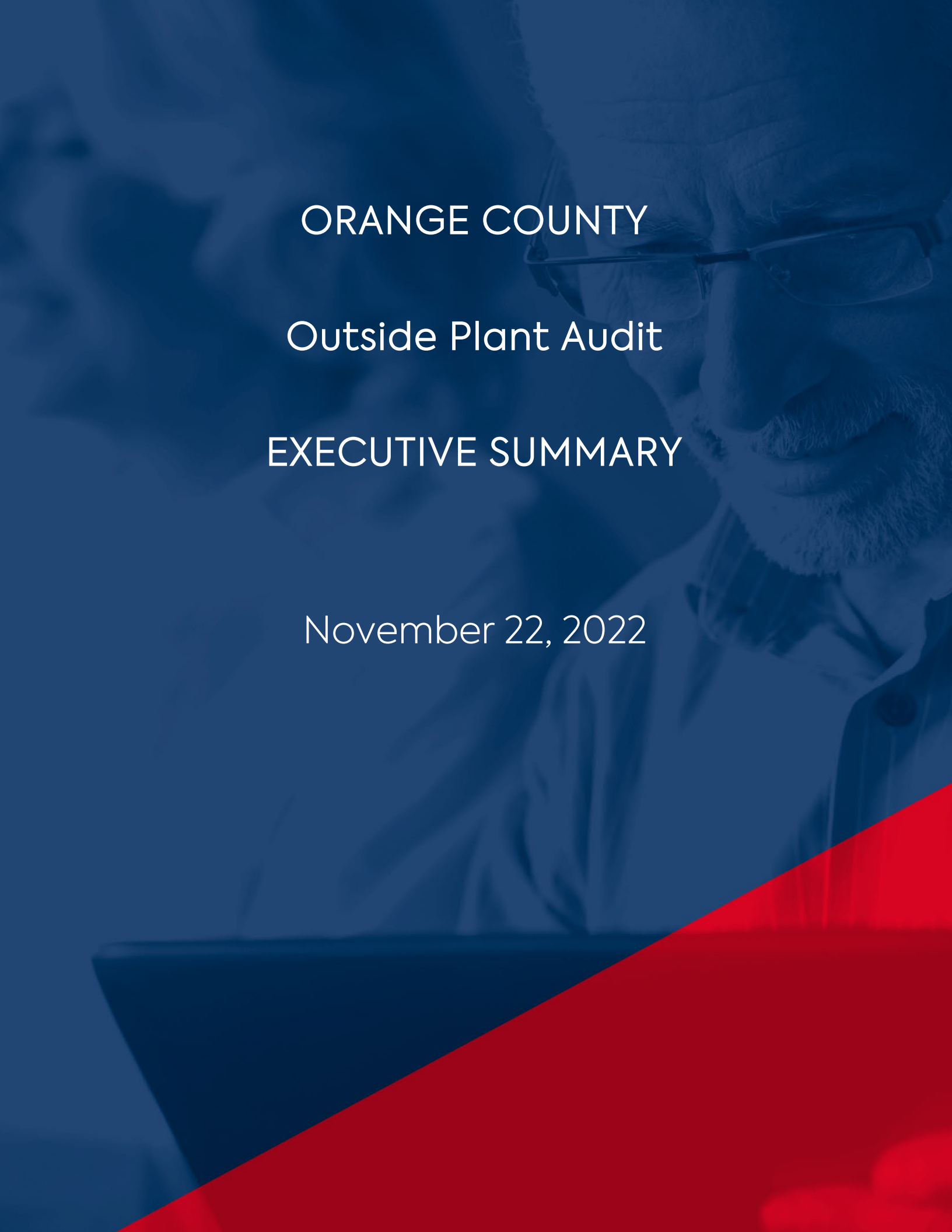


ORANGE COUNTY

Outside Plant Audit

EXECUTIVE SUMMARY

November 22, 2022

Project Overview

On June 6, 2022, Connected Nation (CN) and Orange County, Texas entered into a Part I Services Agreement for assessing broadband availability across the county. CN's mission was to conduct an outside plant (OSP) audit consisting of data collection and assessment. Deliverables include this report, along with a countywide location map for all broadband infrastructure assets that can deliver a minimum 100/20 Mbps broadband service to the county's residents, businesses, and institutions.

Digital subscriber line (DSL), a broadband service delivered over telephone lines, was not included in the data collection due to capacity limitations inherent with legacy copper networks.

Orange County's vision of ensuring all citizens have access to improved broadband infrastructure and robust, affordable high-speed internet can be realized only by understanding the existing broadband landscape across the county. The end goal is providing all citizens with access to gigabit-plus broadband infrastructure, but this will require incremental steps, time, and funding to achieve.

Beginning September 8 and working through September 19, 2022, CN's Engineering and Technical Services (ETS) team conducted a "boots-on-the-ground" OSP audit in Orange County.

Lastly, the CN team notes that there are certain mapped assets that may have usage restrictions for residential broadband expansion. For example, certain fiber-optic cable routes for local school districts have been subsidized through the E-Rate program (administered through the Universal Service Administrative Co.) and can be used only for educational purposes, not for privatized residential services.

