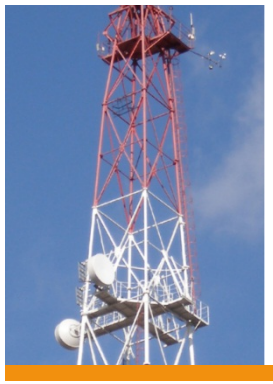

Power System Engineering, Inc.

Developing a Next-Generation Customer Engagement Program

Broadband to the Home a Key Component

UTC and Rural Broadband Council – Workshop

Rick Schmidt

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EXPERIENCED ▮ INDEPENDENT ▮ RESPECTED

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About the Presenter: Rick leads the Utility Automation and Communications Department at Power System Engineering. Rick and his staff provide automation and communication consulting services to utilities including: Technology Work Plans, Strategic Communications plans, procurement, design, and project management. Rick will most often work on projects involving communications infrastructure for SCADA, DA, AMI, demand response, and MWM. Rick has communications expertise with Land Mobile Radio, Microwave, Fiber optics with significant expertise with "last-mile" technologies. Rick has over 30 years of professional experience and focus heavily on the business side of technology. Rick has an MBA from Cardinal Stritch University in Milwaukee, WI.

Agenda

#	Topic
1	**PSE Background and Objectives of this Session**
2	The What, Why, and How of Customer Engagement
3	Creating Your Broadband Strategy and Subsequent Connect America Fund Proposals
4	Developing a Culture for Competition
5	Suggestions for Being Proactive – from Experiment to Phase II

Power System Engineering (PSE) Background

- Power System Engineering, Inc. (PSE) is a **full-service consulting firm** for electric utilities. We work mostly with co-ops and municipals and commonly work with over 200 different utilities each year.
- The professionals at PSE include engineers, IT and communications experts, utility strategy experts, economists, and financial analysts.
- 70+ employees with main office in Madison WI
- Complete many types of automation projects – SCADA, AMI, MDM, DA, DSM, CIS, MWM, GIS, technology strategy and strategic planning.
- PSE has provided communications infrastructure strategy, design, and procurement for dozens of utility's.
- PSE is independent:
  - PSE is a 100 % independent consulting firm
  - PSE is NOT a value-added reseller (VAR)
  - Our entire business model is based on what is best for our clients

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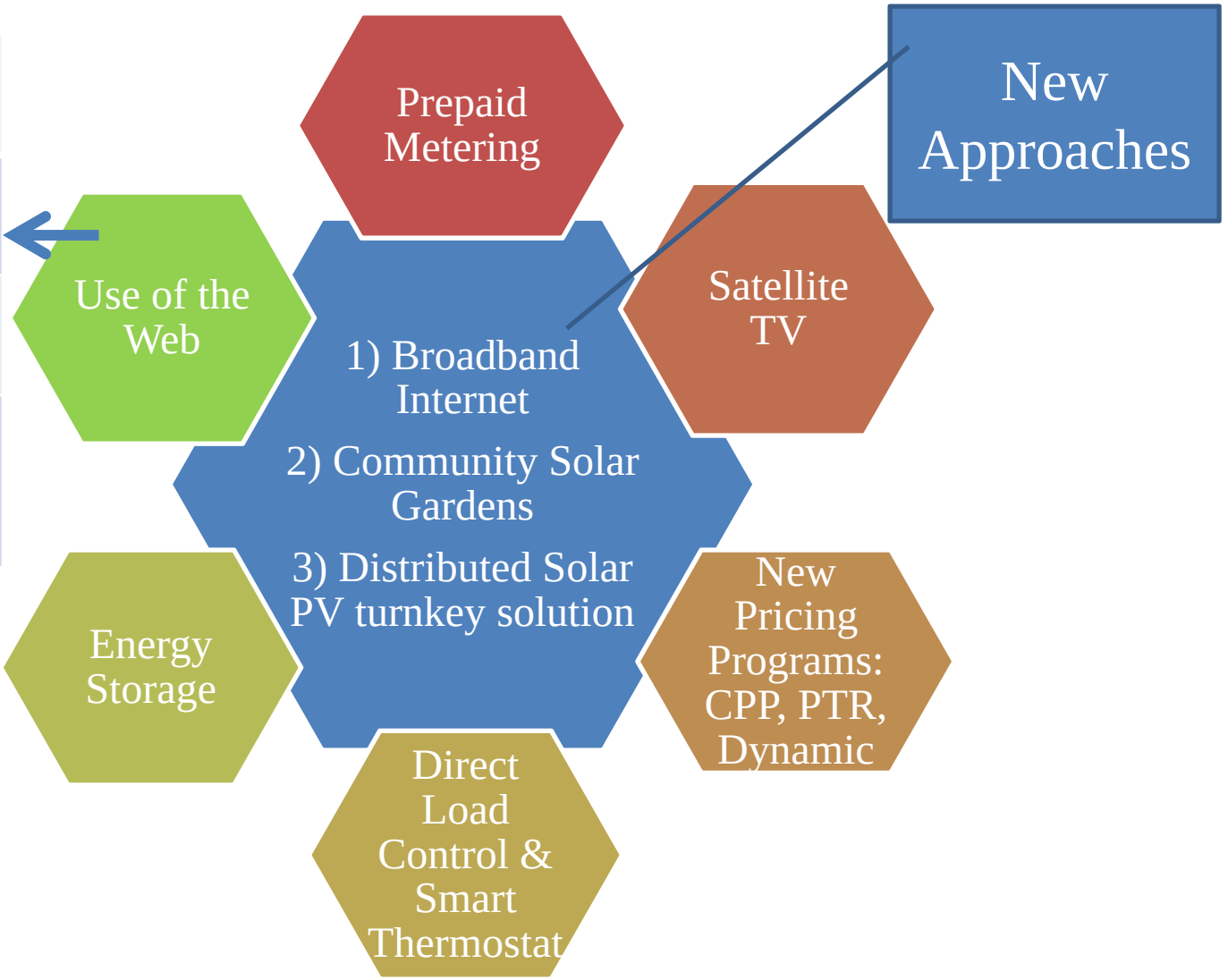
What is Customer Engagement?

