ctc technology & energy
engineering & business consulting

Serving the Public Sector Since 1983

Queen Anne's County
October 21, 2019

Broadband Strategy Kickoff/Workshop

© CTC Technology & Energy 2019

Agenda

- Introductions
- Confirm Project Goals
- Broadband Service Gaps
- Broadband Assets
- Broadband and Related Initiatives Underway
- Next steps

Introduction

- CTC team
- Which stakeholders/community do you represent?
- What are your primary concerns and hopes for this study?
  - What do you see as the major gap in broadband and what are the real current and potential future repercussions of broadband gaps for your community/stakeholders?

- Challenging conditions for rural broadband
  - Standard market economics does not work for investing in broadband infrastructure
    - Too sparsely populated
    - Too little existing infrastructure to build from
  - Little appetite/funding from federal and state governments to step in with huge comprehensive broadband infrastructure projects
- Unique opportunity
  - Federal and state grant funds and willingness to invest in public-private partnership

Project Background

- Incremental approach:
  - Find areas where existing ISPs could enter with the right incentives and create better market conditions/lower infrastructure costs
  - Where wireline is not feasible, fixed wireless may be only cost-effective option, but will not reach 25/3 Mbps
  - No magic bullet, but string together practical strategies to extend broadband infrastructure where feasible
  - Identify strategic commercial sector partners who could work with County to potentially submit grant application
  - High level design/cost estimates based on different partnership scenarios to establish feasible, practical models
  - If successful, extension of infrastructure can be built on later for further expansion

Project Background (Con'd)

Project approach

Analyze broadband infrastructure & gaps

- Discussions, field surveys, GIS mapped assets

Evaluate current and future demand for broadband

- Discussions with County & stakeholders
- Outreach to ISPs

High level design & cost estimate

Grant strategy

PPP strategy

Financial & business plan

Confirm Project Goals

1

Understand service gaps in County

2

Develop candidate design and cost estimate

3

Develop public-private partnership strategy

Factors Influencing Actual Access

Availability	Density
	Income-based
	Urban/rural
	Obstructed (wireless/satellite)
	Commercial
	Residential
	Corporate policies
Quality	Speed
	Consistency
	Reliability
	Scalability
Cost	Pricing
	Bandwidth caps
	Contract terms

Economics

Too early to quantify economic impact i.e. "$X of investment creates $Y of economic benefit and jobs"

Broadband investment often part of larger economic development campaign

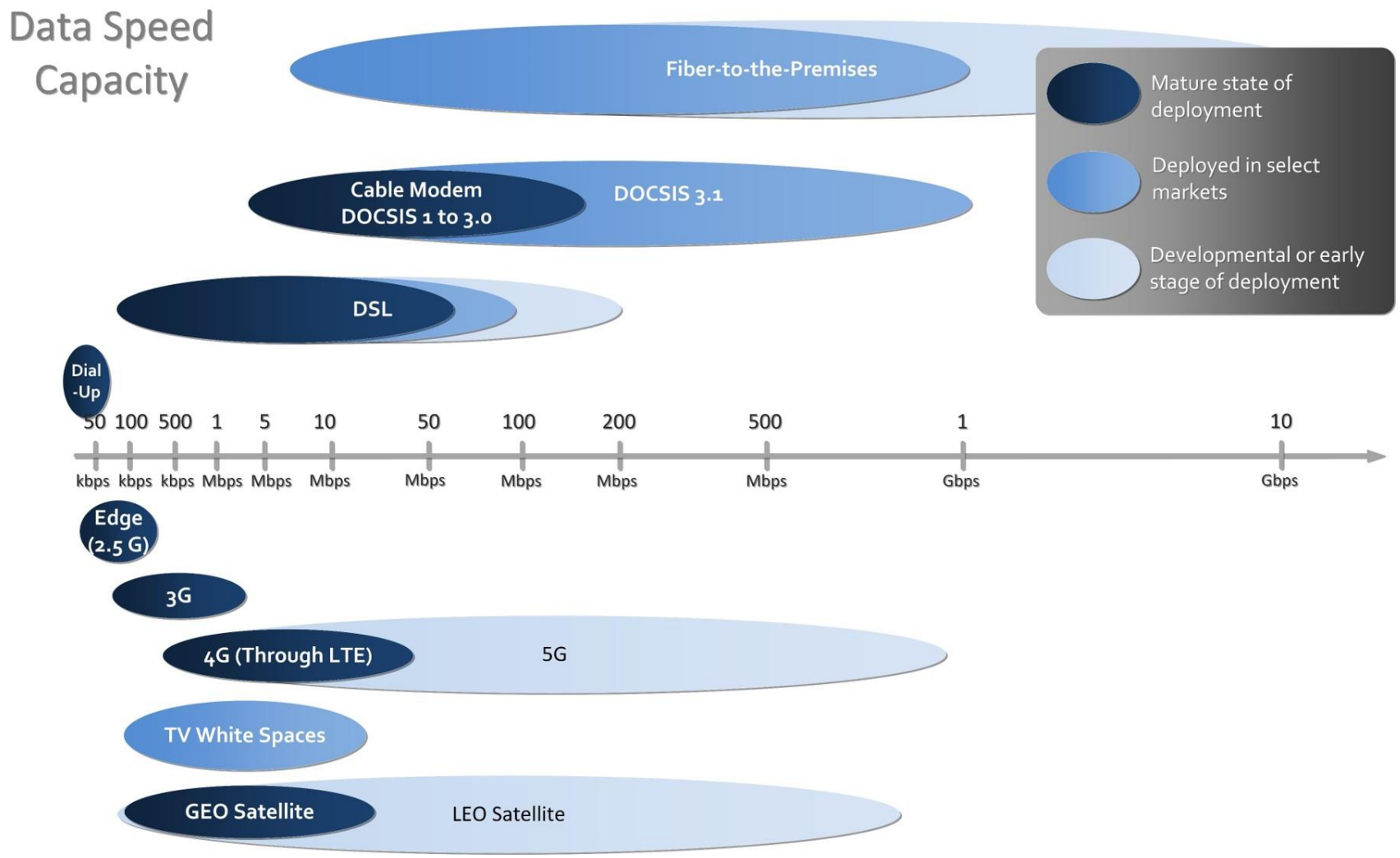
- Chattanooga also did environmental cleanup, redevelopment, marketing over more than a decade

