METRONET FIBER-OPTIC BROADBAND PLANNING: RURAL REBOOT

ABSTRACT

The MetroNet partnership owns and manages a fiber-optic broadband network in northeast lowa. The network was established to satisfy demand for affordable and reliable high-speed internet. The partnership wishes to increase broadband access through network and organizational expansion. Recommendations and an implementation strategy were created to guide future development.

KEY POINTS

- Rural telecommunications planning
- Broadband Planning in underserved regions
- Broadband as an economic development tool
- Legal hurdles in broadband planning
- Scenario planning for broadband expansion

INTRODUCTION

In 2010, the MetroNet fiber-optic network was created in response to a need for reliable, affordable high-speed internet services. Community leaders organized under a 28E agreement, as established by Iowa State Code, to build the required network. All of the members are public or non-profit organizations with public purpose as the forefront of their missions.

The current system relies primarily on annual payments from the six anchor members. Additional funding comes from two entities that purchased Indefensible Rights of Use. The network current uses 40% of its 2GB capacity. Having reached their initial goals, the partnership has expressed interest in expanding the network to better serve the region.

ORGANIZATIONAL STRUCTURE

-MetroNet Network - Roads The City of Decoral O Current Users Source: ESRI, IowaGISdat

RONET FIBER-OPTIC NETWORK (2016)

JRRENT INFRASTRUCTURE

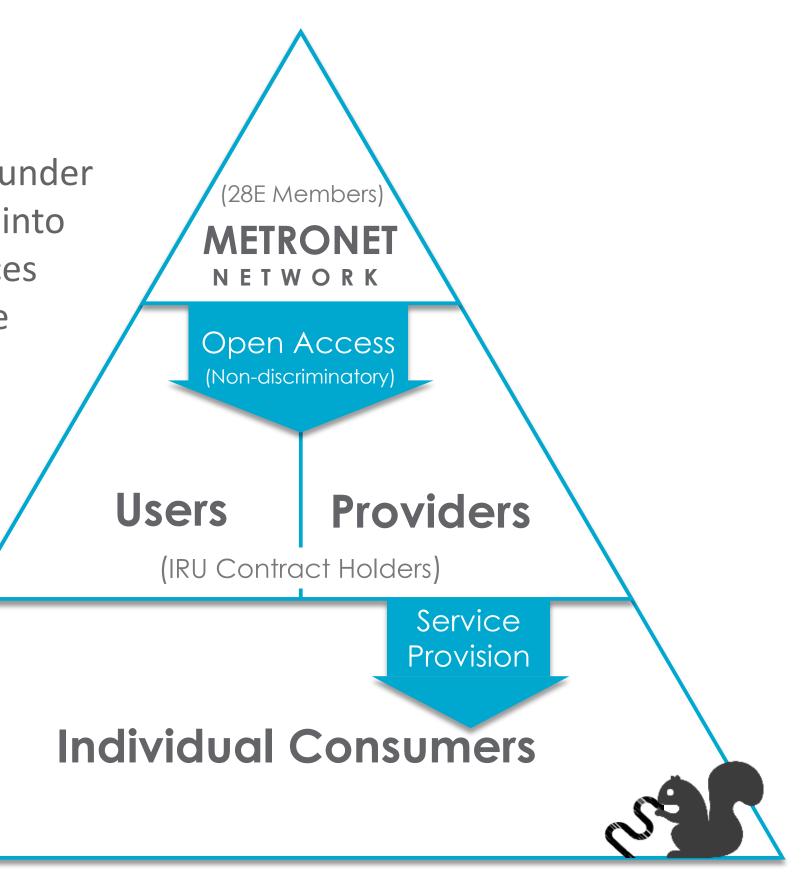
- Fiber-optics use glass or plastic tubing to transmit data
- A shell covers the fibers to prevent hungry squirrels or other damage
- Loops, or rings, are used in the network to ensure reliable service
- They use light to deliver internet at higher speeds and longer distances
- It is less expensive and more environmentally friendly



<u>Iowa 28E Partnership</u>: The MetroNet is a public-private partnership operating under a 28E Agreement, enabled by the Iowa Code. Local governments can enter into an agreement with public and private entities to share authority and resources to better serve the community. The MetroNet will continue as a 28E because it offers flexibility in management and administrative practices.

