

### Application for Federal Assistance SF-424

\* 1. Type of Submission:

- Preapplication
- Application
- Changed/Corrected Application

\* 2. Type of Application:

- New
- Continuation
- Revision

\* If Revision, select appropriate letter(s):

\* Other (Specify):

\* 3. Date Received:

03/04/2022

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

#### 8. APPLICANT INFORMATION:

\* a. Legal Name:

Michigan State University

\* b. Employer/Taxpayer Identification Number (EIN/TIN):

38-6005984 (DUNS 193247145)

\* c. UEI:

R28EKN92ZT29

d. Address:

\* Street1:

426 Auditorium Rd., Room 2

Street2:

\* City:

East Lansing

County/Parish:

\* State:

MI: Michigan

Province:

\* Country:

USA: UNITED STATES

\* Zip / Postal Code:

48824-2600

e. Organizational Unit:

Department Name:

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:

\* First Name:

Middle Name:

\* Last Name:

Suffix:

Title:

Organizational Affiliation:

\* Telephone Number:

Fax Number:

\* Email:

## Application for Federal Assistance SF-424

**\* 9. Type of Applicant 1: Select Applicant Type:**

H: Public/State Controlled Institution of Higher Education

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

\* Other (specify):

**\* 10. Name of Federal Agency:**

National Telecommunication and Information Administration

**11. Catalog of Federal Domestic Assistance Number:**

110.31

CFDA Title:

Broadband Infrastructure Program

**\* 12. Funding Opportunity Number:**

NTIA-BROADBAND-INFRASTRUCTURE-PROGRAM-21

\* Title:

Broadband Infrastructure Program

**13. Competition Identification Number:**

NTIA-BROADBAND-INFRASTRUCTURE-PROGRAM-21

Title:

Broadband Infrastructure Program

**14. Areas Affected by Project (Cities, Counties, States, etc.):**

Add Attachment

Delete Attachment

View Attachment

**\* 15. Descriptive Title of Applicant's Project:**

MOON-Light project

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

## Application for Federal Assistance SF-424

### 16. Congressional Districts Of:

\* a. Applicant

\* b. Program/Project

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment

Delete Attachment

View Attachment

### 17. Proposed Project:

\* a. Start Date:

\* b. End Date:

### 18. Estimated Funding (\$):

* a. Federal	<input type="text" value="10,500,000.00"/>
* b. Applicant	<input type="text" value="11,075,897.00"/>
* c. State	<input type="text" value="0.00"/>
* d. Local	<input type="text" value="0.00"/>
* e. Other	<input type="text" value="0.00"/>
* f. Program Income	<input type="text" value="0.00"/>
* g. TOTAL	<input type="text" value="21,575,897.00"/>

### \* 19. Is Application Subject to Review By State Under Executive Order 12372 Process?

- a. This application was made available to the State under the Executive Order 12372 Process for review on
- b. Program is subject to E.O. 12372 but has not been selected by the State for review.
- c. Program is not covered by E.O. 12372.

### \* 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)

Yes  No

If "Yes", provide explanation and attach

Add Attachment

Delete Attachment

View Attachment

21. \*By signing this application, I certify (1) to the statements contained in the list of certifications\*\* and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances\*\* and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)

\*\* I AGREE

\*\* The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

### Authorized Representative:

Prefix:  \* First Name:

Middle Name:

\* Last Name:

Suffix:

\* Title:

\* Telephone Number:  Fax Number:

\* Email:

\* Signature of Authorized Representative:

\* Date Signed:

**BUDGET INFORMATION - Construction Programs**

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for

COST CLASSIFICATION	a. Total Cost
1. Administrative and legal expenses	\$ 161,577.00
2. Land, structures, rights-of-way, appraisals, etc.	\$ -
3. Relocation expenses and payments	\$ -
4. Architectural and engineering fees	\$ -
5. Other architectural and engineering fees	\$ -
6. Project inspection fees	\$ -
7. Site work	\$ -
8. Demolition and removal	\$ -
9. Construction	\$ -
10. Equipment	\$ 21,026,520.00
11. Miscellaneous	\$ 387,800.00
12. SUBTOTAL (sum of lines 1-11)	\$ 21,575,897.00
13. Contingencies	\$ -
14. SUBTOTAL	\$ 21,575,897.00
15. Project (program) income	\$ -
16. TOTAL PROJECT COSTS (subtract #15 from #14)	\$ 21,575,897.00

## FEDERAL FUNDING

17. Federal assistance requested, calculate as follows:  
 (Consult Federal agency for Federal percentage share.)

Enter eligible costs from line 16c. Multiply X



participation. If such is the case, you will be notified.

b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
\$ -	\$ 161,577.00
\$ -	\$ -
\$ -	\$ -
\$ -	\$ -
\$ -	\$ -
\$ -	\$ -
\$ -	\$ -
\$ -	\$ -
\$ -	\$ -
\$ -	\$ 21,026,520.00
\$ -	\$ 387,800.00
\$ -	\$ 21,575,897.00
\$ -	\$ -
\$ -	\$ 21,575,897.00
\$ -	\$ -
\$ -	\$ 21,575,897.00
48.67%	\$ 10,500,000.00

ASSURANCES - CONSTRUCTION PROGRAMS

OMB Number: 4040-0009  
 Expiration Date: 02/28/2022

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0042), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

**NOTE:** Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant:, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose of, modify the use of, or change the terms of the real property title or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure non-discrimination during the useful life of the project.
4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progressive reports and such other information as may be required by the assistance awarding agency or State.
6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards of merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
10. Will comply with all Federal statutes relating to non-discrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681 1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

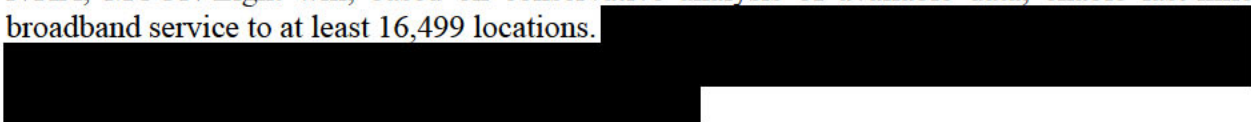






## Executive Summary

Michigan State University (MSU) and Merit Network, Inc. (Merit) present this Broadband Infrastructure Program (BIP) application to fund the “**MOON-Light**” project.<sup>1</sup> With a grant from NTIA, MOON-Light will, based on conservative analysis of available data, enable last-mile broadband service to at least 16,499 locations.



The MOON-Light enhancement will move the Merit statewide open-access optical network onto the leading edge of middle mile technology by enabling direct wavelength access for last mile ISPs to global Internet exchange points, effectively removing traditional barriers of distance and geography for remote last-mile networks. MOON-Light also will enable Merit to manage its optical capacity on a “colorless” basis, enabling highly efficient software-based network management that will deliver cost and simplification benefits to last-mile networks. In other words, just as NTIA’s Broadband Technology Opportunities Program (BTOP) played a pivotal role in expanding the reach of the Merit network in the past decade, today’s BIP program can help to future-proof its ability to enable expanded access across unserved areas of Michigan.

Michigan faces an urgent need to expand access, with over 300,000 households, businesses, and community anchor institutions (CAI) lacking access to adequate broadband (defined as a minimum 25 Mbps downstream and 3 Mbps upstream). One reason for this gap is that many unserved areas of Michigan face a key barrier to last-mile broadband deployment: a lack of capacity within accessible and affordable “middle mile” connections between global Internet hubs such as Chicago and the local networks that connect directly to homes and businesses. Merit today offers an open access, affordable middle mile solution with a presence in many unserved areas of Michigan, but the current Merit network has limited capacity and is currently unable to support significant future growth in last-mile connections. Upon completion of MOON-Light, Merit will have the capacity to provide affordable middle mile service to effectively any last-mile provider seeking interconnection where Merit has a presence, and to affordably scale that service well into the future as demand grows.

Why is an NTIA grant essential? Because in Michigan and many other states, privately funded networks have failed to deliver attractive middle mile options to many unserved areas – an unsurprising outcome given high capital investment costs and relatively low financial returns available. Even when deployed in unserved areas, privately funded middle-mile networks typically do not provide access on an open, nondiscriminatory basis. A grant from NTIA for MOON-Light therefore would support an expanded open access middle-mile option that would not be achieved via private investment.

Created in 1966 by MSU, the University of Michigan, and Wayne State University, Merit’s role as Michigan’s leading nonprofit communications service provider has expanded in importance during the broadband era. Using various sources of investment, including two rounds of BTOP funding, Merit has successfully deployed over 2,200 miles of fiber infrastructure and has over 2,000 miles third party fiber connecting universities as well as over 400 CAIs across the state.

---

<sup>1</sup> Michigan Open Optical Network - Leveraging Innovation to Get High-Speed Technology.

MOON-Light would future-proof this established foundation by making a highly efficient investment in expanding the optical capabilities of Merit’s existing physical fiber network.

