to be done in developing programs that offer digital literacy training and ensuring that all residents, regardless of age or economic status, can fully participate in the digital world. These efforts will likely require more investment in infrastructure, partnerships with local organizations, and a focus on long-term solutions to bridge the digital divide.

7.7 Digital Opportunity Strategy Planning

The Digital Opportunity Roadmap is divided into three phases that progressively build on each other to create the required momentum for change. The three imperatives for the roadmap are availability, affordability, and adoption.

- Phase 1: Laying the groundwork
 - Developing the structures, processes, and influence necessary to set the foundation for change.
- Phase 2: Preparing a strategy
 - Operationalizing goals, actively communicating, and supporting changes while addressing challenges.
- Phase 3: Monitor and update strategy
 - Iterating, refining, and solidifying changes in the county's network, while expanding new programs or parts.

Each action area has pivotal implementation steps to take in each phase that help deliver on the goals for change. Mapping dependencies across areas also highlights the interconnectedness of the roadmap.

7.8 Recommendations

BEAD Grant Recommendations

- (1) Reeves County should participate in the BEAD challenge process in December 2024 in order to review the accuracy of locations and CAIs.
- (2) For the broader BEAD application, the county should partner with a local provider that has a strong track record infrastructure provision and customer service in the region to serve the eligible BEAD locations.

Digital Opportunity Recommendations

- (1) The county should adopt a Digital Opportunity Strategy to address adoption and affordability challenges specific to covered populations in the county.
- (2) The county or an eligible entity should apply for the Digital Equity Capacity Grant to fund digital adoption programs in the community. Some of the relevant eligible entity types in this county under this grant include: the county (political subdivision of state), not-for-profit entity, community anchor institution, or a partnership.
 - d) The county previously submitted an application for the Digital Equity Competitive Grant. This application could be expanded or resubmitted.
 - e) Specific entities the county should consider a partnership with for participation in the Texas Digital Equity Capacity Grant are the PEDC, Reeves County Library, and Odessa College – Pecos.

- f) A regional application through the Rio Grande Council of Government or Region 18 ESC could also provide a path to expand digital adoption in Reeves County.

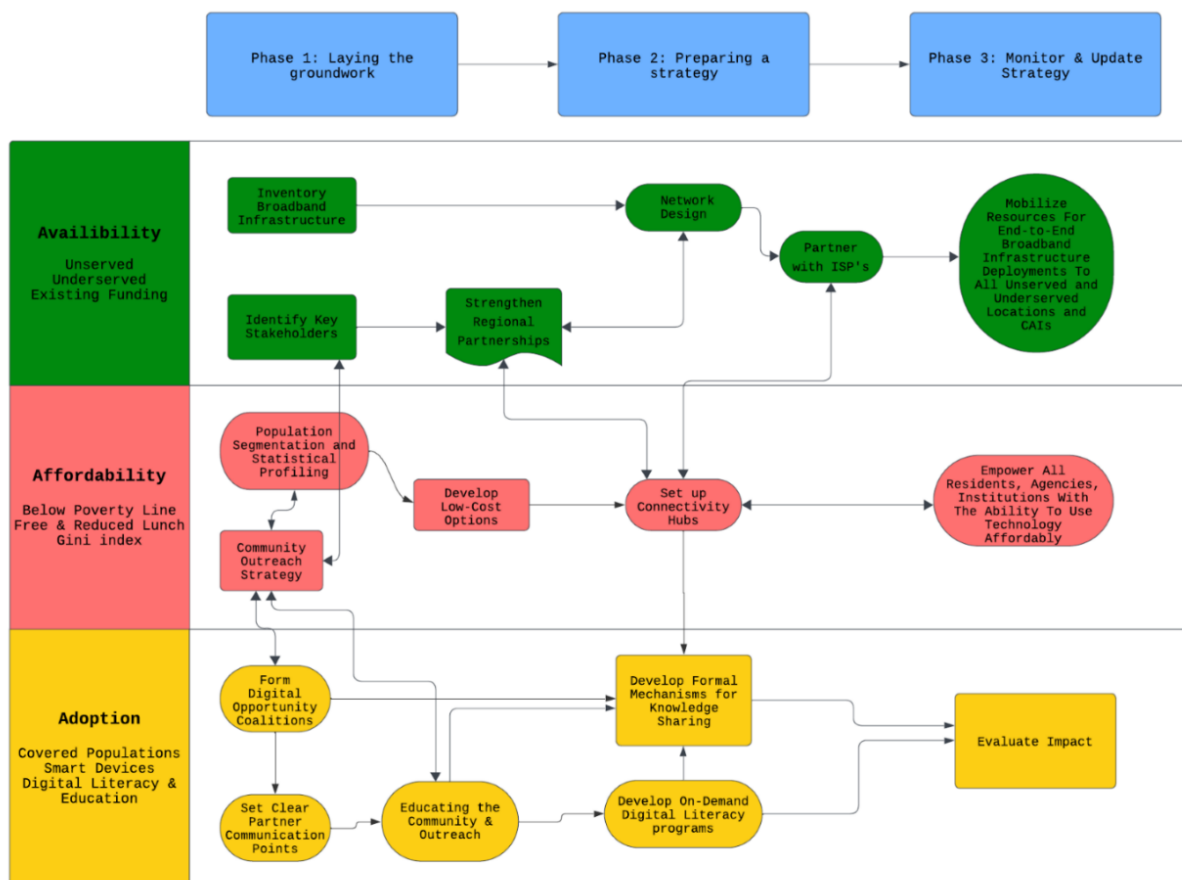
Colonia Area Specific Recommendation

- (2) The county should apply for the Colonia Fund - Construction to fund digital access infrastructure or facilities for the Lindsay Addition and Toyah colonias.
- a. This Texas Department of Agriculture program is designed to primarily upgrade water and sewer infrastructure but joint trenching to install conduit or installation of a tower could assist with broadband deployment in these communities.

