Lancaster County Virginia

Community Broadband Survey Executive Summary

September, 2019

Prepared by The Center for Innovative Technology
Powered by Lancaster County Virginia

CIT
CENTER FOR INNOVATIVE TECHNOLOGY

DHCD Requirement

3. Engagement of the Center for Innovative Technology

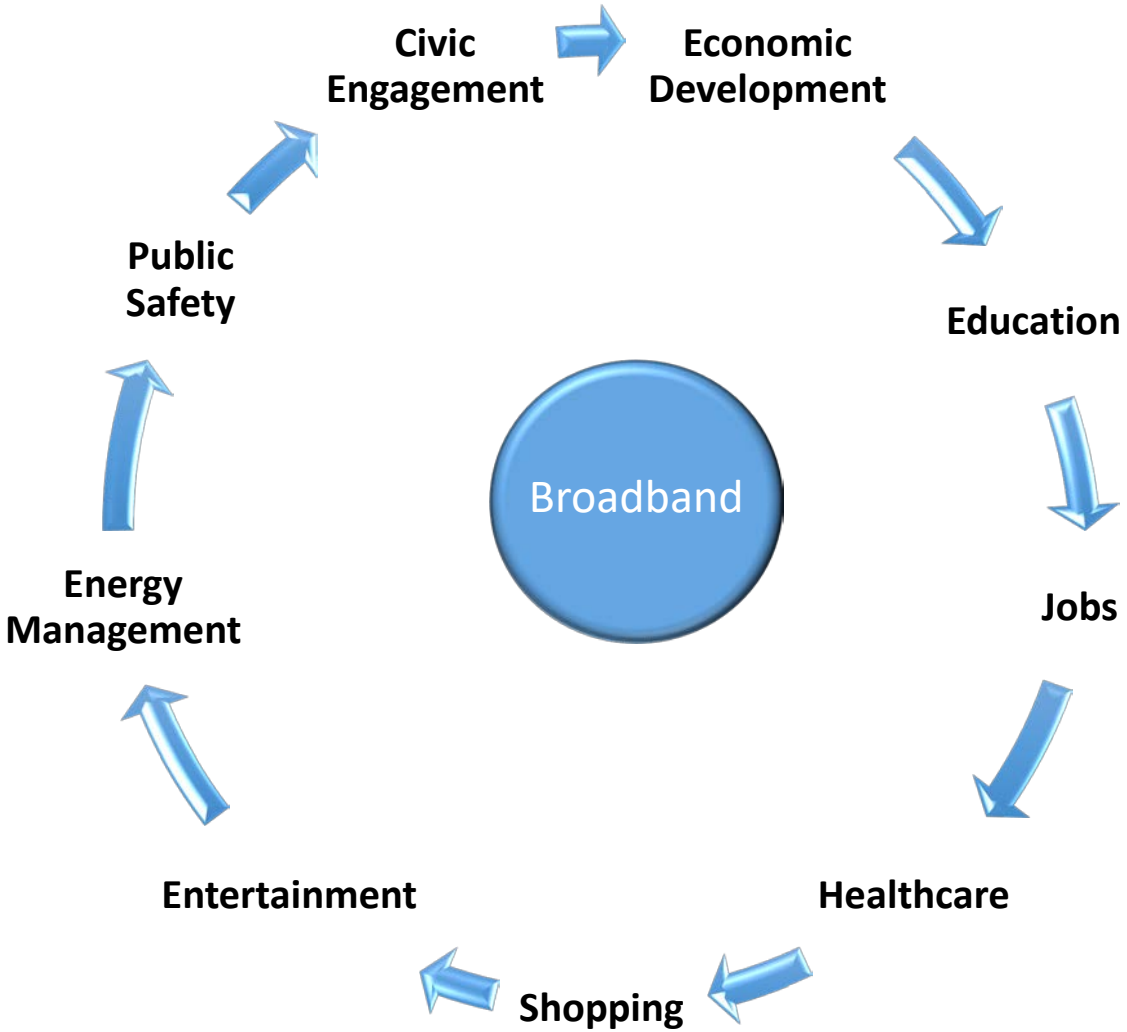
The County should consult the Center for Innovative Technology to assist with the completion of the community needs assessment survey. Documentation of the consultation should be including with the response to completion of all Initial Activities.

The County must conduct a community-wide survey to assess existing broadband telecommunication assets and services and identify needs. Efforts must be made to target and receive responses from a good representation of residents, businesses and industries in the County. The survey also should include income information for residents, a sample question has been attached. The income data to populate the survey can be found at https://www.huduser.gov/portal/datasets/il/il2019/select_Geography.odn .

Topics

- Why Broadband/Adoption Matters
- Current Reported Coverage
- Broadband Demand
- Local Assets
- Review of local policies & fees
- Broadband Needs
- Next Steps

Why Does Broadband Matter?

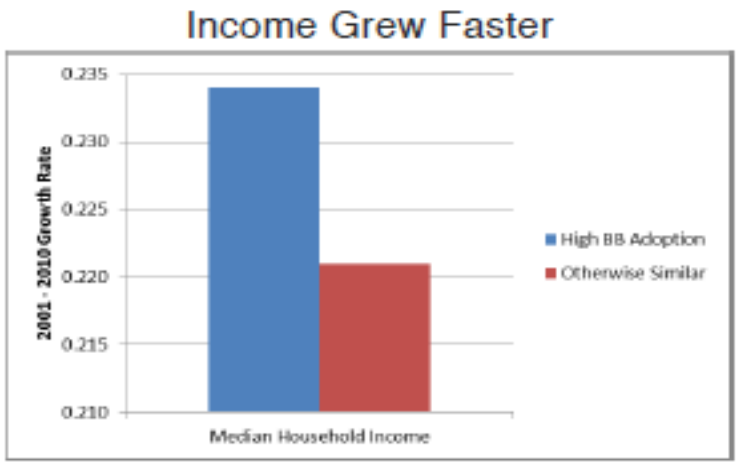


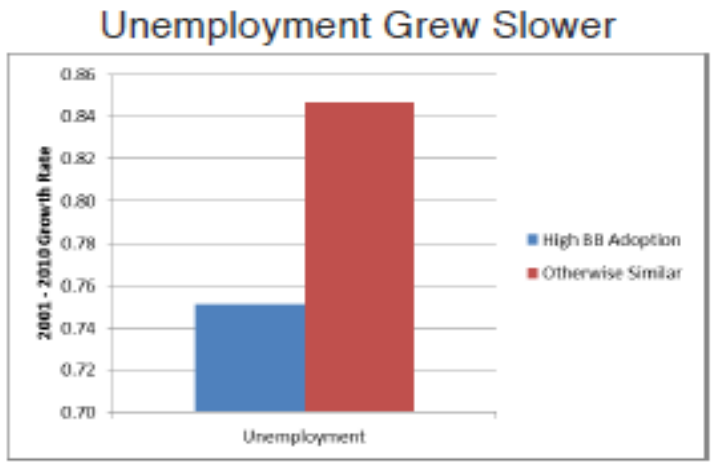
Why Does Broadband Adoption Matter?

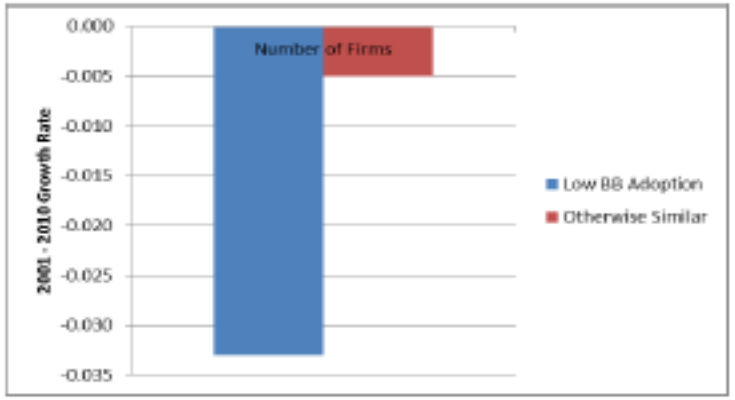
In rural counties, between 2001 and 2010…

Where broadband adoption was high, (60%+)…

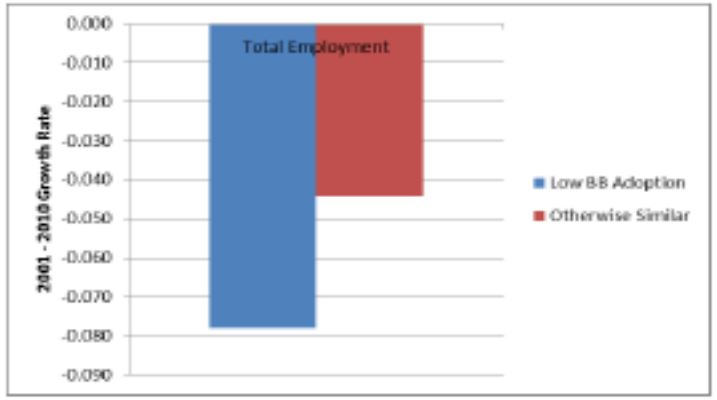
Where broadband adoption was low, (<40%)…







Lost More Businesses



Lost More Jobs

Whitacre, Gallardo, and Strover. 2014a. *Telecommunications Policy*

The Economics of Broadband

Local Perspective

According to a study by Ohio State University Swank Program, "Estimates of the average annual benefits received by US broadband subscribers range from $1,500 (Greensteinand McDevitt, 2012) to $2,200 (Nevo et al., 2016) per household.