Census Data

According to the U.S. Census Bureau's[1] 2020 redistricting data, the population for Orange County is 84,808. In addition, Census data indicates the county's population per square mile is 254.1 across an area of 333.79 square miles of land.

Census data also suggests there are 32,811 occupied households in Orange County, and a 2021 estimate[1] indicates that 74.3% of the housing units are owner-occupied with median values of $116,100.

Additional Census data indicates that 91.4% of all homes own a computer, and that 86.2% of all homes have an internet subscription.

NOTE: Census data reports a 15.1% poverty rate within Orange County.

[1] https://www.census.gov/quickfacts/orangecountytexas

Broadband and Service Providers

Broadband access refers to the infrastructure that enables a high-speed internet connection. There are two primary types of broadband connections: fixed and mobile.

Fixed broadband is delivered to a user via several technology platforms, including hybrid fiber coaxial (HFC) from the local cable television provider; digital subscriber line (DSL) over copper wires from the incumbent local exchange carrier (ILEC), otherwise known as the local phone company; fiber optics, which can include middle-mile and transport as well as fiber-to-the-X (where X can be home, node, curb, premise, etc.), and fixed wireless. Fixed broadband is designed for stationary use at a fixed location such as a home, business, or institution (see examples at Appendix II: Infrastructure).

Mobile broadband is a wireless technology used to connect portable devices (telephone, tablets, laptops, etc.) to the internet. These networks are designed to provide seamless connectivity as the user moves from one location to the next while accessing the web from a portable device.

The ongoing deployment of fifth generation, or 5G, wireless services will likely have little impact across much of Orange County. Such networks are designed to push immense amounts of data across the mobile network in areas with higher population densities (e.g., city of Orange).

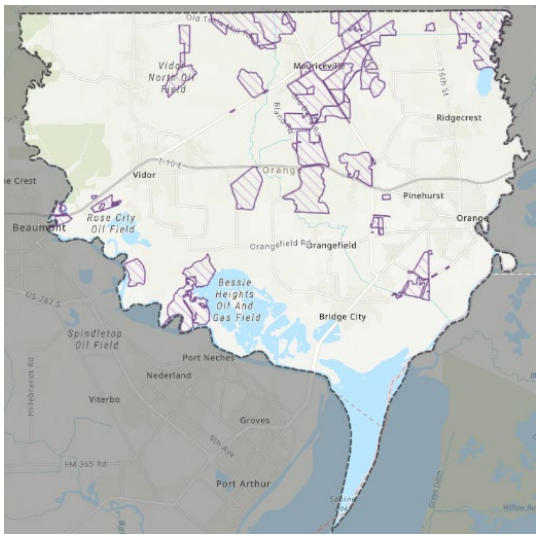
Broadband Background

The broadband infrastructure in Orange County is typical of many counties in the United States, where broadband providers have deliberately focused their capital investments in areas with the highest population density, the most ideal demographics, and areas with the least number of geographic impediments. A common pattern, in counties of this size, is an HFC network provider, Spectrum, also offering entertainment television, competing directly with an ILEC; and AT&T, offering DSL service. When there is a third provider in the area, it is commonly a fixed wireless provider.

Unusual for a county this size is AT&T providing fiber-to-the-home (FTTH) broadband service.

To entice incumbent providers to expand broadband services to less dense areas of the country, state and federal agencies have subsidized deployment, and in some cases, continued operational support. The active programs listed below are but a small sample. For a more detailed list, see CN's current Broadband Funding Guide.

Connect America Fund

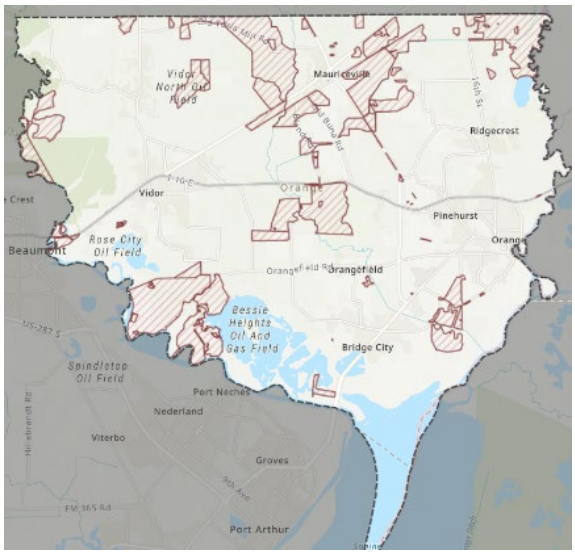


It is necessary to understand the obligations and network expansion projects within the county related to providers participating in the Connect America Fund (CAF) program. These providers are receiving, or have received, federal subsidies to expand internet service.

CAF recipients typically agreed to the delivery of minimum throughput speeds of 10 Mbps (download) by 1 Mbps (upload); see sample map at left illustrating CAF II deployments. CAF recipients, and their related deployment activities, can be found at the USAC CAF broadband map located at https://data.usac.org/publicreports/caf-map/.

CAF recipients in Orange County include AT&T for deployments of 10 Mbps x 1 Mbps.

