Broadband Plan Report Champaign County, IL

CCG Consulting & Finley Engineering
March 21, 2022

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Purpose of the Study

- The primary scope of the project was to create a *sustainable broadband master plan for the entire county to address existing digital inequities and barriers to access, adoption, and utilization of robust broadband by all residents, businesses, and institutions*.

- After the project was started it became known that a large amount of state and federal broadband grants were going to be available in 2022 and 2023, so the focus was expanded to discuss taking advantage of the grant opportunities.

- We see three major uses of this report: inform elected officials and the public about broadband issues, provide a framework for deciding how to move forward, and to provide the facts that are needed for ISPs interested in serving the county.

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Study Area

- The analysis was done for all areas outside of Champaign and Urbana.

- We secondarily split the analysis in the other cities and towns that have a cable provider versus the rural areas with no cable broadband option.

- We further split the rural areas into places that are covered by the FCC's tentative RDOF broadband awards and those without.

Existing ISPs

- AT&T and Frontier are the incumbent telephone companies in the county. AT&T announced in October 2020 that it will no longer connect new DSL customers.

- Comcast (Xfinity) and Mediacom are the incumbent cable companies, serving only in towns and cities.

- There are several fiber overbuilders in the study area including I3 Broadband and Campus Communications Group (CCG)

- Fixed wireless broadband is provided by AgPro Wireless, Volo Internet + Tech, Rising Wireless, WATCH Communications, and Wireless Data Net.

- Residents also use satellite broadband and cellular broadband for home broadband.