Using the mean from the Swank study; $1,850, and broadband defined as: **minimum speeds of 25 Mbps download/3 Mbps upload** we can *estimate* economic benefits and losses expected from broadband availability in Lancaster County:

Estimate of **County Households without broadband** (connections < 25/3) = 2107
Estimate of **County Households with broadband** (25/3 and above) = 5295

Potential annual economic benefits or losses according to the Swank Study could range from:

- Without Broadband: 2107 * $1,850 = **$3,897,950 economic loss -** due to not having broadband connected homes.
- With Broadband : 5295 * $1,850 = **$9,795,750 economic gain –** due to a broadband connected homes.
- The economic gain if all households in Lancaster County had broadband service: 7,402 x $1,850 = **$13,693,700**

FTTH Council released a study showing access to **fiber-delivered** Internet boosts home values by up to 3.1 percent.
Median household value (census 2017) for Lancaster County Virginia: $226,900 * .031X = $7,034 increase

The Economics of Broadband

Locality Perspective

Localities can improve the investment opportunity for broadband expansion by helping to balance the sustainability equation. Recall:

$$[Revenues > (CapEx + OpEx)] = Sustainability$$

Increase Revenues ⬆	LOWER COSTS ⬇
Adoption and Demand	Local Assets/Infrastructure
Population Density	Policies & Fees
Community Anchor Institutions*	Partner for Funding Opportunities

***Revenues from a few of the biggest customers in a community (anchors/carrots) can make or break a business plan.**

Reported Current Coverage

FCC Provider Reported Data

Source: FCC Form 477, December 2017

Important note about FCC reported coverage

Seriously

All facilities-based broadband providers* **are required** to file data with the FCC twice a year (Form 477) on where they offer Internet access service at speeds exceeding 200 kbps in at least one direction.

Fixed providers file lists of census blocks in which they **can or do offer service** to at least one location, …
Mobile providers file maps of their coverage areas for each broadband technology (e.g., EV-DO, HSPA, LTE).

Block-Level Deployment and Competition

A provider that reports deployment of a particular technology and bandwidth in a particular census block may not necessarily offer that particular service everywhere in the census block. Accordingly, a list of providers deployed in a census block does not necessarily reflect the number of choices available to any particular household or business location in that block, and the number of such providers in the census block does not purport to measure competition.

Source: Source: https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477
***A Facilities-based Broadband Provider** is an entity that provides broadband services over facilities it owns, provisions and/or equips.

Take away – FCC coverage maps are overstated – but it's all we have!

Lancaster County Providers that Report to the FCC via From 477

DBA Name	Technology Name	Total Blocks	Covered Blocks	Percentage of Blocks	Covered Households	Percentage of Households	Max Consumer Download	Max Consumer Upload	Max Business Download	Max Business Upload
COMCAST*	CABLE	1,490	3	0.20%	12	0.16%	987	35	0	0
COX COMMUNICATIONS*	CABLE	1,490	1	0.07%	12	0.16%	0	0	300	30
MCI	DSL or COPPER	1,490	1	0.07%	77	1.04%	0	0	4	4
METROCAST/ABB	CABLE – Tech code: 42– DOCSIS 3.0, Max 200 Mbps	1,490	409	27.45%	5,030	67.95%	105	10	150	10
VERIZON VIRGINIA LLC	DSL or COPPER	1,490	342	22.95%	4,150	56.07%	15	1	0	0
VIRGINIA BROADBAND, LLC	FIXED WIRELESS	1,490	441	29.60%	2,692	36.37%	25	25	0	0

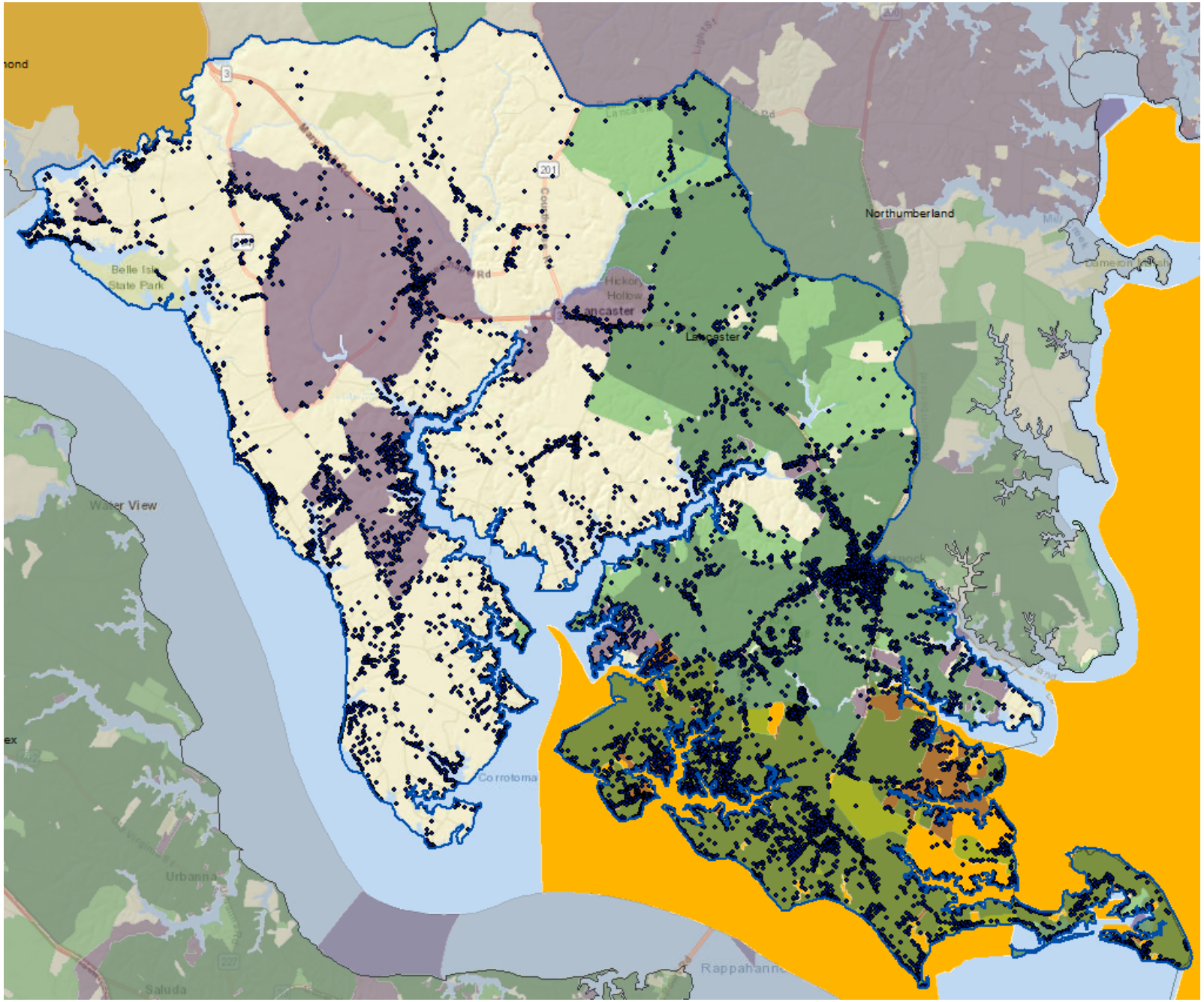
Source: FCC Form 477, December 2017
Households from 2010 census. 2010 is the last time households were reported by census block.

Comcast & COX reported coverage is erroneous. ABB is the only cable operator in Lancaster County.

NOTE: SignaWave LLC formerly Northern Neck WiFi serves some unknown amount of households but not reporting to FCC.

Lancaster County
All Coverage Areas

Cable
DSL
Cable / DSL overlap
Fixed Wireless



NOTE: SignaWave LLC formerly Northern Neck WiFi serves some unknown amount of households but is not included in FCC 477 Dec2017v2 data.

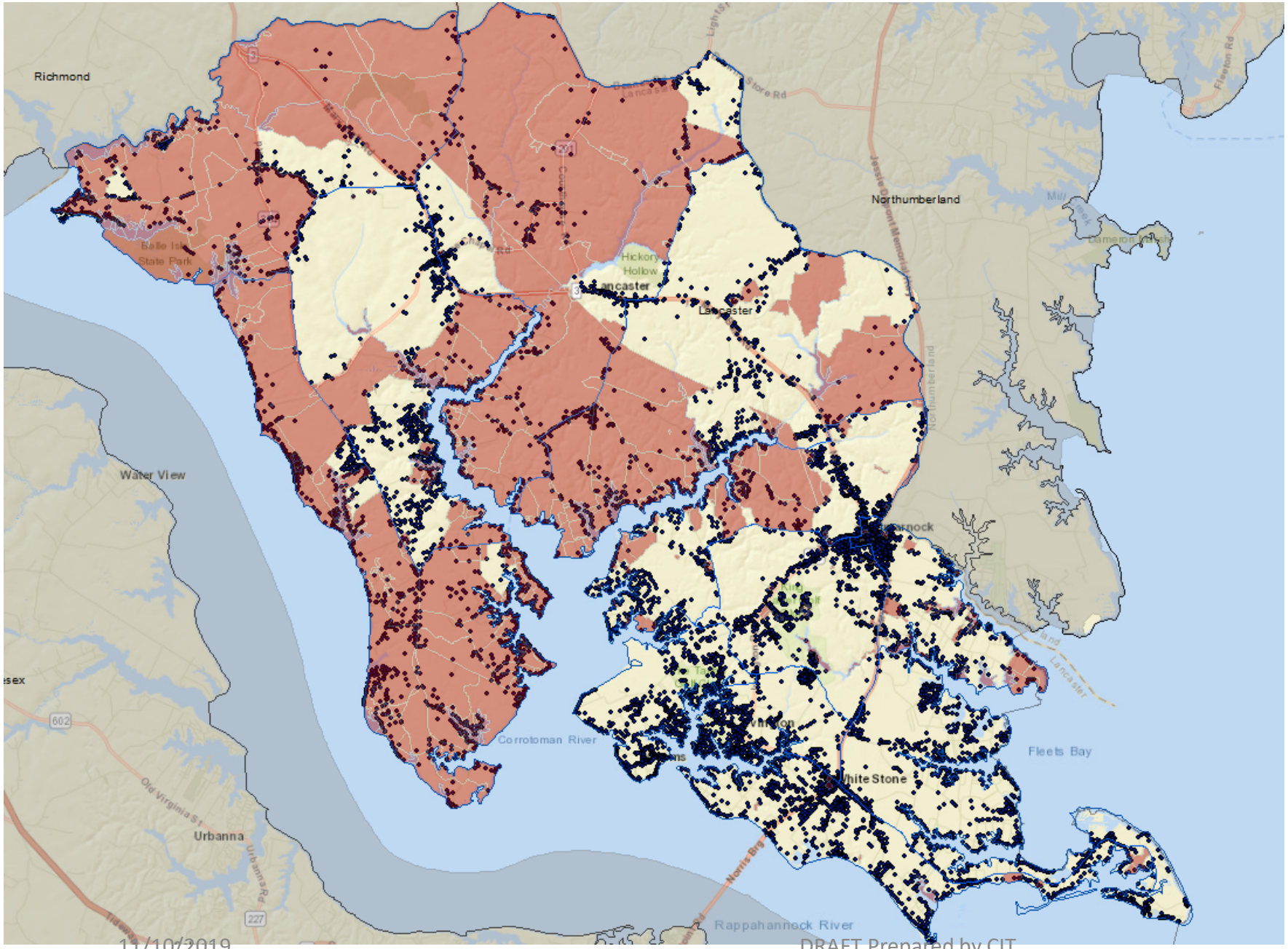
Source: FCC 477 Dec2017v2

Lancaster County

Fiber Services
(Not Commercial Fiber Routes)

No consumer or business fiber delivered services are reported.