RDOF Coordination Recommendation

- (2) Engage with the provider building out RDOF areas in the county regarding the timeline for the buildout to better understand the deployment technology and buildout timeline.

Exhibit 49: Digital Opportunities Roadmap



8 Network Design Assessments

Network Design Assessments introduces the purpose and intent of the High-Level Design (HLD). The information provides proposed broadband solutions that serve commercial, residential and public facilities where they are most needed—where gaps are identifiable and align with local broadband goals. This

includes different idealized county solutions. Guidance throughout the network development process may continue to update this process as more information is gathered until deployment occurs.

PLEASE NOTE: The National Broadband Serviceable Location Fabric is a common data set of all residential and business locations (or structures) in the U.S. where fixed broadband internet access service is or can be installed. Each location in the Fabric is called a Broadband Serviceable Location (BSL), and the definition of a BSL is determined by the FCC. The Fabric is the foundational location database that is being used across several government programs, including NTIA’s BEAD, the FCC’s Broadband Data Collection, National Broadband Maps, and more. CostQuest is the official contractor and provider of the National Serviceable Location Fabric data. Data used within this report was obtained from CostQuest and is Version 4 as of December 31, 2023. Version 4 data was the expected data source for the Texas BDO’s BEAD Challenge Process at the time of writing this report. Please be aware that ISPs may have continued construction and implementation of new service locations since Version 4, and the data within may be outdated by the time this report finalizes. Please conduct continuing conversations with potential partners to see where changes may have been made.

8.1 Preliminary Network Design Assessments

8.1.1 Primary Network Design Assessments

Middle- and last-mile HLDs can play an important role in helping communities and ISPs understand options to reach unserved and underserved BSLs. Determining potential routes and generating a cost per passing for each BSL for the construction of network infrastructure sheds light on the feasibility of options and provides data for discussions of those options.

Being able to see existing middle-mile and options to build last-mile helps communities and ISPs to evaluate options to extend their services to the home. HLDs with high-level costs can point out the financial needs and limitations that have traditionally deterred private internet service providers from investing in Reeves County’s unserved and underserved regions.

This knowledge presented from the HLD could potentially facilitate public and private sector endeavors by lowering backhaul expenses and establishing connections to county and municipality facilities in areas where such assistance would yield the greatest benefits.

These high-level costs may also possibly be used for certain parts of grant applications.

For discussions with potential ISP partners, in addition to HLDs, it is helpful to know where current ISPs have service. In considering what ISPs to talk with to possibly take next steps towards building out the HLD areas, it is helpful to know which ISPs have infrastructure in relative proximity. Other ISPs might consider building the HLD areas, but it often makes the most financial sense for the closest ISP to extend their existing network.

To fully grasp the impact of the HLD developed for Reeves County, it is essential to understand the current landscape of last-mile providers offering broadband services to served addresses, as well as the geographic distribution of these ISPs within the county. The accompanying map offers a visual representation of existing service coverage.