- Developing a means to introduce new services, programs, and products for your customers – all customers are unique.
- Segmenting your customer base and understanding your customer base differences for unique types of services.
- Introducing services, programs, and products that have meaning and purpose – not every product/service is for everyone.
- Avoid cross-subsidizing the costs of one customer segment, service, program, or product from one another.

Possible Customer Engagement Services

1. Outage notification
2. Energy web reporting
3. Peak alert text messaging
4. Branding and marketing via social media



What Systems are Needed to Introduce New Services?

- Robust communications infrastructure
- AMI and MDM
- Home automation with cellular, broadband, or traditional AMI
- GIS
- OMS
- Integration of systems

What else is needed?

- An overall strategic plan (plus cross-dept. utility/board buy-in)
- Sales and marketing capabilities in a competitive environment
- A culture to move forward while taking some risks
- Flexibility to change directions
- Sufficient due diligence to avoid major mistakes

Why Develop a Customer Engagement Philosophy

- For the co-op and munis –customers/members are owners of the utility. New services, programs, and products can enhance their lives or save them money.
- Services such as broadband Internet can impact the quality of life, and enhance economic development in the communities you serve.
- Some customer engagement programs have very specific goals:
  - Load management and new pricing programs can shift peak costs/demand and save the utility money, which can save members money.
  - Prepaid metering can benefit both staff and customers.
- For the same reason as above, many co-ops have been selling electric appliances for many years.

Why Develop a Customer Engagement Philosophy

- Various forms of competition have already arrived.
  - The threat may seem small now, the impact could gradually become more painful and cause costs to shift between various rate classes and flatten and decline revenues.
    - From who Google, Apple, Home Automation vendors, solar, etc.
- If new services and products can be profitably introduced, they can help add revenues to avoid shrinking the core electric revenues.
- To compete with substitute and competing technologies such as solar photovoltaic:
  - Introducing your own solar PV program could be a means to more tactically leverage solar, enhance safety elements of solar, and possibly preserve revenues.