Lancaster County Virginia



- Unserved (below 25/3) according to FCC 477 Dec 2017v2
- 911 Address Points

According to FCC 477, 72% of households are served with connections of minimum 25 Mbps download, 3 Mbps upload.

Lancaster County Unserved

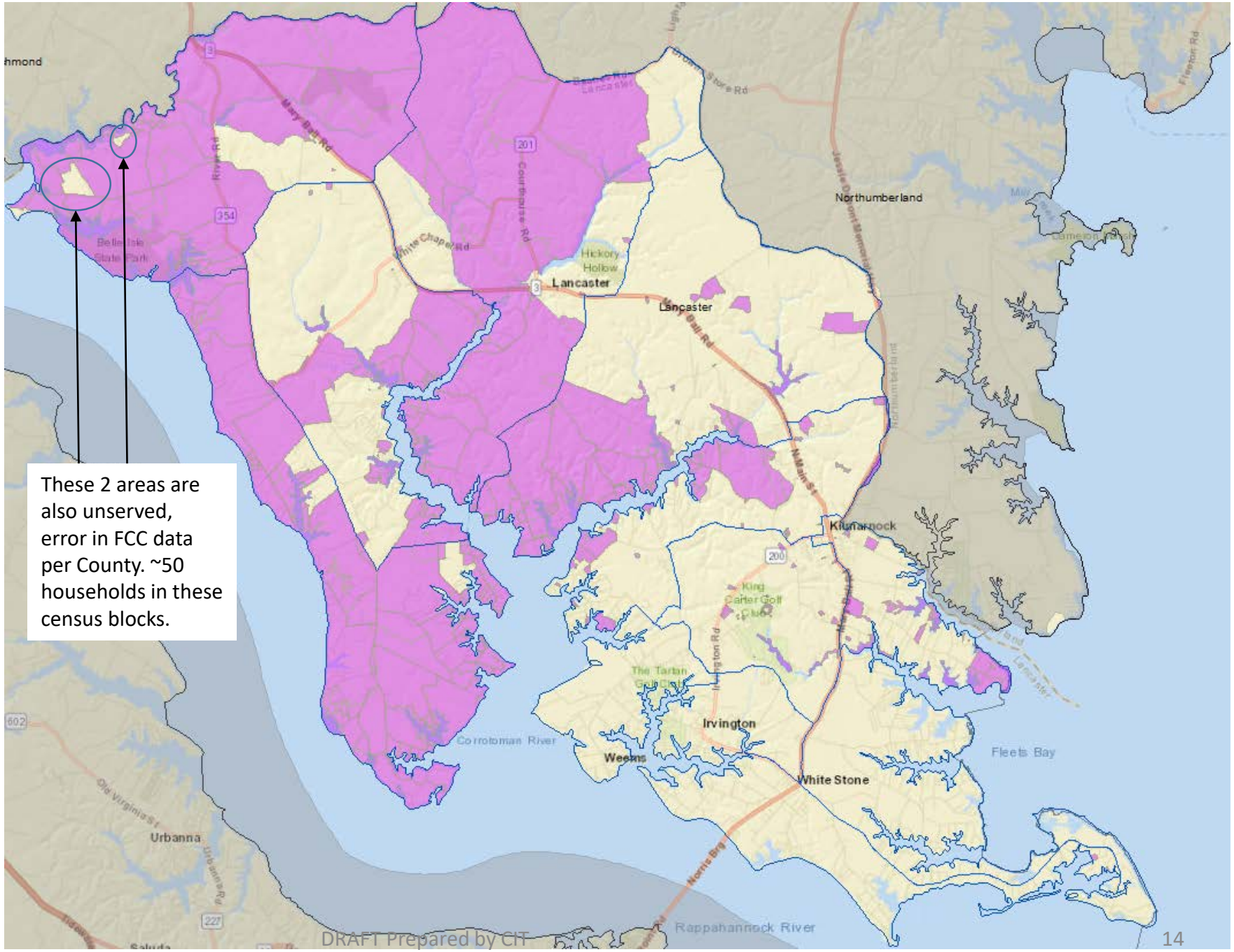
Areas of coverage reported at 10 Mbps download and 1 Mbps upload or less.

~25% (2220) of address points in these unserved areas.

These areas may be eligible for funding under the Virginia Telecommunication Initiative (VATI).

VATI defines unserved areas as having broadband speeds of less than or equal to 10 Mbps download and 1 Mbps upload.

Excel file of all potentially eligible census blocks available upon request.

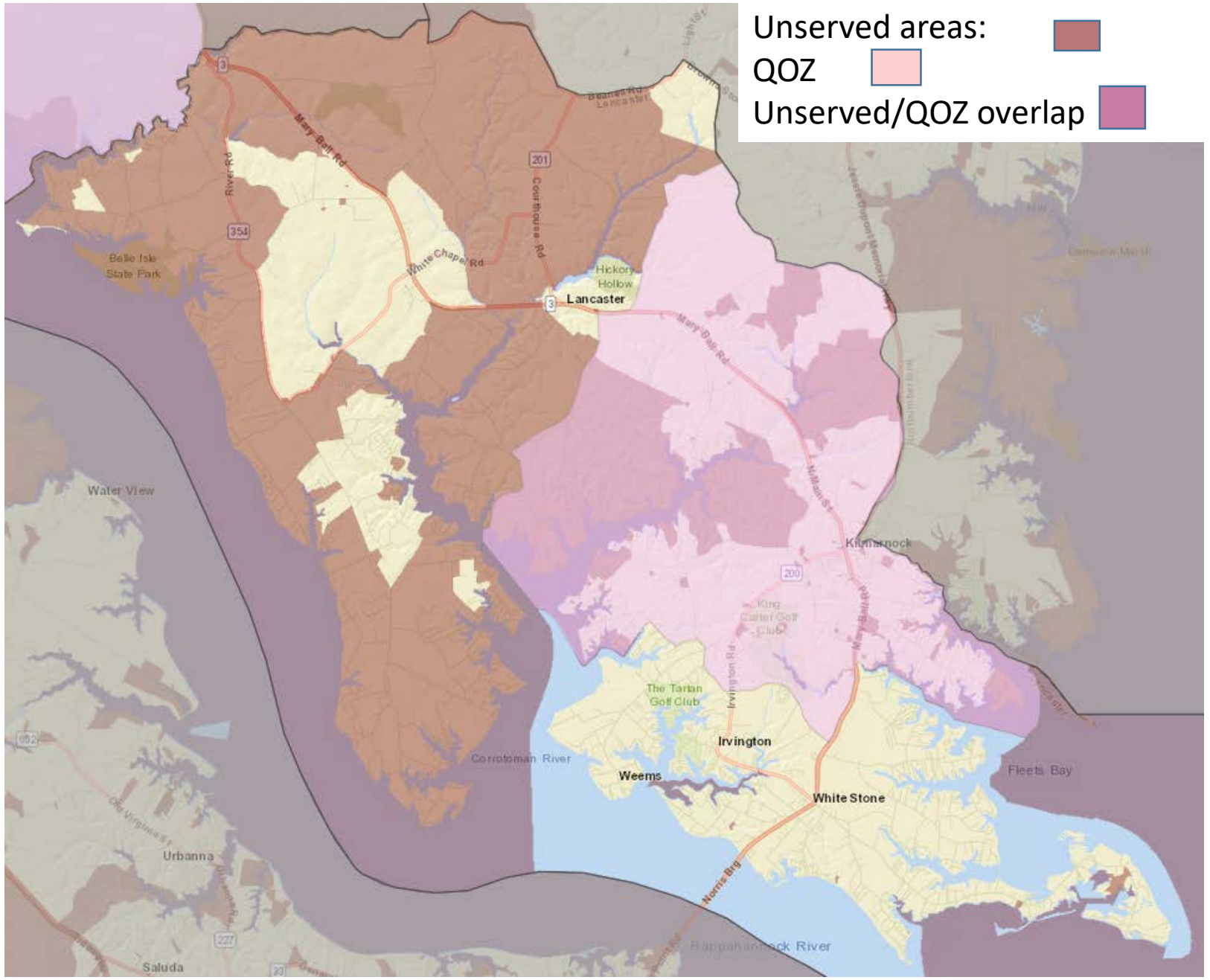


Lancaster County Opportunity Zone

The Federal Tax Cuts and Jobs Act of 2017 included provisions for a new revitalization tool, the Opportunity Zone and Opportunity Fund. The Zones and Funds will allow investors to receive tax benefits on currently unrealized capital gains by investing those gains in qualified census tracts (Opportunity Zones).

Qualified Opportunity Zones (QOZs) allow keen investors and developers to turn redevelopment opportunities into tax savings while fulfilling a need for community reinvestment and renewal.

Take away: County, local providers, others should consider if/how the QOZ can aid in broadband expansion efforts.