Exhibit 50: Self-reported ISPs in Reeves County

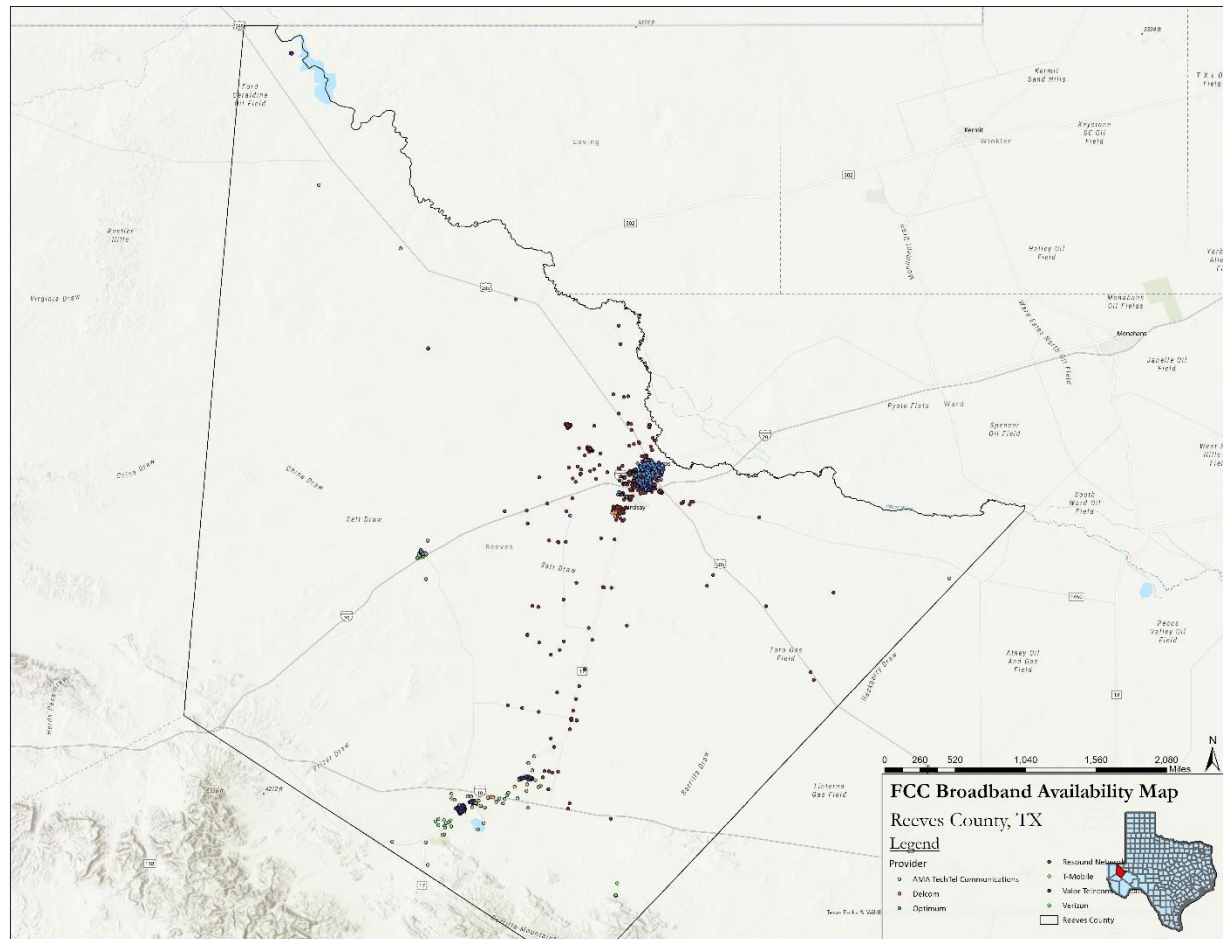


Exhibit 50 illustrates the self-reported Internet Service Providers (ISPs) in Reeves County. Resound Network, Valor Telecommunications, and Optimum have emerged as the most dominant providers in these identified regions. It would be prudent to engage in discussions with these ISPs regarding any HLDs for unserved and underserved addresses in proximity to their service areas.

Exhibit 51: HLD Areas for Reeves County

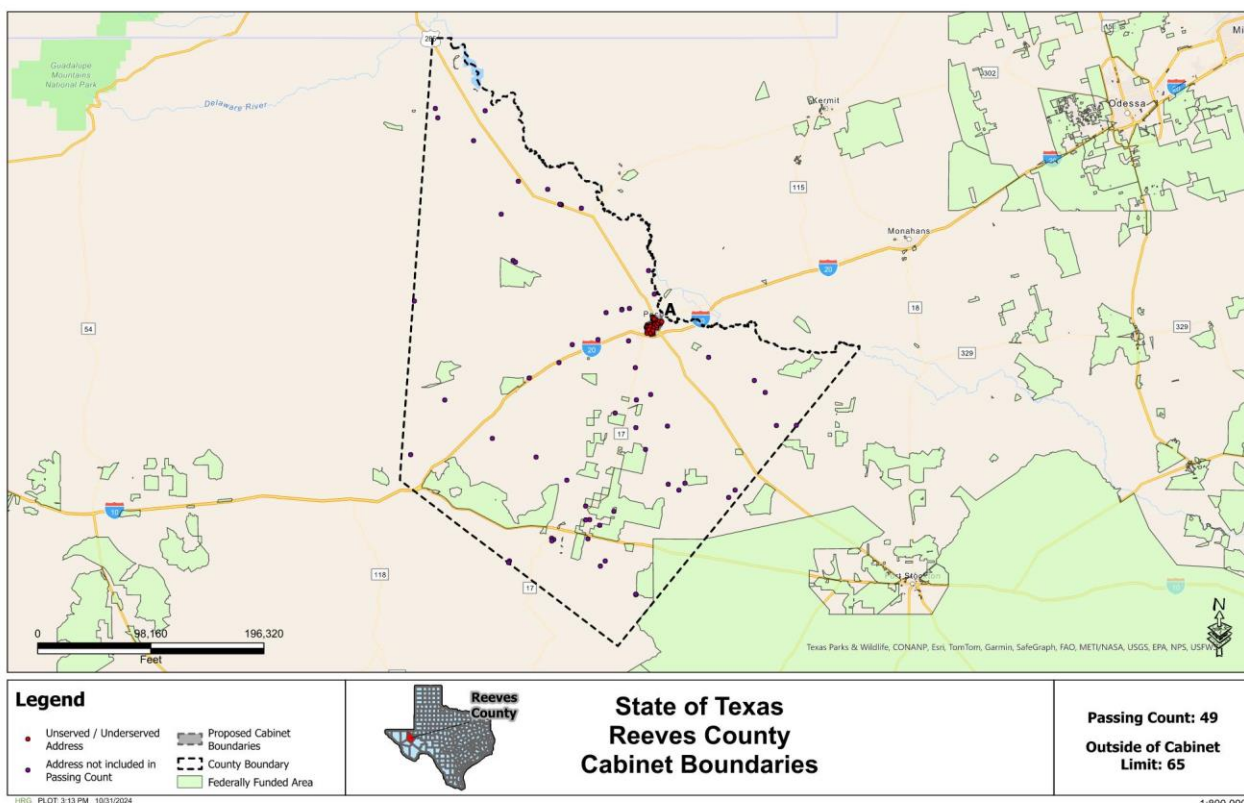


Exhibit 51 shows the HLD areas for Reeves County. Each letter labels a “cabinet” area. A cabinet area can be defined as an individual network within which all the extensions to the BSLs tie back to one cabinet. Each cabinet must be tied to a middle-mile source. The unserved and underserved BSLs are divided into cabinets to provide the most efficient and cost-effective last-mile options. Each cabinet area can be discussed with an ISP or cabinets can be clustered together if an ISP wants to extend their network to multiple HLD areas. Cabinet areas were determined by the locations and numbers of unserved and underserved BSLs.

Please see the appendices for the network design, unserved and underserved BSL counts and high-level cost per passing.

The HLDs for the middle- and last-mile routes have been marked to leverage county right-of-way (ROW). Although the availability of ROW was not explicitly verified, given the rural nature of the HLD areas, ROW availability should not present significant issues. Additionally, the ownership of ROW along these routes was not thoroughly investigated.