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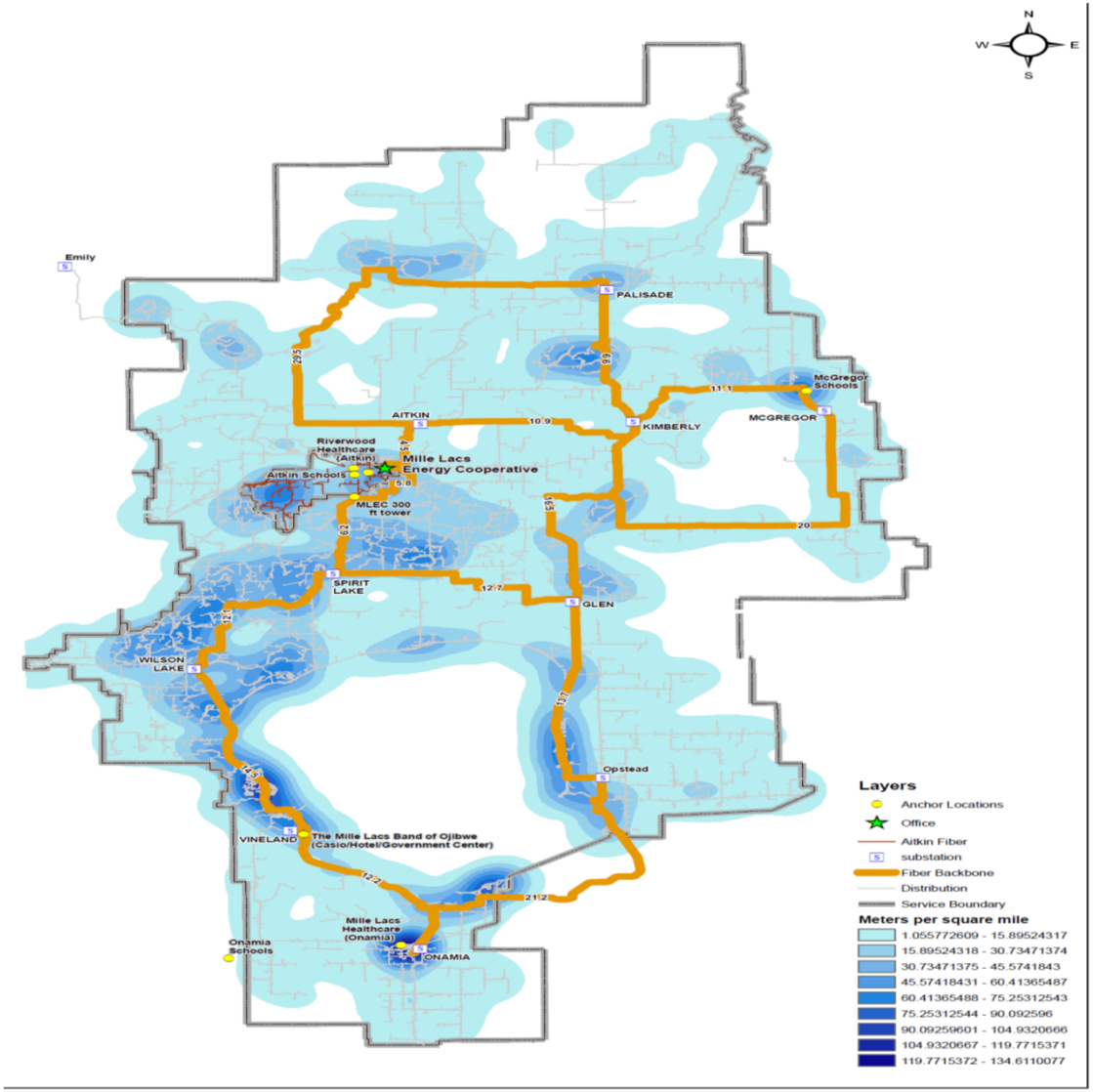