Often gigabit broadband is part of a larger marketing message

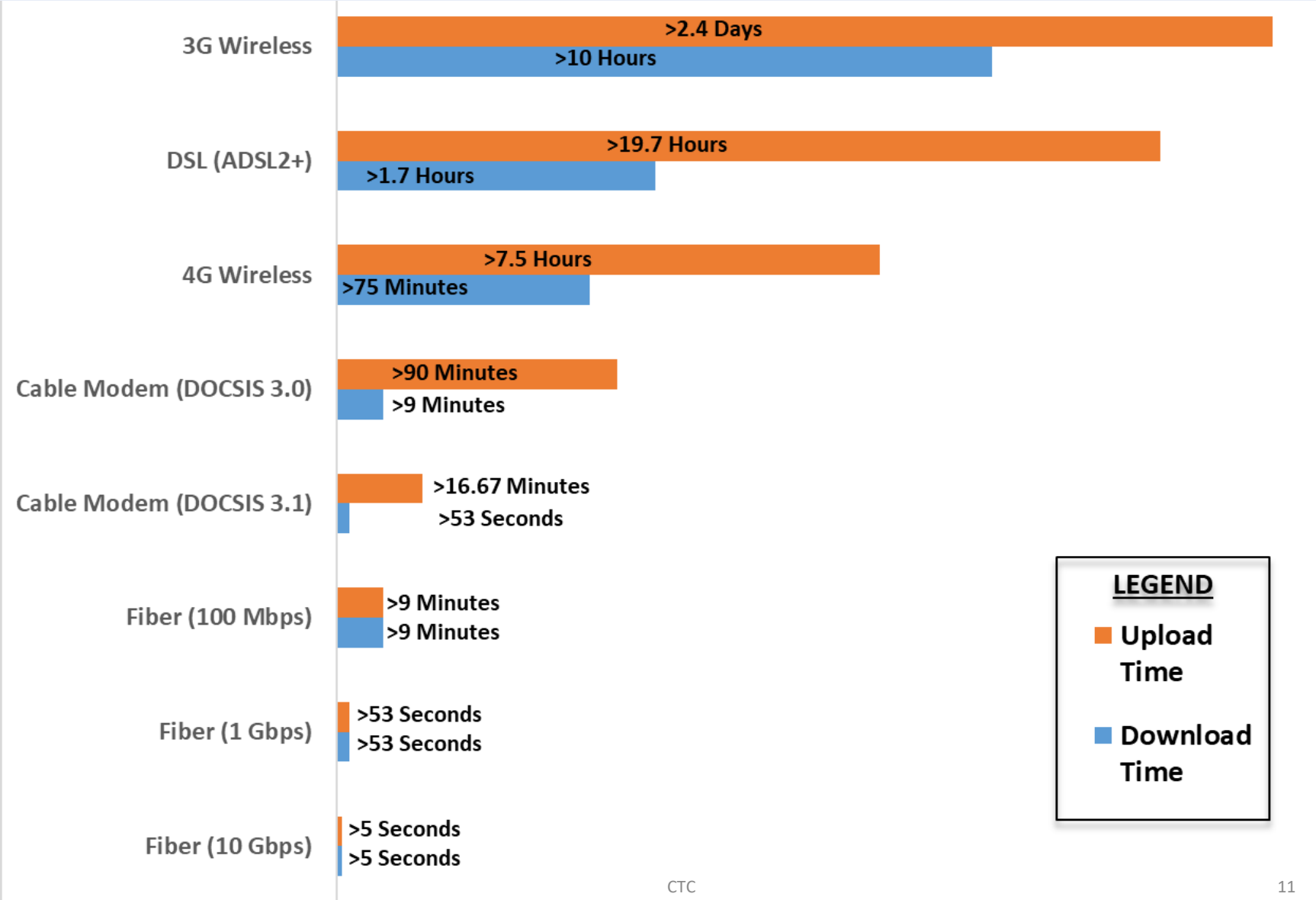
- Economic dynamism, outdoor life, affordability, schools, safety

In future– message will be primarily negative

- Lack of broadband becomes show stopper to locating businesses or selling houses


Data Speed Capacity
Fiber-to-the-Premises
Cable Modem DOCSIS 1 to 3.0
DOCSIS 3.1
DSL
Dial -Up
Mature state of deployment
Deployed in select markets
Developmental or early stage of deployment
50 kbps
100 kbps
500 kbps
1 Mbps
5 Mbps
10 Mbps
50 Mbps
100 Mbps
200 Mbps
500 Mbps
1 Gbps
10 Gbps
Edge (2.5 G)
3G
4G (Through LTE)
5G
TV White Spaces
GEO Satellite
LEO Satellite