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The RDOF Issue

- Three companies have tentatively been awarded FCC funding to bring fast broadband to rural areas.
- Largest winner is AMG Technologies (NextLink) which promises fast wireless technology.
- Connect Everyone (Starry) promises 200 Mbps wireless.
- LTD Broadband promises bringing fiber to scattered Census blocks.
- The FCC has not made any of these awards. There are question of the FCC will award to AMG or LTD Broadband.
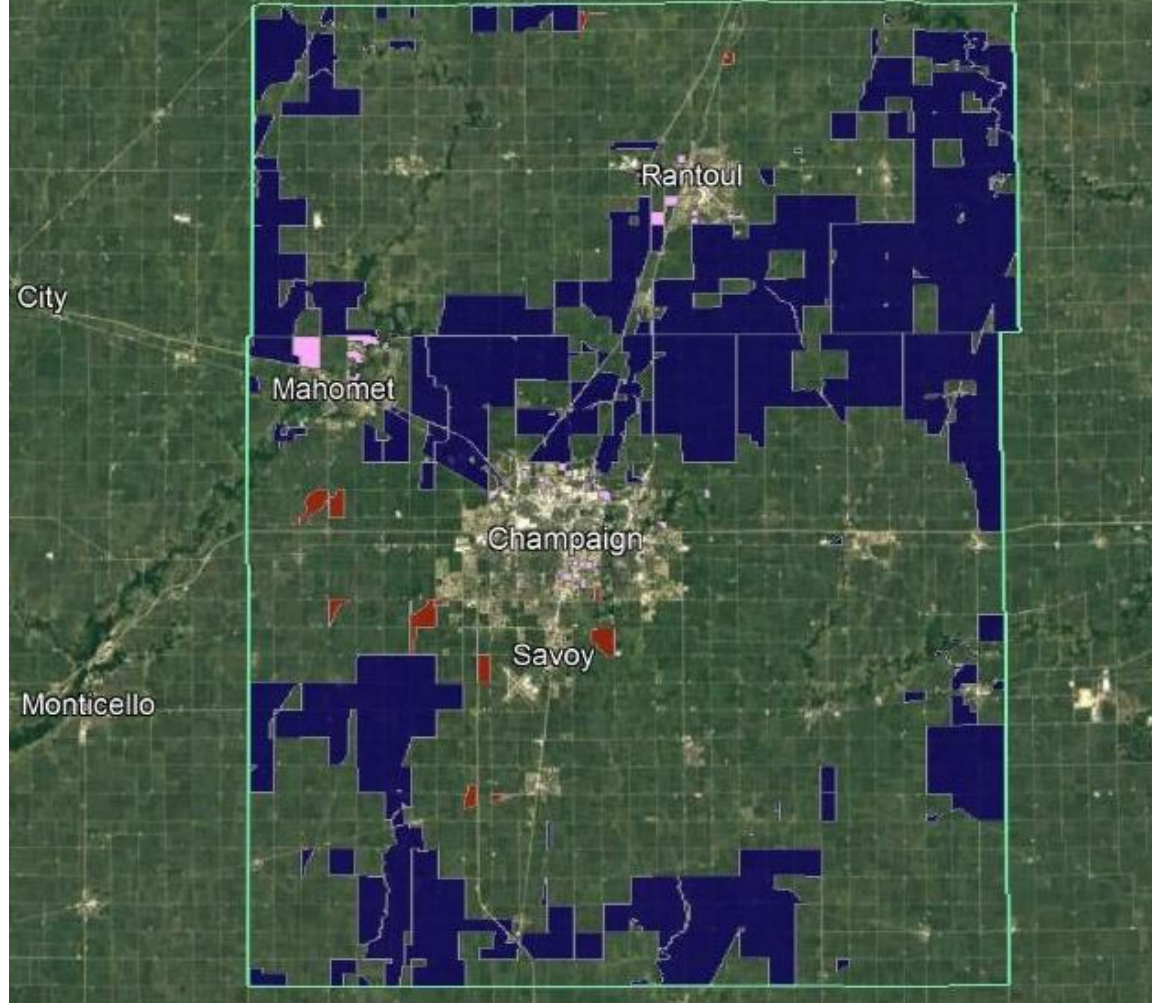- Dilemma is for planning to get grant for these areas if the awards aren't made.
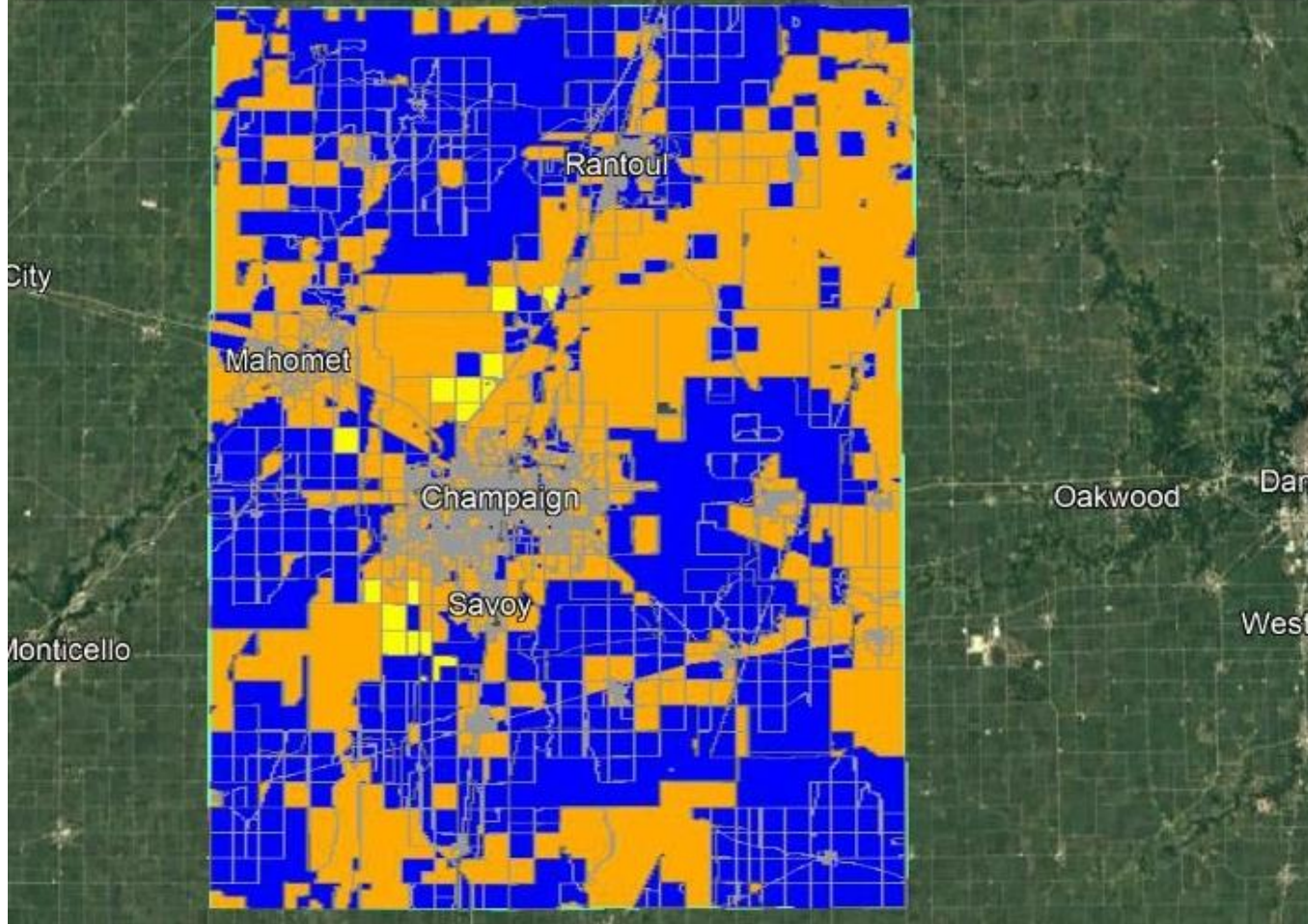
Champaign County, IL
Future Speeds + RDOF