Rural Digital Opportunity Fund



Federal subsidy recipients, such as those that were winning bidders of the Rural Digital opportunity Fund (RDOF) can be found at https://www.fcc.gov/reports-research/maps/rdof-phase-i-dec-2020/. This includes LTD Broadband LLC, CCO Holdings LLC, and Windstream Services LLC.

Many of the CAF-awarded areas were also subsequently awarded funds under the RDOF program.

U.S. Department of Agriculture

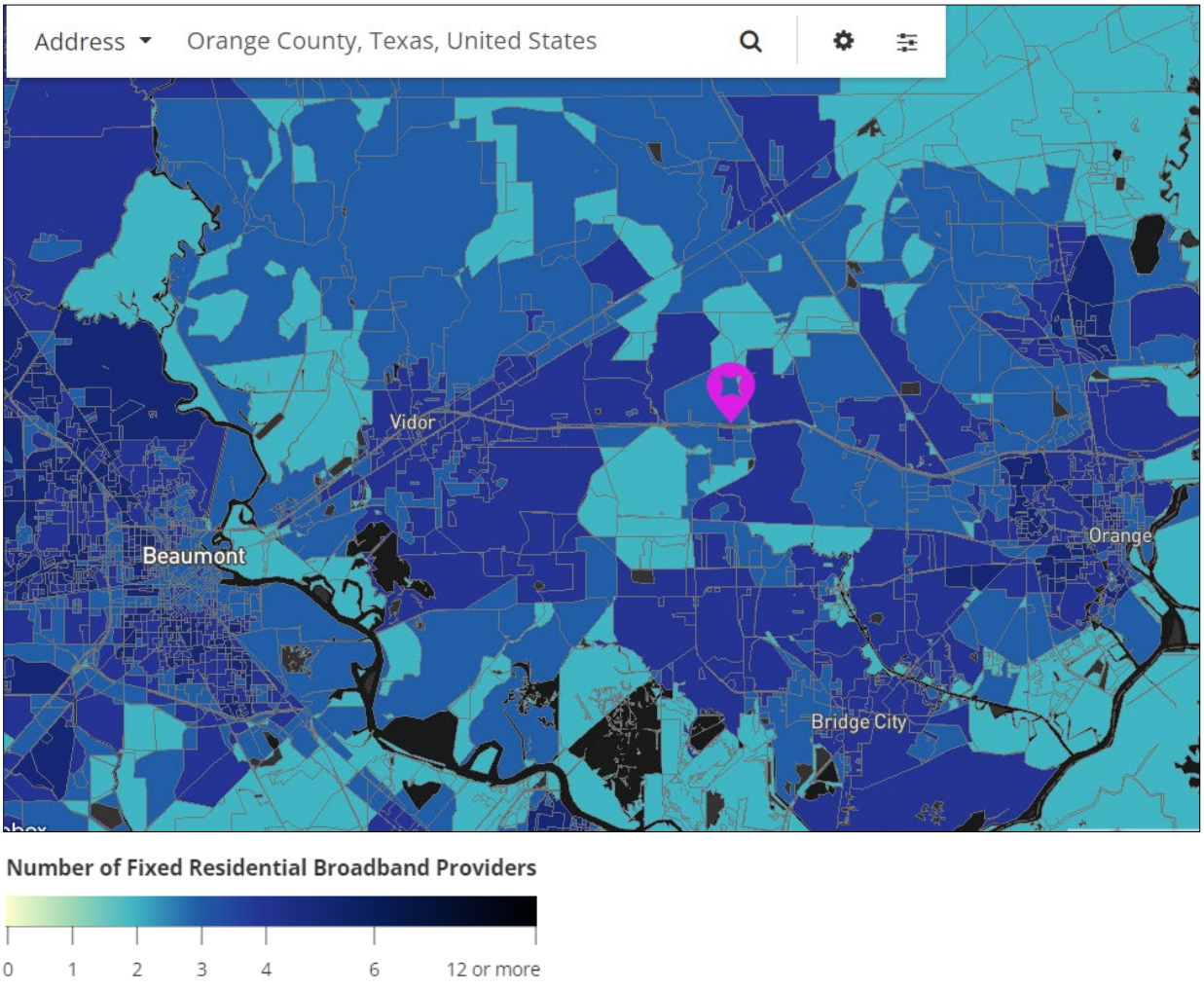
Broadband providers who received a grant or loan through the U.S. Department of Agriculture (USDA) rural development/telecommunications programs (Broadband Infrastructure Program, CAF2, Community Connect, ReConnect, etc.), or are considered as a protected borrower can be viewed at

https://ruraldevelopment.maps.arcgis.com/apps/webappviewer/index.html?id=93ba783edf5b407c9641b2f8653e8c1d.

Orange County Broadband Landscape

The federal broadband map (see map on the next page), managed by the Federal Communications Commission (FCC), clearly overestimates coverage, and does not account for federal auctions, federal subsidies, outstanding grant and/or loan applications, etc. The map provides a visualization of the residential fixed broadband deployment data collected on FCC Form 477.

Facilities-based providers of broadband service report Form 477 data in June and December each year. The map below constitutes data collected in June of 2021. Providers report fixed-broadband deployment data at the census-block level. Providers may not offer service to every home in every block in which they report service. If a provider offers service to a single location within a census block, the entire block is considered as being served, therefore the FCC broadband map typically overestimates broadband coverage, particularly in areas with large census blocks.