Lancaster County Public Safety
and
Vertical Assets

FirstNet 1x1 mile grids.

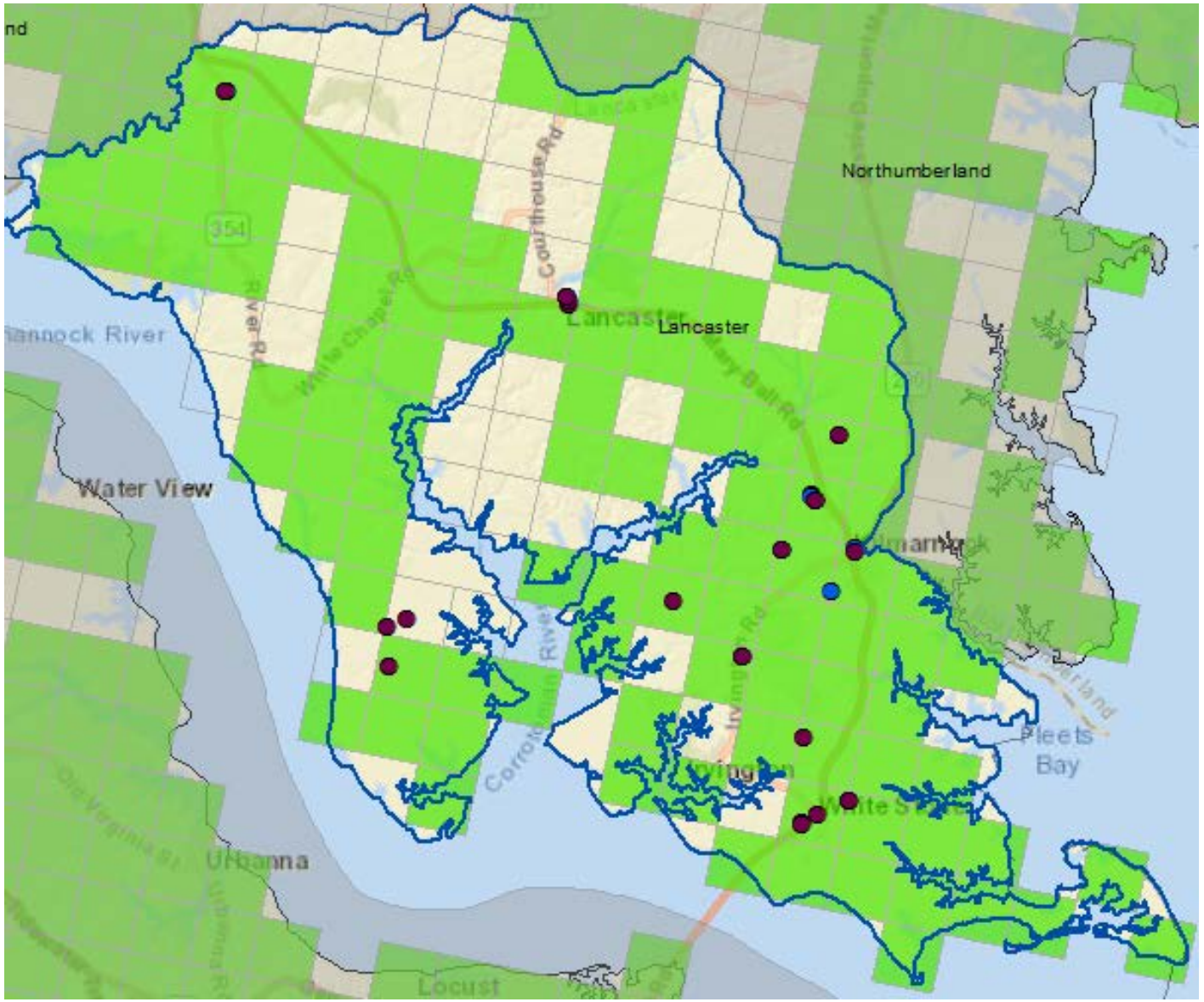
Proposed terrestrial coverage

Proposed non-terrestrial coverage

***VDEM coordinating FirstNet activities**

FCC registered Vertical Assets

FiberLocator identified Vertical Assets



Broadband Demand

Now and Into the Future

Patrick County Survey Results

Lancaster County Broadband Survey Summary

1778 residential responses

- **~ 35% of occupied households (5081) responded**
- **80%** of residential respondents subscribe to the Internet at home.
- The primary reasons cited for no home Internet was "Internet service not available, Internet service not reliable."
- **20%** of residential respondents report they have NO Internet service at home. Primary reasons cited: **25%** "Internet service not available," **18%** "Internet not reliable," and **2**% "Device is too expensive."
- At least **42%** of residents depend upon inadequate, expensive, unreliable and/or obsolete services; **22%** Satellite, **11%** DSL, **11%** Cellular, **<1%** Dial-up.
- **52%** report their home Internet service ***does not meet*** their needs, citing slow connection and unreliable service as the primary reasons.
- Satellite, Cellular and Fixed Wireless were cited most often as Internet service that ***does not meet*** the residential needs.
- The majority of respondents (**57%**) - 2 persons households earning above $44,750
- **90%** of respondents said they would commit to a new contract if an affordable, faster option became available.
- **53**% of respondents would be willing to pay between $50-$100 per month for a faster home Internet connection, 35% under $50./month.
- **66%** of respondents depend on cellular service for their home phone, **30**% landline.
- **70%** of residents say their home phone service is reliable;
  - 38% report cellular is not reliable
  - 13% report landline is not reliable
- **9%** of respondents report K12 school-aged children report no Internet at home.
- **12%** of K12 households report no access after school.
- **5%** of K12 household report they depend on the Lancaster Community Library for Internet access after school.
- **34%** of respondents would work from home if they had better access – CATA Question
- **14%** (225) report operating home based businesses.
- **27%** commute outside the county for work.
- County health behavior estimates for diabetes (**14%**) and obesity (**30%**) exceed national estimates; diabetes (**10%**), obesity (**28%**)

Occupied housing units 5081 (2017 Census)

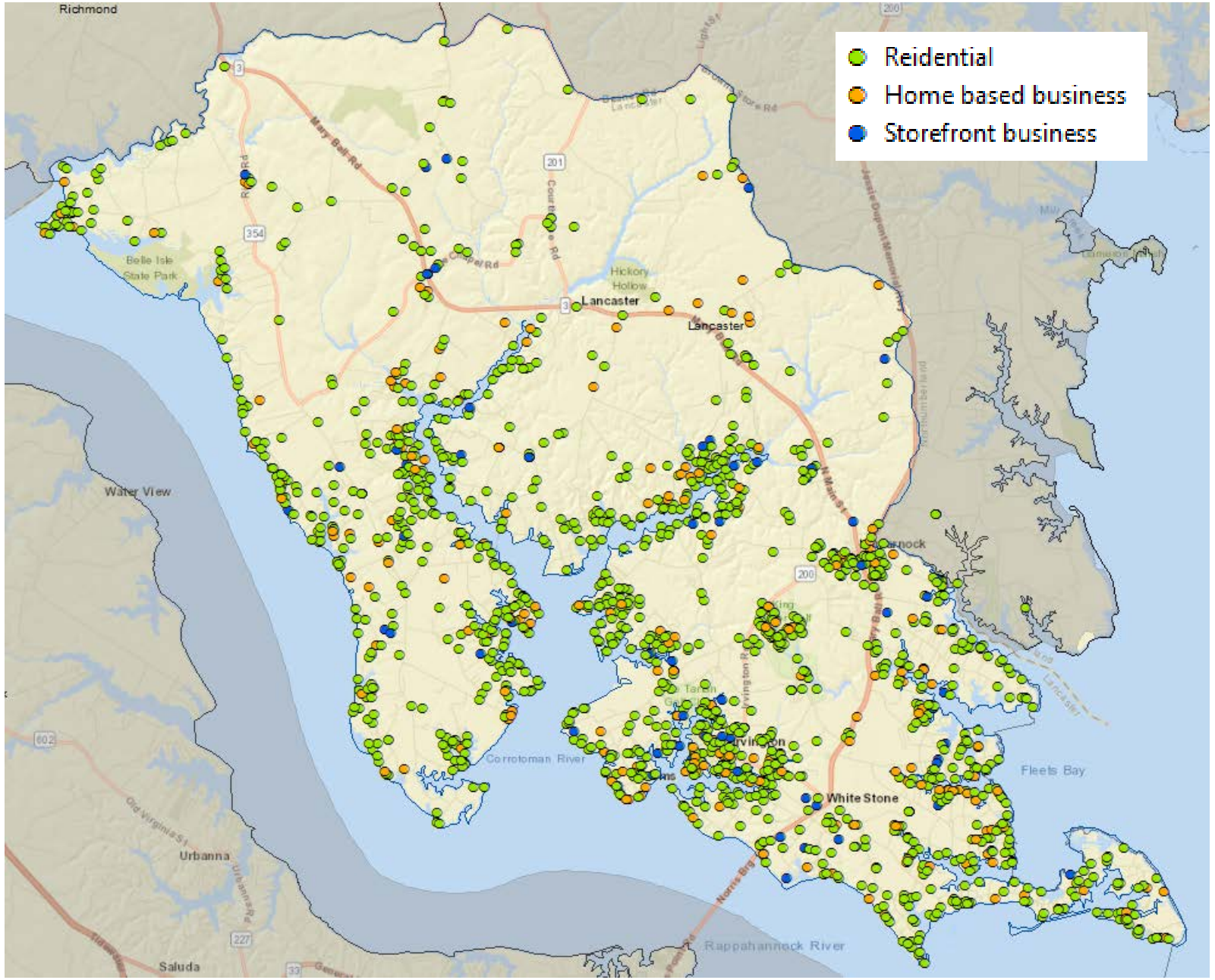
Based on 5081 occupied housing units, these 1778 unique residential responses represents Lancaster County households with:

99 % (+/- 2%) accuracy

Lancaster County

Survey Response Locations

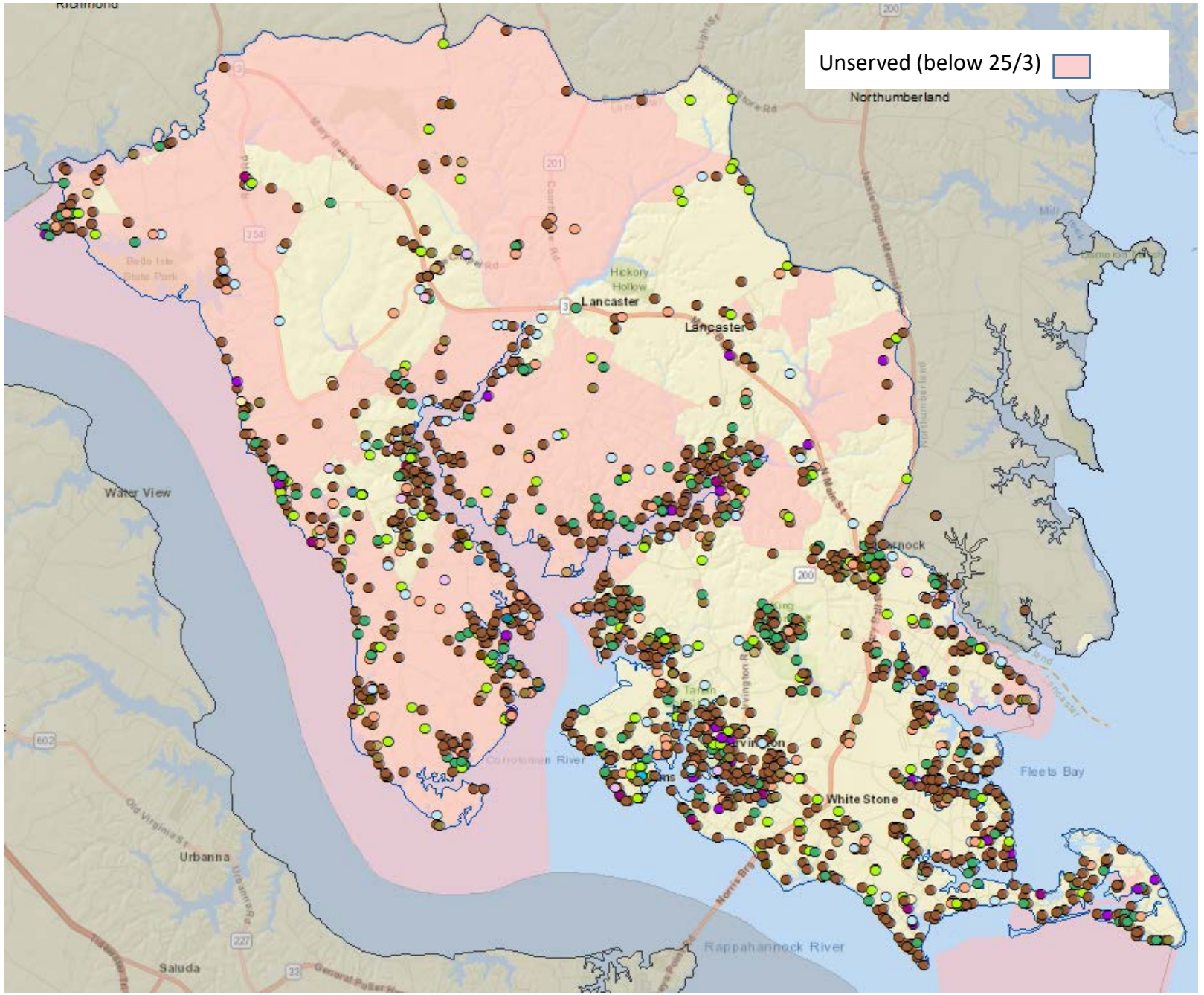
Location	Counts
Heathsville	7
Irvington	182
Kilmarnock	137
Lancaster	327
Lively	19
Merry Point	10
Millenbeck	1
Mollusk	16
Morattico	12
Ottoman	4
Weems	247
White Stone	203



Lancaster County HUD Income Data

HUD Category	# of Responses
2 PERSONS HOUSEHOLD - ABOVE $44,750	1008
1 PERSON HOUSEHOLD - ABOVE $39,150	229
1 PERSON HOUSEHOLD - BELOW $39,150	147
2 PERSONS HOUSEHOLD - BELOW $44,750	115
3 PERSONS HOUSEHOLD - ABOVE $50,350	96
4 PERSONS HOUSEHOLD - ABOVE $55,900	80
5 PERSONS HOUSEHOLD - ABOVE $60,400	34
3 PERSONS HOUSEHOLD - BELOW $50,350	13
4 PERSONS HOUSEHOLD - BELOW $55,900	12
6 PERSONS HOUSEHOLD - ABOVE $64,850	10
8 PERSONS HOUSEHOLD - ABOVE $73,800	9
5 PERSONS HOUSEHOLD - BELOW $60,400	8
3 HOUSEHOLD PERSONS - BELOW $50,350	5
6 PERSONS HOUSEHOLD - BELOW $64,850	4
7 PERSONS HOUSEHOLD - ABOVE $69,350	4
8 PERSONS HOUSEHOLD - BELOW $73,800	2
7 PERSONS HOUSEHOLD - BELOW $69,350	1

- 1 PERSON HOUSEHOLD - ABOVE $39,150
- 1 PERSON HOUSEHOLD - BELOW $39,150
- 2 PERSONS HOUSEHOLD - ABOVE $44,750
- 2 PERSONS HOUSEHOLD - BELOW $44,750
- 3 HOUSEHOLD PERSONS - BELOW $50,350
- 3 PERSONS HOUSEHOLD - ABOVE $50,350
- 4 PERSONS HOUSEHOLD - ABOVE $55,900
- 4 PERSONS HOUSEHOLD - BELOW $55,900
- 5 PERSONS HOUSEHOLD - ABOVE $60,400
- 5 PERSONS HOUSEHOLD - BELOW $60,400
- 6 PERSONS HOUSEHOLD - ABOVE $64,850
- 6 PERSONS HOUSEHOLD - BELOW $64,850
- 7 PERSONS HOUSEHOLD - ABOVE $69,350
- 7 PERSONS HOUSEHOLD - BELOW $69,350
- 8 PERSONS HOUSEHOLD - ABOVE $73,800
- 8 PERSONS HOUSEHOLD - BELOW $73,800

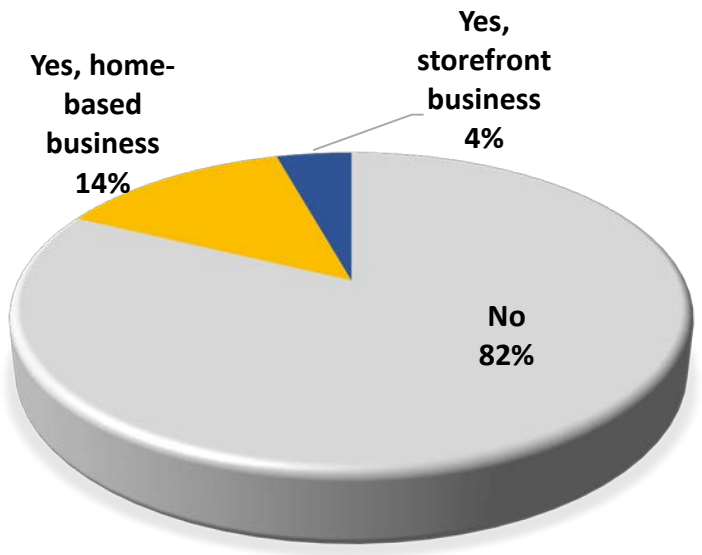


Lancaster County Business Survey Response Summary

72 traditional storefront businesses responded

- **18%** of all respondents report operating a business; **4%** (72) traditional storefront, **14%** (225) home-based.
- **15%** of storefront business report they do not subscribe to the Internet, citing availability and they use their cellphones as the main reasons.
- At least **28%** of businesses depend upon inadequate, expensive, and/or unreliable services; **17%** DSL, **4%** Satellite, **7%** Cellular.
- Nearly all (**97%**) of storefront businesses report the Internet is "Very Important" to their business operations.
- **40%** report their business Internet service does not meet their needs, citing slow connections, and unreliable service as the primary reasons. DSL **(29%)** reported most often as service that does not meet needs, followed by cable (**24%**) and cellular (**14%**).
- **93%** of businesses said they would commit to a new contract if an affordable, faster option became available.
- **45%** of businesses are willing to pay between $50-$100 per month for a faster Internet option, 26% would be willing to pay between $100-$150 per month for a faster service.
- **57%** of respondents depend on a landline, **29%** depend on cellular for their business phone service.
- **17**% of storefront respondents report their business phone service is not consistently reliable; **40%** cellular, **5%** landline.
- **27%** travel outside the county for work.