Providing high quality broadband service to unserved Michiganders is a priority for MSU and the other public universities that oversee Merit. In keeping with that obligation, MOON-Light will provide critical capacity enabling Merit to address Michigan’s digital divide. Merit is currently working with four Internet Service Providers (ISP) as evidenced by letters of intent. Reducing middle-mile transit expenses will substantially enhance the financial sustainability, expansion reach, and project timelines for these last-mile providers.

MSU and Merit’s proposal exemplifies many of the Broadband Infrastructure Program’s priorities. The MOON-Light project is “shovel ready” due to the focus on optical equipment deployments that will allow Merit to meet the priority of one-year project completion even given the state-wide impact of the project. Merit’s status as a nonprofit education and research network means that MOON-Light will be provided on an open-access basis.

Building on their long history of collaboration to improve access to connectivity in Michigan, MSU and Merit will deliver the technical, operational, financial, and management experience to successfully implement the MOON-Light project. MSU plays a significant local role in many rural areas of Michigan via branch campuses and local partnerships. As one of the three University Research Corridor (URC) institutions in Michigan, MSU has played a central role in over \$1.64 billion in infrastructure-related initiatives in recent years including communications infrastructure. Merit has a multi-decade history of providing accessible, affordable service throughout the state of Michigan, currently serving 400 CAIs and six last-mile service providers.

Given this long track record of statewide impact, MSU and Merit are well positioned to fulfill NTIA’s requirement that BIP applications be coordinated at the state level. Since 2018, MSU and Merit have coordinated a state broadband framework (Michigan Moonshot) directly with the governor’s office and the Michigan Department of Economic Development. In inquiring about state coordination related to BIP, MSU and Merit were informed by state officials that coordination was being left to regional and local entities.

Finally, both Michigan State University and Merit are experienced recipients and administrators of federal grants. MSU is a leader in creating knowledge for the 21<sup>st</sup> century, routinely expending in excess of \$500 million in sponsored awards annually, focused in areas such as food systems; plant sciences; health sciences; computational sciences emphasizing biology and food/food chain; population and the environment; as well as community and economic development. Merit successfully deployed two BTOP grants from NTIA over the past decade.

## **I. Description of Covered Partnership**

**Michigan State University** is one of the leading public universities in the United States and under Michigan law is a political subdivision of the state of Michigan because it was created by Article VIII, Section 5 of the Michigan Constitution. Michigan State University has been granted the authority to enact its own ordinances and other regulations<sup>2</sup> and is considered a unit of government

---

<sup>2</sup> MCL 390.101 and MCL 390.106

for purposes of Michigan’s governmental immunity statute.<sup>3</sup> Michigan State University has its own police department and power source and receives appropriations from the State of Michigan.

MSU brings deep institutional experience and capabilities to federal grant management. MSU receives over \$500 million in grants annually, spanning a range of topics and awarding federal agencies. The two MSU key personnel for the covered partnership, Dr. Melissa Woo and Dr. Johannes Bauer, as described in their attached resumes,<sup>4</sup> bring a distinctive combination of administrative expertise and substantive experience with broadband policy and research. Dr. Woo is MSU’s Executive Vice President for Administration and Chief Information Officer, as well as Chair of Merit’s board of directors. She plays a central leadership role in all of MSU’s federal grant management efforts and works closely with Merit’s management team. Dr. Bauer is the Quello Chair in Media and Information Policy and Director of the James H. and Mary B. Quello Center, Michigan State University. He has an extensive record of scholarly publication in the field of digital communications and holds numerous honorary positions.

The covered partnership will further MSU’s mission of “... advancing outreach, engagement, and economic development activities that are innovative, research-driven, and lead to a better quality of life for individuals and communities, at home and around the world.” By providing critical infrastructure to enable the deployment and expansion of high-performance broadband, MOON-Light will empower thousands of unserved Michigan residents to access a range of services provided by MSU, including a leading set of telehealth services. MSU students and faculty will be able to conduct research and engage from new remote locations, including in and around MSU’s 16 agricultural research centers located throughout rural areas of the state.

**Merit Network, Inc.** is a 501(c)(3) nonprofit, member-owned organization, governed by Michigan’s public universities. Since 1966, Merit has served 12 of the public universities in the state of Michigan and over 400 affiliate Member organizations. Examples of community network projects and collaborations Merit has established over the years include:



Merit’s key personnel for the covered partnership will deliver all necessary capabilities to ensure its success. Charlotte Bewersdorff is Merit’s Vice President for Community Engagement with many years of experience developing successful strategic relationships with local users of the Merit network; Ms. Bewersdorff will lead the effort to help new last-mile service providers in unserved areas take advantage of the capabilities enabled by MOON-Light. Michael Milliken is Merit’s Vice President for Technology and Innovation with over 20 years of telecommunications network engineering experience in both the private and nonprofit sectors; Mr. Milliken will be responsible for planning and implementation of the MOON-Light project. Karen Smith has been

---

<sup>3</sup> MCL 691.1401(g).

<sup>4</sup> Resumes for MSU and Merit personnel are in Appendix A.

Merit's Chief Financial Officer and Vice President for Finance and Administrations since 2010; Ms. Smith brings extensive experience in financial management and grant oversight and administration, including successful management of two BTOP awards. Additional description of Merit's engineering and finance capabilities overseen by Mr. Milliken and Ms. Smith follow below.

Merit Engineering and Operations Over the past decade, Merit has deployed more than 2,200 miles of fiber infrastructure across Michigan, Wisconsin, and Minnesota. The majority of this construction was performed during Merit's federally funded BTOP fiber infrastructure projects. During that time, Merit issued multiple engineering, construction, and environmental assessment RFPs, contracted and arranged for substantial materials shipments, worked with numerous federal, state, and local permitting agencies, and managed multiple construction teams simultaneously. Merit also worked closely with Michigan's State Historic Preservation Office, local Tribal Historic Preservation Offices, the United States Bureau of Indian Affairs, the U.S. Army Core of Engineers, and the U.S. National Forest Service.

Merit today manages the operation and maintenance of its fiber throughout its three-state footprint. It has contracted with a Michigan based fiber maintenance firm to be on call 24/7/365. Merit participates in the call-before-you-dig databases, Michigan's MISS DIG and Wisconsin's Diggers Hotline, to ensure the safety of the underground infrastructure. Additionally, Merit works within NJUNS, the National Joint Utility Notification System, ticket service for utility pole owners, to ensure safe aerial infrastructure.

Merit operates its own 24/7 Network Operations Center (NOC), a contractor call out service ensuring reliable and safe service for the communities that Merit serves. In addition, the Merit organization is staffed with skilled engineers, technicians, and Geographic Information System (GIS)-fiber network planning and mapping specialists. Its Outside Plant team is well versed in splicing and acceptance testing of fiber infrastructure, utilizing such tools as industry standard fusion splicers, Optical Time Domain Reflectometers, underground locators, and IKE measuring and modeling software.

Merit Finance and Administration Merit is governed by a Board of Directors composed of Chief Information Officers from twelve of the state's universities. The Board of Directors has established a Finance Committee with several board members as well as Merit's CEO, CFO and controller. The Finance Committee oversees audits, budget approval, investments, and various other financial matters. In addition, Merit utilizes outside legal counsel and consultants for contracting and other corporate issues.

Merit has the resources to support MSU on all the accounting and administrative requirements of the grant. It has experienced finance and human resource departments.

[REDACTED]

The system allows for the separation of grant related documentation,

asset management, and general account tracking for liabilities and funding. This will enable Merit to provide the detailed information that MSU will need to comply with the grant reporting and audit requirements.

This covered **partnership between MSU and Merit**<sup>5</sup> represents another important chapter in a decades-long institutional relationship focused on improving access to connectivity in Michigan, and it advances the core missions of both MSU and Merit. Examples of large-scale network enhancement efforts that MSU and Merit have delivered over the years include:



Michigan Statewide Education Network (MISEN) - Since 2016, Merit has provided statewide leased lit wide area network services to MISEN. Merit enables this 100 Gbps statewide transport connectivity over existing Merit middle mile, facilities owned by K-12 schools, and private fiber leases or circuits. Merit also delivers 90 Gbps Internet Access across this network to serve K-12 education throughout Michigan. Over the past five years, Merit, the Michigan Department of Education, and MISEN collaborated with state organizations including the Michigan Educational Technology Directors and the Michigan Association of Intermediate School Administrators to make the MISEN a showcase for high-performance networking both regionally and nationally.

Michigan Moonshot - Since 2018, Michigan Moonshot has been leveraging public-private partnerships to expand broadband in unserved and underserved Michigan communities. This statewide initiative focuses on bringing accurate and granular broadband data collection, policy and financing programs, and education and resources to local Michigan communities. Through community engagement, education, and centralized resources Michigan Moonshot builds a cohesive strategy to make tangible progress on this complex issue for local communities. Collaborators include: the Quello Center at Michigan State University, the MI Broadband Cooperative, and a range of private firms including ISPs, as well as equipment and software providers.