Broadband Providers in Orange County

PROVIDER	PROVIDER DOING-BUSINESS-AS NAME	TECHNOLOGY	WEBSITE	MAXIMUM DOWNLOAD SPEED (Mbps)	MAXIMUM UPLOAD SPEED (Mbps)
En-Touch Systems Inc.	Astound Broadband	Fiber	http://www.entouch.net/	1000	1000
En-Touch Systems Inc.	Astound Broadband	Cable	http://www.entouch.net/	115	20
SOUTHWESTERN BELL TELEPHONE COMPANY LP	AT&T Southwest	Fiber	http://www.att.com	1000	1000
SOUTHWESTERN BELL TELEPHONE COMPANY LP	AT&T Southwest	DSL	http://www.att.com	25	2
SOUTHWESTERN BELL TELEPHONE COMPANY LP	AT&T Southwest	Fixed Wireless	http://www.att.com	10	1
Cable One Inc.	Sparklight	Cable	http://www.cableone.net	1000	50
Charter Communications Inc.	Spectrum	Cable	http://www.charter.com	940	35
T-Mobile USA Inc.	T-Mobile	Fixed Wireless	http://www.t-mobile.com	25	3

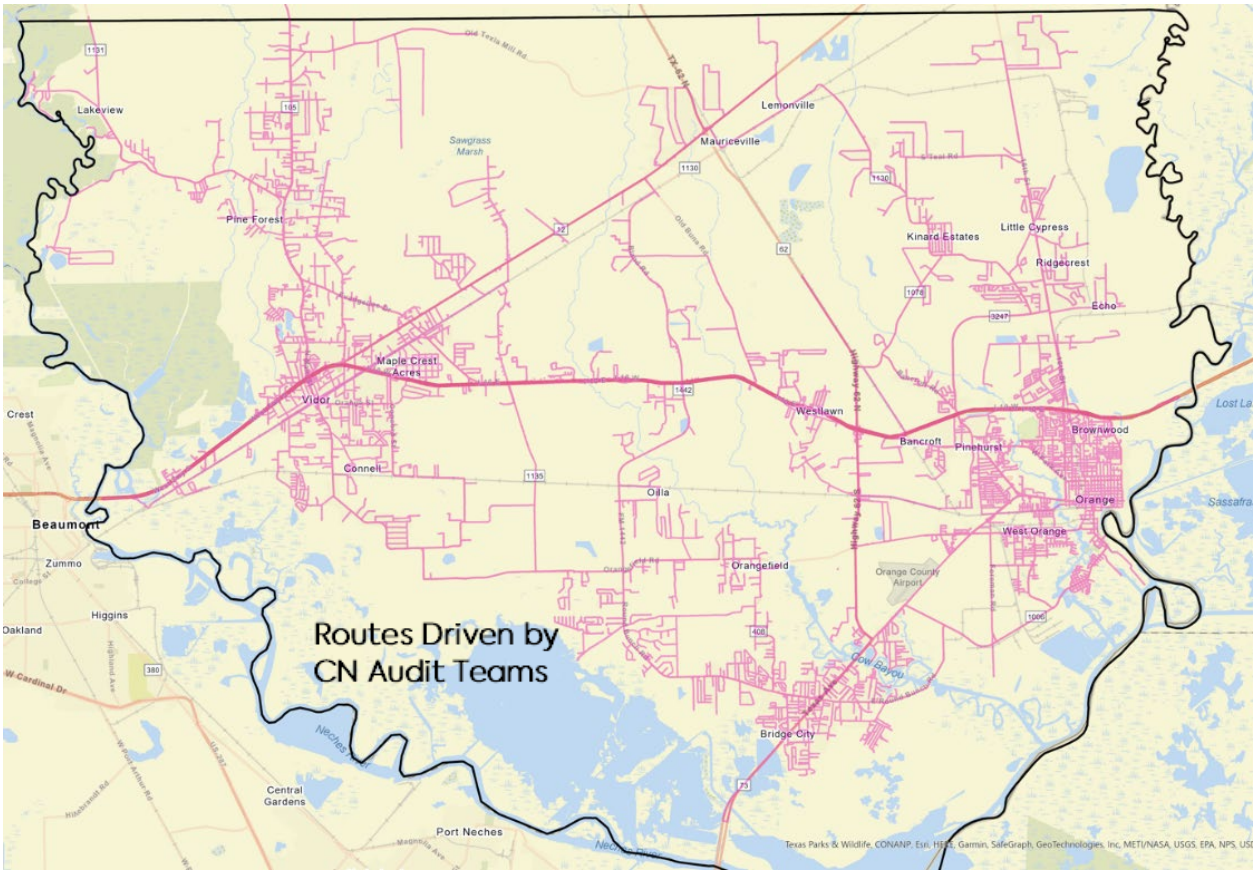
The Outside Plant Audit Process

Prior to in-field verification, CN conducted extensive desktop research using existing tools and publicly available datasets to interpret and identify areas that may contain eligible infrastructure assets such as middle-mile or business-only fiber networks, or from subscription-based services such as FiberLocator. This research also included opportunity zones and fixed wireless point-to-point licenses authorized by the FCC and other federal/state agencies.