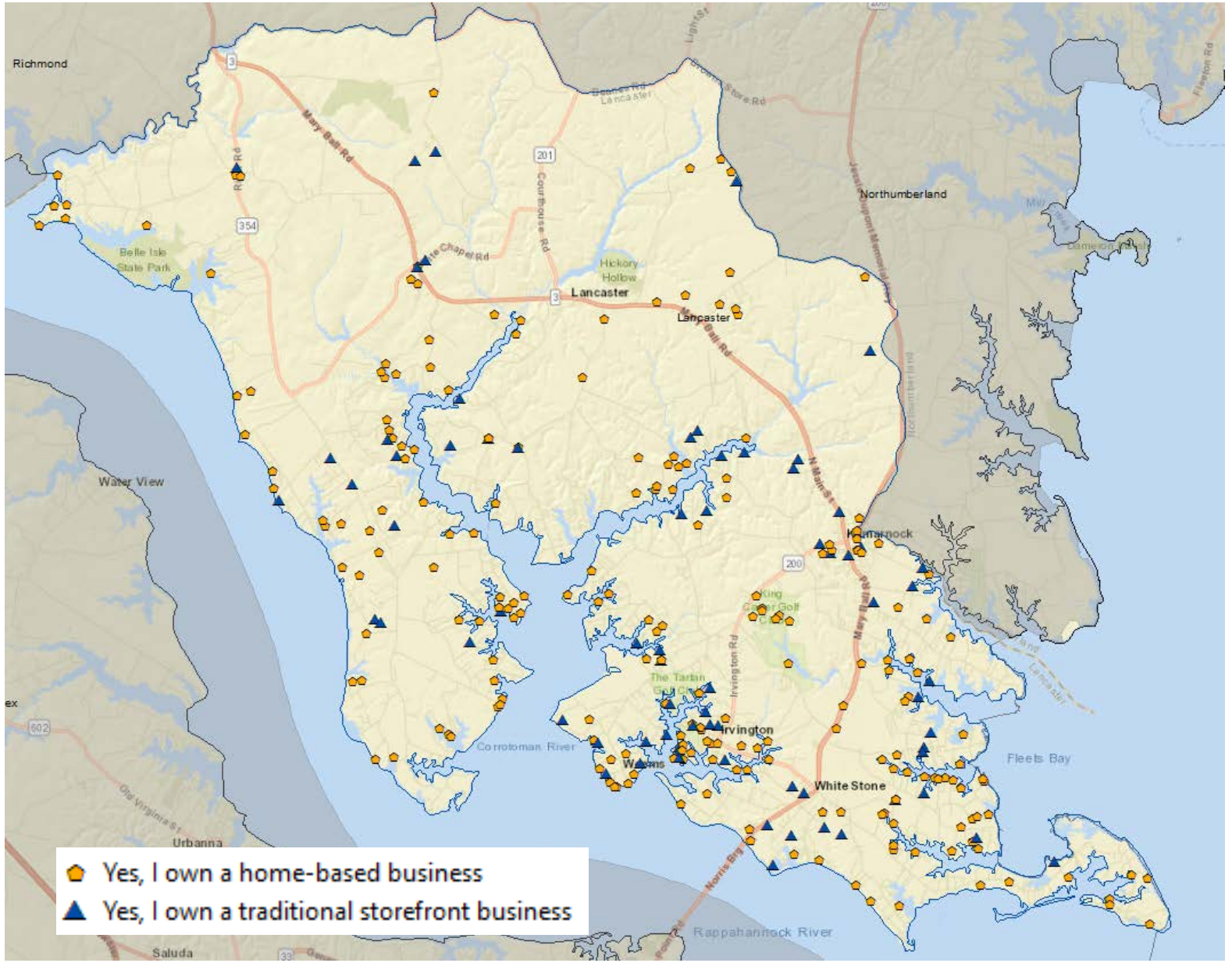
Do you own a business in Lancaster County?



Take away: **18%** of all respondents report operating a business; **4%** (72) traditional storefront. **14%** (225) home-based businesses; Working from home and teleworking keeps dollars circulating in the local economy. Nearly all business respondents report the Internet is “Very Important” to their business operations.

85% of storefront businesses report they subscribe to the Internet.

Lancaster County Business Locations



Local Assets

Vertical Assets, Fiber, Conduit and Community Anchors

Lancaster County

Commercial Fiber Route(s)

NO Long haul fiber reported in Lancaster County

Long haul fiber is for longer point to point connectivity using single mode fiber technology – big capacity/ bandwidth. Single mode uses fewer splice points and is harder to tap into.

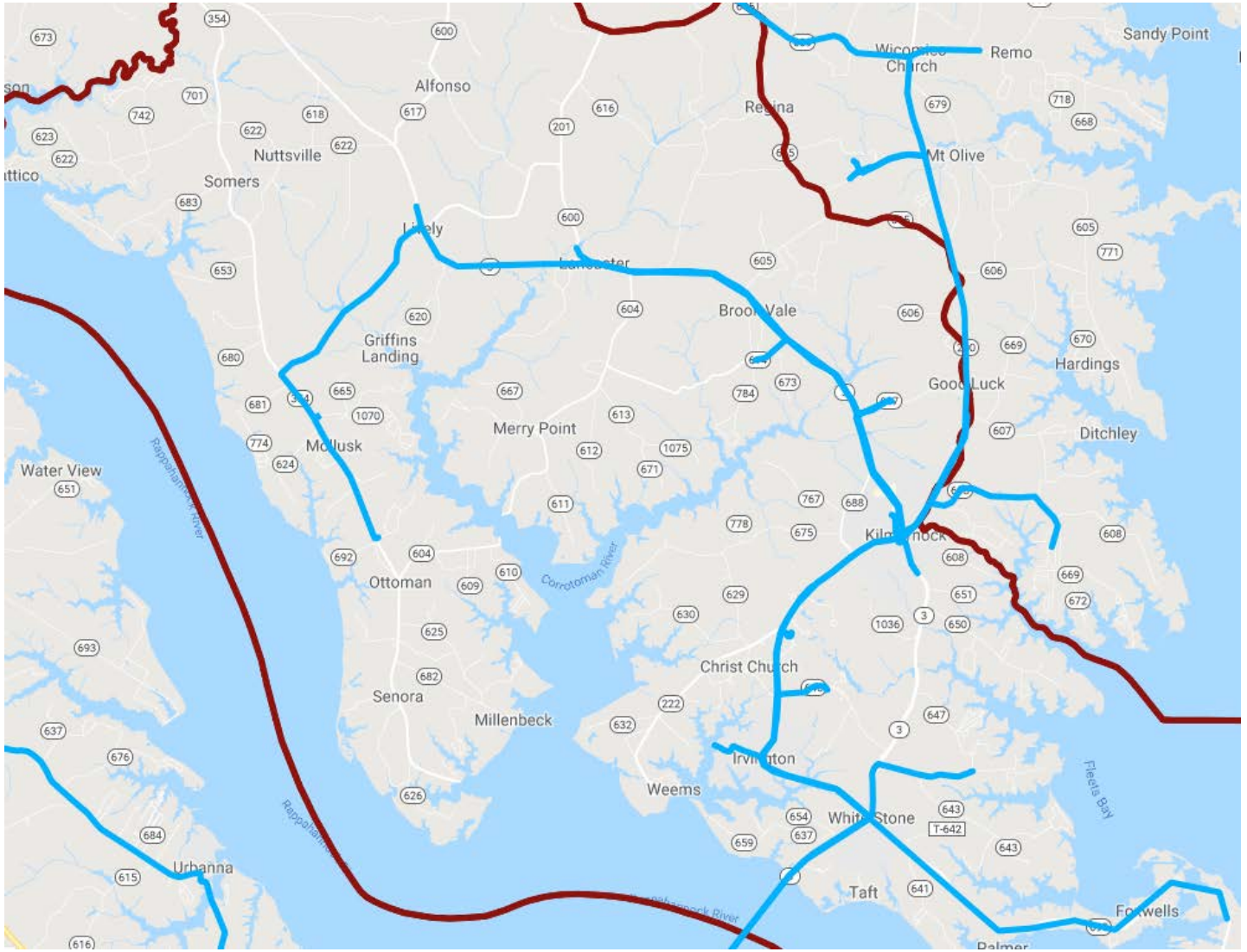
Source: FiberLocator

Lancaster County

Commercial Fiber Route(s)

Metro Networks are generally for local connectivity. Using multi-mode fiber which allows for more splice points and easier to tap into. Many routes overlap.

Atlantic Broadband



Source: FiberLocator

Lancaster County

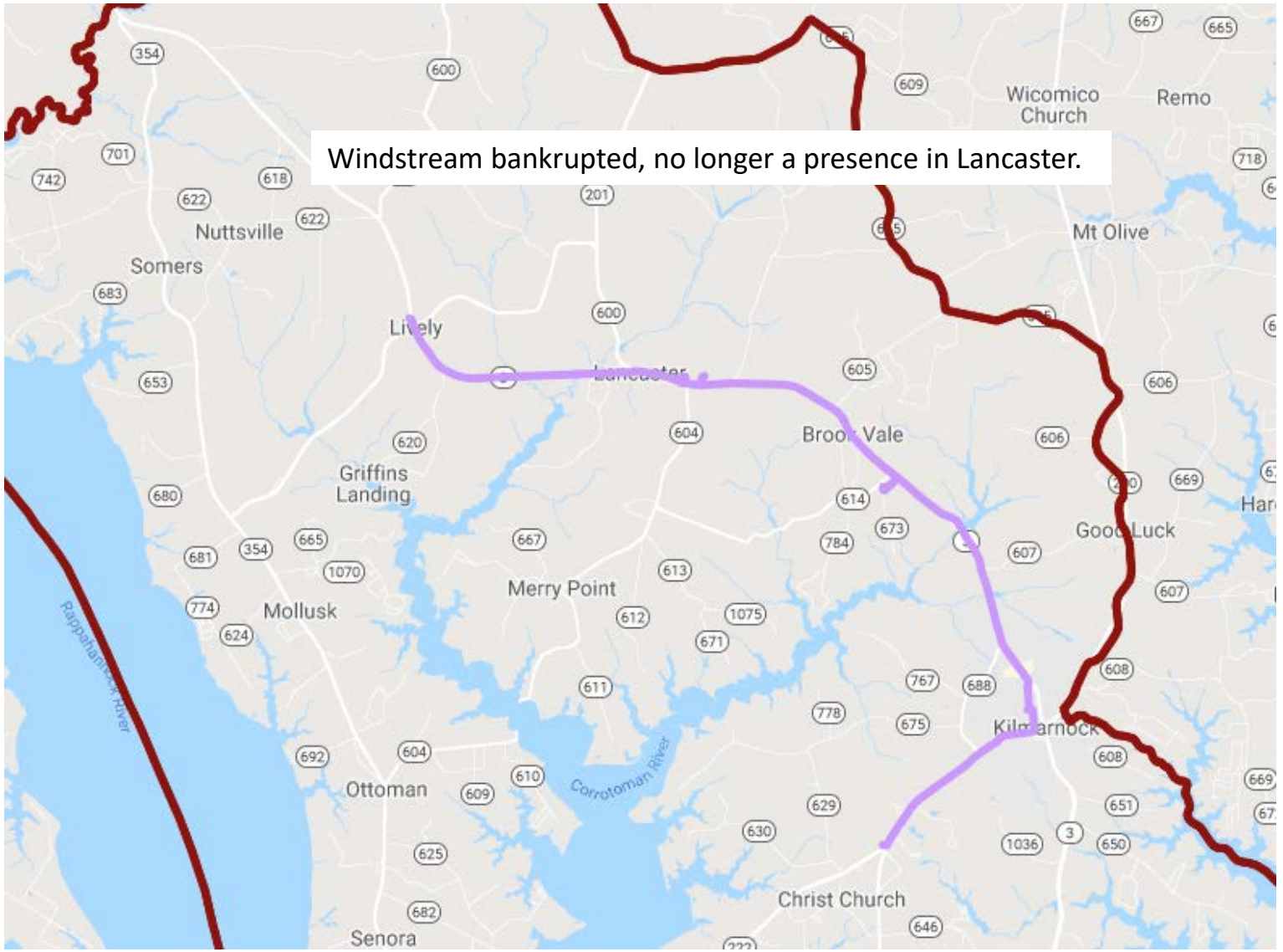
Commercial Fiber Route(s)

Metro Networks are generally for local connectivity. Using multi-mode fiber which allows for more splice points and easier to tap into. Many routes overlap.