## Summary

**This covered partnership provides a unique opportunity for statewide impact in Michigan that would not otherwise be realized.** MSU and Merit, via the recent and ongoing Michigan Moonshot initiative, are actively engaged with state government including the Governor's office and the Michigan Department of Economic Development. Although Michigan's newly formed state broadband office is not yet in a position to coordinate an official statewide application for the BIP program, this MSU-Merit covered partnership's focus on the MOON-Light would deliver a

---

<sup>5</sup> The Letter of Commitment between MSU and Merit is attached in Appendix B

crucial strategic building block to enable expanded last-mile access across the state. As a non-profit with a mission to advance accessible affordable connectivity across the state, Merit is uniquely positioned to deliver a middle-mile solution in support of expanded last-mile access that would not otherwise be made from private funding alone.

**Table of Funded Project Participants and Unfunded Informal Collaborators**

Organization	Address	Administrative Role	Scope of Work	Proposed Funding Amount
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

## II. Description of the project to be covered by the grant

In support of its mission to provide broadband connectivity for unserved and underserved Michigan communities, Merit seeks to enhance its existing optical network with a new high-speed data, coherent-based open line system that will increase flexibility, reduce operating cost and therefore increase affordability for last mile networks and users. This will prepare the Michigan community for increasingly shared and software-driven infrastructure to support the expansion of last-mile broadband access.

As part of the project, Merit will adjust the sizing and capacity of the optical network to reduce power and colocation requirements and replace aging multi-slot terminal technologies with modern data center interconnect technologies capable of supporting both new and existing services from 10 Gbps to 800 Gbps capacities either natively or through aggregation onto the coherent core architecture. The project will also enable all of Merit's existing community members, public sector, nonprofit and private organizations, governmental agencies, educational institutions, and regional broadband service providers with expanded and economical access to layer 3 commodity Internet services, peering opportunities, and cloud service provider access by leveraging new Dark Wavelength transport services.

MOON-Light therefore will directly enable and advance the goal of providing ubiquitous, high performance broadband and Internet access across Michigan by enabling end-to-end use of the platform by networks wishing to deploy services by connecting to Merit's network. Extension to these collaborators is enabled both by technical support for [REDACTED]

[REDACTED]

[REDACTED]

Although the specific economic benefits to last-mile providers will vary depending on technical architectures and end-user customer profiles, based on the new capabilities of MOON-Light, Merit would expect to be able to allow last-mile networks to increase traffic substantially without significant increases in transport costs. This will lower the cost of entry for new ISPs that





[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



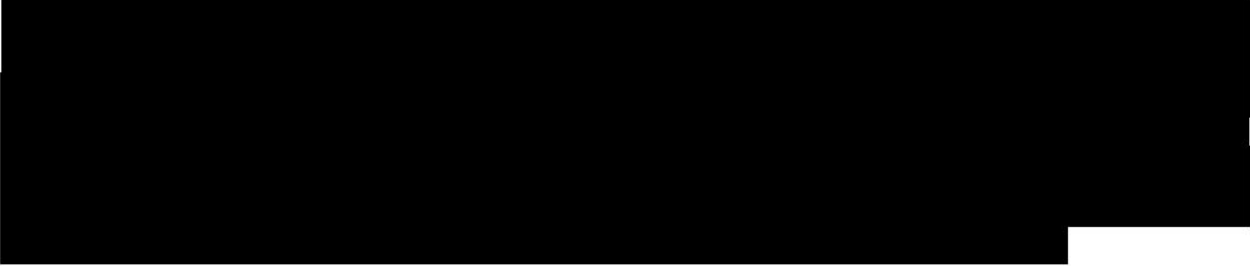
[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

### **Cost Details of the Project**

MSU and Merit are proposing a budget of \$21,575,897 in support of the project.<sup>6</sup> The budget includes the following expenses:

- **Administrative and Legal Expense: \$161,577**

This amount is in support of MSU's administrative, travel, and indirect costs.

- **Equipment: \$21,026,520**

This funding is for the optical equipment detailed in the budget narrative and includes five years of maintenance, fiber optic characterization, staging, assistance with installation, Optical Director setup, professional service, service activation, and training. In addition, this category also includes two 100 G testers and one 400 G tester to be utilized during installation.

- **Miscellaneous: \$387,800**

This amount includes installation components, colocation support, and equipment staging costs.

All cost will directly provide a benefit to the project and are considered to be reasonable and necessary. The budget supports all equipment, installation components, testers, colocation utilization, and a temporary staging facility required for the project. It also provides for MSU staffing and indirect cost. Merit is able to provide the cost share support necessary for the project from its own available funds as shown in the pro forma financials in Appendix G. Merit is not expecting additional revenues from the MOON-Light project within the one-year timeframe.

---

<sup>6</sup> A full description of the budget may be found in the Budget Narrative below and Appendix F: Budget Justification.

The proposed project is large and costly due to the statewide scope of the enhanced optical network. Therefore, a grant from NTIA’s Broadband Infrastructure Program is critical to the successful implementation of the MOON-Light Project. Without grant funding, Merit and MSU which both operate as non-profits, do not have the resources to fully fund a project of this magnitude. With grant funding, the partnership between Merit and MSU is in a unique position to be able to vastly improve the availability, capacity and speed of broadband services to be deployed by last mile providers to unserved and unserved households across the state.

**III. Description of the Area to be Served**

As a middle-mile network with widespread presence throughout Michigan, MOON-Light could potentially connect to last mile networks reaching census blocks throughout the state.



Merit has secured Letters of Intent from three last-mile service providers which are provided in Appendix E. MOON-Light will enable broadband service in their territories to at least 16,499 unserved households. Merit identified only those households indicated by FCC 477 data, which are by definition fully unserved within our per provider counts below.

Provider Name	Status	Household Count
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
<b>Total</b>		<b>16,499</b>
<small>*Any overlap areas between providers were subtracted from the total counts to avoid duplicate counting of unserved households.            *RDOF funded households were excluded from all counts as many RDOF projects are not yet constructed and the treatment of RDOF awards for NTLA purposes remains unclear.</small>		

The MOON-Light project is essential to optimize connection capacity on a next generation network. Only through the MOON-Light expansion can Merit support the thousands of Michigan locations within the eligible service areas of unserved census blocks via last-mile provider collaborations.

**III. Description of meeting the statutory priorities from Section 905(d)(4) of the Consolidated Appropriations Act, 2021**

This application distinctively meets the first statutory priority because of its impact on Michigan. MOON-Light is a middle-mile expansion with unique state-wide impact that will enable broadband service to currently unserved communities. This application includes letters of intent from last-mile service providers with the ability to provide service to up to 16,499 such households

in eligible or partial eligible service areas, providing specific support for MOON-Light’s impact on closing the unserved access gap in Michigan.

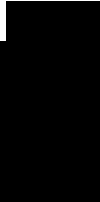
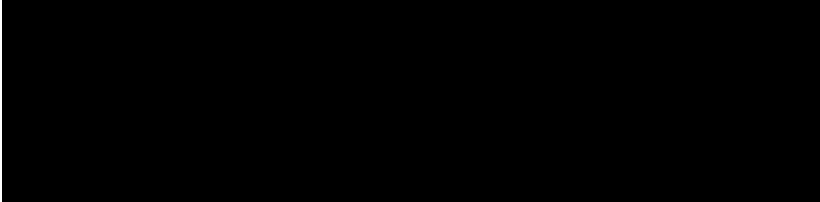
This application meets the second statutory priority because within its total impact on eligible serviced areas MOON-Light will enable service to households in municipalities with fewer than 50,000 inhabitants.

This application meets the third statutory priority because of its direct improvement to the economics of providing last-mile service in remote, rural, and otherwise unserved areas. In addition to high capital costs per location, a major economic barrier to last-mile service in unserved areas are high transport costs to connect to the global Internet. Merit’s existing accessible, affordable middle mile network lacks the connection and traffic capacity to serve expanded or new last-mile networks. MOON-Light will solve this problem and allow Merit to make its open-access network broadly available in support of currently planned and future last-mile networks in now-unserved rural areas, such as the Upper Peninsula and Crawford County.<sup>7</sup> MOON-Light’s ability to make a systematic, structural improvement in the provision of high-performance broadband to and throughout many unserved areas represents a highly cost-effective use of scarce NTIA BIP grant funds.

This application meets the fourth statutory priority because MOON-Light is specifically designed to enable high-performance last-mile connection of Gigabit speeds or higher. Although the complete business case for a given last-mile project will depend on additional factors as well, MOON-Light’s enablement of accessible, affordable transport services will enhance the viability of last-mile deployment project not only at the 100/20 performance level but also at much higher performance levels. Of particular importance, MOON-Light will scale easily along with the high-capacity demand of gigabit-tier last mile networks, such as FTTP, and therefore will tend to support or solidify plans for expanded or new last-mile networks with that performance level.