Time to transfer a 5GB file



Different technologies for different environments

Fiber– where new wired construction is cost effective

- Lifetime of decades

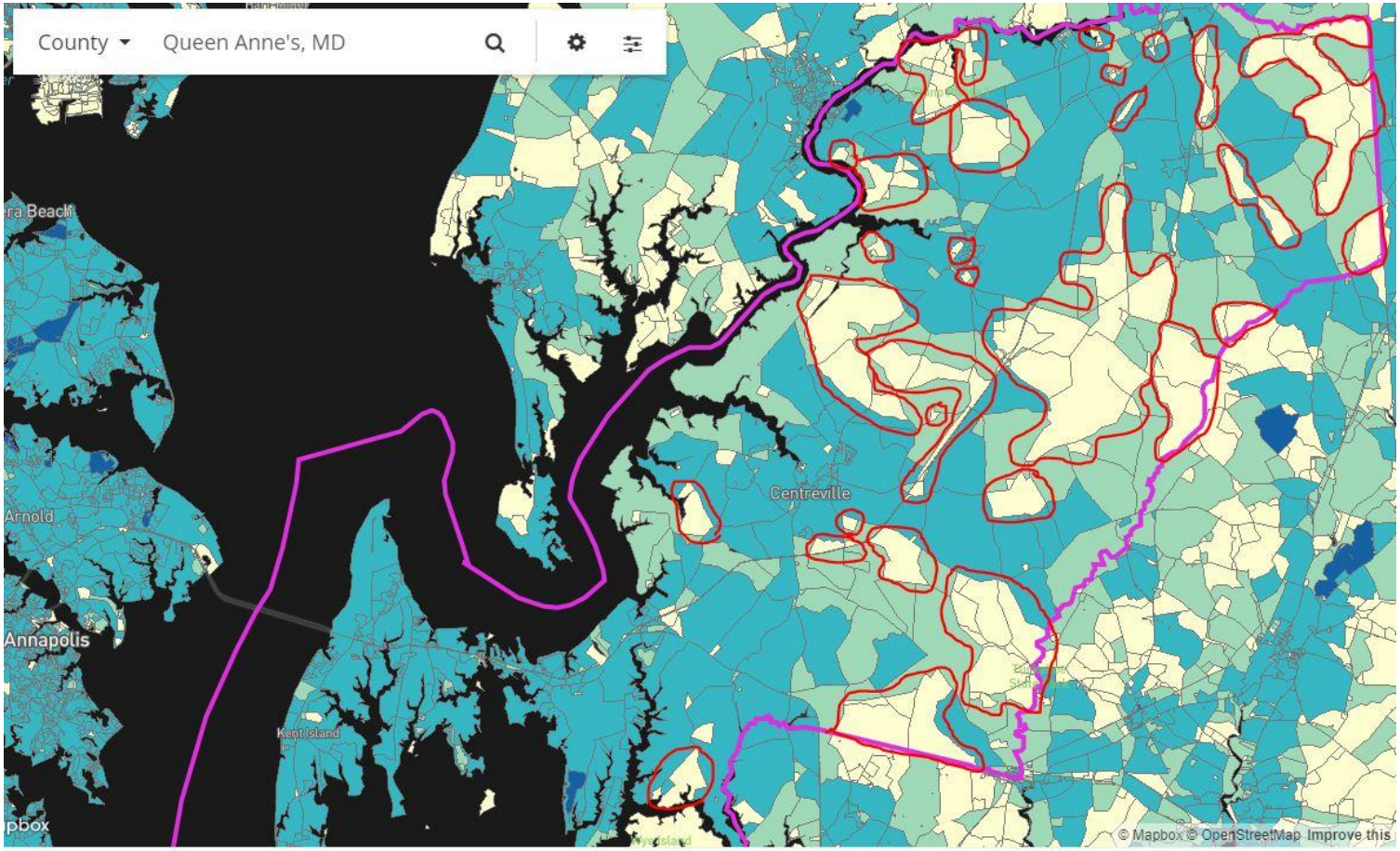
Cable– if provider can cost-effectively expand service

- Gradual fiber buildout upgrades speeds
- Provider needs to keep up with demand

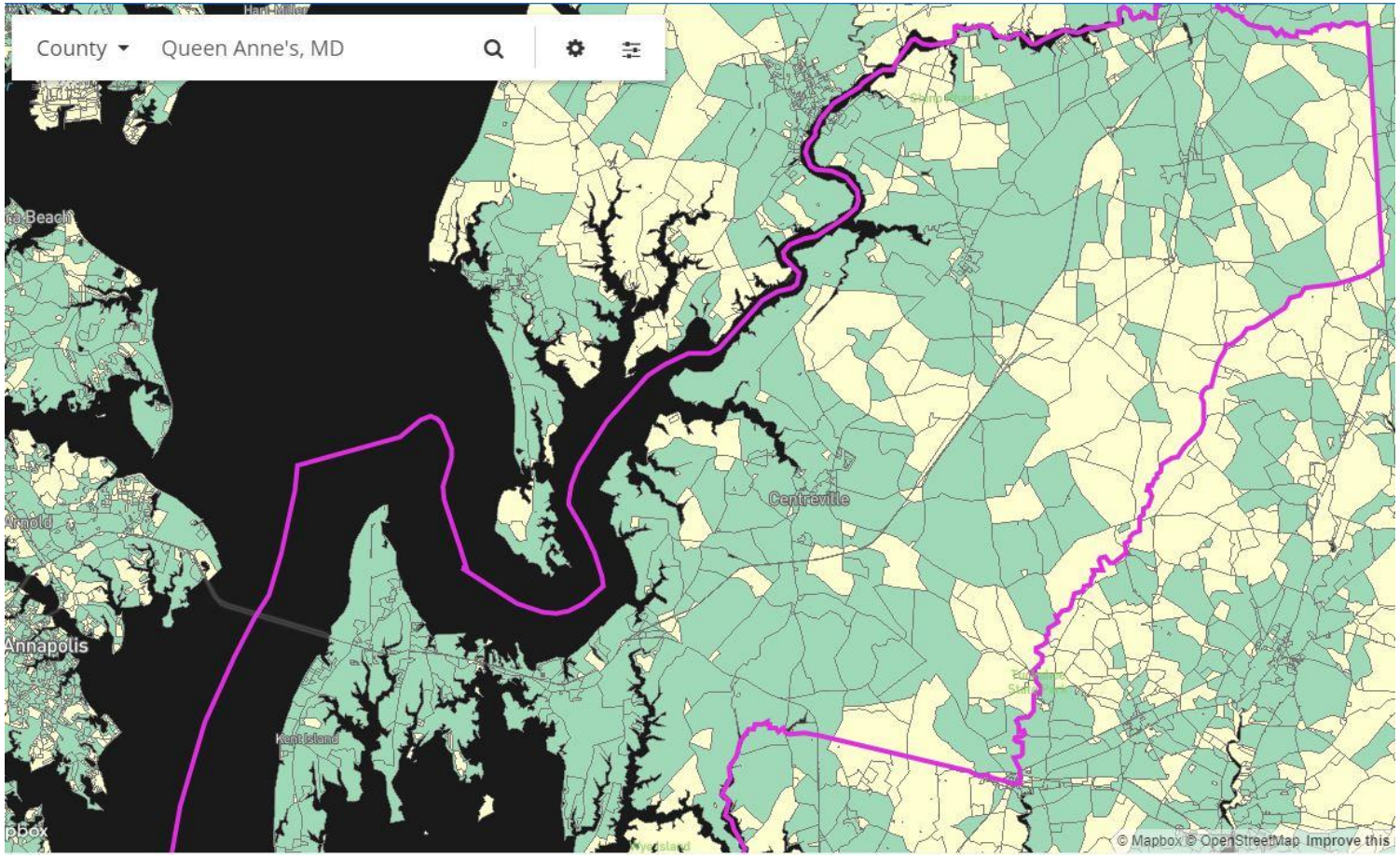
Wireless– if wired is not cost effective