When designing the middle- and last-mile infrastructure, it was crucial to incorporate measures to mitigate outages caused by natural disasters, weather events, and other catastrophes. Consequently, the team developed an HLD with an entirely underground configuration, except for the most isolated addresses. For these outlying addresses, even with grant funding, building fiber was deemed infeasible. These specific locations are marked on the maps, and alternative solutions, such as point-to-point connections, are recommended to provide service to residents. While this approach may not offer the same level of protection from natural disasters as underground fiber, it represents a more cost-effective solution.

It is also helpful to assess the redundancy strategies of the surrounding middle-mile network from ISPs. As of now, there are three middle-mile providers whose middle-mile covers a combination of the following roads: Interstate 20 (I-20), Route 285, Texas-17, W Co Rd 225, Co Rd 232, Co Rd 1450, Co Rd 2019, Co Rd 2903. Several smaller segments stem from the network near Pecos. In discussions with two of the middle-mile providers, they indicated their network includes redundancy. However, prior to the county to verify this information and to obtain this information from the other provider.

Achieving redundancy poses challenges. Efforts were made to design redundancy where feasible, but it was not possible in many areas. As highlighted in the middle-mile section, redundancy at the middle-mile level may exist, but it is often cost-prohibitive for the last-mile.

While the primary focus of HLDs is to address current broadband deficiencies, they must also be designed to accommodate future growth while maintaining stable and reliable performance. Accordingly, the HLDs for the county to include provisions for excess capacity, allowing for potential network expansion as needed. Designers aimed to include sufficient excess capacity without significantly increasing costs. It is crucial to discuss this capacity with any public-private partner to ensure it aligns with their network plans.

Additionally, the design incorporates a Gigabit Passive Optical Network (GPON) architecture with a cabinet in each design area. This architecture facilitates scalability and adaptability. The layout and capacity of the network should also be discussed with any P3 partner to ensure it integrates seamlessly with their existing network and future plans.

8.2 Primary Preliminary Network Design Assessments

The current HLD is focused on extending fiber connections to the unserved and underserved regions of Reeves County. Our primary objective is to ensure that all BSLs within these categories are connected.

Any additional connections, including those for municipal facilities or community public access points (CPAs), can be addressed in a secondary network design if necessary. Considering the middle-mile infrastructure, the HLD network designs, the geographic locations of the BSLs, and the available excess capacity, it is feasible to design segments to reach other addresses.

This HLD paves the way for comprehensive connectivity, laying a robust foundation for further expansion and enhancements. By prioritizing these unserved and underserved areas, we aim to bridge the digital divide and bring high-speed internet access to communities that need it most.

Given the substantial grant funding allocated for broadband networks, concerns have arisen regarding the availability of construction labor and materials. Therefore, it is essential to thoroughly evaluate timelines in discussions with Internet Service Providers (ISPs) and construction companies.

Several factors will influence the timeline, including the formation of partnerships, the definition of network designs, the bidding processes for contractors and materials, potential shortages, and the terms of agreements. These elements collectively create a complex landscape where accurately defining the construction start date and duration becomes challenging.

Due to the uncertainty associated with these factors, it is not feasible to establish a precise timeline until the terms of agreements have been finalized. This understanding underscores the importance of proactive planning and communication with all stakeholders involved in the project to ensure realistic expectations and effective project management.

By acknowledging these challenges and addressing them collaboratively, we can better navigate the uncertainties and work towards the successful implementation of the broadband network.

8.3 Cost Analysis of Assessments

The HLDs utilize buried fiber to extend connectivity to underserved addresses as efficiently and cost-effectively as possible. The designs employ GPON architecture, incorporating a cabinet in each highlighted area. While individual Internet Service Providers (ISPs) may not require a cabinet at every designated location, we have included them to accommodate potential costs if needed.

For very remote addresses, an alternative solution, such as point-to-point connections, may be necessary. The costs for these solutions have not been included in the current design due to the need for a detailed assessment of distance and topography.

Each HLD includes additional capacity, aiming to provide some room for growth without unnecessarily inflating costs. The goal is to ensure there is enough excess capacity to allow for network expansion while maintaining economic feasibility.

By focusing on the deployment of buried fiber and incorporating flexible design elements, these HLDs aim to deliver robust and scalable broadband solutions to the most underserved areas, fostering greater connectivity and digital inclusion.

The HLDs in this section of the report are intended to serve as a valuable tool for discussions with potential P3 providers. It is recommended that the county utilize these HLDs to explore options with providers regarding both network designs and broadband serviceable locations (BSLs), as well as other critical connection points.

Given that ISPs will likely require grant funding to make the business case for reaching these addresses, discussing design and BSLs is crucial to verify cost estimates for grant applications. ISPs may have existing network extension plans that these HLDs could complement. Therefore, engaging in discussions with ISPs about their needs and options, alongside municipal opportunities, will be vital in finalizing the network designs.

Further discussions with ISPs are essential to ensure that policies and permit procedures help the community manage their ROWs and assist providers in extending their networks in an organized manner. Specific discussions on policies and procedures with providers can foster a true partnership within a P3 arrangement. While communities should maintain control over their ROWs, working collaboratively with ISPs can create a positive and efficient process.

If a community provides financial resources or assets in P3 negotiations, it is crucial to ensure that the use of public funds and infrastructure complies with local, state, and federal regulations. From meetings with middle- and last-mile providers that the consulting team successfully conducted, most ISPs expressed a keen interest and willingness to collaborate with the county and communities to enhance broadband services.

There are multiple goals that can be pursued within P3 discussions, as outlined in this report. These include stakeholder engagement, ISP collaboration, digital equity, and workforce development analyses. These elements serve as foundational building blocks to address underserved and unserved BSLs and to align broadband connectivity with broader community objectives. In discussions and negotiations with ISPs, incorporating these diverse data sources will maximize the overall benefits achieved.