It will incorporate a tiered system of membership to encourage financially limited entities, such as rural municipalities, to become associate members, for a reduced fee and corresponding board influence.

Open Access Model: Open access refers to the non-discriminatory, wholesale access to the fiber-optic network infrastructure. Secondary research and expert interviews identified this model for system access because it limits legal vulnerability. This framework also promotes greater service coverage by lowering barriers to entry.





COMMUNITY ENGAGEMENT

VISIONING SESSION

In January of 2016, focus groups were organized into a mixture of local community leaders with the purpose of soliciting input on the role of broadband in the digital future of Winneshiek County. Common themes were extracted from group feedback and used in the criteria for recommendations.

Common Themes:

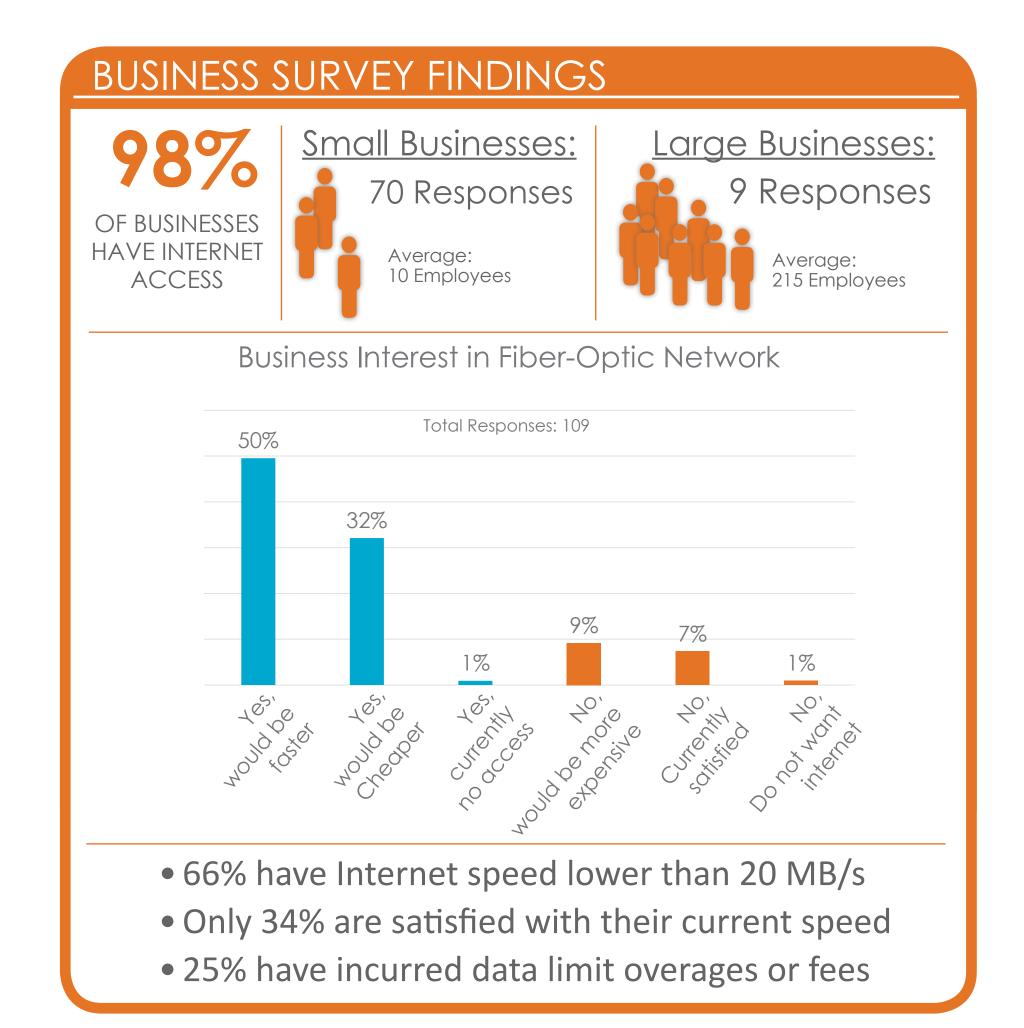
- More broadband accessibility to rural areas
- Support for technology based businesses
- Concern over cost of construction
- Lack of understanding the benefits of broadband
- Including more community partners in broadband planning

RESIDENTIAL & BUSINESS SURVEYS

Two separate surveys were conducted in Winneshiek County to assess internet connectivity, demand, and access for businesses and residents.