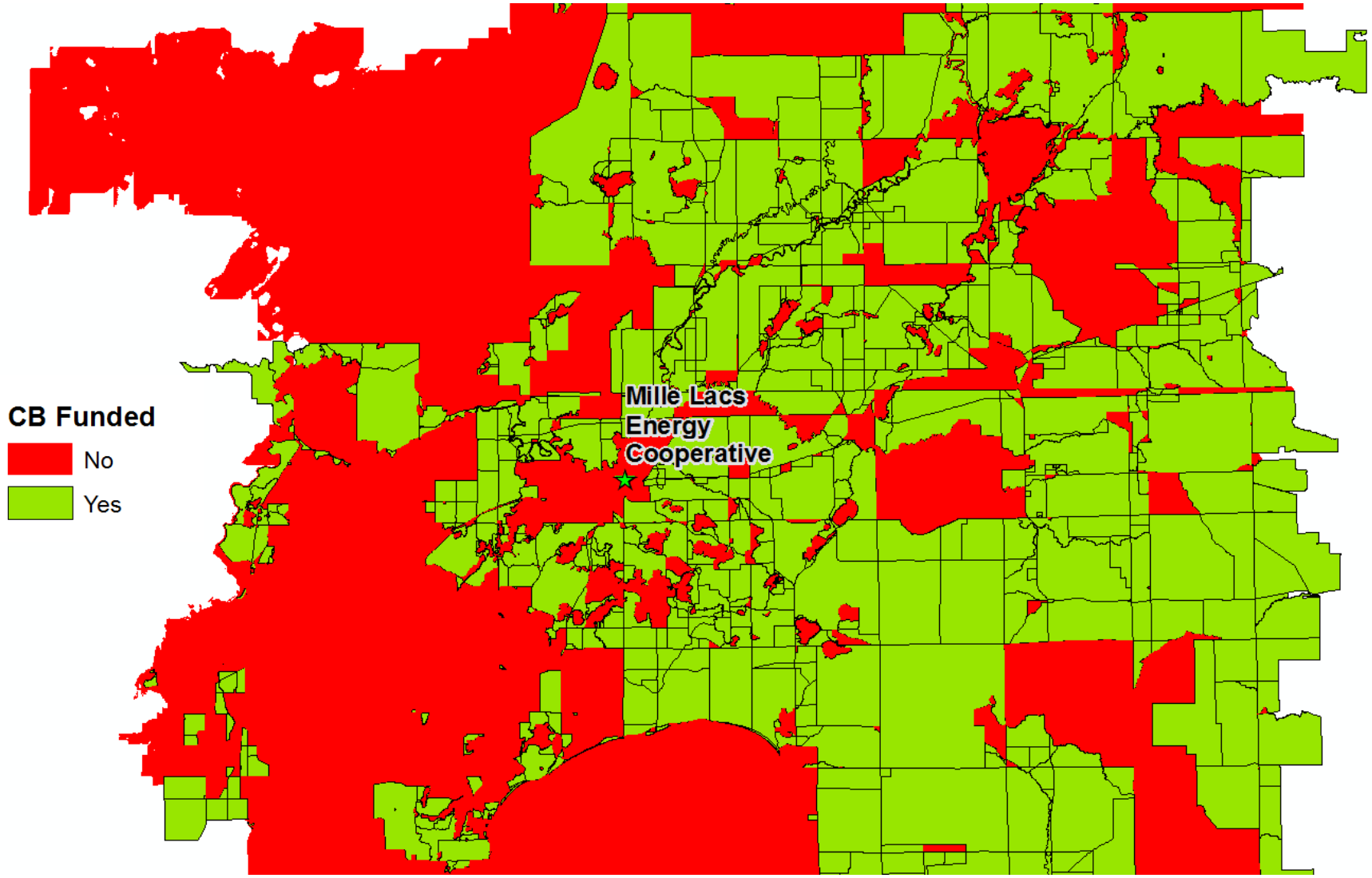
What Do We Know So Far from the FCC Filing?