8.4 Legal / Risk Analysis of Assessments

The broadband industry is experiencing a monumental transformation, driven by an influx of grant dollars that are reshaping networks, ISPs, construction practices, policies, and procedures. While this presents significant opportunities, it also introduces potential risks.

In a P3 arrangement, if the community does not contribute municipal funds, the financial risk largely falls on the providers. However, if ISPs overextend or make imprudent decisions, the county or municipalities might be left with unfinished projects. Therefore, it is essential to assess the business strength of ISP's when deciding which ones to negotiate with.

In many rural areas, there may be only one ISP providing last-mile services. During P3 negotiations, it is crucial to understand their pricing structures and how these might change if the ISP is acquired by another entity.

Communities might be asked to support grant applications with letters of support. Deciding which ISP to support, especially if there are multiple contenders, can be challenging. A framework for selecting ISP's or providing support to all applicants might be necessary. Key criteria for selection could include the ISP's business stability, willingness to connect municipal facilities and CPAs, guarantees on pricing structures, and their growth and long-term goals.

If the community invests in public funds, it is imperative to clearly understand what they will receive in return and how they can control the use of that investment. In such P3 negotiations, the role of the municipal attorney is crucial. If the municipality has any ownership stake, clear definitions of responsibilities for construction, operations, and maintenance must be established.

Through thorough discussions and careful consideration of these factors, communities can ensure that P3 arrangements are both beneficial and sustainable, effectively balancing the risks and rewards of broadband expansion.

8.5 Research and Analysis on Comparable Networks

When evaluating the HLD and planning future steps, Reeves County should examine case studies from the City of Mont Belvieu, TX, and the City of McKinney, TX, to understand their broadband network designs. This analysis will equip Reeves County with valuable insights into various design routes, thereby laying a solid foundation for future design discussions.

City of Mont Belvieu, TX:

Some communities may elect to build, own, and operate their own network. However, in Texas, there are specific restrictions on how this can be accomplished. Mont Belvieu is one community that has successfully taken this approach.

The challenges of this path include managing all aspects of construction, material procurement, operations and maintenance. While many communities are accustomed to overseeing construction projects, owning and operating a broadband utility presents unique challenges. Unlike most municipal utilities, the broadband industry is competitive. This means municipal leadership must navigate the complexities of hiring skilled talent and managing customer choices. Additionally, while these projects are typically financed through revenue bonds, the municipality must possess the bonding capacity to support such a large-scale initiative.

City of McKinney, TX:

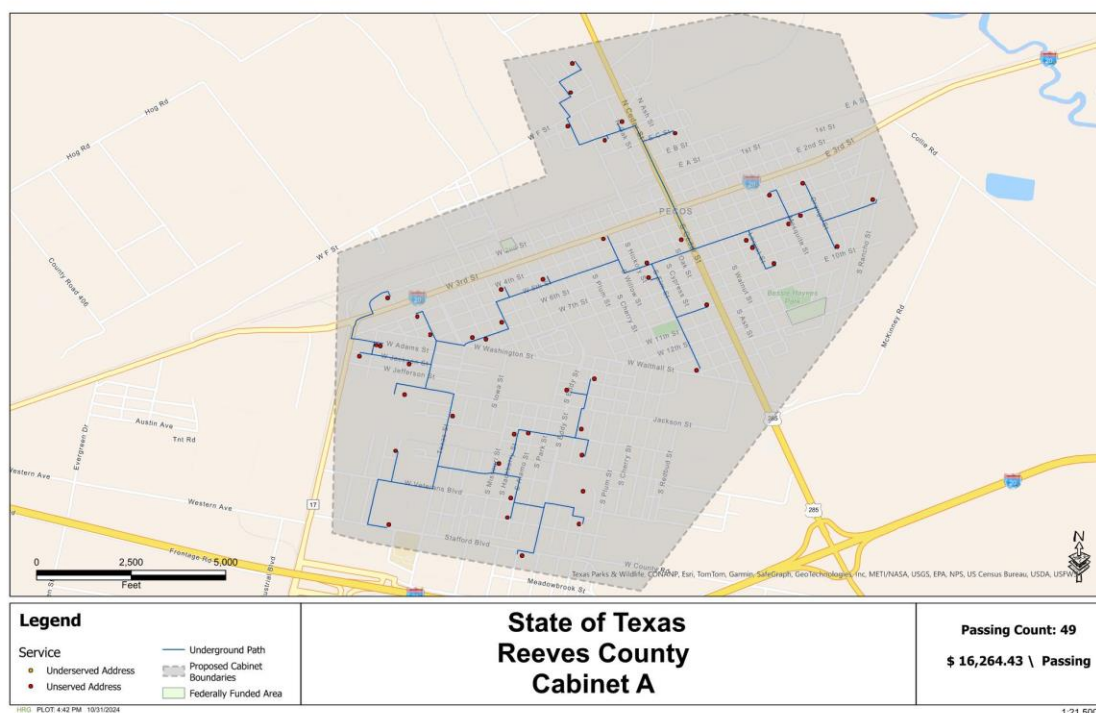
McKinney serves as an example of a municipality that has successfully implemented its own connectivity infrastructure while seeking P3 relationships. The city determined the need to own and operate the connectivity infrastructure for their facilities. Without eligibility for grants, they financed the infrastructure through Capital Improvement Plans (CIP) and other budgeted projects. The city chose not to provide retail broadband services to residents and businesses. Instead, they issued a Request For

McKinney did not have a significant number of unserved or underserved addresses, making them ineligible for need-based grants. The responses to their RFP did not require grants or any investment from the city. As a result, McKinney has progressed significantly with their municipal ring and has already built out fiber for the majority of the city.