From this information and telecommunications engineering analysis, CN identified the areas of the county in which to conduct field research and an outside plant (OSP) audit to validate and identify telecommunications infrastructure assets and their termination points. CN staff rode out over 1,600 road miles in the county to validate, document, and map the infrastructure assets capable of delivering high-capacity broadband service. This project resulted in identifying the precise locations of existing broadband assets and, more importantly, the areas without such assets available for county stakeholders

and ISPs to make informed decisions for broadband middle-mile and last-mile expansion and buildout.

The map below highlights the roads driven by the CN audit teams.



The data gathered through the OSP audit activities has been aggregated into a comprehensive online interactive map that can be shared with users across the county.

On September 8, 2022, CN dispatched an OSP audit team consisting of Melissa Castaneda, Evan Leonard, Ryan Martin, and Layne Wagner (team leader).

Summary of Findings

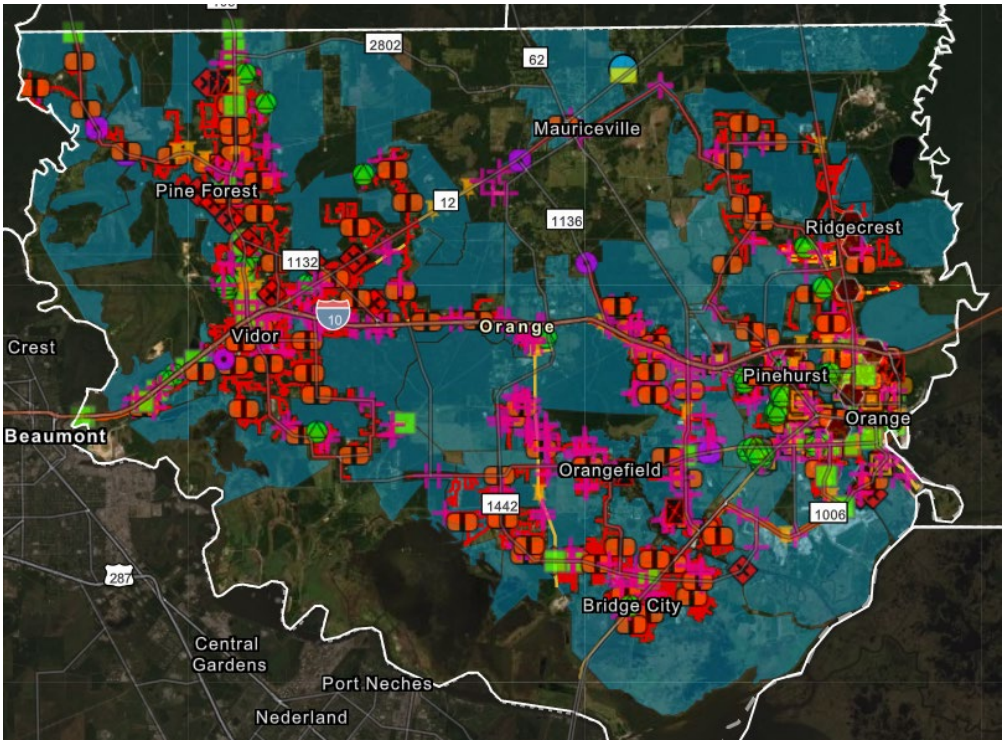
The map below reveals the current broadband infrastructure in Orange County, compared with the FCC Form 477 reported coverage as highlighted in the blue-shaded areas. It clearly shows the overstatement of broadband availability across the county. The interactive map will allow visualization of these blue-shaded areas without relevant infrastructure, and areas added where new infrastructure was located in greater detail.

[An interactive map of CN's finding]

Because of the sensitive nature of critical telecommunication infrastructure, the link provided above is password protected