The business survey was non-random and voluntary. They were distributed through the Decorah Chamber of commerce email database.

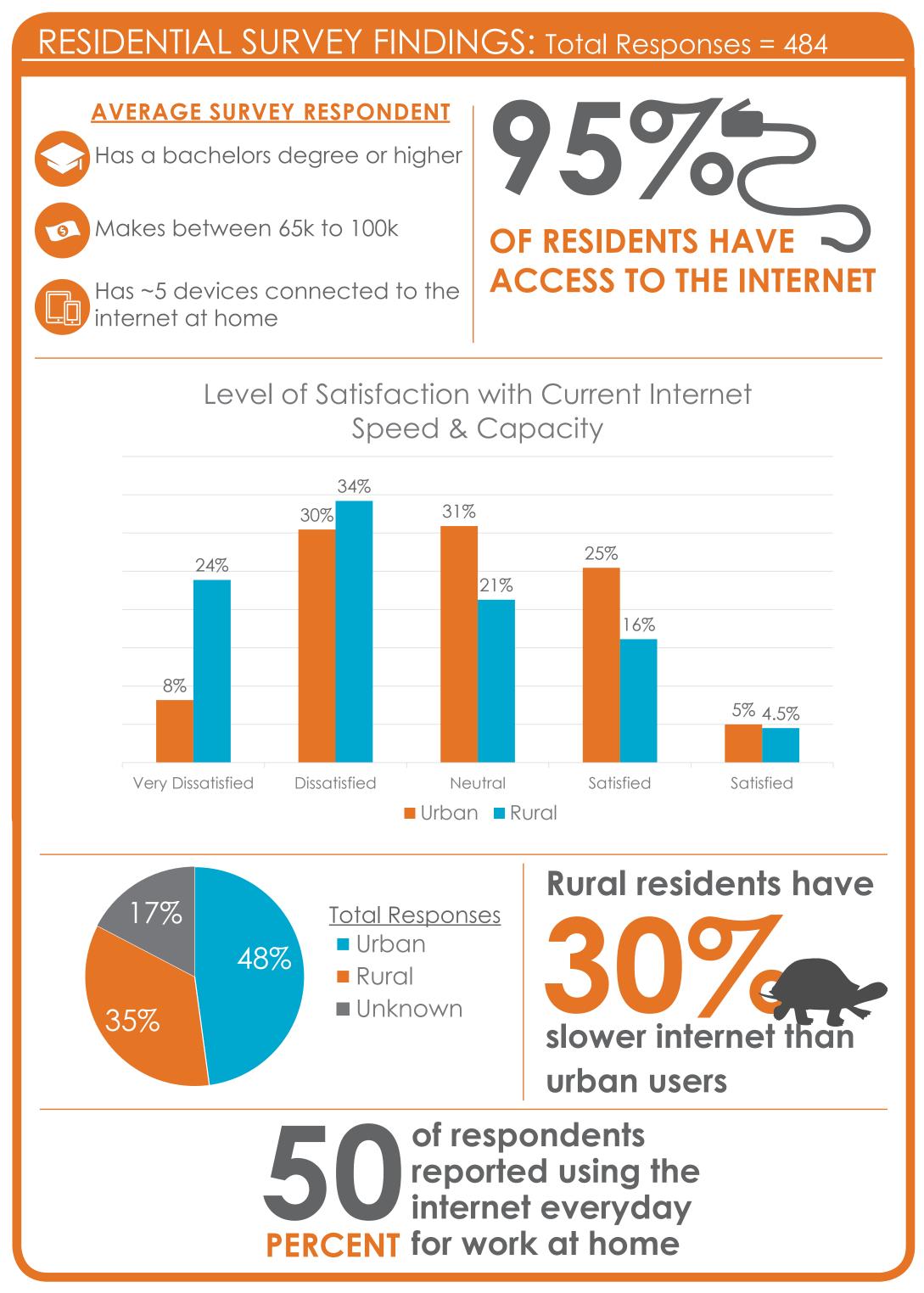
The residential survey was advertised using print, online, and radio media outlets. The survey began as non-random and open to county residents. However, there was an under-representation of rural residents. To improve this, 2200 post-cards were randomly mailed to rural residents. This promotion nearly tripled rural response rates.