- Fiber is strongly preferred from a funding perspective.
- Enough money is available from the Experiment to complete a pilot but not a full deployment.
- The funding – even for the Experiment – will be paid over ten years (versus all the money upfront).
- Some areas of the service territory are already disqualified from receiving funding from the Experiment or CAF Phase II.
- The areas possible for funding are defined per census block versus census track.
- Your proposed funding request has to be less than the FCC defined costs for the High-Cost Areas.
- Many homes will be ineligible for funding. If not already in place, would make sense to develop wireless or some form of lower cost Internet to serve the locations that can't be funded with fiber.
- A case study is as follows:

Case Study # 1 Service Territory Map – Mille Lacs, MN

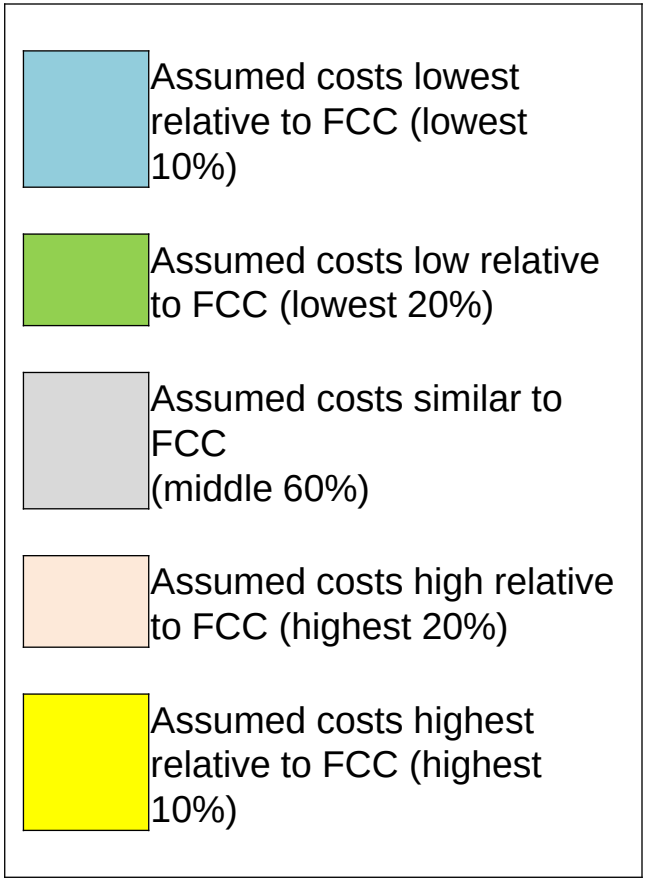


Eligible Areas for Mille Lacs Electric Co-op



Example - Identifying Cost Effective Census Blocks

Census Tract	Census Block	Customers	Line Miles	Ratio of PSE Determined Costs / FCC Modeled Costs
770086	3097	2	12.6	0.917
770086	3165	4	12.6	0.926
770186	2104	20	6.4	0.858
770186	2131	28	10.7	1.406
770186	2154	6	9.5	1.155
770186	2165	1	8.1	0.959
770286	2058	2	1.9	0.977
770386	3044	9	10.4	0.876
790487	1050	19	8.7	0.938
790488	1115	41	5.0	1.037
790488	2071	15	5.9	0.991
950786	1056	11	1.2	1.145
951586	2091	19	1.3	0.887
970086	2094	3	0.9	1.069
970186	1152	7	3.2	1.086
970186	2075	16	4.1	1.460



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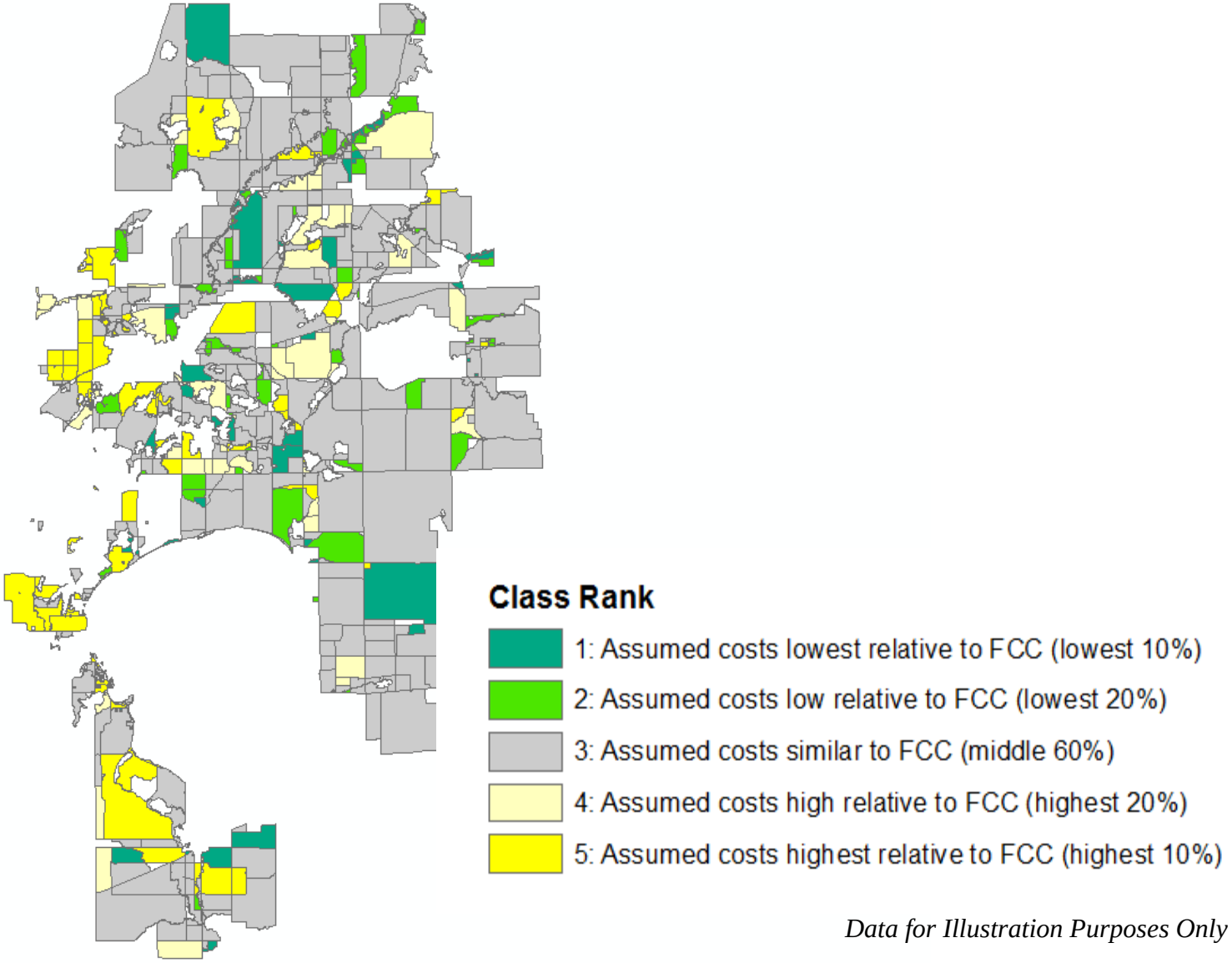
Census Block Assumed Cost per Customer Relative to FCC Cost per Customer