8.6 Network Design

Please see below for the network design, unserved and underserved BSL counts and high-level cost per passing within Reeves County. Please note that the number of BSLs and the distance to BSLs have from the designed fiber impacts the specific cost per passing for this cabinet area. There are, however, some steps that can be taken to lower the cost per passing. For example, grant funding, changing the boundaries of a cabinet area (which can raise or lower the cost per passing), extending an existing network that is in close proximity to unserved or underserved BSLs, utilizing a different infrastructure (aerial fiber or point to point technology, etc.).

Exhibit 52: Reeves County Networks Design of Cabinet Area A



9 Appendices

9.1 Recommended Organizations for Extended Outreach

Non-profits, Community-based, and other organizations
Permian Basin Regional Planning Commission
Reeves County Medical District
Local Electric Cooperatives

Local Telephone Cooperatives
Local Community Centers
Local Libraries

Government Entities
City of Balmorhea
City of Toyah
Reeves County Road and Bridge

*Reeves County Broadband Committee Members	Entity
Judge Leo Hung	Reeves County
Emily McKinney	Businesswoman (PBTISD Board of Trustees)
Randy Graham	Town of Pecos City
Marco Cruz	Reeves County

**Includes only committee members that did not participate in the questionnaire*

9.2 Data Sources For Demographic and Census Related Information

- The American Community Survey (ACS) is an ongoing survey that provides vital information on a yearly basis about our nation and its people. Information from the survey generates data that helps inform how trillions of dollars in federal funds are distributed each year.
- The Texas Digital Opportunity Plan - The BDO published and promoted a public draft of the TDOP. We encouraged all Texans to provide feedback on the plan and received more than 300 comments on the TDOP draft. Following public comments and related revisions, the BDO submitted the draft to the NTIA on Feb. 28, 2024. The NTIA accepted the TDOP on March 28, 2024.

9.3 Asset Mapping Sourcing

PDF Maps		
FCC Fabric Maps	Data created with FCC Fabric latest version and exports of ISP Fixed Broadband Availability Data	https://broadbandmap.fcc.gov/data-download
Locations service by Broadband Types	ULFW, FTTH, LFW, Copper, Cable	created by joining FCC fabric and ISP downloads
Unserved Locations		created by joining FCC fabric and ISP downloads
Underserved Locations		created by joining FCC fabric and ISP downloads
Served Locations		created by joining FCC fabric and ISP downloads
Number of Broadband Providers by Locations		created by joining FCC fabric and ISP downloads
Population	U.S. Census Blocks	US_Census_Blocks_v1 (FeatureServer) (arcgis.com)
Household Median Size	ACS Median Income and Household size	ACS_Household_Size_Centroids (FeatureServer) (arcgis.com)
Household Median Income	ACS Median Income and Household size	ACS_Median_Income_by_Race_and_Age_Selp_Emp_Centroids (FeatureServer) (arcgis.com)
Households without Smart Device	ACS Internet Connectivity	ACS_Internet_Connectivity_Boundaries (FeatureServer) (arcgis.com)
Median Age	ACS Median Age	ACS_Median_Age_Boundaries (FeatureServer) (arcgis.com)
Urban and Rural		NBAM_Omnibus_v4b_Living_Atlas_gdb_View (FeatureServer) (arcgis.com)

Households without Internet	Addresses with zero providers from the FCC data	created by joining FCC fabric and ISP downloads
Right of Ways/ Jurisdictions	TxDot, RR, Pipelines, City/County Limits, Waterways, etc	Various
Fiber Locator — Metro Networks		Fiberlocator.com
Fiber Locator — Long Haul Networks		Fiberlocator.com
Fiber Locator— Connected Buildings		Fiberlocator.com
Asset Inventory	Existing infrastructure- Fiber, Towers, etc.. If acquired from ISPs	

9.4 P3 – Request for Expression of Interest (RFEI)

The purpose of this RFEI is used to gauge the interest and capabilities of potential suppliers or vendors before initiating a formal procurement process. The information gathered will be used to inform Reeves County’s decision-making process for the development and implementation of broadband infrastructure within the county.

Reeves County, located in the Coastal Bend region of Texas, is characterized by its small-town charm and rich history. As of 2022, the county has a population of approximately 6,718 residents. The economic environment is diverse, with key sectors including health care and social assistance, retail trade, and construction. Major employment sectors also encompass mining, quarrying, and oil and gas extraction, which offer some of the highest wages in the region. The county’s natural resources are significant, featuring oil and gas reserves that play a crucial role in its economy. Additionally, the agricultural sector, particularly cattle ranching and farming, contributes to the local economy. Reeves County leverages its strategic location and natural assets to support a dynamic and growing economic landscape.

Broadband, once considered a luxury, has now evolved into a critical driver for economic growth and overall quality of life. It plays a pivotal role in education, business attraction, telemedicine, tourism, remote work, and supporting our senior citizens. Beyond mere convenience, broadband is now an essential tool for residents’ work, medical care access, and children’s education. Businesses also recognize it as a key factor when contemplating relocation. Given its significance, Reeves County is enthusiastically strengthening broadband services to benefit the entire community.

Project Overview

A project overview is a high-level summary of a project that outlines its key aspects. It serves as a roadmap for stakeholders and provides a clear understanding of the project's purpose, scope, and objectives {Insert Project Overview}:

The main components typically include:

- Project Title
- Overview
- Project Justification
- Objectives
- Phases of Work
- Metrics for Evaluating and Monitoring
- Timeline
- Estimated Budget

Objective:

A project objective is a specific, measurable, and time-bound goal that a project aims to achieve. It provides a clear direction for the project team and stakeholders, ensuring everyone is aligned with the project's purpose {Insert Project Objective}:

The main key characteristics typically include:

- Specific
- Measurable
- Achievable
- Relevant
- Time-bound

Scope of Work (SOW):

A project Scope of Work (SOW) is a detailed document that outlines the work to be performed for a project. It serves as a formal agreement between the project team and stakeholders, ensuring everyone has a clear understanding of what is expected {Insert Scope of Work}:

- Infrastructure Development: The service provider will be responsible for the design, planning, and installation of broadband infrastructure in the specified territory. This includes all necessary surveys, permits, and construction work.
- Partnership with ISPs: The installed infrastructure will be made available to ISPs for their use as a backhaul for their last-mile service. The service provider will coordinate with ISPs to ensure seamless integration and operation.
- Maintenance and Support: Post-installation, the service provider will provide ongoing maintenance and support to ensure the infrastructure's optimal performance and reliability.
- Grant Assistance: The service provider will collaborate with the county to identify and apply for grants that can offset the project's costs. This includes preparing necessary documentation and providing expertise on grant applications.
- Benefits to the Service Provider:
 - Public-Private Partnership: This project offers the opportunity to enter into a public-private partnership with the county, opening avenues for future collaborations and projects. Reeves County does not intend to own or operate the proposed Broadband infrastructure.

- Visibility and Reputation: Being part of this initiative will enhance the service provider’s visibility and reputation in the broadband market.
- Financial Support: Potential access to grant funding can significantly reduce the financial burden of the project.

Reeves County is looking forward to potential service providers’ interest and is open to discussions to explore this mutually beneficial opportunity further. Please feel free to contact us for any clarifications or additional information.

Illustration Map (Appendix A)

High-level Design (HLD) Options (Appendix B)

Questions and Response Guidelines

Respondents may submit questions by email to Reeves County no later than {Insert Time} by the deadline set forth in the Schedule of Events. Questions concerning this RFEI must be in writing and addressed to Reeves County at the email address below. Reeves County expects to electronically respond with answers to the written questions on or about the date set forth in the Schedule of Events.

Questions Contact

{Insert Contact Name and Email Address}

Response Guidelines

Submit one (1) electronic copy titled “{Insert File Name} Reeves County Broadband Network Deployment Submittal” to {insert contact email address}. Include {Insert File Name} Reeves County Broadband Network Deployment Submittal as the email subject title.

Schedule Of Events

- Issuance of RFEI: {Insert Date}
- Deadline for Submission of Questions: {Insert Date}
- Deadline for Submission of Response: {Insert Date}
- Interviews (if required): {Insert Date}

Proposal Format

Introduction

Each original Proposal and copy shall contain a cover sheet with the following: “{Insert File Name} Reeves County Broadband Network Deployment” and the name and address of Respondent. Proposal pages must be numbered consecutively.

Proposals must be organized as described in the section titled “General Organization of Response Content” below. Proposals not organized in this manner may be subject to disqualification. Conciseness and clarity of content are required; vague and general Proposals may be considered non-responsive, which may result in the disqualification of said Proposals. Proposals must be complete; failure to provide all required information may result in the disqualification of the Proposal.

ALL EXHIBITS TO THIS RFEI ARE PREPARED EXCLUSIVELY FOR THIS RFEI. RESPONDENT’S SUBMISSION OF OTHER EXHIBITS OR DOCUMENTS, INCLUDING PRIOR RFEI EXHIBITS, MAY RESULT IN DISQUALIFICATION OF THE PROPOSAL.



General Organization of Response Content

The respondents must provide the following identifying information:

- (1) Cover Letter which includes the name and address of the business entity submitting the response
- (2) Response to the following four categories of information:
 - a. Existing service in the vicinity of Reeves County
 - b. Details of the infrastructure (technology) you are proposing
 - c. The service options that would be offered as the result of the project
 - d. Operational details such as who will operate and maintain the network
- (3) Detailed overview of Respondent's experience providing the requisite Services listed in the RFEI. Respondent must demonstrate its knowledge of and experience with activities relevant to the Services. Respondents must provide a detailed profile that describes the following:
 - a. The size and scope of all operations, including number of Respondent's employees and years in business;
 - b. References from similar fiber broadband projects;
 - c. Case studies of previous similar work performed, particularly work in the last three (3) years;
 - d. Depth and length of experience with state agencies;
 - e. Depth and length of experience with local governments;
 - f. Any other information Respondent believes is pertinent to this RFEI.
- (4) Estimated project timelines for the following:
 - a. Planning and design.
 - b. Permitting and approvals.
 - c. Construction and installation.
 - d. Testing and activation
- (5) Anticipated and unforeseen hurdles
 - a. Provide detailed insights into the anticipated difficulties related to the scope of work;
 - b. Lay out strategies for handling unforeseen issues that may arise.
- (6) Cost and budget
 - a. Supply estimated costs for materials (fiber, structure);
 - b. Labor (installation, maintenance);
 - c. Any recurring costs (maintenance, upgrades).
- (7) The County desires to pursue grant funding from the Broadband Equity, Access, and Deployment (BEAD) program and any subsequent funding opportunities that may become available. Discuss your intent to pursue grant funding in coordination with the county.
 - a. Describe previous successes in securing grant funding.
 - b. Explain strategies for pursuing grant funding in relation to this scope of work.

In addition, please provide any and all-important information and data your firm feels is important to the project. This could include insights, recommendations, potential challenges, and opportunities.

Response Evaluation

The response will be evaluated on completeness and compliance with the requirements. Reeves County may eliminate any responses that (a) are non-conforming, (b) do not meet the minimum requirements, (c) are not economically competitive with other responses, or (d) are submitted by respondents who lack appropriate qualifications.

Reeves County will evaluate responses based on merit and the following criteria:

1. Completeness of response.

2. Willingness to provide last-mile service in identified regions and unserved areas of the county.
3. Approach and philosophy concerning broadband deployment.
4. Qualifications, experience, and references.
5. Comparative financial and partnership arrangements requested.
6. Overall professional organization and quality of the RFEI.

Responder Selection

Reeves County reserves the right to reject any or all responses or portions thereof, to issue RFEI updates at any time, and to make any (or no) partnership arrangements based on County policies and needs.