BUSINESS INTERVIEWS

Business interviews were conducted with businesses in Winneshiek County with 40 or more employees. Interview feedback indicated a move to more digital based sales and services. Companies expressed the internet's importance in sales, file sharing, and database management. Businesses shared their difficulties working with outdated infrastructure and finding a digitally skilled workforce.







INVESTMENT SCENARIOS

UMMARY

Feedback from the surveys, visioning session, and project partners identified targets of interest for each scenario. Five investment scenarios were created to predict future impacts related to target user groups, network build-out, financial analysis, granting opportunities, and social benefits.

INVESTMENT SCENARIO 2: Residential Decorah

Target Population: City of Decorah Residents

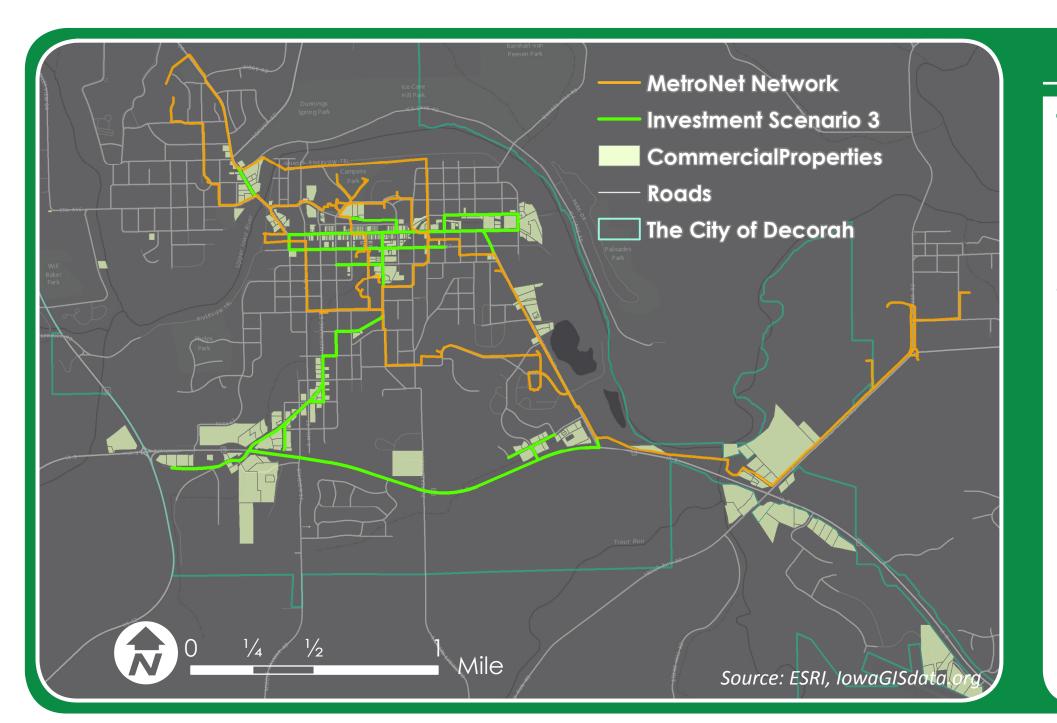
Build-Out: 37.78 Miles of fiber within the city limits of Decorah to all residential parcels (2,565)

Social Benefits: Direct benefits to residents and community organizations through increased access to tele-health, telecommuting, and educational tools

Total Construction Cost: \$5,471,947



Total Potential Grants:

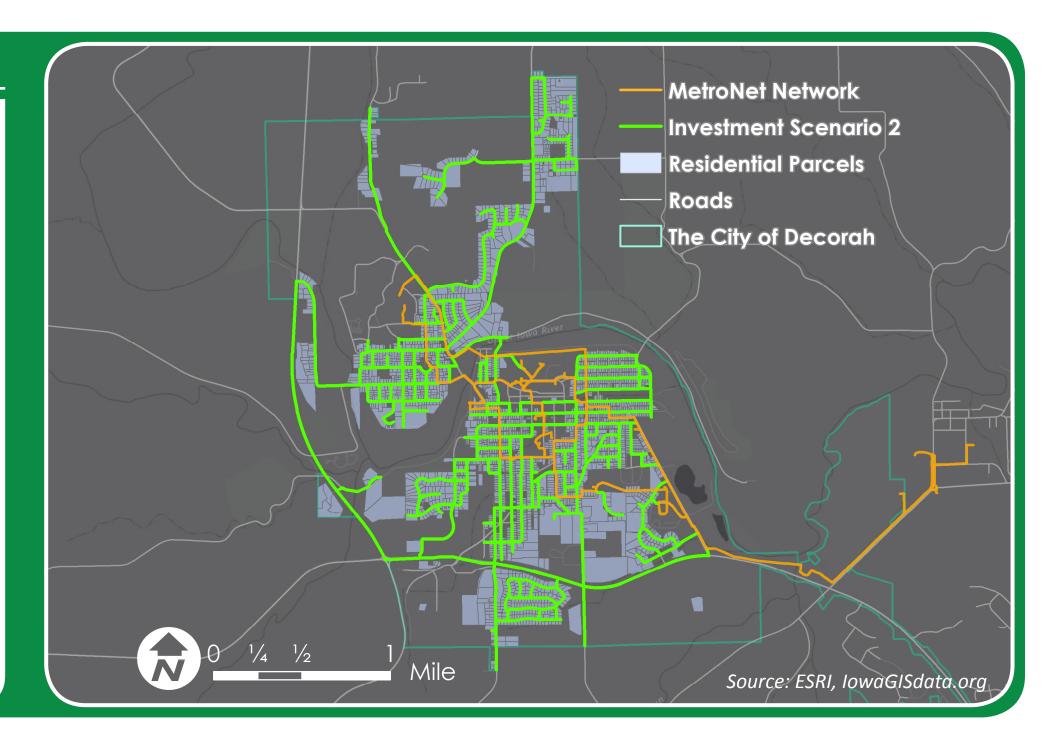


INVESTMENT SCENARIO 1: No Expansion

Target Population: Current MetroNet anchor members

Build-Out: No additional expansion of network

Social Benefits: Indirect benefits to the community through increased services



INVESTMENT SCENARIO 3: Commercial Decoral

Target Population: Commercial Businesses within the City of Decorah

Build-Out: 6.2 Miles of fiber will be deployed within the city limits of Decorah to commercial parcels (125)

Social Benefits: Increasing costs savings for small businesses in the community and the ability to market and sell goods and services online