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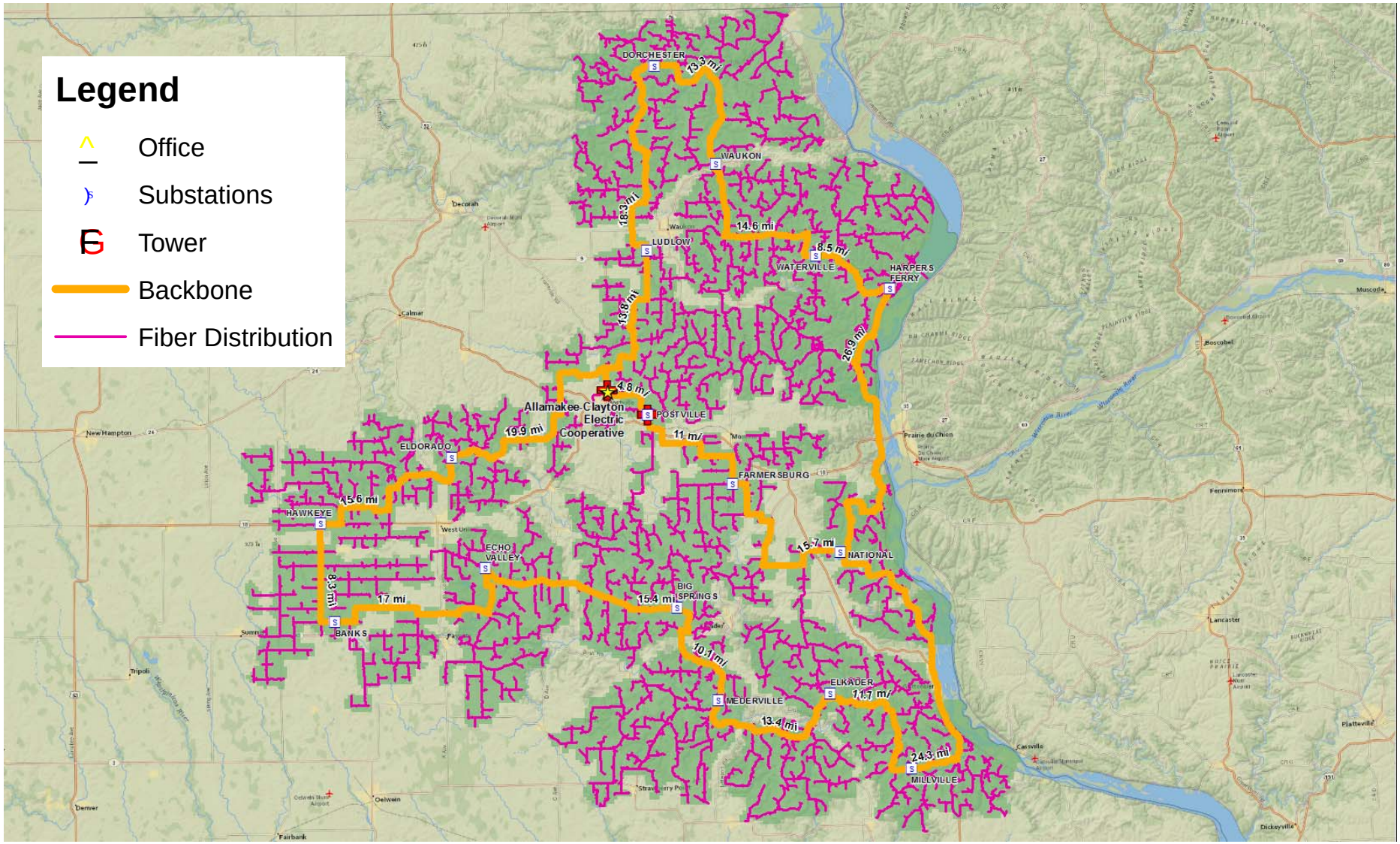
Allamakee-Clayton Fiber Conceptual Design