Reeves County reserves the right to make an award without further discussion of the responses submitted; there may be no best and final offer procedure. Interviews and negotiations may be conducted with one or more of the respondents. Each initial offer should contain the respondent's best terms from a cost or price, service, timing, and technical standpoint.

Reeves County may consult references familiar with the respondent regarding its prior operations and projects, financial resources, reputation, performance, or other matters. Submission of a response shall constitute permission for the county to make inquiries and authorization to third parties to respond to them.

Reeves County may elect to initiate contract negotiations with one or more respondents including negotiation of costs/price(s) and any other issues, terms and conditions, and modifying any requirement in the RFEI. The option of whether to initiate contract negotiations rests solely with the county. No respondent shall have any rights against Reeves County arising from such negotiations.

As a result of the selection of a respondent to supply products and/or services to Reeves County, the county is neither endorsing nor suggesting that the respondent's product or service is the best or only solution. The respondent agrees to make no reference to Reeves County in any literature, promotional material, brochures, sales presentation, or the like without the express written consent of Reeves County.

This RFEI does not create any obligation on Reeves County to make any contract award.

Compliance With Federal, State, And Local Laws

Respondent warrants in submitting a response and in the performance of an award as a result of the response, that respondent has complied with, or will comply with, all applicable federal, state, and local laws, ordinances and all lawful orders, rules, and regulations hereunder.

Additional Information

If not explicitly asked in this request, respondents are encouraged to provide additional information that may be helpful to the county.

Limitation Of Liability

Reeves County makes no representations, warranties, or guarantees that the information contained herein is accurate, complete, timely, or that such information accurately represents the conditions that would be encountered in pursuing the work now or in the future. The furnishing of such information by Reeves County shall not create or be deemed to create any obligation or liability upon it for any reason whatsoever and each respondent, by submitting its response, expressly agrees that it has not relied upon the foregoing information and that it shall not hold Reeves County liable or responsible therefore in any manner whatsoever. Accordingly, nothing contained herein and no representation, statement, or promise, of Reeves County, its directors, officers, agents, representatives, or employees, oral or in writing, shall

impair or limit the effect of the warranties of the respondent required by this RFEI and that it shall not hold Reeves County liable or responsible therefore in any manner whatsoever.

Confidentiality

Any portions of the response containing confidential or proprietary information should be clearly marked “Proprietary and Confidential”. Reeves County reserves the right to release any such information to its agents or contractors for the purpose of evaluating the respondent’s response. Under no circumstances will Reeves County be held liable for any damages resulting from any disclosure of respondents claimed confidential information during or after the RFEI process.

Reeves County Confidential Information

Specifications, drawings, sketches, models, samples, tools, computers or other apparatus programs, trade secrets, confidential research, development or commercial information, intellectual property, patents, and /or other technical or business data are hereinafter designated as “Confidential Information.” Confidential Information shall not include information that (a) is generally available to the public prior to the date of this Agreement; (b) enters the public domain during the term of this Agreement through no fault of the respondent; (c) the respondent can establish, through its own contemporaneous records, was in its possession prior to disclosure of the Confidential Information to the respondent; or (d) is independently developed by the respondent without reference to or use of the Confidential Information.

The respondent shall: (a) hold and maintain all Confidential Information received in strict confidence; (b) restrict disclosure of Confidential Information only to those employees of the respondent or its wholly owned subsidiaries who have been informed of the confidential nature of the information and have agreed to be bound by the restrictions of this Agreement governing disclosure of Confidential Information, and who need to know the Confidential Information for responses to Reeves County for furnishing material, software, documentation, or services hereunder; and (c) not duplicate, reproduce, distribute, store in any electronic information retrieval system, or disseminate Confidential Information in any other manner. All Confidential Information, whether written, oral, or other furnished to the respondent hereunder, or in contemplation hereof, shall remain the property of Reeves County. All copies of such Information in written, graphic, or other tangible form shall be returned to Reeves County or permanently destroyed at Reeves County’s request.

Respondent obligations with respect to the Confidential Information shall survive termination of this Agreement and remain in full force and effect for a period of five years from the date of receiving of this Agreement.

Due Diligence

Prior to submitting a response, respondents should carefully examine all the supplied materials, including plans, specifications, and designs related to this project.

9.5 Digital Opportunity Definitions

Digital Opportunity	Digital opportunity is a condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy and economy. Digital opportunity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services.
Digital Inclusion	Digital inclusion refers to the activities necessary to ensure that all individuals and communities, including the most disadvantaged, access

	and use Information and Communication Technologies (ICTs). This includes five elements: 1) affordable, robust broadband Internet service; 2) Internet-enabled devices that meet the needs of the user; 3) access to digital literacy training; 4) quality technical support; and 5) applications and online content designed to enable and encourage self-sufficiency, participation and collaboration. Digital inclusion must evolve as technology advances. Digital inclusion requires intentional strategies and investments to reduce and eliminate historical, institutional, and structural barriers to access and use of technology.
Digital Divide	The digital divide is the disparity in access to, knowledge of, and ability to use digital tools and technology.
Digital Literacy	The American Library Associations has defined "digital literacy" as the following: Digital literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.
Covered Populations	<ul style="list-style-type: none"> (1) Individuals who live in covered households (i.e. households with income less than or equal to 150 percent of the federal poverty level); (2) Aging individuals; (3) Incarcerated individuals, other than individuals who are incarcerated in a federal correctional facility; (4) Veterans; (5) Individuals with disabilities; (6) Individuals with a language barrier, including individuals who— (7) are English learners; and have low levels of literacy; (8) Individuals who are members of a racial or ethnic minority group; (9) and Individuals who primarily reside in a rural

9.6 Digital Opportunity Roadmaps