#### **IV. Description of how the project meets the evaluation criteria**

MSU and Merit’s proposed project meets the evaluation criteria detailed in Section V of the NOFO in the following ways:

1. Project Purpose and Benefits
  - a. Level of Impact in the Proposed Service Area: MOON-Light could potentially connect to last mile networks reaching census blocks throughout the state.   
 OON-Light will enable broadband service in their territories to at least 16,499 unserved households.

---

<sup>7</sup> A full list of rural locations reached by MOON-Light is available in Appendix C: List of Census Blocks

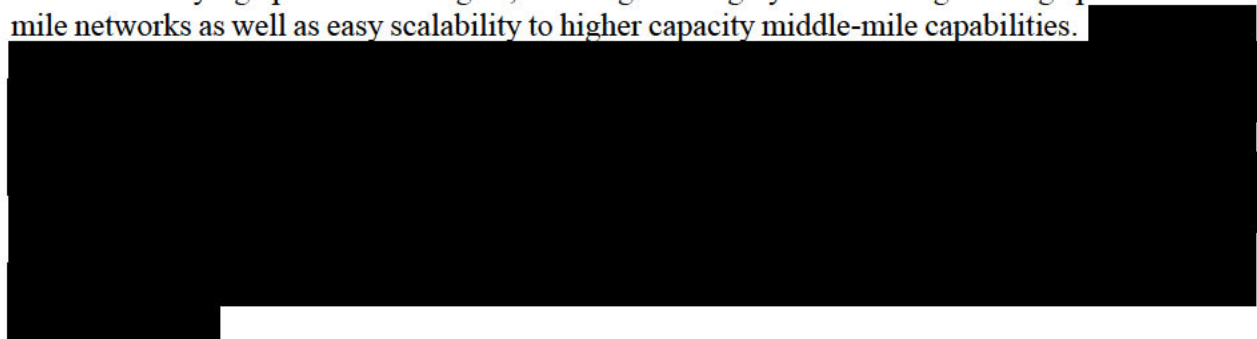
- b. Affordability of Services Offered: Based upon Merit’s most recent market price analysis, the services offered to last mile providers as described are competitive and affordable.
2. Project Viability
- a. Technical Approach and Related Network Capacity and Performance: As described in Section I, the proposed project is able to provide more than sufficient capacity and scalability to meet the needs of the users in the proposed service area. Additionally, the capacity and performance of the middle mile network will allow last mile providers to offer service with at least 100Mbps/10Mbps if not higher. Finally, the MOON-Light project is shovel ready and as detailed in the Project Timeline can be completed within a one-year award period.
  - b. Applicant’s Organizational Capability: MSU and Merit are well-versed in the project management skills required for a project and funding of this size. Experienced engineering, project management, and financial management staff are assigned to the project. MSU and Merit are long-term collaborators in addressing the digital divide in Michigan, therefore have an established relationship to complement each organization and begin to implement the project plan once funding is issued.
3. Project Budget and Sustainability
- a. Reasonableness of the Budget: All cost will directly provide a benefit to the project and are considered to be reasonable and necessary. Merit has decades of experience running a multistate network and is extremely knowledgeable in the procurement, installation, and utilization of network equipment and the associated costs. Merit is not expecting additional revenues from the MOON-Light project within the one-year timeframe. A detailed description of the budget is available in the Budget Narrative and Budget Justification.
  - b. Sustainability of the Project: Once funded, Merit and MSU’s proposed project is sustainable beyond the one-year award period due to commitments from last mile providers to use the middle mile network and continued outreach by both organizations to last mile providers able to deploy in unserved areas. The capacity of the enhanced middle mile network not only provides opportunities for additional last mile providers but is also capable of enabling the deployment of next generation advanced services, such as FTTP.
  - c. Leverage of Non-Federal Sources: Merit is willing and able to support the project by committing the following internal and external resources in order to ensure the successful completion of the project:
    - i. Merit engineering will develop the final plans for setting priorities, managing the migration of existing services to the new system, and mitigating the service impact for existing members per region. They will also be reviewing, strategizing, and approving all final engineering design and working across the different regions; alternating between deployment, implementation, migration, deprecation of the old system, and planned maintenance activities.



- ii. Merit’s senior project manager and an assistant will supervise the scheduling of equipment receipt and deployment, network downtime for the ninety-nine installation sites and the field staff required for deployment. This individual will work directly with two field coordinators assigned to the field implementation teams.
- iii. Merit has a robust software development team that will be leveraged to develop applicable integrations across Merit systems to ensure that the proper monitoring and software tools are in place to support the equipment. Developers will also implement integrations of GIS data and automation of other data types to the applicable systems needed to deploy, monitor and support the project. In addition, mapping technicians will be utilized to document equipment and equipment locations, infrastructure, light wave assignments, and overall network topology.
- iv. Merit will form two deployment teams which will be focused on field site prep, rack and stack readiness, fiber optic characterization (FOC), physical cabling and site logistics, existing service migration, new service activation across regions, and testing. The teams will be composed of a site manager and five Merit network personnel along with personal from the equipment vendor. The site managers will work with the project manager on scheduling, trouble shooting, resolving entry problems, and assisting with equipment delivery. They will also be responsible for inspecting the work, verifying the equipment that was deployed, and reporting on project status.
- v. In addition, Merit will support community outreach, accounting, human resource, and shipping and receiving services required for successful grant administration with internal staffing.

**V. Description of how deployment will have the ability to scale over time for greater capability, such as interfaces for 5G or by deploying fiber.**

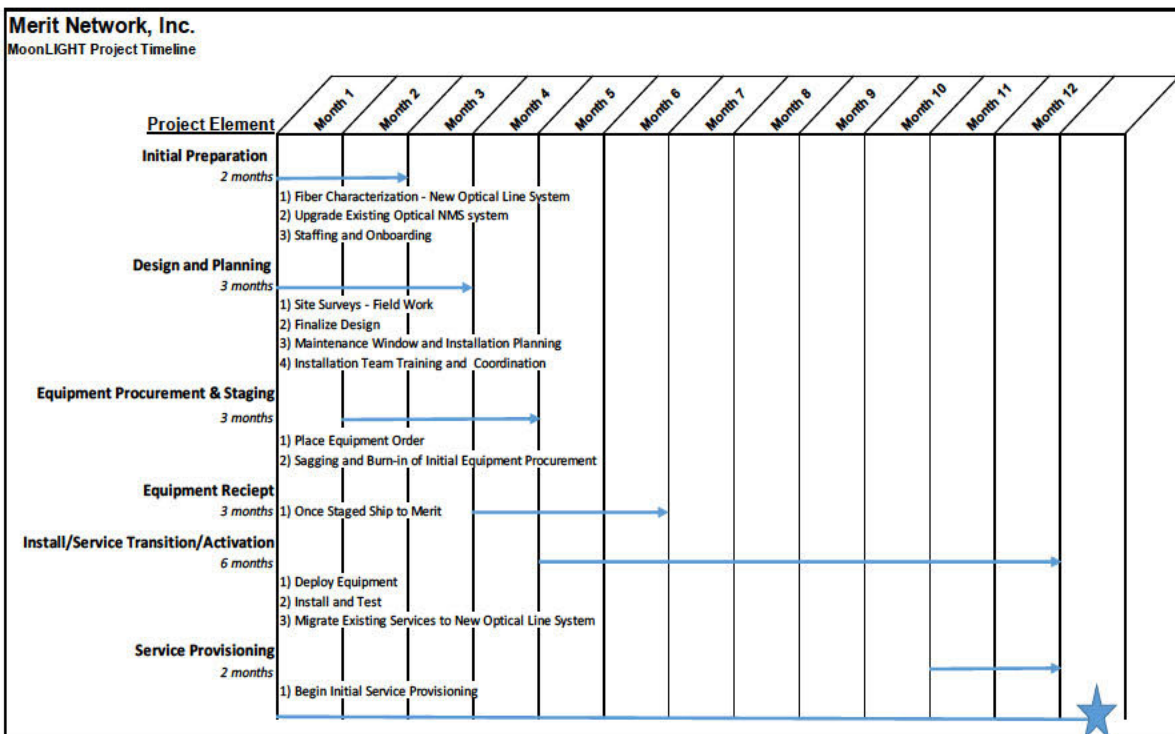
As described in detail in section II above, MOON-Light is purposefully designed to be a future-proof solution for making accessible, affordable middle-mile service across Michigan. In particular, a main benefit of MOON-Light will be highly flexible access for network users to Merit’s underlying optical wavelengths, enabling both highly efficient engineering options for last-mile networks as well as easy scalability to higher capacity middle-mile capabilities.



**VI. Project Plan describing all major project activities and timelines, must include key deployment milestones.**

A key advantage of MOON-Light is that it can be implemented quickly as it is a “shovel ready”.

intense design and planning phase, many steps can be done in parallel. For example, equipment vendor contracts will require precisely staged deliveries and engineering contractor agreements will be calibrated to execute installation, testing, training, and service provisioning steps at multiple points of the network on a concurrent basis. The result is the one-year project plan shown below.