Windstream

Question: does/did this fiber belong to Windstream? If so, did ABB acquire that route?

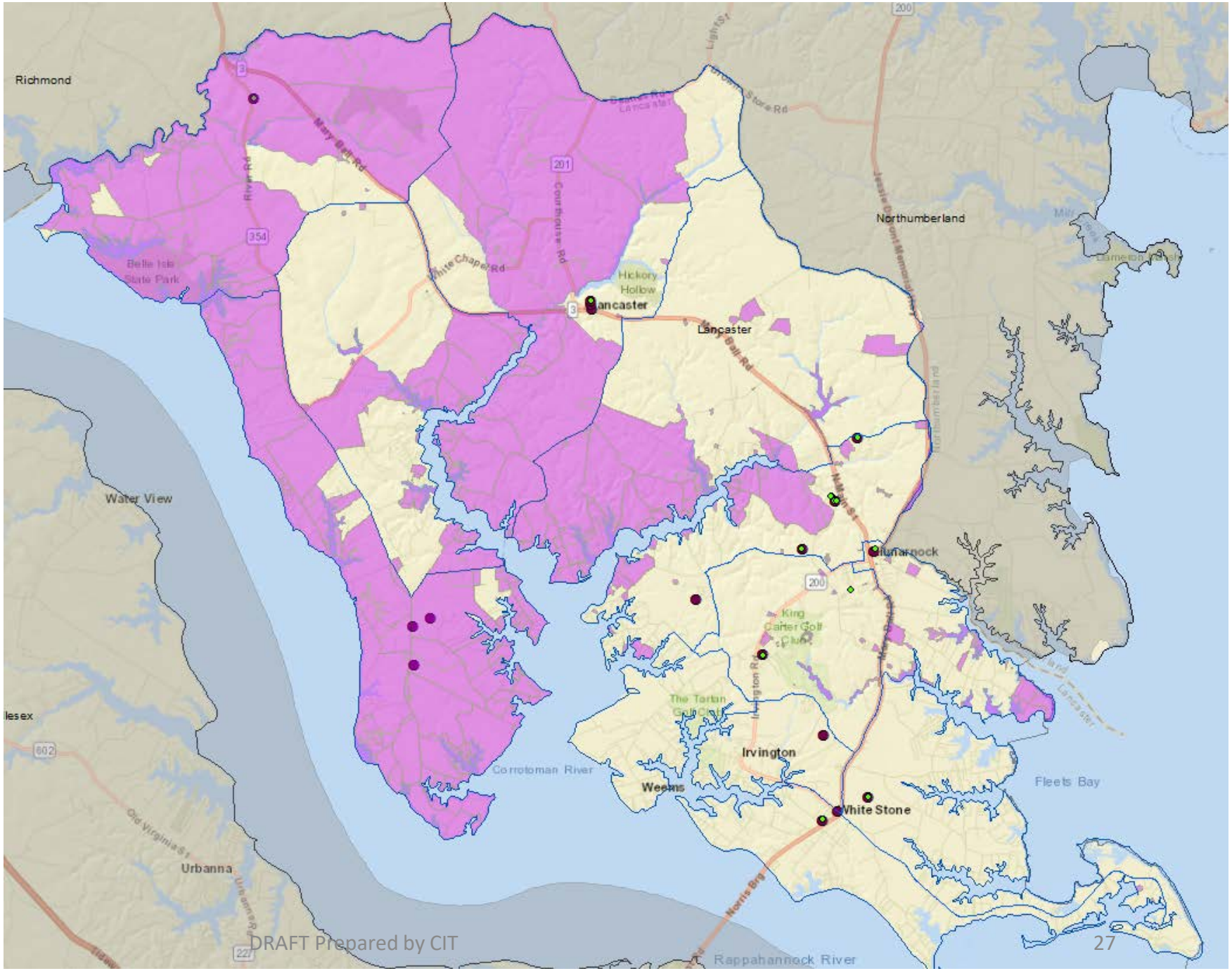
Source: FiberLocator



Lancaster County Vertical Assets WRT potential funding areas

Lancaster County Tower Site Locations

- FCC Data
- Other data source



Review of Local Policies & Fees

Affect the Broadband Economics

Make sure your policies and procedures are "Broadband Friendly"

Review comprehensive plans, community zoning regulations and process, policies, fees, etc. must **encourage and enable broadband investment**.

Review local franchise agreements for **setback or long-drop** policy. Long-drop policy information should be proactively conveyed to all new homebuilders, and real estate developers.

Adopt Dig Once: Dig Once means less construction disruption, and lower costs.

Google Fiber Checklist:
https://fiber.storage.googleapis.com/legal/googlefibercitychecklist2-24-14.pdf

Remember to make it "cheap, quick & easy"

County Local Policies

The following policies may not represent a comprehensive list of potential local Internet related policies. All local Internet related policies should be reviewed with potential partners and adjusted as necessary to explore incentives and identify barriers to broadband expansion

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Lancaster County has adopted the PPEA procurement process.

The primary reason for using PPEA procurement rather than a traditional RFP is that the bulk of any broadband project is going to be defined as “engineering” or “construction” under the Public Procurement Act. Engineering needs to be done by competitive negotiation; construction can only be procured by competitive sealed bidding. You can do a design/build contract, but that’s a pain as well and still leaves you with an operating phase that you don’t have covered. So you wind up doing at least two and probably three separate procurements and contracts: (1) RFP for engineering services to design; (2) IFB for construction services; (3) an RFP for operational services. As an administrative matter, a PPEA is usually faster, more flexible, and no more expensive; (4) the PPEA is the most provider friendly procurement type for responding to local broadband expansion requests.

COMMUNITY BROADBAND NEEDS

Assessment Based

The Economics of Broadband

Provider Perspective

$$[Revenues > (CapEx + OpEx)] = Sustainability$$

It doesn't matter if it is the private or public sector building and/or deploying services, the math has to work; revenue has to offset – be greater than - capital and operating expenses in order to sustain the network and create profit for upgrades, maintenance etc.

Lancaster County

Lancaster County should take advantage of the use of Service Districts to expand broadband services:

Virginia HB2141 - http://lis.virginia.gov/cgi-bin/legp604.exe?191+sum+HB2141
Local service districts; broadband and telecommunications services.

15. To contract with **a nongovernmental broadband service provider** who will construct, maintain, and own communications facilities and equipment required to facilitate delivery of last-mile broadband services to unserved areas of the service district, provided that the locality documents that less than 10 percent of residential and commercial units within the project area are capable of receiving broadband service at the time the construction project is approved by the locality. As used in this subdivision:

"Area unserved by broadband" means a designated area in which less than 10 percent of residential and commercial units are capable of receiving broadband service, provided that the Department of Housing and Community Development for its Virginia Telecommunication Initiative may by guidelines modify such percentage from time to time.

"Broadband" means Internet access at speeds greater than 10 Mbps download speed and one Mbps upload speed, provided that the Department of Housing and Community Development for its Virginia Telecommunication Initiative may by guidelines modify such speeds from time to time.

#3

Median Income: $37,969
Household Density: 345 ± 110 households
20 households/sqmi