- Requires fiber backhaul
- Higher frequencies– shorter range, fewer obstructions– higher speeds
- Lower frequencies– better with obstructions and distance, but tradeoff on speed
- Shorter lifetime-- replacement cycle of a few years
- Mobile providers limit speeds/total usage

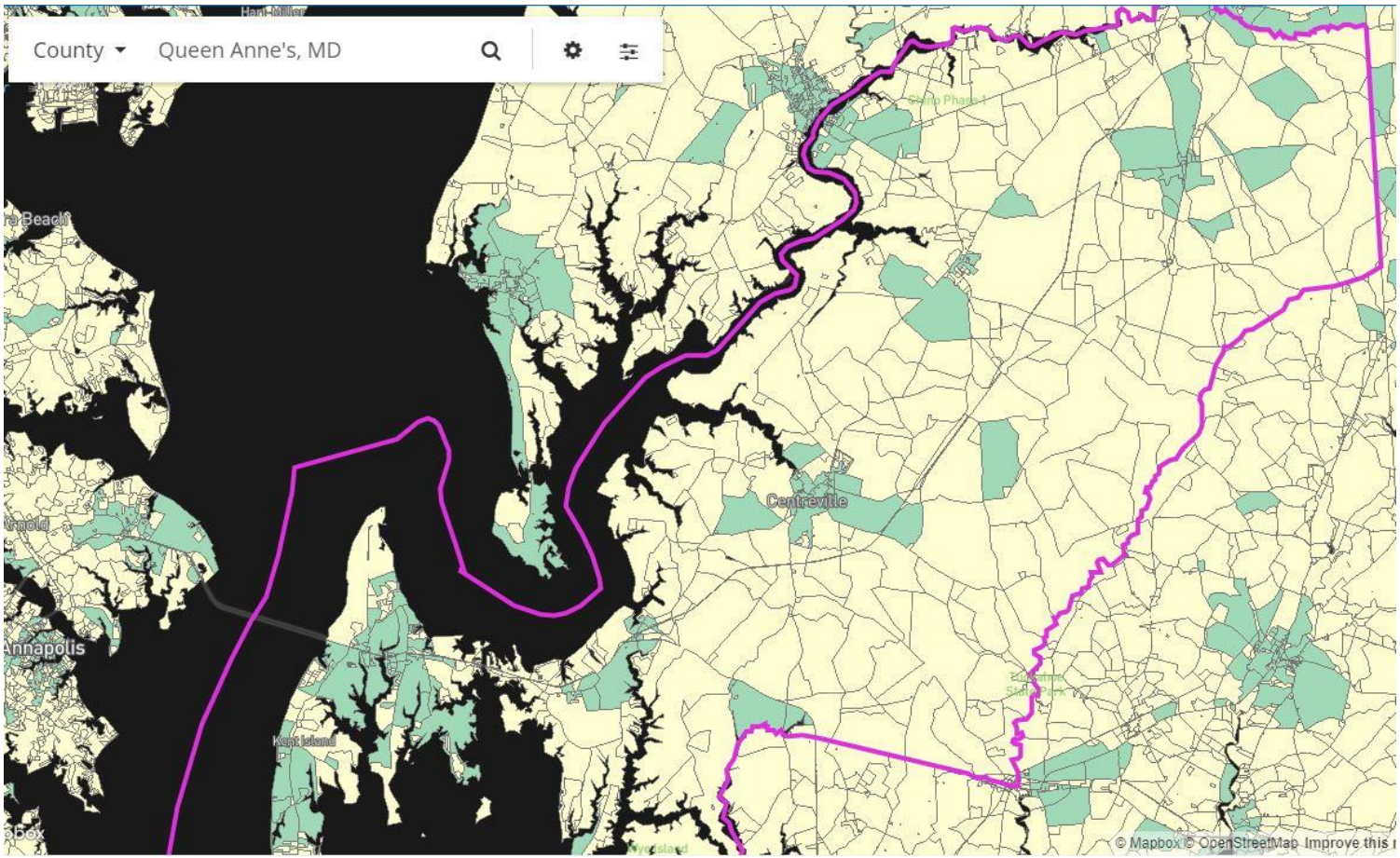
A first (unreliable) look at service– FCC Data Less than 200 kbps