Legend
Served - 100/20 Mbps or Greater
Underserved - 25/3 Mbps to Less Than 100/20 Mbps
Unserved - Less Than 25/3 Mbps

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Market Outreach

- We reached out to the public to ask about current broadband usage:
    - Separate online surveys for residents and businesses.
    - Online Speed tests.
    - Interviews with key stakeholders.

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Online Residential Survey Results

- 10% of households don't have a home broadband.

- 70 of respondents have somebody working at home at least part-time. 19% of homes have somebody working full-time.

- 14% of respondents lack workable cell coverage at home.

- Average price being paid for broadband is $68.

- 73% of residents support building a fiber network. Another 26% might support the idea but need more facts.

- 46% said they would buy from a new fiber network. 31% said they would probably buy.

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Business Surveys and Interviews

- The most common problems we heard were slow broadband in daytime, occasional multi-day outages, regular shorter outages.

- We heard that it is difficult to sell rural homes that don't have good broadband.

- Farmers are mostly using fixed wireless. They were happy with this when it first came ten years ago but is now inadequate. Some farmers are able to get faster broadband from T-Mobile or Starlink.

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Speed Tests

	Technology	Latency (ms)	Download (Mbps)	Upload (Mbps)
Fiber	Fiber	12	232.7	180.3
DSL	DSL	39	11.5	2.2
Cable	Cable	19	200.3	23.9
Fixed Wireless	Wireless	44	28.7	8.5
GEO Satellite	Satellite	637	26.1	3.1
LEO Satellite	Satellite	35	95.5	11.5
Fixed Cellular	Cellular	53	43.2	8.9