**VIII. Brief description of the physical project area if the project includes construction or ground disturbing.**

A unique advantage of MOON-Light is that it is an optical enhancement of an existing fiber network. As such, MOON-Light requires no new ground disturbances or other types of new construction. Instead, 100% of the implementation activities for MOON-Light will be an equipment enhancement of the existing Merit fiber infrastructure (as described in Section II above) which was supported through BTOP funding.

Merit has a strong track record of proactively managing and complying with all environmental and historical preservation requirements prior to new construction. However, due to the limited nature of the MOON-Light project, no engagement with Fish and Wildlife, Forest Service, Army Corp of Engineers, or state environmental agencies is expected. Should facilities subject to the National Historic Preservation Act require work, Merit will engage with Environmental and Historic Preservation professionals to work with Michigan's State Historic Preservation Office and any appropriate Tribal Historic Preservation Officer to ensure any work on the MOON-Light project does not negatively impact historic sites.

#### **IX. Description of support received by Merit to provide service in the service area.**

##### **Includes:**

Merit has received two BTOP grants from NTIA for the expansion of its fiber network in Michigan:

**BTOP 1:** Merit's first awarded BTOP (Broadband Technology Opportunities Program) project, "Rural, Education, Anchor, Community, Health Care: Michigan Middle Mile Collaborative" (REACH-3MC), had a project cost of \$41,611,526, was awarded on 1/01/2010, and resulted in construction of 955 miles of 72-strand fiber into rural and underserved areas of Michigan. REACH-3MC was a component of a larger plan to address underserved areas by engaging three commercial subrecipient service providers to address the broadband shortfalls of Michigan homes and businesses. The network brought high-performance low-cost backhaul service closer to unserved areas, to 12 completely underserved counties, and to 14 counties with significant underserved areas in the state of Michigan.

**BTOP 2:** Merit's second awarded BTOP project, "Rural, Education, Anchor, Community, Health Care: Michigan Middle Mile Collaborative II" (REACH-3MC II) had a project cost of \$87,049,114, was awarded on 8/01/2010, and resulted in construction of a 1,270-mile fiber network in Michigan's Upper Peninsula and Lower Northern Peninsula with diverse paths to Wisconsin and Minnesota Merit Network, together with five commercial subrecipient service providers, developed the infrastructure to serve significant underserved areas in the state of Michigan.

Both projects leveraged Merit and subrecipients' existing networks to deliver maximum benefit for cost. Merit's mission of serving CAIs, combined with the subrecipients' business plans, ensured that households, businesses, and CAIs all realized major benefits from the two projects. By addressing the backhaul issue for Michigan's remote areas, service providers were able to offer higher speeds at lower costs, expand services, and better serve homes and businesses. Lowering the cost and increasing the speed and options for backhaul also provided the opportunity for all CAIs to take part in peer networks. The benefits of the statewide CAI network were distributed throughout the state, not just the funded service area.

**X. Description of how the project will incorporate strong labor standards**

All Merit staff are paid in accordance with prevailing market rates, which will be reviewed to ensure continued compliance. Financial and human resource management is reliable with strong internal controls in place to make sure unallowable costs are excluded, payroll integrity is maintained, related documentation preserved, and a segregation of duties supported. Merit has a control system where multiple levels of manager review, approval, authority, and responsibility are required and a written code of conduct and conflict of interest policy that every employee must annually acknowledge. Merit also maintains and reviews a nondiscrimination policy that applies to all human resource actions.

Merit will incorporate the applicable prevailing wage provisions for the covered occupations associated with this federally funded project as determined by the U.S. Department of Labor, in accordance with the Davis-Bacon Act or wage determinations covered by 29 CFR Part 1 and/or the Fair Labor Standards Act, in its contractual agreements with vendors. Merit will be responsible for assuring that all vendors have been made aware, both contractually and in pre-contract negotiations, of the requirements, including but not limited to: the federal prevailing wage obligations, the condition to adhere to state, county or municipality prevailing wage rates whether at or above the federally mandated rates, the submission of certified payrolls, the vendor responsibility for prevailing wages not paid to their subcontractors and any other regulations, laws, or conditions of performance while working on a federally funding project. In addition, Merit will require all vendors to include written codes of conduct, conflict of interest, and nondiscrimination policies in their contracts as conditions of employment.

# JOHANNES M. BAUER

## CURRENT POSITIONS

- 2018-present Quello Chair in Media and Information Policy and Director, [James H. and Mary B. Quello Center](#), Michigan State University
- 2003-present Professor, Department of Media and Information, Michigan State University

## EDUCATION

- 1989 Ph.D. in Economics, University of Economics, Vienna, Austria
- 1982 M.A. in Economics, University of Economics, Vienna, Austria
- 1975 Engineer in Mechatronics, Federal Secondary College of Engineering, Mödling, Austria

## PROFESSIONAL EXPERIENCE (selected)

- 2013-2019 Chairperson, Department of Media and Information, Michigan State University
- 2012 Visiting Professor, Institute of Media and Communications Research (IPMZ), University of Zurich, Switzerland
- 1994-2003 Associate Professor, Department of Telecommunication, Michigan State University
- 2000-2001 Visiting Professor, Faculty of Technology, Policy and Management, Delft University of Technology, Delft, the Netherlands
- 1990-1994 Assistant Professor, Department of Telecommunication, Michigan State University

## HONORARY POSITIONS AND HONORS (selected)

- 2016-present Consulting Editor, *Telecommunications Policy*
- 2012-present Fellow, Columbia Institute for Tele-Information (CITI), Columbia University, New York
- 2010-present International Editor, *International Telecommunications Policy Review*
- 2009-present Member, International Scientific Advisory Board, LIRNEasia, Colombo, Sri Lanka
- 2004-present Member, Editorial Board, *Information Economics and Policy*
- 2013 Distinguished Faculty Award, Michigan State University
- 2016-2020 Member of the Board of Directors and Treasurer, iSchools

## SELECTED PUBLICATIONS AND REPORTS

Hampton, K.N., Robertson, C.T., Fernandez, L., Shin, I., & **Bauer, J.M.** (2021). How variation in internet access, digital skills, and media use are related to rural student outcomes: GPA, SAT, and educational aspirations. *Telematics and Informatics*, 101666, <https://doi.org/10.1016/j.tele.2021.101666>

**Bauer, J.M.**; Hampton, K.N.; Fernandez, L.; & Robertson, C.T. (2020). Overcoming Michigan's Homework Gap: The Role of Broadband Internet Connectivity for Student Success and Career Outlooks (October). Technical Report, Quello Center Working Paper No. 06-20, <https://ssrn.com/abstract=3714752>

Hampton, K.N., Fernandez, L., Robertson, C.T., & **Bauer, J.M.** (2020). Broadband and Students Performance Gaps. Technical Report, Quello Center, Michigan State University, East Lansing, MI, March.

**Bauer, J.M.** & Latzer, M. (eds.) (2016), *Handbook on the Economics of the Internet*, Cheltenham, UK and Northampton, MA: Edward Elgar.

**Bauer, J.M.**, Madden, G., & Morey, A. (2014), Effects of economic conditions and policy interventions on OECD broadband adoption, *Applied Economics*, 46(12): 1361-1372. <https://doi.org/10.1080/00036846.2013.872765>

Larose, R., **Bauer, J.M.**, DeMaagd, K., Chew, H., Ma, W., & Jung, Y. (2014), Public broadband investment priorities in the United States: an analysis of the Broadband Technology Opportunities Program, *Government Information Quarterly*, 31(1): 53-64. <https://doi.org/10.1016/j.giq.2012.11.004>

# CHARLOTTE BEWERSDORFF

---

Dedicated senior leader with a passion for solving long-term challenges in Michigan's research and education community through organizing around action, assimilating team components and managing with a strong sense of urgency across local, state and national ecosystems has aligned perfectly with Merit's mission of "Connecting Organizations and Building Community."

Proven track record of growth, innovation, and performance. Highly successful in business planning and in building effective state and national ecosystems, partner relationships and programs to support Merit's expansion and growth initiatives. Thrives in fast paced, uncharted territory and able manage multiple diverse and complex projects and people while adhering to objectives, deadlines and performance goals. Strong ability to represent visionary strategic initiatives to varying audiences and in leveraging engagement to nurture relationship development in pursuit of mutually beneficial outcomes. Possesses the rare ability to move from vision to actualization both directly and with use of extended resources across multiple organizations.

---

## STRENGTHS & AREAS OF EXPERTISE

- ◆ Senior Leadership
- ◆ Problem Solving
- ◆ Decision Making
- ◆ C-Suite Communications
- ◆ Strategic Thinking
- ◆ Change Management
- ◆ Emotional Intelligence
- ◆ Relationship Development
- ◆ Broadband Expansion
- ◆ Grant Writing
- ◆ Business Development
- ◆ Strategic Collaboration

---

## PROFESSIONAL EXPERIENCE

### University of Michigan – Merit Network | Ann Arbor, MI | Oct 2013 to Present

#### **VICE PRESIDENT FOR COMMUNITY ENGAGEMENT:** 10/2019 to Present

Executive officer responsible for operational leadership across all community facing teams including Member Engagement, Engagement Support and Marketing, Communications & Events. Responsible for strategy development and execution related to organizational growth initiatives and diversification. Responsible for affiliate Membership growth, strategic relationship development and services revenue generation (14MM Annually) across four lines of business. Strong focus on building teams and structure to support revenue growth in a fast paced and competitive technology services marketplace via Membership based non-profit structure.

