

Grant Request Number	GRN-000174
Funding Program Name	Middle Mile Broadband Infrastructure Grant Program
Funding Request Name	State of Maine - Middle Mile - GRN-000174
Applying Organization	Maine Connectivity Authority
Applicant Name	Andrew Butcher

Primary Applicant Type

Identify the primary applicant type:

Single Entity

Primary Entity Type

Type of entity: Primary entity type, (A) a State, political subdivision of a State, Tribal government, technology company, electric utility, utility cooperative, public utility district, telecommunications company, telecommunications cooperative, nonprofit foundation, nonprofit corporation, nonprofit institution, nonprofit association, regional planning council, Native entity, or economic development authority; or (B) a partnership of two (2) or more entities described in (A).

What is the primary applicant's entity type?

State

Is parent/owner of applicant a foreign entity?

No

Managerial Capability

Applicants shall submit to the Assistant Secretary one-page resumes for (a) all key management personnel and (b) all key personnel of subcontractors or other entities that will play substantial roles in building, managing, or operating the middle mile network built using Middle Mile Grant (MMG) Program funding.

Key Personnel - Andrew Henry; (claires@maine.edu); NOC Coordinator; andrewh@maine.edu

KeyPersonnel_Resume_Andrew_Henry

Managerial Capability

Applicants shall submit to the Assistant Secretary one-page resumes for (a) all key management personnel and (b) all key personnel of subcontractors or other entities that will play substantial roles in building, managing, or operating the middle mile network built using Middle Mile Grant (MMG) Program funding.

Key Personnel - Andrew Butcher; Maine Connectivity Authority; President;
abutcher@maineconnectivity.org
KeyPersonnel_Resume_Andrew_Butcher

Managerial Capability

Applicants shall submit to the Assistant Secretary one-page resumes for (a) all key management personnel and (b) all key personnel of subcontractors or other entities that will play substantial roles in building, managing, or operating the middle mile network built using Middle Mile Grant (MMG) Program funding.

Key Personnel - [REDACTED]

KeyPersonnel_Resume_ [REDACTED]

Managerial Capability

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Key Personnel - Colby Fortier-Brown; Maine DOT; Transportation Engineer II (MCA Liaison);
colby.fortier-brown@maine.gov
KeyPersonnel_Resume_Colby_Fortier-Brown

Managerial Capability

Applicants shall submit to the Assistant Secretary one-page resumes for (a) all key management personnel and (b) all key personnel of subcontractors or other entities that will play substantial roles in building, managing, or operating the middle mile network built using Middle Mile Grant (MMG) Program funding.

Key Personnel - David Wedick; Maine Connectivity Authority; CFO; dwedick@maineconnectivity.org
KeyPersonnel_Resume_David_Wedick

Managerial Capability

Applicants shall submit to the Assistant Secretary one-page resumes for (a) all key management personnel and (b) all key personnel of subcontractors or other entities that will play substantial roles in building, managing, or operating the middle mile network built using Middle Mile Grant (MMG) Program funding.

[REDACTED]

Managerial Capability

Applicants shall submit to the Assistant Secretary one-page resumes for (a) all key management personnel and (b) all key personnel of subcontractors or other entities that will play substantial roles in building, managing, or operating the middle mile network built using Middle Mile Grant (MMG) Program funding.

Key Personnel - James Troutman; Maine Connectivity Authority; Advisor;
jtroutman@maineconnectivity.org

KeyPersonnel_Resume_James_Troutman

Managerial Capability

Applicants shall submit to the Assistant Secretary one-page resumes for (a) all key management personnel and (b) all key personnel of subcontractors or other entities that will play substantial roles in building, managing, or operating the middle mile network built using Middle Mile Grant (MMG) Program funding.

Key Personnel - Jeff Letourneau; University of Maine System; Executive Director; jeffl@maine.edu
KeyPersonnel_Resume_Jeff_Letourneau

Managerial Capability

Applicants shall submit to the Assistant Secretary one-page resumes for (a) all key management personnel and (b) all key personnel of subcontractors or other entities that will play substantial roles in building, managing, or operating the middle mile network built using Middle Mile Grant (MMG) Program funding.