Login – TX_OrangeCounty

Password – OrangeCty_Tx!!48



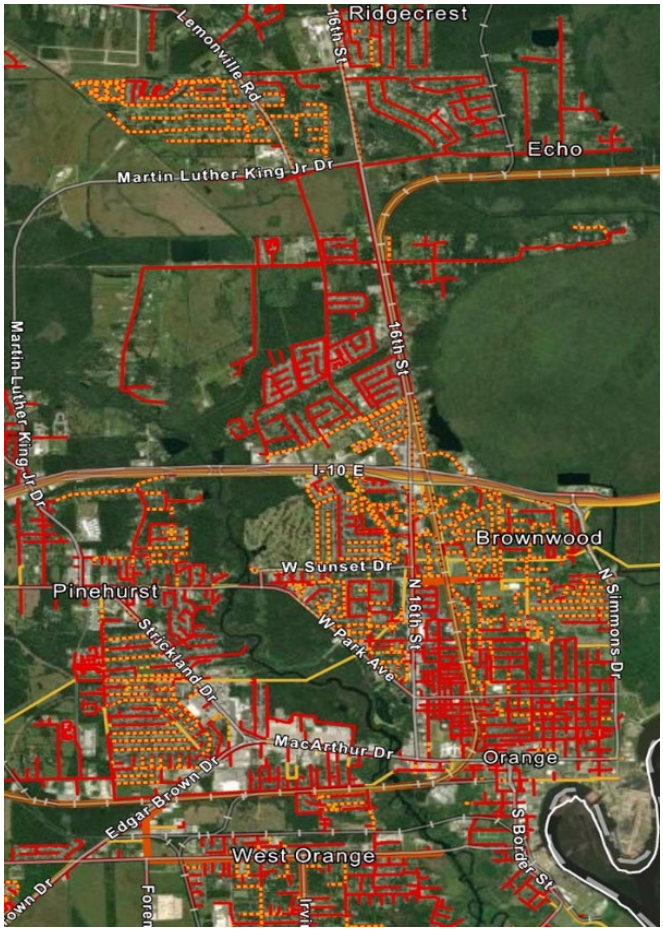
Fiber-to-the-Premise (FTTP) Assets

AT&T has deployed a FTTP network in the city of Orange and its surrounding communities, as shown in the adjacent map and represented as orange dotted lines.

The households in these communities have the option of subscribing to Spectrum or AT&T for broadband service.

The AT&T network offers up to 5 Gbps symmetrical service to end users.

Spectrum offer non-symmetrical service up to 1 Gbps to end users.



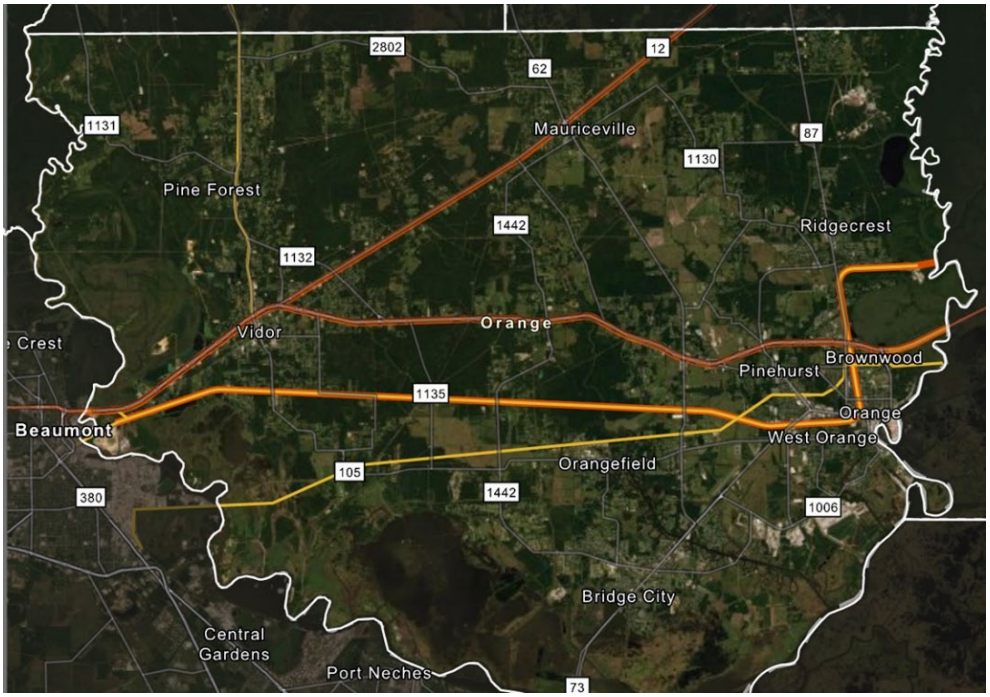
Orange County Broadband Infrastructure

Of the 32,811 households in Orange County, the FCC broadband map (477 data) reports 91.65% as having broadband availability at 100/20 Mbps. The results of the CN OSP audit reveal only 81.20% of households actually have access. This information should be reported to the Texas Broadband Office so the state can use this information to challenge the reported coverage areas of current providers. The challenge process can benefit the state and Orange County by potentially bringing in additional federal funds to help providers expand their coverage areas.

Category	Pre-Audit	Post Audit
Total households (2020 Census)	32,811	32,811
100/20 Mbps availability (477 data)	91.65%	81.20%
Underserved households	2,740	6,168
Underserved %	8.35%	18.80%