**Key Accomplishment:** Spearheads the [Michigan Moonshot](#) initiative for Merit, working tirelessly to solve our state's broadband access challenges through data and research efforts, community education initiatives and the development of public/private partnerships. This effort is an active expansion of Merit's mission to expand technology and education resources specific to closing the digital divide. Merit took a state leadership role to catalyze an ecosystem at local, state and national levels. Established strong state, local and national relationships among a new community dedicated to this important issue. In partnership with MSU Quello Center, led the effort to pioneer Merit's approach to crowdsourced citizen science broadband access and adoption data collection & mapping techniques. Developed and hosted Michigan's first two Broadband Summit events. In a short time, this evolutionary program has effectively educated communities on broadband expansion and worked to effectively support communities taking action and demonstrating tangible progress. Honored with the [2021 Rose-Werle Award](#) for her contributions to the education community by extending advanced networking, content, and services to community anchors nationwide through her work with the Michigan Moonshot.

#### **EXECUTIVE DIRECTOR OF MEMBER ENGAGEMENT:** 10/2016 to 10/2019

Senior leader focused on organizational structure alignment in pursuit of planned growth strategies. Strong focus on establishing strong lieutenants and growing ability to manage operational duties independently. Responsible for services revenue generation. Co-led initiative to shed unsuccessful service offerings, strategically planned to overcome revenue deficit left by sun setting of services.

#### **DIRECTOR OF SALES:** 10/2013 to 10/2016

Provide operational leadership to individual contributors within sales team at Merit.

---

## EDUCATION, TRAINING, ADDITIONAL LEADERSHIP

BA Business Management – Finance concentration | University of Detroit Mercy | Detroit, MI  
Dale Carnegie Institute | Michigan | 2004  
State of MI Licensed Life Insurance Agent | Michigan | 2005  
Predictive Index Institute Certification (Behavioral science) | Arizona | 2008

Michigan Broadband Alliance Board Member  
Michigan Council of Women in Technology  
Best Buddies International (Michigan Expansion): Fundraising event chair, Annual Walk fundraiser

# Michael Milliken

---

Vice President, Technology & Innovation



---

## Core Skills

Executive leader with 20+ years of experience in large enterprise arenas, including designing, architecting, deploying, securing, operating, maintaining, and troubleshooting large-scale optical networks

Experienced in enterprise IT & Network ISP Leadership; enterprise software applications/ERP, compute/storage infrastructure, security, help desk, field operations, provisioning, construction, and service delivery including network maintenance and monitoring

Enterprise strategy development, budget and financial planning, workforce management, project management including operations under federal grant awards

Experienced in k12, higher education, healthcare and research industries

---

## Career Summary

### VP Technology & Innovation / Merit Network

2018 - PRESENT, Ann Arbor, Michigan.

### Director Network Engineering / Merit Network

2011 - 2018, Ann Arbor, Michigan

### Network Engineer / Merit Network

2008 - 2011, Ann Arbor, Michigan

### Team Leader / Network Engineer / EDS

2006 - 2008, Auburn Hills, Michigan

### Manager Technical Team / Verizon Business / MCI

1999 - 2006, Southfield, Michigan

---

## Education

### Washtenaw Community College / Eastern Michigan University

Ann Arbor, MI

Dual program business degree in progress

---

## Notable Projects

Two federal stimulus grants through the Broadband Technology Opportunities Program (BTOP) under which Merit Network with its partners built 2300+ miles of fiber network in Michigan. In addition to supporting Middle Mile infrastructure, lead technical design, RFP, and provisioning for Optical, Route & Switch, Central Office facilities & Telecommunication shelters

# Karen Smith

## PROFILE

Strong analytical and problem solving skills with the ability to examine and understand both the financial and operational needs of business. Aptitude for developing and implementing financial controls, processes, and reporting mechanisms. Solid leadership, communication and interpersonal skills in establishing rapport with all levels of staff and management. Accustomed to managing multiple projects simultaneously in fast-paced environment.

## PROFESSIONAL EXPERIENCE

**Chief Financial Officer / Vice-President Finance & Administration** Jul 2010 - Present, *University of Michigan – Merit Network, Inc., Ann Arbor, MI* Partner in strategic planning and organizational leadership, directs budgeting, forecasting, and cost management, guides contract negotiations, performs profitability and cost analysis, oversees insurance coverage and investment policies, supervises HR functions, key team member in ERP implementation, strategic contributor to two awarded BTOP grant submissions, administers in-house grant management, reports directly to CEO and Board of Directors, and manages staff of eight providing accounting, administrative, human resource, and facilities support.

**Controller / Director of Finance and Administration** Dec 2000 – Jun 2010, *University of Michigan – Merit Network, Ann Arbor, MI* Served as financial and administration controller, executed company's first financial audit, restructured accounting architecture and financial reporting, supervised grant submissions, updated 990 and 990T filings.

**Senior Financial Analyst** Apr 1998 – Dec 2000 *University of Michigan – Information Technology Central Services, Ann Arbor, MI* Prepared department budgets, developed internal reporting tools, prepared statistical analysis of department project and infrastructure costs, department lead for university MPathways implementation.

**Accountant / Senior Accountant** Apr 1996 - Mar 1998 *University of Michigan – Information Technology Division, Ann Arbor, MI* Produce division financials, assisted in budget development, and prepared costing analysis.

**Accounts Payable / Cash Manager** May 1993 - Jan 1995 *Grancare, Inc. - Michigan Service Center, Ann Arbor, MI* Managed cash forecasting, reporting, and international bank transfers, accounts payable and processed payroll and benefits packages.

## EDUCATION

**B.B.A Accounting** Dec 1992  
Eastern Michigan University Ypsilanti, MI



Melissa Z.Y. Woo  
Michigan State University, East Lansing, MI 48824  
Email: EVPA@msu.edu Tel: 517-355-5014

Professional Preparation

University of California, Berkeley CA	Biophysics	BA, 1987
University of Illinois at Urbana-Champaign, IL	Biophysics	PhD, 1994

Appointments

- Executive Vice President for Administration and Chief Information Officer, Michigan State University (September 2020 – Present)
- President and Board of Directors Member, Michigan State University Foundation (February 2020 – Present)
- Senior Vice President for Information Technology and Chief Information Officer, Michigan State University (December 2019 – September 2020)
- Vice President for Information Technology and Chief Information Officer, Stony Brook University, (April 2016 – November 2019)
- Vice Provost for Information Services and Chief Information Officer, University of Oregon (September 2012 – February 2016)
- IT Director, University Information Technology Services (UITS), University of Wisconsin-Milwaukee (UWM) (July 2008 – August 2012)
- Assistant Director, Campus Information Technologies and Educational Services (CITES), University of Illinois at Urbana-Champaign (August 2006 – July 2008)
- Manager, Campus Information Technologies and Educational Services (CITES), University of Illinois at Urbana-Champaign (April 2002 – August 2006)
- Senior Research Programmer, Campus Information Technologies and Educational Services (CITES), University of Illinois at Urbana-Champaign (April 2002 - August 2004)
- Research Programmer, Campus Information Technologies and Educational Services (CITES), University of Illinois at Urbana-Champaign (January 2000 - April 2002)
- Health Physicist, Division of Environmental Health and Safety, University of Illinois at Urbana-Champaign (July 1994 - January 2000)
- Acting Head, Radiation Safety Section, Division of Environmental Health and Safety, University of Illinois at Urbana-Champaign (October 1994 - July 1995)

Most Closely Related Activities and Recognitions

- National Institute of Standards and Technology, National Initiative for Cybersecurity Education (NICE), Modernizing Talent Management Working Group, Co-chair, 2021
- National Science Foundation Award ID 2018432, Co-Principal Investigator, “CC\* Networking Infrastructure: A Science DMZ for Quantitative Biology and Precision Agriculture
- Trusted CI, The NSF Cybersecurity Center of Excellence - Member, Advisory Committee, 2017 - Present
- Merit Network, Inc. - Chair, Board of Directors, 2020 - Present
- EDUCAUSE - Recipient, Inaugural DEI (Diversity, Equity, and Inclusion) Leadership Award, 2019
- NYSERNet.Org - Director, Board of Directors, 2017-2020
- EDUCAUSE - Recipient, Rising Star Award, 2012

**Budget Narrative**

**1. Administrative and Legal Expense: \$161,577**

- [REDACTED]
  - [REDACTED]
    - [REDACTED]
- [REDACTED]
  - [REDACTED]
  - [REDACTED]
- [REDACTED]
  - [REDACTED]
- [REDACTED]

[REDACTED]