[REDACTED]

Managerial Capability

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Key Personnel - Kwame Yeboah; Maine Connectivity Authority; Workforce Development Manager;
kyeboah@maineconnectivity.org
KeyPersonnel_Resume_Kwame_Yeboah

Managerial Capability

Applicants shall submit to the Assistant Secretary one-page resumes for (a) all key management personnel and (b) all key personnel of subcontractors or other entities that will play substantial roles in building, managing, or operating the middle mile network built using Middle Mile Grant (MMG) Program funding.

Key Personnel - Stephenie MacLagan; Maine Connectivity Authority; Director of Broadband Impact;
smaclagan@maineconnectivity.org
KeyPersonnel_Resume_Stephenie_MacLagan

Organizational Charts

Each applicant shall submit any necessary organizational chart(s) detailing all of its parent companies, subsidiaries, and affiliates.

This upload section should also be used for any letters of support from the organizations that will be involved in the project as a community stakeholder.

MCA MM Grant Org Chart-09-28-2022 07-08-Maine Connectivity Authority-GRN-000174.pdf

Organizational Details

Each applicant must also provide a narrative describing the applicant's readiness to manage a middle mile broadband network. This narrative should describe the experience and qualifications of key management set to undertake this project, the applicant's experience undertaking projects of similar size and scope, recent and upcoming organizational changes including mergers and acquisitions, relevant organizational policies, and ownership information consistent with 47 CFR § 1.2112.

This narrative shall denote who will own the assets at the end of award period. This response is limited to 6000 characters as an open field narrative.

The Maine Connectivity Authority (MCA) and its partners - the University of Maine System (UMS), Maine Department of Transportation (DOT), and [REDACTED] - are experienced in building and delivering broadband projects of a similar size and scope as MOOSE Net. The MCA, founded in June 2021 through unanimous bi-partisan legislation, is Maine's broadband agency charged with achieving universal high-speed broadband access. Since inception, the MCA has rapidly established a highly credentialed team and merged with the prior state office, the ConnectMaine Authority (ConnectME), created in 2006. As a strategic priority, MCA evaluated critical barriers to expanding affordable universal broadband for all Mainers and determined that a strategic investment in publicly owned middle mile is essential for the state's future connectivity. MCA's proposed network design and goals align directly with the NTIA MMG program's purpose of serving unserved and underserved locations with a redundant, resilient, high-speed broadband middle mile network. The MCA is led by Andrew Butcher (President), who has an extensive background in community and economic development, including leading the Maine Broadband Coalition (MBC). At MBC, Mr. Butcher co-led a 2020 state bond campaign (Maine's first state investment in Broadband) providing \$15 million for community driven, public private partnerships. He also designed and deployed multiple data collection, partnership building, and public education activities.

To develop this project, MCA retained the consulting services of Jim Troutman and Ben Dinovelli. Mr. Troutman is the director and co-founder of the regional Internet Exchange for Northern New England. Mr. Troutman has over 25 years of experience in Internet infrastructure, operations, and business development, consulting with many ISPs across New England. Mr. Dinovelli was engaged via his involvement with the Berkman Klein Center at Harvard Law School to develop strategy, engage stakeholders, and apply his broadband infrastructure financial analysis expertise to the MOOSE Net business plan.

David Wedick, MCA's CFO will oversee the strategic and day-to-day aspects of MOOSE Net's financial management. Mr. Wedick brings over two decades of experience in capital markets and economic development, including as CFO of Coastal Enterprises, a leading national Community Development finance Institution based in Maine.

The MCA - through an RFP process - partnered with Maine-based [REDACTED] and KPMG. These firms have played an integral part in developing the MCA's overarching strategy for delivering equitable broadband access. This team has been heavily involved in preparing this application and includes industry veterans such as John Costa and Frank Jaffe who have decades of experience and worked on prior successfully-completed NTIA projects, including the Three Ring Binder (3RB) in Maine.

UMS provides connectivity services, through a subsidiary, Networkmaine, to over 1,000 K-12 schools, libraries, colleges, research institutions, government offices, and other non-profit entities in Maine. Networkmaine is led by Jeff Letourneau, who was involved in Maine's first-ever internet connection in the 1980s and was a co-author of the successful Broadband Technology Opportunities Program (BTOP) funded 3RB project – a similar statewide \$25 million NTIA funded network. Jeff's knowledge and experience were critical in this application.