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Network Design: Key Considerations
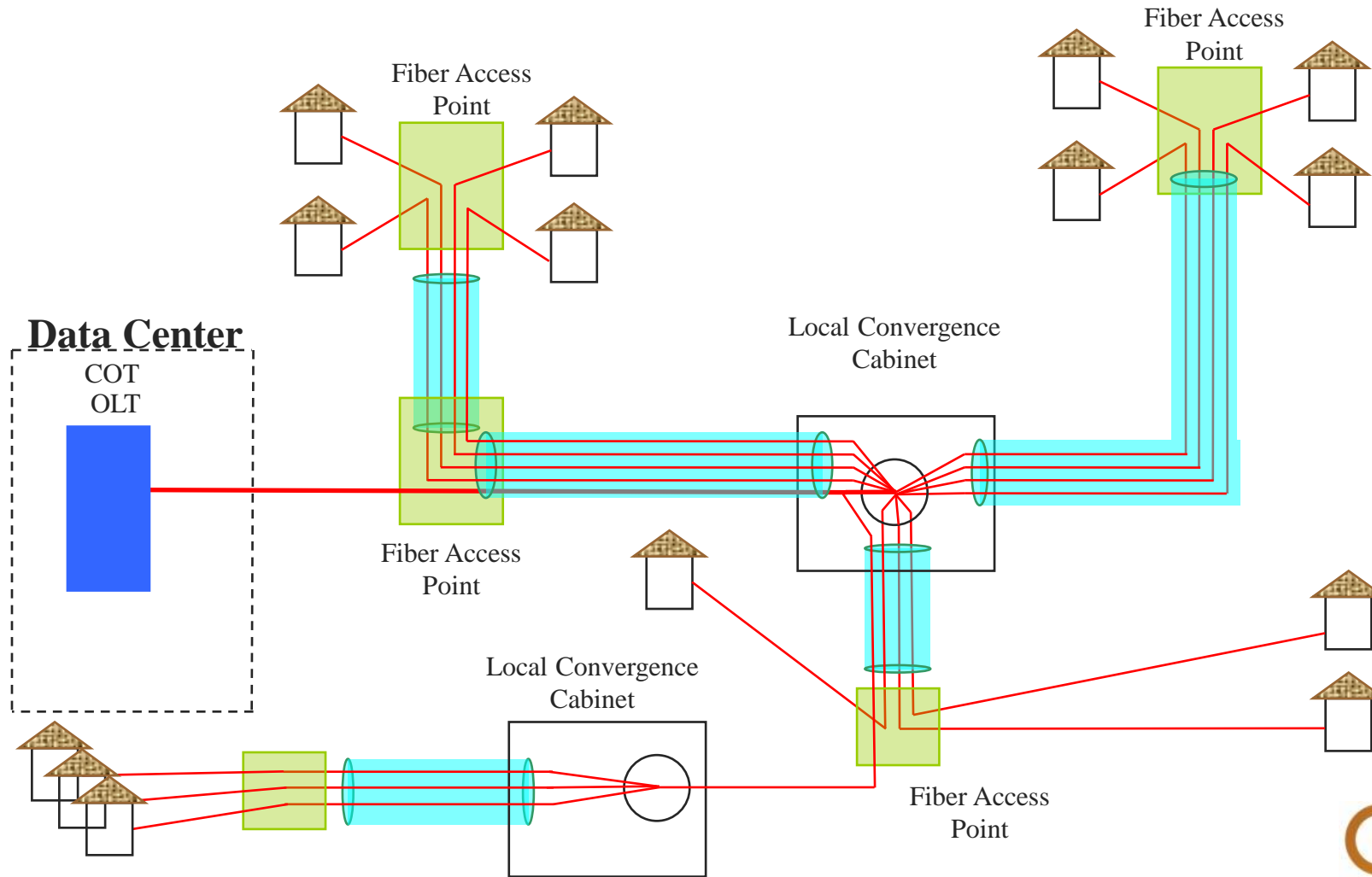
Design Considerations

- Largest Investment

- Longest Estimated Life

- Look Forward – Not What is
  - Uses
    - Work From Home
    - Content Creation
  - Definition of Broadband
    - 2019 – 10/1
    - 2020 – 25/3
    - 2021 – NTIA & USDA 100/20

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Technology

- The RFP asked us to consider what technologies might be used to close the broadband gaps. Finley Engineering considered both wireless and fiber technologies.
  - We could not find a wireless solution that made sense due the housing density, trees, and topology.
  - We considered several fiber technologies and determined that passive optical network fiber technology is the best fit for the County.
- Network designed with XGS-PON technology capable of delivering 10-gigabit broadband.
- Required fiber: 1,956 whole study area, 1,332 miles in total rural areas, 920 miles in non-RDOF areas.

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Network Design: Key Considerations

Network Design: Key Considerations

Key Design Points

- Where: Fiber Network follows existing utilities for aerial / buried construction.

