In three years, Merit Network extends the reach of its middle-mile fiber-optic network by 2,300 miles using CommScope fiber solutions

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After receiving $128 million in federal funding to revitalize broadband Internet access across rural Michigan, Merit Network, Inc., needed the right fiber and materials partner. Some RFP finalists were too large to provide the custom, hands-on approach Merit needed. Others, while smaller and more agile, couldn’t deliver on the magnitude of its vision for the REACH-3MC initiative.

Headquartered in Ann Arbor since 1966, Merit owns and operates America’s longest-running research and education network. Governed by Michigan’s major public universities, Merit’s network backbone is a strategic collaboration and innovation asset. It connects universities, K-12 schools, libraries, health care, government institutions and other nonprofits across the state.

Injecting true broadband Internet

In remote rural areas of Michigan, a lack of backhaul infrastructure was severely limiting the availability and performance of affordable Internet service. Community institutions, businesses and homes were left with Internet speeds far below their needs.

Merit Network stepped in to solve the problem with the Rural, Education, Anchor, Community and Healthcare—Michigan Middle Mile Collaborative (REACH-3MC) initiative.

When the American Reinvestment and Recovery Act of 2009 (ARRA) was signed into law, Merit saw the nearly $7.2 billion in available federal funding as an opportunity to address broadband shortfalls throughout Michigan. The 501(c)(3) nonprofit organization could finally realize its nearly 50-year dream of spreading state-of-the-art broadband services across thousands of acres of rural Michigan.
Navigating complex, competing factors

A variety of complex factors placed critical importance on selecting the most cost-effective, flexible, responsive fiber-optic partner. These factors included:

- **Funding and timing limits:** The federal grant agency National Telecommunications and Information Administration (NTIA) stipulated a strict three-year completion timeframe—on time and under budget. Compliance required a comprehensive environmental assessment that resulted in an overhaul of the engineering route. To protect the project from volatile raw materials costs that could increase prices, Merit needed to secure a fixed rate for materials purchases.

- **Merit’s nonprofit status:** As a nonprofit, Merit does not directly serve residential and commercial customers. To make sure the “last mile” was taken care of, it enlisted the help of seven Internet Service Providers (ISPs). These ISPs were considered sub-recipients of ARRA funds. Each ISP owns fiber strands on the infrastructure.

- **Project complexity:** Coordinating seven different ISP/sub-recipient organizations was a massive challenge. Beyond the 2,300-mile mainline, Merit and the ISPs required access points to construct laterals that connect end users. The project also featured construction of entrance facilities into Incumbent Local Exchange Carrier (ILEC) central offices, colocation in telecommunications huts, service to cellular towers, and more. Fiber counts ranged from 24 to 288—even 432 in some instances.

- **A high possibility of delays:** Merit was concerned that the collective demand from ARRA projects would outpace supply, causing an unsustainable delay in the construction process. Also, the sheer magnitude and complexity of the project was a challenge in the face of a decentralized permitting process. Finally, two record-breaking Michigan winters threatened to slow construction.

CommScope delivers

Given all of these complicating factors, Merit placed tremendous importance on finding a cost-effective, flexible, responsive fiber-optic partner who could maintain high availability of various reel-sizes to ensure timely materials delivery.

During the evaluation process, the Merit team visited CommScope’s international headquarters in North Carolina. They left impressed and convinced by the company’s size and scalability. But the most compelling differentiator was delivery method.

CommScope delivered fiber directly to the job site in specialized semi-trucks equipped with dedicated cranes, then offloaded the materials at no additional charge. Delivery charges from other vendors would have cost Merit an additional $1 million.

Mike Fleming, CommScope’s Central Region Sales Director, explained, “We are the only network infrastructure provider in the world with a cable transport fleet capable of not only delivering cable reels to a site, but also unloading them via our cargo-master lift-gate service. Merit definitely appreciated this convenience.”