Total Construction Cost: \$901,004

Total Potential Grants: \$1,550,000

INVESTMENT SCENARIO 4: Decorah Business Park

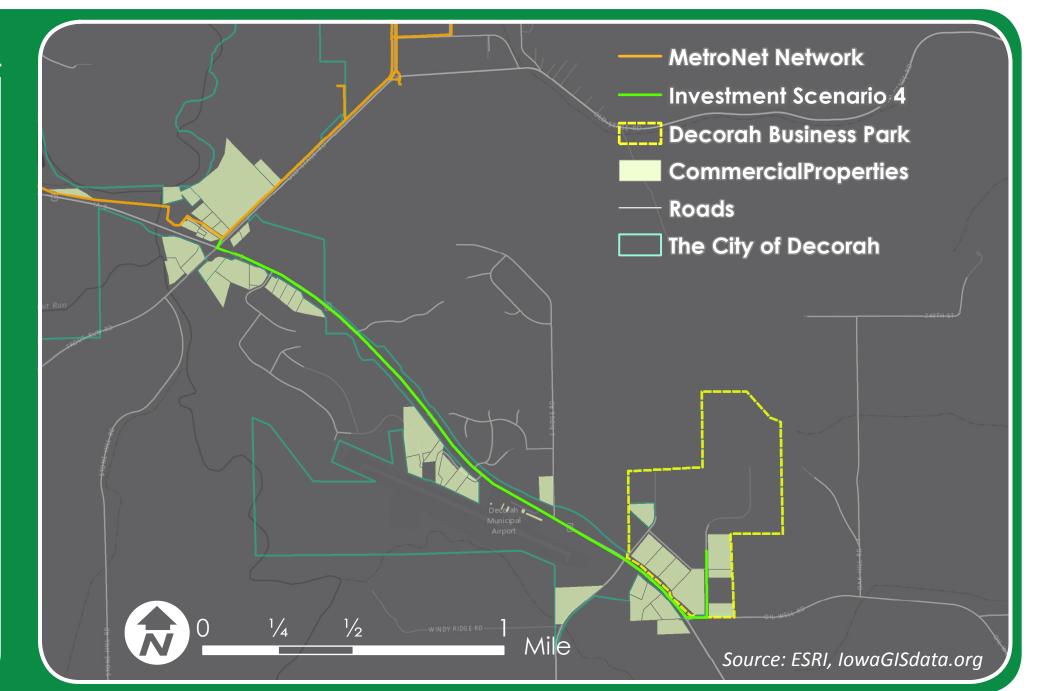
Target Population: Major industries in the Decorah Business Park

Build-Out: 2.35 Miles of fiber extending to the City of Decorah Business Park

Social benefits: Increased access to online markets and communications for businesses to operate more efficiently and effectively

Total Construction Cost: \$343,745

Total Potential Grants: \$1,550,000



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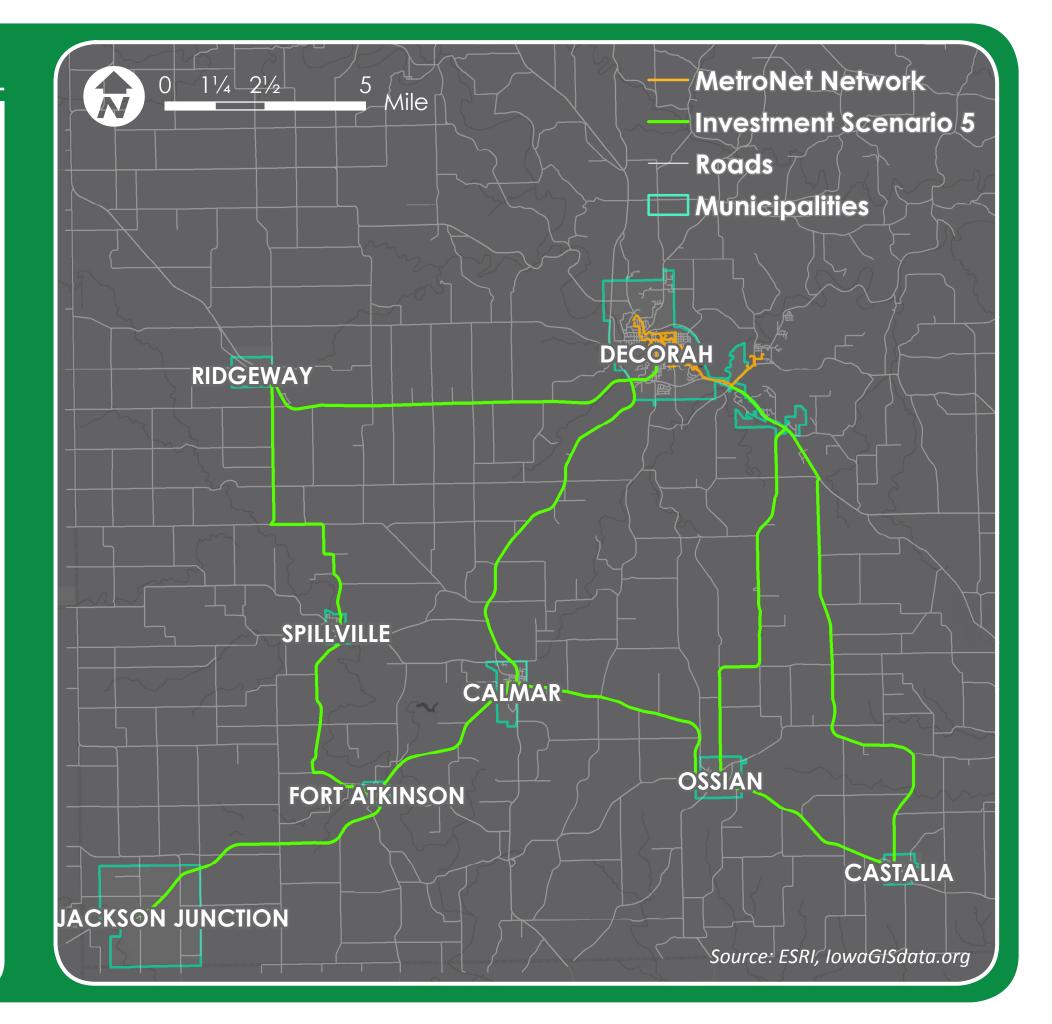
INVESTMENT SCENARIO 5: Regional Expansion