- Active vs Passive: Cost Model used an ODN capable of supporting both
  - Where is the research and development dollars going

- Capacity: 10Gbps today across the entire network, the upper limits are a limitation of electronics, not the ODN

- One Data Center: Redundant interconnect routes to one or more ISPs

- Extra fiber provided for future growth / expansion.
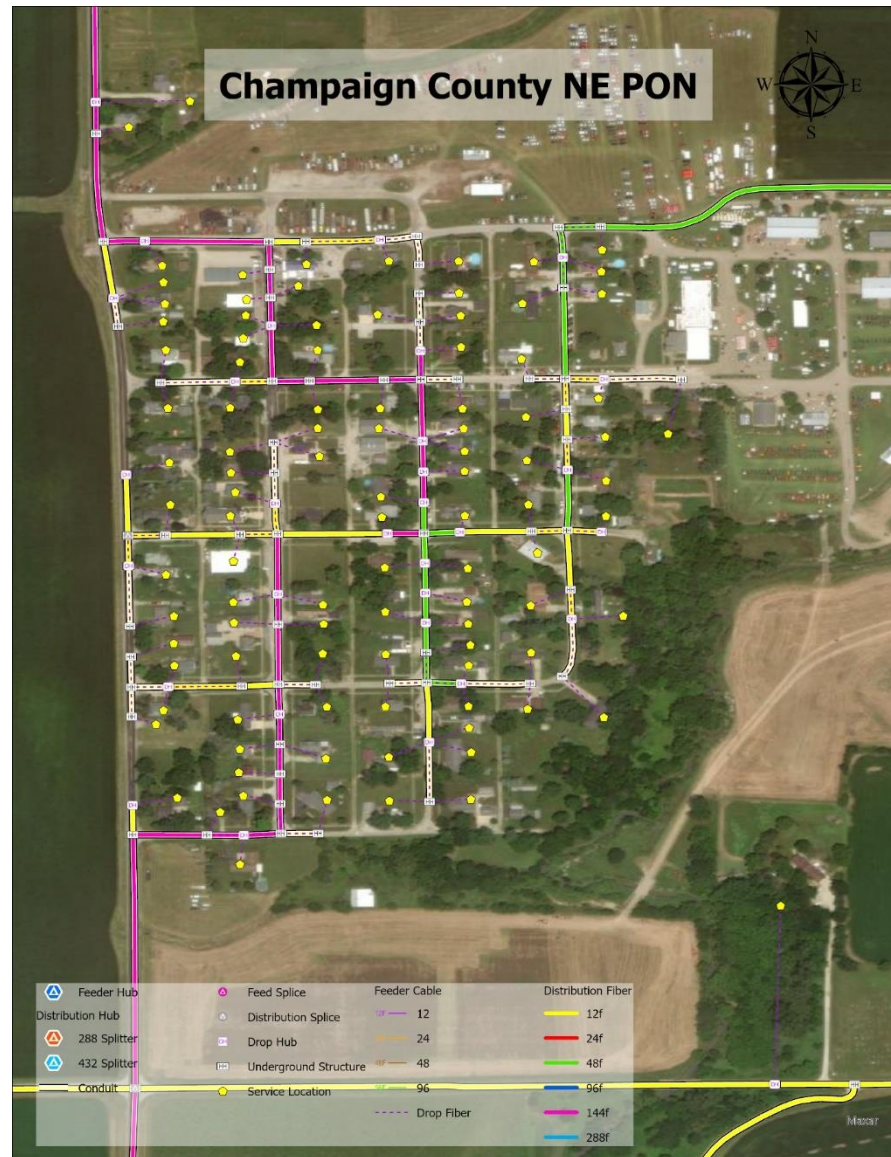
Network Design: Methodology