2. Land, Structure, Right-of-Ways: \$0
3. Relocation Expense and Payment: \$0
4. Architecture and Engineering: \$0
5. Other Architectural and Engineering Fees: \$0
6. Project Inspection Fees: \$0
7. Site Work: \$0
8. Demolition and Removal: \$0
9. Construction: \$0
10. Equipment: \$21,026,520

- [REDACTED]

[REDACTED]

[REDACTED]



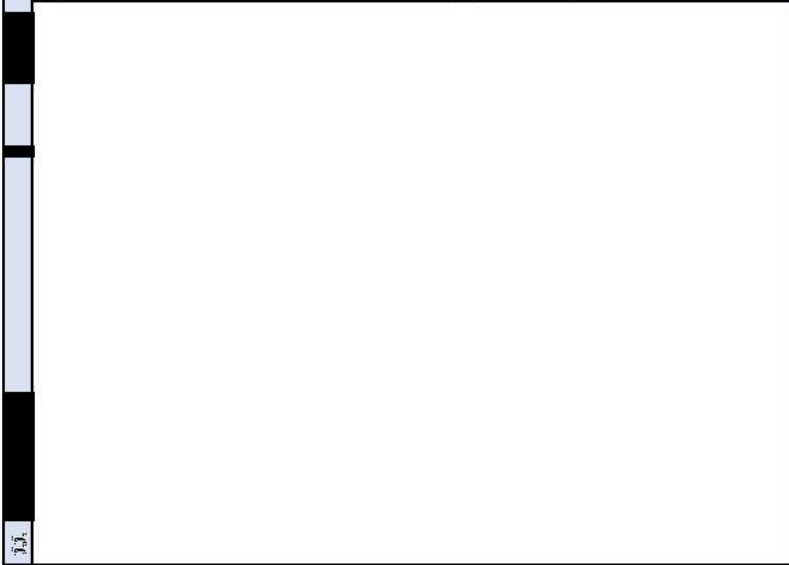
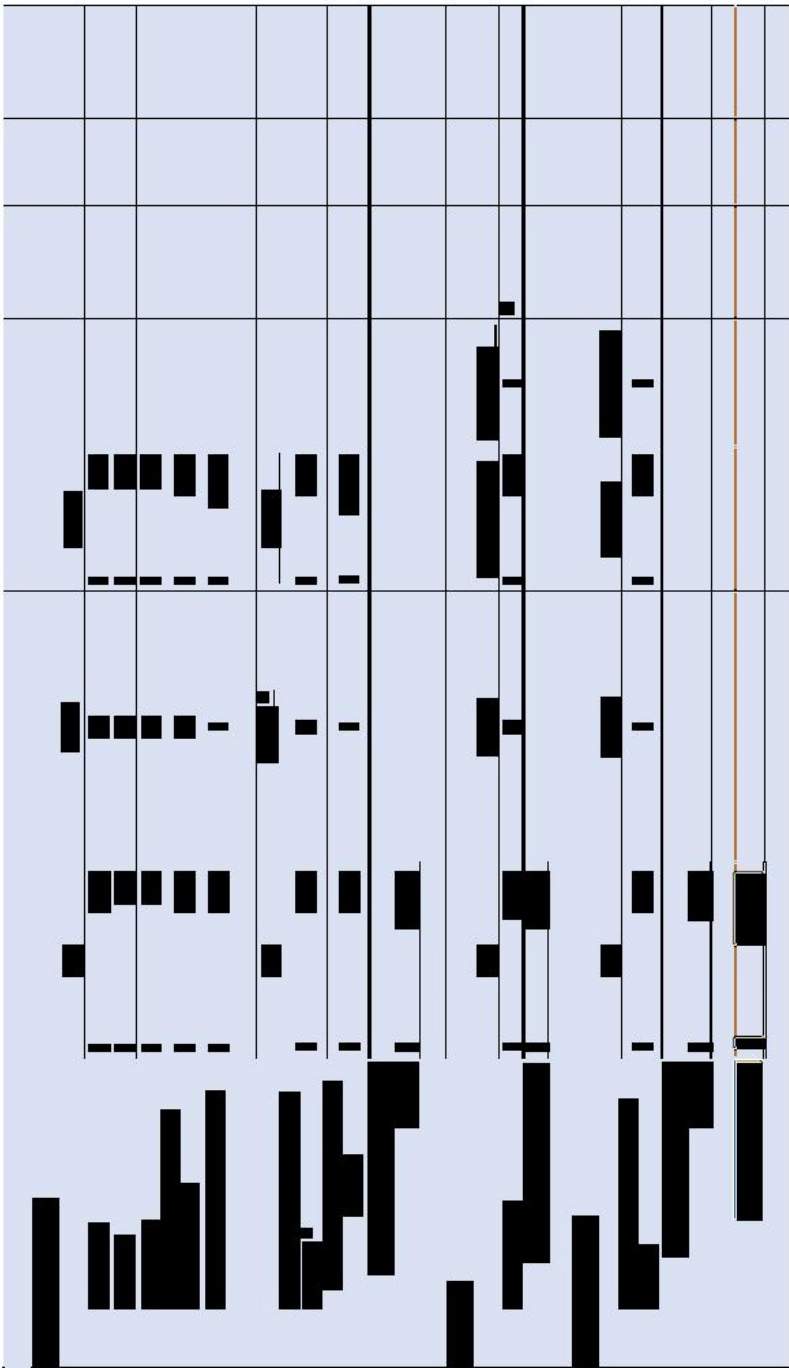












<b>12 Subtotal</b>	\$	<b>21,575,897</b>
<b>13 Contingencies</b>	\$	-
<b>14 Subtotal</b>	\$	<b>21,575,897</b>
<b>15 Project Income</b>		
<b>16 Total Project Costs</b>	\$	<b>21,575,897</b>
<b>17 Federal Assistance requested</b>	\$	<b>10,500,000 48.7%</b>
<b>Merit Support</b>	\$	<b>11,075,897 51.3%</b>

(1) Summer salary differential

(2) Off-Campus (Modified Total Direct Cost -- 26% 2022, 26% 2023), applied to subrecipient expenses with limit of \$25,000

(3) Off-Campus (Modified Total Direct Cost -- 26% 2022, 26% 2023)

(4) **FOC** - Fiber Optic Characterization, **Steering** - Kiting, software, inter-shelf cabling, shipping, **I&C** - Professional services, install, service activation, **Optical Director Setup** - Replace current system with Optical Director functionality

(5) Five year software entitlement, 12 seats for Optical Director management training

(6) Racks and PDU not required for the Ann Arbor, Michigan sites

(7) **PDU** - Power Distribution Unit

(8) Average power cost/site/month to run equipment during setup and testing

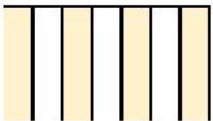


└











**COLLEGES AND UNIVERSITIES RATE AGREEMENT**

EIN: 1386005984A1

DATE:05/28/2019

ORGANIZATION:

FILING REF.: The preceding agreement was dated 06/26/2015

Michigan State University  
426 Auditorium Road  
Room 2  
East Lansing, MI 48824-1046

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

**SECTION I: Facilities And Administrative Cost Rates**

RATE TYPES:      FIXED                  FINAL                  PROV. (PROVISIONAL)      PRED. (PREDETERMINED)				
<u>EFFECTIVE PERIOD</u>				
<u>TYPE</u>	<u>FROM</u>	<u>TO</u>	<u>RATE(%) LOCATION</u>	<u>APPLICABLE TO</u>
PRED.	07/01/2016	06/30/2019	55.00 On Campus	Organized Research
PRED.	07/01/2015	06/30/2019	36.00 On Campus	Other Sponsored Activities
PRED.	07/01/2015	06/30/2019	26.00 Off Campus	All Programs
PRED.	07/01/2019	06/30/2023	56.50 On Campus	Organized Research
PRED.	07/01/2019	06/30/2023	36.00 On Campus	Other Sponsored Activities
PRED.	07/01/2019	06/30/2023	26.00 Off Campus	All Programs
PROV.	07/01/2023	Until Amended		Use same rates and conditions as those cited for fiscal year ending June 30, 2023.

\*BASE

ORGANIZATION: Michigan State University

AGREEMENT DATE: 5/28/2019

---

Modified total direct costs, consisting of all direct salaries and wages, applicable fringe benefits, materials and supplies, services, travel and up to the first \$25,000 of each subaward (regardless of the period of performance of the subawards under the award). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, rental costs, tuition remission, scholarships and fellowships, participant support costs and the portion of each subaward in excess of \$25,000. Other items may only be excluded when necessary to avoid a serious inequity in the distribution of indirect costs, and with the approval of the cognizant agency for indirect costs.

ORGANIZATION: Michigan State University

AGREEMENT DATE: 5/28/2019

---

---

**SECTION II: SPECIAL REMARKS**

---

TREATMENT OF FRINGE BENEFITS:

The fringe benefits are specifically identified to each employee and are charged individually as direct costs. The directly claimed fringe benefits are listed below.