Target Population: Municipal governments within Winneshiek County

Build-Out: 76 Miles extending to outlying municipalities to serve more rural and underserved areas

Social Benefits: Increasing service capability of municipalities. Broadband access to the rural areas may spur the development of internet service cooperatives and utilities offering better, more affordable service to Winneshiek residents.

Cost	Miles	Route	Cost	Miles
\$2,140,147	15	Calmar -> Fort. A	\$652,453	5
\$1,076,046	7	Calmar -> Ossian	\$942,491	7
\$1,215,120	8	Decorah -> Ossian	\$1,707,988	12
\$850,479	6	Ossian -> Castalia	\$733,976	5
\$1,475,580	10	Decorah -> Calmar	\$1,537,777	11
		Total	\$11 Million	76
	\$2,140,147 \$1,076,046 \$1,215,120 \$850,479	\$2,140,147 15 \$1,076,046 7 \$1,215,120 8 \$850,479 6	\$2,140,147 15 Calmar -> Fort. A \$1,076,046 7 Calmar -> Ossian \$1,215,120 8 Decorah -> Ossian \$850,479 6 Ossian -> Castalia \$1,475,580 10 Decorah -> Calmar	\$2,140,147 15 Calmar -> Fort. A \$652,453 \$1,076,046 7 Calmar -> Ossian \$942,491 \$1,215,120 8 Decorah -> Ossian \$1,707,988 \$850,479 6 Ossian -> Castalia \$733,976 \$1,475,580 10 Decorah -> Calmar \$1,537,777



CONCLUSIONS

There are two components of recommendations made by the team. The first recommendation highlights the benefits of remaining a 28E partnership and adopting an open access model. Based on secondary research and interviews with experts, these organizational assets present the most flexible and protected operational structure for future expansion.

Most feasible

cost structure

Secondly, an analysis of the Investment scenario recommendations is provided. Investment scenarios will be ranked based on the number of criteria they fulfill. There are four key criteria as seen in the diagram to the right.

Recommendations will inform the implementation plan, which aims to achieve the goals of the MetroNet and the community. The implementation plan will consist of action items, time range, responsible party, and performance measures.

All methodologies and concepts can be applied throughout the state of Iowa. The open access Model, broadband planning and scenario development is ransferable across the United States.



To the MetroNet Board:

- The City of Decorah Luther College Decorah Community
 Winneshiek County
- School District Winneshiek Medical
- Cente

Dr. Lucie Laurian

- Upper Explorerland
- **Regional Planning** Commission
- Sarah SanGiovanni
- Nick Benson
- Dr. Jerry Anthony • Dr. Charles Connerly



- o our faculty advisors & IISC coordinators



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and MetroNe

Goals Met

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Best Fit

Scenario

lighest level of potential grant funding

Ratio of users

of scenario

served and c

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