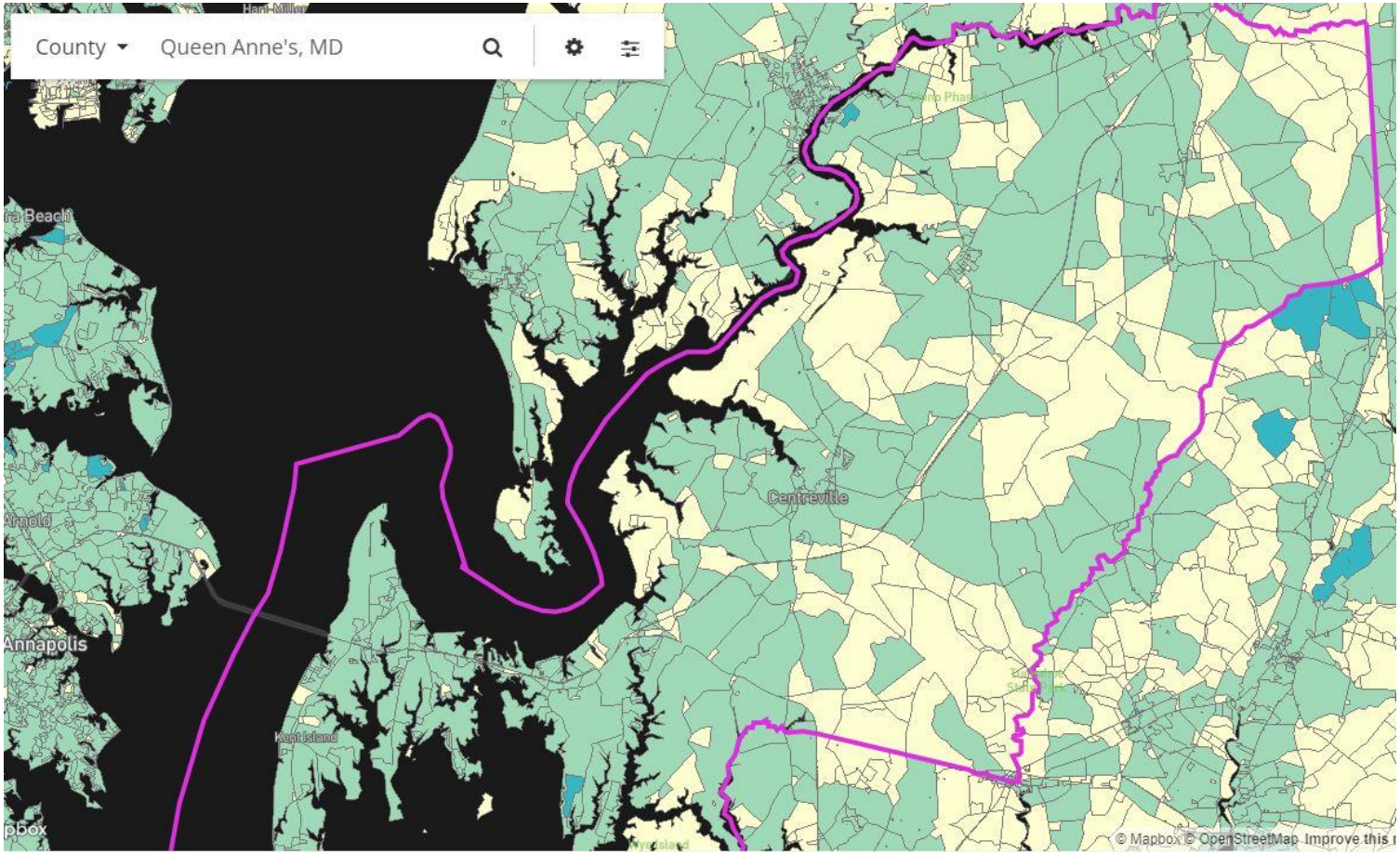
Verizon DSL 200 Kbps or more



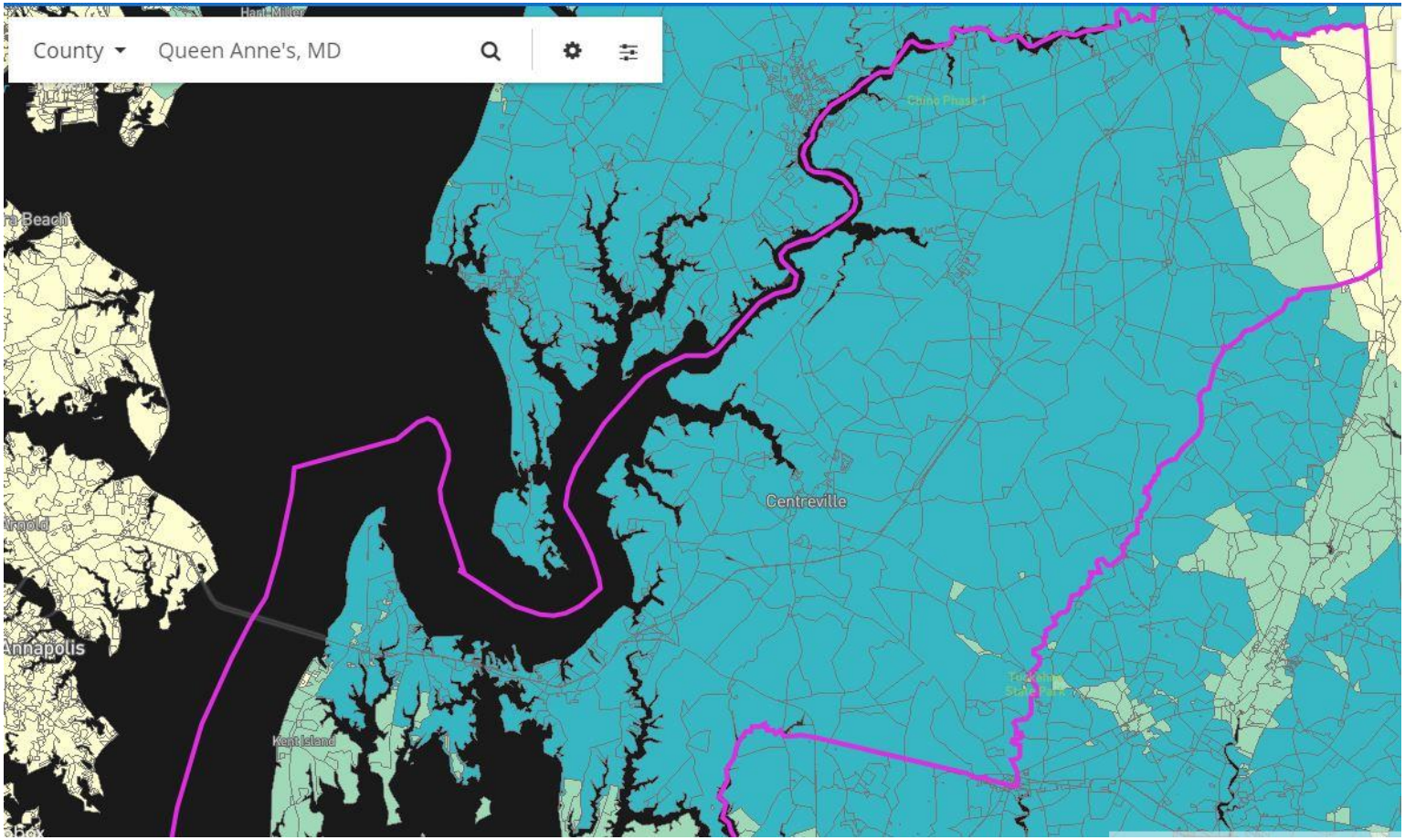
Verizon DSL 10/1 Mbps



Cable 25/3 Mbps



25/3 Mbps Claimed Wireless Coverage Areas (ALTIUS Communications and Delmarva WiFi LLC)



Assets for broadband

Significant synergies collaborating with a utility

- Owning pole lines, conduit and building entry
- Potential spare fiber and cable strand
- Simplifying make-ready

Broadband initiatives often draw simultaneously on multiple departments and stakeholders

- IT, public works, economic development, public safety, public schools, higher education, GIS, planning, roads

Regional and state entities

- Maryland Broadband Cooperative, MDOT, MdTA

Assets for broadband -- coordination

Capital improvement projects

- Roads, sidewalks, water, sewer, electrical, new public buildings.