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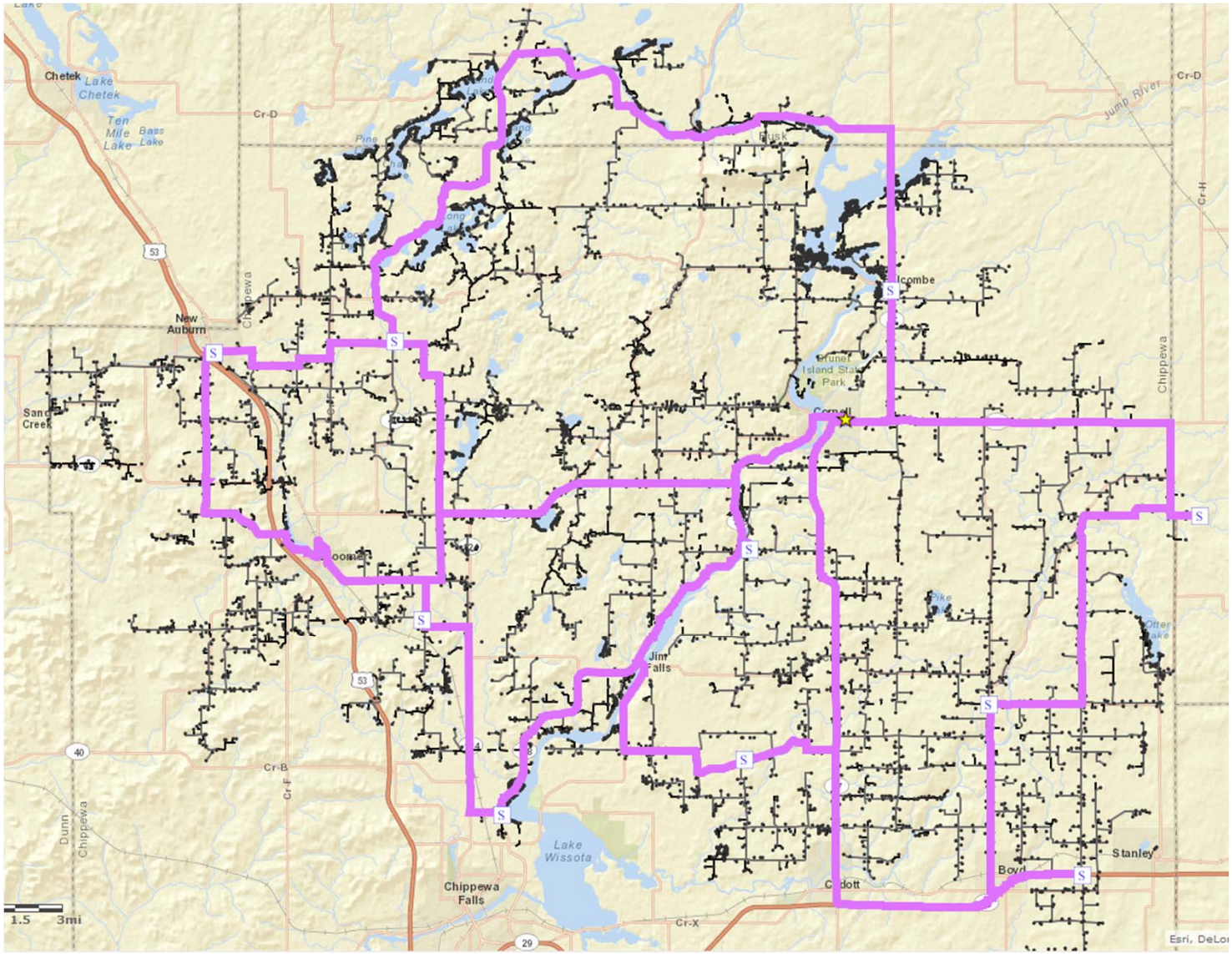
A WI Co-op–Fiber Backbone and FTTP