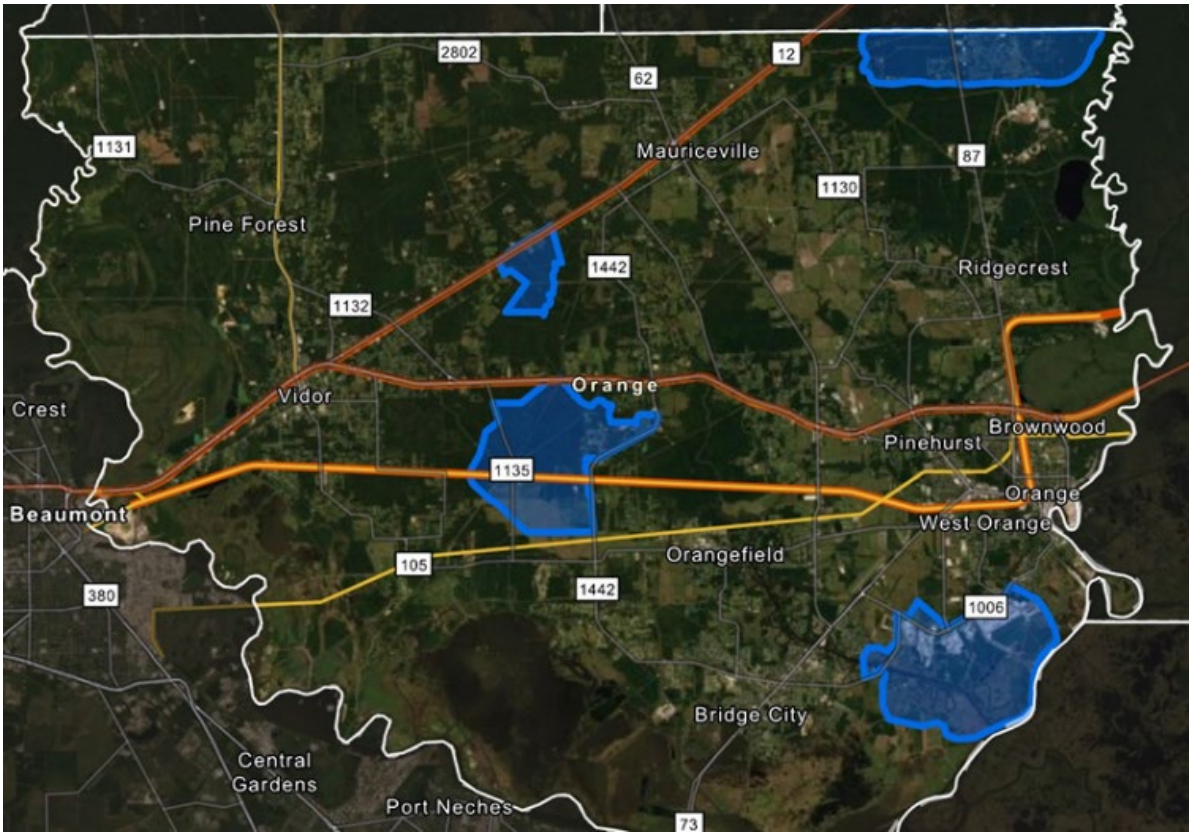
Middle-Mile and Long-Haul Fiber Routes

The middle-mile fiber infrastructure identified across the county is indicated in the map below. Knowing where these interconnecting fiber routes are located can be helpful in planning broadband expansion, as these middle-miles fiber networks typically feed last-mile connections.



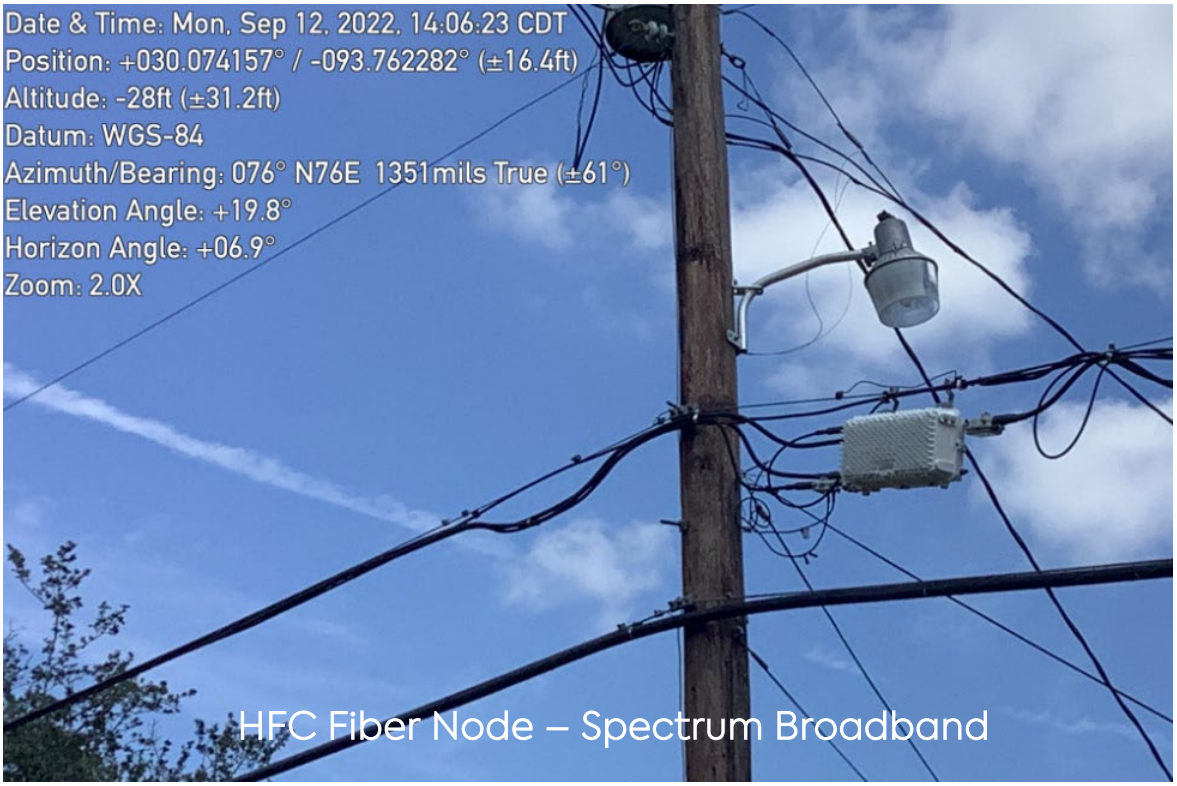
Special Interest Areas

In addition to driving all county roads with verified broadband infrastructure, the CN audit teams surveyed four specific areas of interest. It was determined that no assets capable of meeting the speed threshold existed in any of the identified locations. These areas are highlighted in blue in the map below.