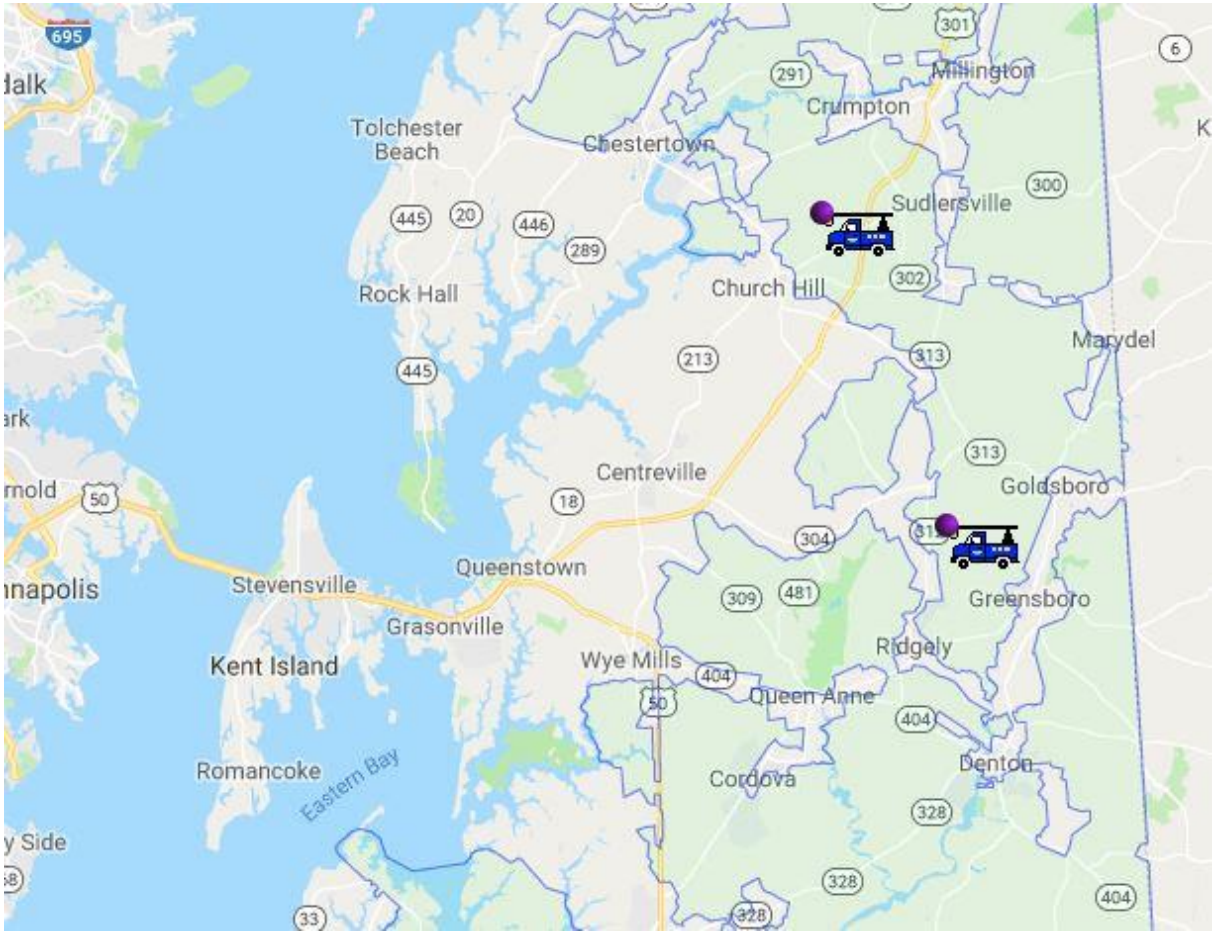
Physical assets

- Fiber, conduit, towers, rooftops, water towers

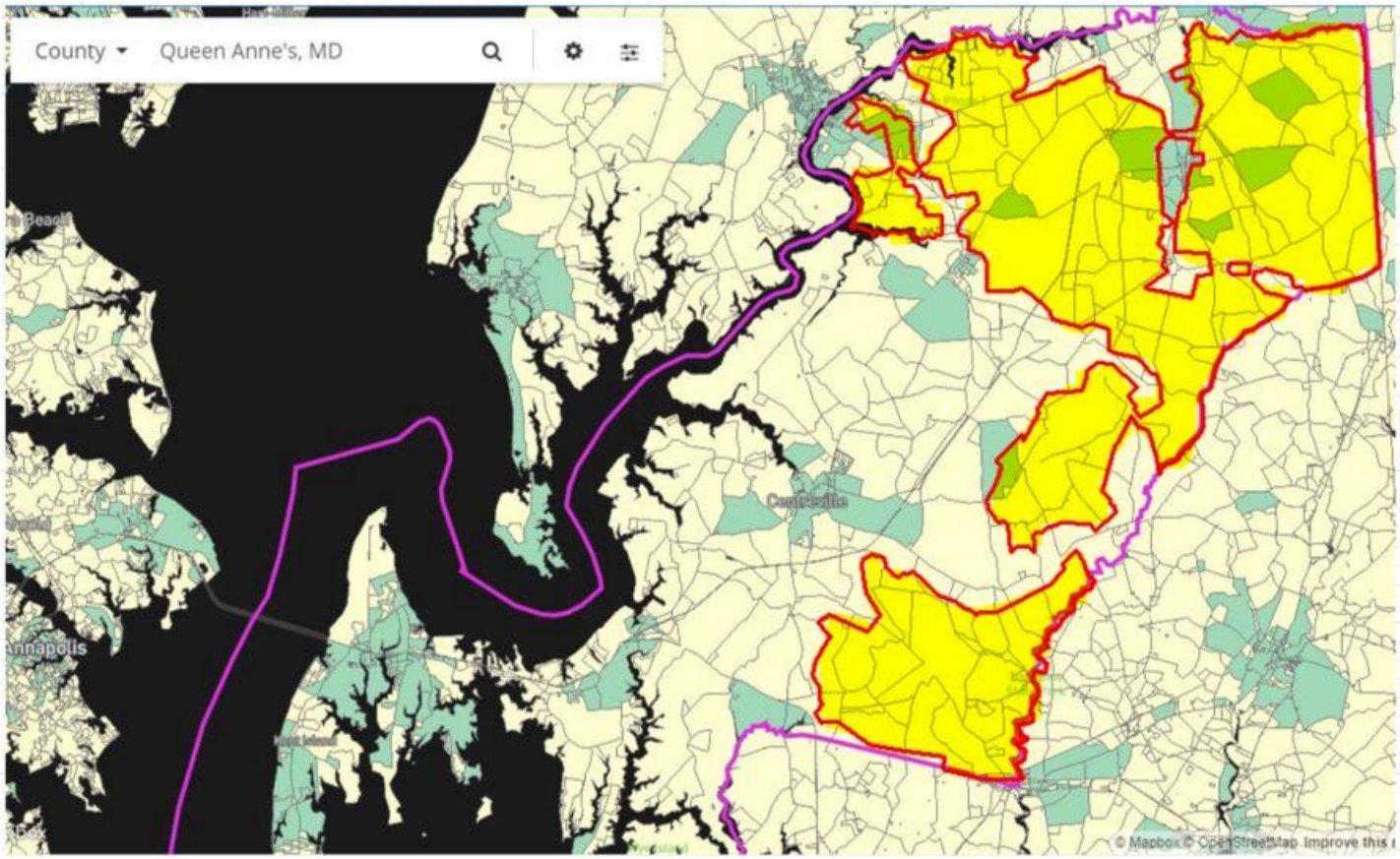
Maryland Broadband Cooperative

Along with County fiber– a backbone network

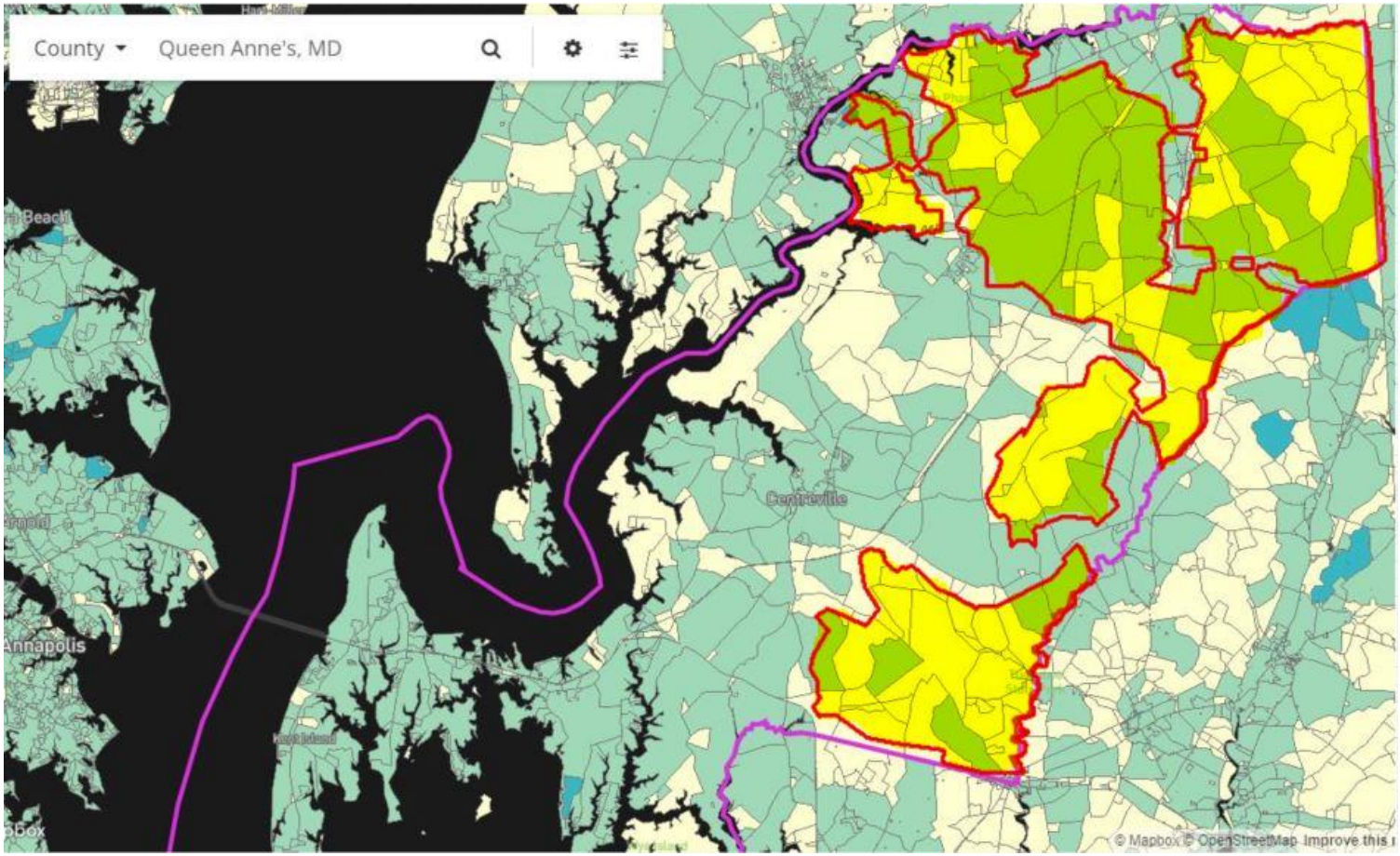
Areas Served by Choptank Electric Co-op



Overlap of Choptank Electric Co-op and Areas lacking 10/1 Mbps DSL



Areas Served by Choptank Electric Co-op and Areas With 25/3 Mbps Cable



Alternative Rural Technologies

Wireless

- 5 GHz similar to WiFi (potentially uneven coverage)
- Longer-range 3.5 GHz CBRS spectrum potentially emerging
- 60/70/80/90 GHz mmWave for high-speed and backhaul
  - Unlicensed and lightly licensed, augments fiber

Large advantage to infrastructure owners

- Cable companies on existing attachments
- Power companies on existing poles

Potentially low cost, low barrier to entry

Satellite Broadband Potential

Long-standing challenges

- Cost
- Latency