Prior experience and a diverse range of solutions ultimately convinced Merit that CommScope truly understood complex broadband deployments.

“CommScope was excellent to work with in finalizing the purchasing agreement,” said Bob Stovall, Vice President of Network Operations and Engineering, Merit Network. “Together, we secured a win-win contract that locked in purchases at a consistent rate for the entire project, protecting us from rising raw materials costs.”

<table>
<thead>
<tr>
<th>REACH-3MC: Round 1</th>
<th>REACH-3MC: Round 2</th>
<th>Grand Total:</th>
<th>Win:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$41.6M, 1,017 miles</td>
<td>$87M, 1,270 miles</td>
<td>$128.6M, 2,287 miles</td>
<td>A 59% increase in Merit’s fiber-optic backbone</td>
</tr>
<tr>
<td>55 lateral 1 Gbps connections</td>
<td>88 lateral 1 Gbps connections</td>
<td>143 lateral 1 Gbps connections</td>
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“Without the federal funding assistance provided by ARRA and the right network infrastructure solutions partner, the REACH-3MC project would have taken well over 10 years to complete.”

Don Welch
President and CEO, Merit Network

CommScope provides flexible TeraSPEED® and OFNR fiber solutions

Merit purchased all project materials from CommScope. Based on network traffic distances, Merit selected SMFE 28 E+, dispersion-unshifted, singlemode fiber that met ITU G.652.D specifications.

Merit also selected OFNR cable for the central office entrance facility, including termination inside colocation facilities. The OFNR is riser-rated, enabling deployment directly from the mainline access point of the entrance lateral into the facility itself. OFNR can also be deployed through fire-stops, plenum walls, raised computer floors, and more. Ultimately, the solution’s “go-anywhere” quality translated to vital cost- and time-savings.

Merit completes REACH-3MC

Three years later, Merit had expanded its fiber backbone by 59 percent. Since REACH-3MC began on January 1, 2010, Merit’s membership has grown by 41 percent, from 218 to 307. The project added dedicated 1 Gbps connectivity to 143 community institutions. While 271 current members enjoy dedicated connections to Merit’s backbone, the initiative will eventually enable another 900 public institutions to connect. The project also added 12 new colocation facilities in Michigan’s Upper Peninsula.

This significant expansion of Merit’s footprint also acts as a cost-cutting mechanism, providing better, cheaper service to more constituents in more areas. In fact, more than 1 million homes and 55,000 businesses will benefit as direct customers of a REACH-3MC ISP. ISPs can also access 51 central office facilities to leverage the infrastructure of existing ILECs for improved service.

1 Gbps is only the beginning

As a "middle-mile" project, the aim of REACH-3MC was not to directly connect every home and business in a certain service area, but to build backhaul into an entire region. Thanks to the success of REACH-3MC, both new and existing Merit members benefit from 21st century broadband in remote and rural areas.

Since the solutions provided by CommScope are capable of delivering speeds of 10, 40, even 100 Gbps—and network speed and capacity can be increased with simple upgrades—Merit is also now ready to take control of its broadband future. As Merit and sub-recipients add laterals to complete the last mile for end-users, businesses and community institutions, CommScope will remain a welcomed, vital network infrastructure provider.

“We recognize that Merit reviewed several worthy candidates during the RFP process. We were honored and delighted to be selected as the sole fiber provider for the REACH-3MC project.”

Mike Fleming
Central Region Sales Director,
CommScope
Everyone communicates. It's the essence of the human experience. How we communicate is evolving. Technology is reshaping the way we live, learn and thrive. The epicenter of this transformation is the network—our passion. Our experts are rethinking the purpose, role and usage of networks to help our customers increase bandwidth, expand capacity, enhance efficiency, speed deployment and simplify migration. From remote cell sites to massive sports arenas, from busy airports to state-of-the-art data centers—we provide the essential expertise and vital infrastructure your business needs to succeed. The world’s most advanced networks rely on CommScope connectivity.