Block Group: 511030301001

#1A

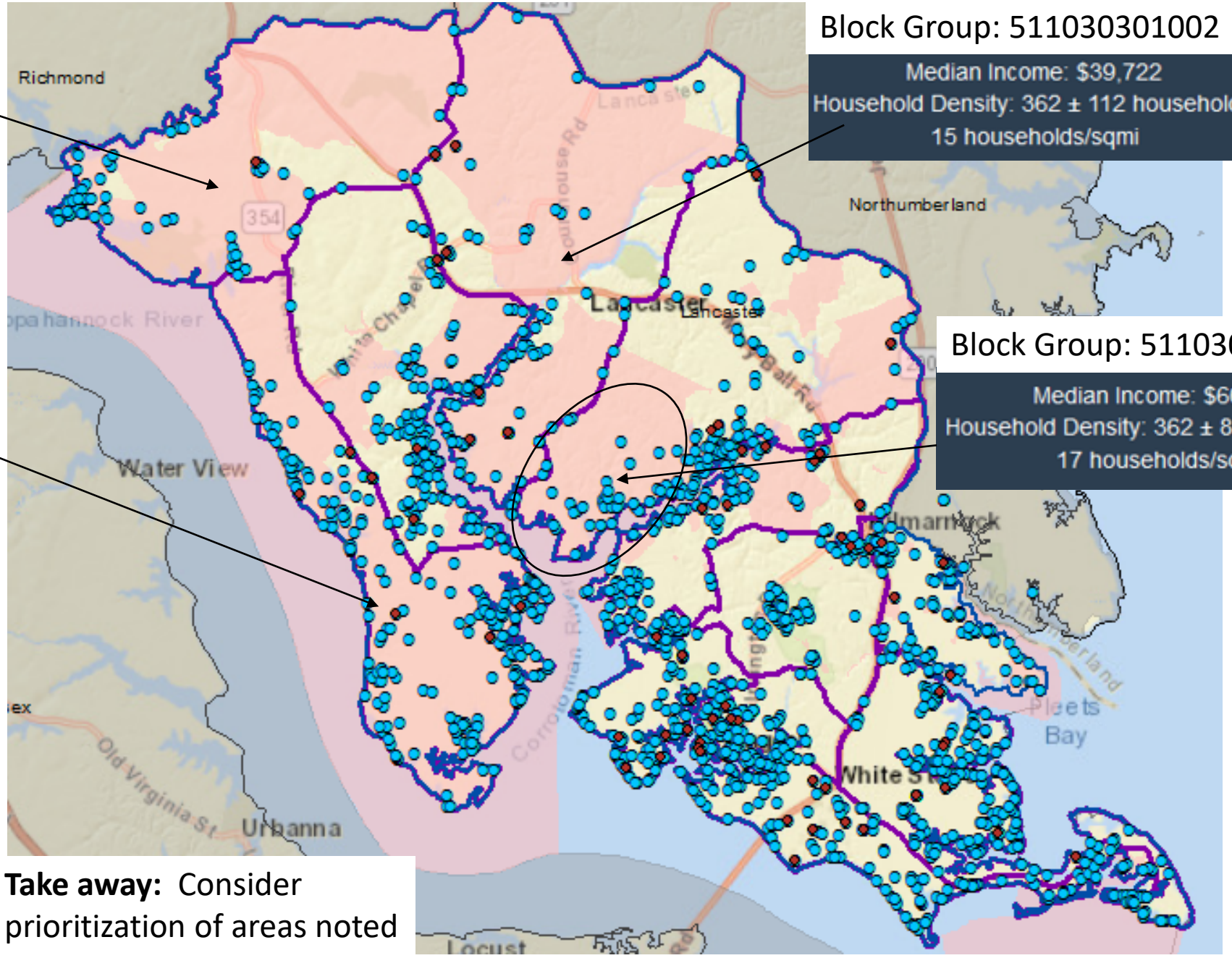
Median Income: $55,417
Household Density: 332 ± 79 households
22 households/sqmi

Block Group: 511030301004

Unserved:

Would commit to new residential service

Would commit to new business service



Block Group: 511030301002

Median Income: $39,722
Household Density: 362 ± 112 households
15 households/sqmi

#2

Block Group: 5110303032001

Median Income: $60,000
Household Density: 362 ± 89 households
17 households/sqmi

#1B

Take away: Consider prioritization of areas noted

Lancaster County

Reports of unreliable cellular service with respect to vertical assets and public safety facilities.

Reported unreliable cellular service

FCC registered vertical assets

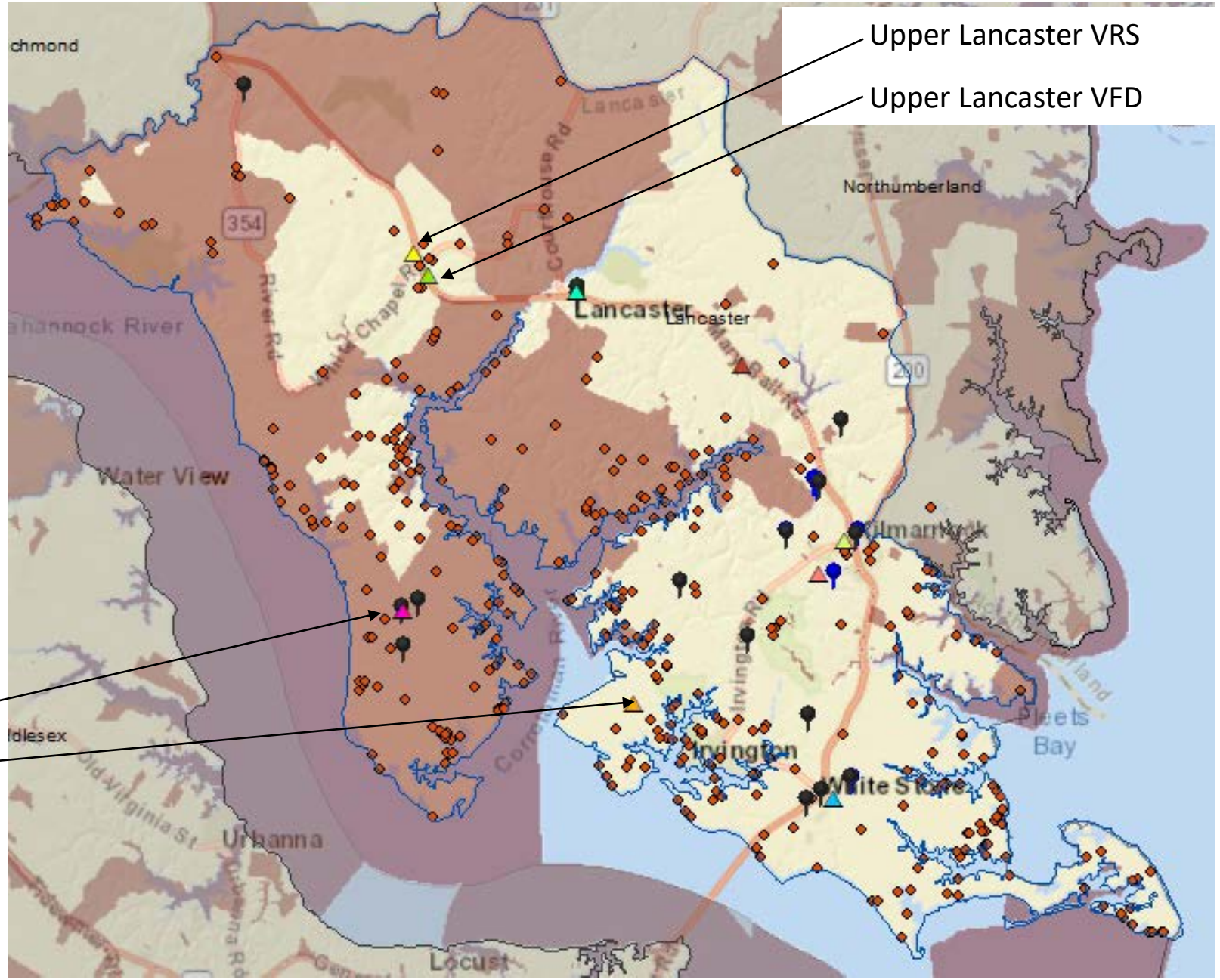
Other source vertical assets

Unserved areas

Upper Lancaster VFD Ottoman Substation

White Stone FD Weems Substation

Take away: Cellular service across county needs improvement. Solicit for expanded and improved cellular services as well as expanded broadband.



Lancaster should work to increase digital literacy and exposure to technology's benefits

Tract #:51103030100, Lancaster, Virginia

Demographics
Population: **3,112**
Age 65+: **28.7%**
Less than HS Degree: **7.2%**
Poverty Rate: **10.9%**
Disability: **8.9%**

Broadband
Avg. Download: **610.9 Mbps**
Avg. Upload: **567.7 Mbps**
Pop. no access 25/3: **0.0%**
Homes w/ no internet access (subscriptions): **27.4%**
Homes w/ no computing devices: **14.0%**

Score
Digital Divide Score: **22.3**
Socioeconomic Score: **22.5**
Infrastructure Score: **16.4**

Tract #:51103030200, Lancaster, Virginia

Demographics
Population: **3,798**
Age 65+: **36.6%**
Less than HS Degree: **11.6%**
Poverty Rate: **14.2%**
Disability: **22.3%**

Broadband
Avg. Download: **511.2 Mbps**
Avg. Upload: **470.1 Mbps**
Pop. no access 25/3: **0.0%**
Homes w/ no internet access (subscriptions): **34.1%**
Homes w/ no computing devices: **27.9%**

Score
Digital Divide Score: **34.9**
Socioeconomic Score: **35.9**
Infrastructure Score: **24.9**

Tract #:51103030300, Lancaster, Virginia

Demographics
Population: **3,938**
Age 65+: **37.4%**
Less than HS Degree: **10.2%**
Poverty Rate: **7.9%**
Disability: **16.2%**

Broadband
Avg. Download: **505.4 Mbps**
Avg. Upload: **463.0 Mbps**
Pop. no access 25/3: **0.0%**
Homes w/ no internet access (subscriptions): **19.9%**
Homes w/ no computing devices: **13.3%**

Score
Digital Divide Score: **26.1**
Socioeconomic Score: **30.5**
Infrastructure Score: **14.3**

The Digital Divide Index or DDI ranges in value from 0 to 100, where 100 indicates the highest digital divide. It is composed of two scores, also ranging from 0 to 100: the infrastructure/adoption (INFA) score and the socioeconomic (SE) score.

If a particular county or census tract has a higher INFA score versus a SE score, efforts should be made to improve broadband infrastructure. If on the other hand, a particular geography has a higher SE score versus an INFA score, efforts should be made to increase digital literacy and exposure to the technology's benefits.

Source: https://www.pcrd.purdue.edu/signature-programs/digital-divide-index.php

Potential State and Federal Funding

https://commonwealthconnect.virginiainteractive.org/sites/default/files/CIT%20Documents/Broadband%20Funding%20Opportunities%202019.pdf

Next Steps:

- Decisions / chosen goals reviewed by Broadband Management Team.
- Broadband Management Team makes decisions for Steps 1-3.
- Assessment findings and decisions conveyed to County Board of Supervisors (BoS) by Broadband Management Team.
- Policy Team passes its recommendations for policy updates to BoS for approval.
- BoS's approval of decisions and recommendations.
- County decides RFP/RFI or straight to partnership.
- If RFP is desired, consult CIT or use local procurement processes.
- CIT will can prepare a 'requirements' appendix for a PPEA RFP based on County decisions.
- County reviews, approves and publishes RFP.
- County will evaluate responses and choose partner(s) for broadband expansion
- If partnership without RFP is decided, County works with chosen partner(s) to address all local goal based decisions for expansion of broadband services.

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