- Speed
- Bandwidth limitation

Potential opportunity

- Move from GEO to LEO
- Reduction in deployment costs

Satellite Broadband: Orbit and Latency

	Orbit	Broadband speed	Latency
Geostationary • Hughes • Viasat	22,236 mi	• 2 to 30 Mbps down • Far less up	600+ ms
Low earth orbit • SpaceX • Telesat • OneWeb	up to 1,200 mi	?	25+ ms

Planning considerations

- Right of way and easements
- Environmental restrictions
- Condition and space on utility poles
- Tower build and use restrictions
- Planned expansion by broadband providers
- County/government communications needs

Next steps

Proposed Project Schedule

Task #	Task Item	Milestone Date
0	Kickoff/Strategic Planning Workshop	21-Oct-19
1	Assess the County's current broadband infrastructure and market	13-Dec-19
2	Evaluate current and future demand for broadband	13-Jan-20
3	Prepare high-level design and cost estimate for broadband deployment	14-Feb-20
4	Evaluate funding options and develop a grant strategy	14-Feb-20
5	Develop a public-private partnership strategy	21-Feb-20
6	Develop financial analysis and business plan	28-Feb-20
7	Prepare and present a gap analysis and comprehensive written project report	19-Mar-20

Next Tasks

- Analyze broadband infrastructure & gaps
  - Seek GIS information regarding County assets
    - Fiber, Conduits, Towers, ROWs, poles etc.
    - If needed, can conduct group meetings by Skype with County agencies/departments.
  - Survey outside plant to identify unserved areas and condition of the utility poles

Next Tasks (Cont'd)

- Evaluate current and future demand for broadband
- Discussions with County & stakeholders
  - Where is the need, where are there gaps, where are there potential opportunities for partnerships
- Outreach to ISPs
  - What do they have, where? What would it take in terms of incentives to get them to expand into the broadband gaps
  - County to facilitate

Copyright CTC 2019