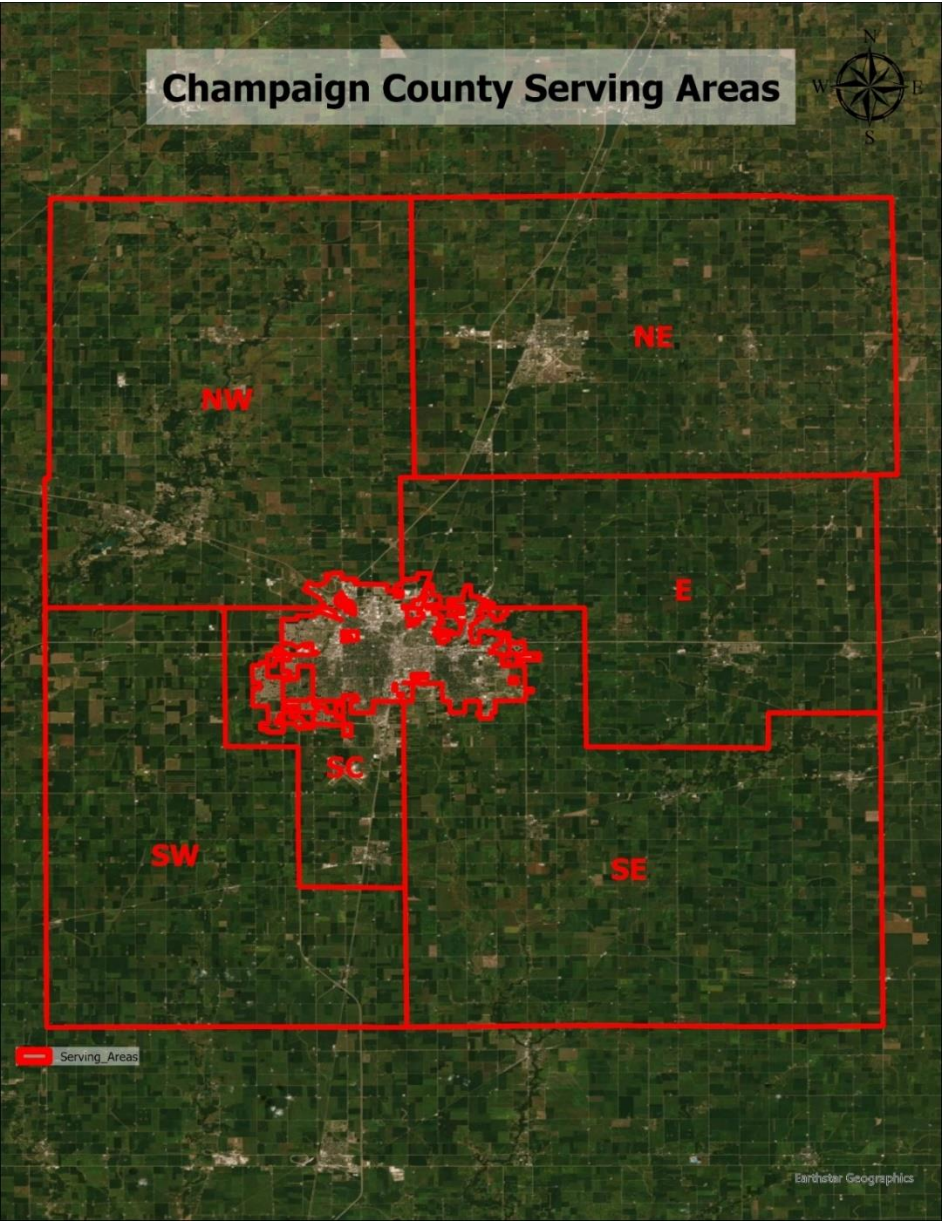
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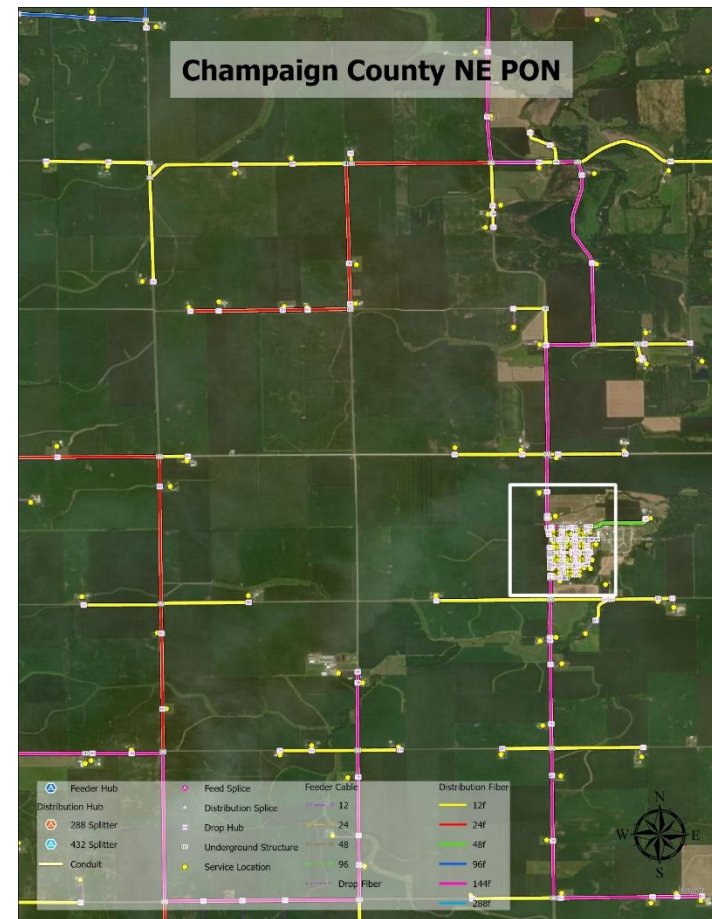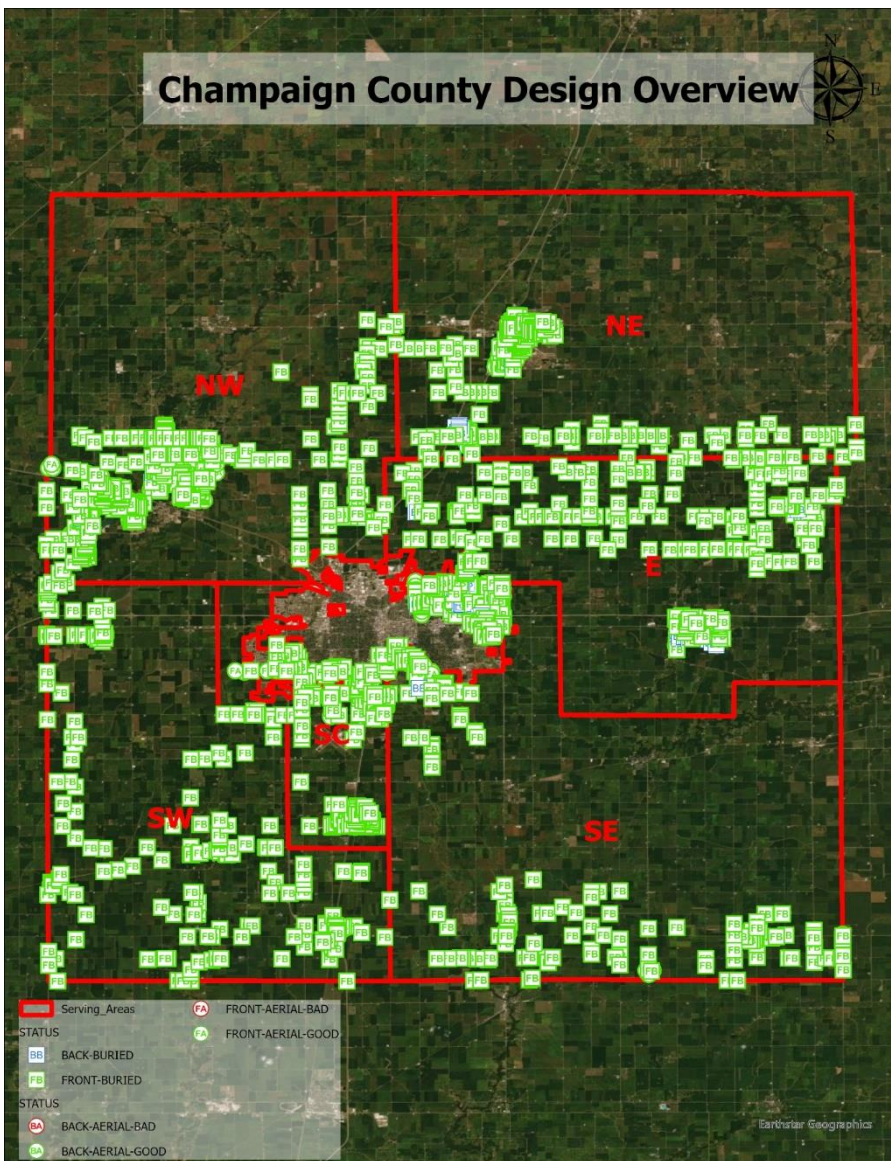
Network Design: Results