TREATMENT OF PAID ABSENCES

Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims are not made for the cost of these paid absences.

OFF-CAMPUS DEFINITION: For all activities performed in facilities not owned by the institution and to which rent is directly allocated to the project(s) the off-campus rate will apply. Grants or contracts will not be subject to more than one F&A cost rate. If more than 50% of a project is performed off-campus, the off-campus rate will apply to the entire project.

FRINGE BENEFITS:

FICA

Retirement

Disability Insurance

Tuition Remission

Worker's Compensation

Unemployment Insurance

Health Insurance

Dental Insurance

Life Insurance

Longevity Pay Increments

Post Retirement Benefits

Unused Leave Payments at Retirement or Termination

Your next F&A cost proposal for fiscal year ending June 30, 2022 is due in our office by December 31, 2022.

Equipment means tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds the lesser of the capitalization level established by the non-Federal entity for financial statement purposes, or \$5,000.

ORGANIZATION: Michigan State University

AGREEMENT DATE: 5/28/2019

**SECTION III: GENERAL**

**A. LIMITATIONS:**

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted; such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

**B. ACCOUNTING CHANGES:**

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

**C. FIXED RATES:**

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

**D. USE BY OTHER FEDERAL AGENCIES:**

The rates in this Agreement were approved in accordance with the authority in Title 2 of the Code of Federal Regulations, Part 200 (2 CFR 200), and should be applied to grants, contracts and other agreements covered by 2 CFR 200, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

**E. OTHER:**

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

Michigan State University

\_\_\_\_\_  
Signature on File

(SIGNATURE)

\_\_\_\_\_

(NAME)

\_\_\_\_\_

(TITLE)

\_\_\_\_\_  
May 31, 2019

(DATE)

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

Darryl W. Mayes - S

Digitally signed by Darryl W. Mayes - S  
DN: c=US, o=U.S. Government, ou=HHS, ou=PSC,  
ou=People, ou=2342, ou=200300, ou=10011, ou=2000131609,  
cn=Darryl W. Mayes - S  
Date: 2019.05.31 08:47:43 -0400

(SIGNATURE)

for

\_\_\_\_\_  
Arif Karim

(NAME)

\_\_\_\_\_  
Director, Cost Allocation Services

(TITLE)

\_\_\_\_\_  
5/28/2019

(DATE) 4448

HHS REPRESENTATIVE:

\_\_\_\_\_  
Matthew Dito

Telephone:

\_\_\_\_\_  
(214) 767-3261

**COMPONENTS OF PUBLISHED F&A COST RATE**

INSTITUTION: **Michigan State University**  
FY COVERED BY RATE: **July 1, 2019 through June 30, 2023**  
APPLICABLE TO: **ORGANIZED RESEARCH**

<u>RATE COMPONENT:</u>	<u>ON CAMPUS</u>	<u>OFF CAMPUS</u>
Building Depreciation	5.0	
Equipment Depreciation	2.7	
Interest	2.6	
Operation & Maintenance	18.2	
Library	2.0	
Administration*	26.0	26.0
TOTAL	<u>56.5</u>	<u>26.0</u>

\* Reflects provisions of Appendix III to Part 200 of Uniform Guidance—Indirect (F&A) Costs Identification and Assignment, and Rate Determination for Institutions of Higher Education (IHEs), C.8. dated December 26, 2013.

CONCURRENCE:

Michigan State University

Signature on File

(Signature)

(Name)

(Title)

May 31, 2019

(Date)

# MICHIGAN STATE UNIVERSITY

18th February 2022

Dear NTIA,

The NTIA's partial funding proposal has been discussed with Merit Network's Board of Directors' Executive Committee and their own internal executive team, as well as the appropriate teams at Michigan State University, and we are all in agreement that a partial NTIA investment in MOON-Light would be highly beneficial for the initiative and the state of Michigan. We are responding in the affirmative and confirm that we will be able to advance the project with partial funding from the NTIA.

To make the partial funding scenario work, we have decided to focus the proposal on equipment only. Merit, in order to see the project to a successfully strategic conclusion, will self-fund other essential elements of the project including: statewide labor deployment and related expenses, internal engineering and outside plant personnel, and the administrative and engagement portions needed in support of the endeavor. In addition, Merit will also supply the capital for the remainder of the required equipment not covered by the NTIA funding. This will result in all 103 sites, as originally presented in the proposal, being equipped and activated. Statewide Impact is critical, as no community left behind is an essential component to equitable connectivity for all. Additionally, from a technical standpoint, all 103 sites are needed to ensure the success of this network with enhanced next-generation capabilities throughout the network footprint. MSU likewise reaffirms its commitment to contribute to the project as planned.



College of  
Communication  
Arts and Sciences

James H. and Mary B.  
Quello Center

404 Wilson Road, Room 405  
Michigan State University  
East Lansing, MI 48824, USA

Phone: +1.517.432.8005  
Fax: +1.517.355.1297  
Web: [quello.msu.edu](http://quello.msu.edu)



With backing by its Board, Merit will leverage capital funding that had already been allocated for future planned fiber builds, redirecting those funds to finance the non-NTIA supported components of the MOON-Light project. Merit will also pursue future funding opportunities, such as applying for grants through federal infrastructure programs, in support of middle mile projects that will strongly compliment MOON-Light by advancing utilization even further across Michigan.

In this era of inflation and supply chain issues, we are very aware that with reduced funding on project administration the undertaking will have to be carefully managed. With Merit and MSU's decades of experience and excellent track record of managing large complex projects we are confident that we can execute the program successfully.

Since our original submission, Merit has continued to work with its LOI last-mile providers as they have advanced their own last-mile project plans. The refined counts of unserved homes per the planned builds are outlined below.

Provider Name	Status	Household Count
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
<b>Total</b>		<b>16,511</b>
<p><i>*Any overlap areas between providers were subtracted from the total counts to avoid duplicate counting of unserved households.</i></p> <p><i>*RDOF funded households were excluded from all counts as many RDOF projects are not yet constructed and the treatment of RDOF awards for NTIA purposes remains unclear.</i></p>		

Merit and MSU are very grateful for the confidence the NTIA has shown in the support of our unique MOON-Light proposal. If any additional funding, besides the proposed adjusted amount, would become available it would be tremendously helpful in off-setting some of the projected project expenses not covered by NTIA funding.

We would like to thank the NTIA for its consideration and responsiveness during this funding opportunity. We greatly appreciate what the NTIA is doing for our nation.

Sincerely,

Johannes M. Bauer  
 Professor, Department of Media and Information  
 Director, James H. and Mary B. Quello Center

Joseph Sawasky  
 Merit Network, Inc.  
 President & CEO



August 11, 2021

Michigan State University (MSU) and Merit Network, Inc. (Merit) hereby agree to form a partnership contingent on the approval of a Broadband Infrastructure Program (BIP) grant by the - National Telecommunications and Information Administration (NTIA). The goal of the partnership is to use the BIP grant to fund a critical – enhancement to Merit’s statewide middle-mile network that will enable last mile providers to serve 30,944 unserved homes, businesses, and community anchor institutions. MSU and Merit have consistently worked together over many decades to tackle the digital divide in Michigan. The *Michigan Open Optical Network - Leveraging Innovation to Get High-Speed Technology for all* (MOON-Light) project closely aligns with the missions of both organizations. This partnership and the underlying project funded by the BIP grant is the next step to bringing high speed broadband to many more residents across Michigan.

Should NTIA approve the grant application submitted by MSU, in partnership with Merit, the parties agree to the following roles and responsibilities during the grant period of performance:

MSU agrees to:

- Be the named applicant and grantee for the BIP grant program
- Be responsible for the administration and financial management of the grant funds
- With support from Merit, comply with reporting and audit requirements of the BIP program
- Provide assistance with outreach to last mile providers that will benefit from the upgraded middle-mile network
- Use MSU’s deep research capabilities and history of broadband policy work to inform the project at all stages

Merit agrees to:

- Plan and implement the proposed upgrade to the middle-mile network
- Hire all necessary contractors in compliance with local and federal prevailing wages and labor laws to perform the work
- Source all the necessary components
- Comply with all historic and environmental preservation laws and regulations related to the work performed on the network
- Execute strategic statewide engagement with last mile providers to enable delivery of open access on the Merit middle-mile network to effectively reach unserved locations in Michigan
- Assist MSU with the necessary reporting and audit requirements of the BIP program

A detailed explanation of the MOON-Light project is contained within the BIP grant application and is incorporated by reference here. MSU and Merit worked closely together to prepare the grant application and agree that the BIP grant is critical to funding the MOON-Light project and providing this opportunity to significantly close the digital divide in Michigan.





Michigan State University

A handwritten signature in blue ink, reading "Karen Smith", positioned above a horizontal line.

Karen Smith  
VP, Finance & Admin/CFO  
Merit Network, Inc.

Four vertical lines, likely representing staple marks or punch holes, are arranged in two pairs across the middle of the page.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]













Nipigon

Lake  
Superior

Elliot Lake

CONFIDENTIAL

merit