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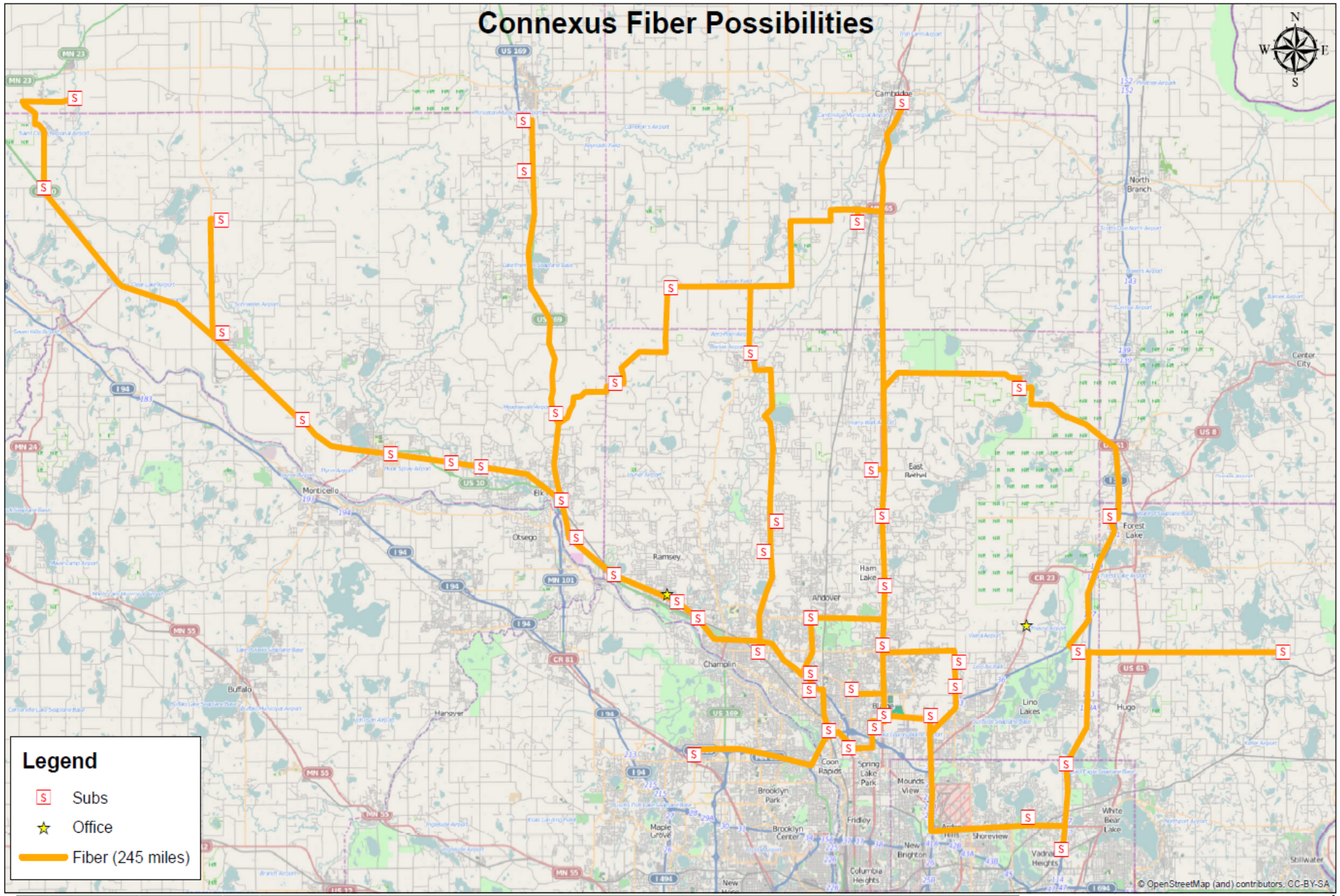
Connexus Fiber Possibilities



Fiber Route Design – Jo Carroll

Key Fiber to the Home Assumptions

- If you build a fiber backbone within your service territory to provide communications to your substations, tower sites, offices, and a few “anchor” customers:
  - How do you apply these common backbone costs as part of your internal cost evaluation?
  - What you decide to request as part of your Experiment funding request?
- Many utilities are faced with spending significant money to upgrade their aging substation and backbone communications:
  - Is it appropriate to allocate all of these costs to your fiber to the home cost/benefit analysis?

Possible Backbone Cost Allocation Approaches

- We are considering modeling the business case with a variety of scenarios, including:
  - Determine the costs for a 10 Mbps wireless link to each substation and a 50 Mbps or greater link to any tower, office, or backbone line.
  - Determine the costs to apply fiber to the same locations: substations, towers, offices, and any backbone links.
  - Subtract fiber costs from wireless costs, and place that into the FTTH cost allocation
- Other allocation methods: 50% of the backbone fiber costs to the FTTH business case. 0% allocation of the backbone to the FTTH business case.

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Developing a Culture for Competition

- Even with a supporting board of directors and management team dealing with risk and uncertainty, it is not easy for an electric utility to enter a competitive market.
- Never underestimate the potential power of a competitor:
  - Expect some possible overbuilds by the CATV and telcos, increased advertising, pricing promotions.
- Complete a detailed competitive analysis of the Internet competition and/or video service capabilities of the providers in your service territory.

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Next Steps

1. Complete a detailed cost/benefit analysis for your entire customer base or areas not served presently by a broadband provider.
2. Complete a risk assessment of your cost/benefit analysis.
3. Closely uncover the funding opportunity by census block.
4. Consider how to offer VoIP telephony and consider how to provide TV programing similar to a CATV provider (Triple Play).
5. Create a fiber backbone design to serve substations, offices, and towers for the provision of AMI, SCADA, DA, DG, LMR backhaul and other internal applications. Also, consider how microwave could be used in the event you elect not to deploy FTTH.
6. Begin building the fiber backbone with or without the FCC fiber funding. However, consider what other robust communications media would cost to determine the amount of additional cost of fiber over robust microwave.

Thank You

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