Cost of a New Network

	Whole Area	Total Rural	No RDOF
Fiber	$133,669,758	$61,133,570	$47,232,678
Drops	$ 14,551,173	$ 5,962,110	$ 3,983,360
Electronics	$ 14,848,896	$ 3,888,042	$ 2,453,748
Huts	$ 270,000	$ 270,000	$ 202,500
Operational Assets	$ 1,072,962	$ 511,454	$ 504,704
Total	$164,412,788	$71,765,175	$54,376,990
Passings	40,215	6,601	4,630
Cost per Passing	$4,088	$10,872	$11,744

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Financial Analysis – Total Study Area

Substantial Grants Needed

Penetration	Assets	Breakeven Grant	% of Assets
35%/60%	$161.6 M	$34.0 M	21%
40%/65%	$164.5 M	$22.0 M	13%
45%/70%	$169.5 M	$ 0.0 M	0%

Note: No ISPs will be interested in a breakeven business, so realistic grants will need to be higher.

Financial Analysis – Total Rural Area

Substantial Grants Needed

Penetration	Assets	Breakeven Grant	% of Assets
60%	$71.0 M	$41.0 M	58%
65%	$71.7 M	$38.0 M	53%
70%	$72.4 M	$35.0 M	48%

Note: No ISPs will be interested in a breakeven business, so realistic grants will need to be higher.

Financial Analysis – No RDOF Area

Substantial Grants Needed

Penetration	Assets	Breakeven Grant	% of Assets
60%	$53.9 M	$38.0 M	71%
65%	$54.4 M	$37.0 M	68%
70%	$54.8 M	$32.5 M	59%

Note: No ISPs will be interested in a breakeven business, so realistic grants will need to be higher.

Other Key Financial Variables

Financial performance is sensitive to other key variables:

- Interest rates

- Loan Terms

- Prices

- Cost of the Network

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Grant Funding

- Congress passed infrastructure bill with over $42.5 billion for broadband funding – will mostly be aimed at rural areas, but state will have a say in who gets funding. State's share likely over $1 billion.

- With some minor limitations the County can use ARPA funding for broadband projects.

- The State of Illinois will have several rounds of state broadband grants.

- There is also funding available for digital literacy and getting computers into homes.

Strategic Questions

- <u>What to do about RDOF areas?</u> What if FCC doesn't decide this soon? If the FCC awards this to wireless provider, will you consider them as a partner?

- <u>Is the County Willing to Help Fund a Solution?</u> If so, how much and in what manner?

- <u>What is the County's Best Role in Finding a Solution?</u> As a partner in grants or a supporter? Digital equity grants on top of infrastructure?

Next Steps

- <u>Identify Staffing Resources</u>. Moving forward needs dedicated effort. There may be grants available to hire temporary help. Use volunteers when it makes sense.

- <u>Reach out to ISPs</u>. We recommend talking to potential ISPs as an early step. Informal discussions, RFI, or RFP?

- <u>Community Outreach</u>. How to involve the public in the process.

- <u>Statistically Valid Surveys?</u> Might require more than one.

- <u>Review Local Fiber Policies</u>. Are there any barriers for ISPs that want to build a fiber solution?

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