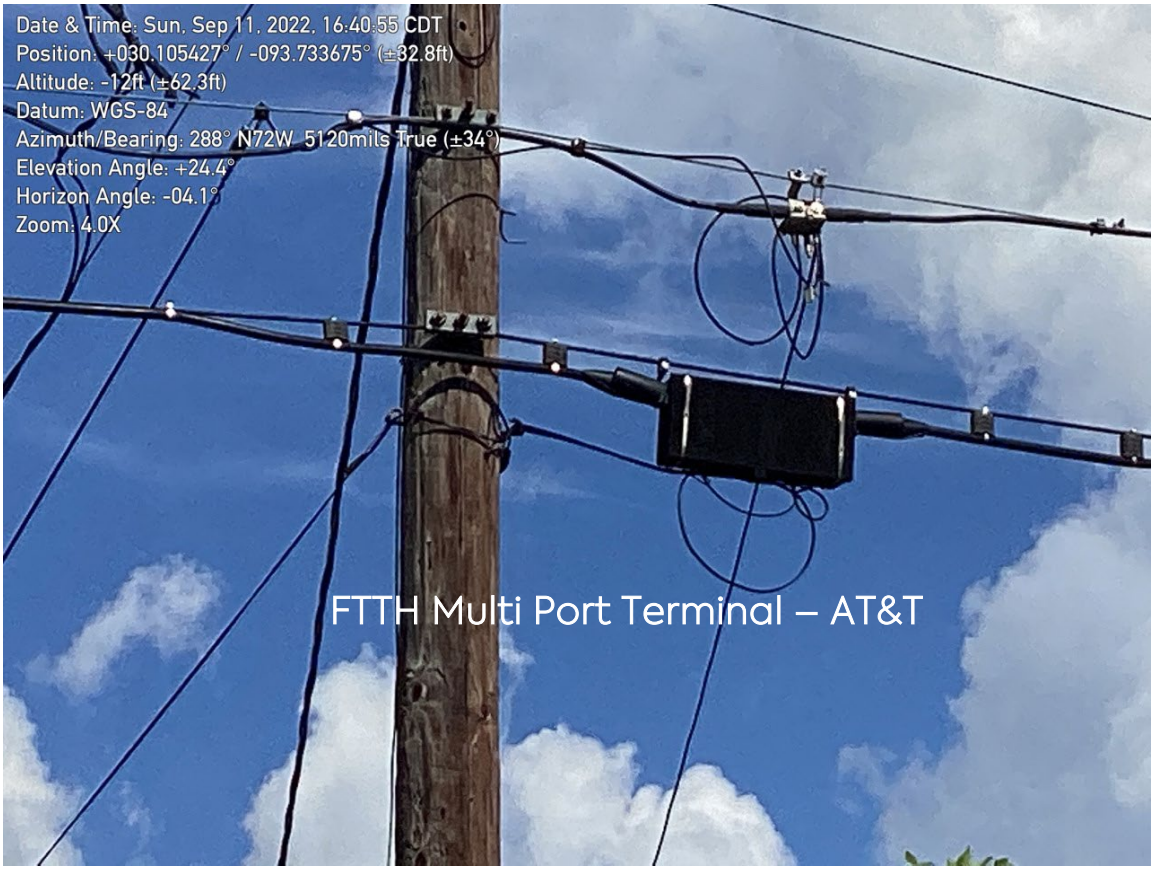


Miscellaneous Assets

The audit teams also mapped several broadband infrastructure assets that can provide critical information to determine connectivity points for broadband network expansion opportunities. Assets such as central offices, fiber markers, fiber splitters, pedestals, vaults, HFC nodes, and OptiSheath MultiPort fiber terminals are noted on the map as indicated in the pictures below.



HFC Fiber Node – Spectrum Broadband



FTTH Multi Port Terminal – AT&T


Date & Time: Fri, Sep 16, 2022, 14:53:45 CDT
Position: +030.117048° / -094.026462° (±16.4ft)
Altitude: 7ft (±31.2ft)
Datum: WGS-84
Azimuth/Bearing: 085° N85E 1511mils True (±20°)
Elevation Angle: +01.9°
Horizon Angle: +00.7°
Zoom: 1.0X
AT&T Central Office (CO)


Date & Time: Fri, Sep 09, 2022, 15:57:09 CDT
Position: +030.104758° / -093.747872° (±16.4ft)
Altitude: -8ft (±31.2ft)
Datum: WGS-84
Azimuth/Bearing: 190° S10W 3378mils True (±31°)
Elevation Angle: -58.7°
Horizon Angle: +12.9°
Zoom: 1.0X
AT&T Fiber Optics Vault