Networkmaine will de-risk MOOSE Net as the network operator. From day one, MOOSE Net will be staffed with key roles, such as cybersecurity engineers, network architect, structured cabling director,

and a Network Operations Center (NOC) manager. For almost 15 years, it has owned, leased, and operated 1,400 miles of dark fiber and provided lit services to various state and nonprofit groups through its Research and Education Network, MaineREN. Networkmaine will contribute 50% of the capacity on their existing network, allowing it to both operate a holistic, statewide optical network for its traditional constituent base of Community Anchor Institutions (CAIs), and provide lit transport, peering, and colocation services for internet transit services to last mile service providers, tripling the geographic reach of MOOSE Net. Networkmaine also has close relationships with major local fiber optic construction and maintenance contractors who will play a critical role in helping operate and maintain the network.

Maine DOT is the state's largest cabinet-level state agency responsible for transportation systems and has identified a need for ubiquitous connectivity. MCA has formed a tight-knit relationship with the DOT through shared feasibility analysis and staffing. Maine DOT will help deploy MOOSE Net, providing ROW permitting and roadside construction, engineering expertise and review, and access to new DOT-owned conduit to minimize build costs and timeline. These efforts will be led by Colby Fortier-Brown, a network engineer at Maine DOT who currently serves as DOT liaison at MCA.

█ is one of the state's largest carriers and pole owners. █ will help fund and build part of the route connecting some of its central offices. In exchange, █ will grant IRUs for 24 strands to MCA perpetually, which will allow MCA to lower last mile deployment costs in nearby un(der)served areas. This is a model the MCA hopes to replicate in other parts of the state to address █ internal connectivity needs, while creating long-term benefit for Maine.

MCA will own the project assets, and is a quasi-governmental agency, led by an experienced staff and board appointed by The Governor. As a public body, none of the provisions of 47 CFR § 1.2112 apply. More details can be found at <https://www.maineconnectivity.org/about>.

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Form CD-511 (Certification Regarding Lobbying)

The applicant must upload a completed form that certifies that Federal funds have not and will not be used for lobbying in connection with this request for Federal financial assistance. A fillable Form CD-511 can be found in the MMG ZIP folder.

CD511 Fillable_Butcher_220926-09-27-2022 07-10-Maine Connectivity Authority-GRN-000174.pdf,
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SAM.gov Registration

Applicants are asked to upload a screenshot of their SAM.gov registration.

Maine Connectivity Authority SAM Registration-09-27-2022 07-10-Maine Connectivity Authority-GRN-000174.pdf

Executive Summary

Please describe how the applicant's proposal will advance the objectives of the MMG Program, as well as the specific objectives of outlined in the Notice of Funding Opportunity (NOFO);

An overview of the proposed route or service area(s), including information regarding rurality and socio-economic indicators in the area to be served by the proposed project.

This response is limited to 12000 characters as an open field narrative.

The Maine Connectivity Authority (MCA) and its partners - the University of Maine System (UMS), Maine Department of Transportation (DOT), and [REDACTED] - propose to design, build, and operate the MOOSE (Maine Online Optical Statewide Enabling) Network, a new, east-west middle mile fiber optic route that will anchor the State's strategic goal of providing universal broadband access. MOOSE Net will provide a publicly owned backbone, enabling expansion and diversification of internet services otherwise deemed not economically viable by existing market conditions.

This network satisfies the NTIA's statutory purposes. It 1) is fiscally sustainable, as evidenced by the Pro Forma financials; 2) offers non-discriminatory interconnectivity access to Last Mile (LM) providers in perpetuity; 3) is supported by LM providers as evidenced by the LOI/MOUs; 4) has financial support from partners, including UMS, DOT, and [REDACTED] and 5) benefits and serves National Security interests. The MOOSE Net proposal reflects an extensive process, led by MCA, that identified critical gaps in Maine's infrastructure, most notably, along an east-west route through some of Maine's most rural regions, which have higher proportions of un(der)served locations and deep economic challenges. MOOSE Net addresses this critical need with a new contiguous, open access, middle mile fiber route that will unlock future public and private last mile broadband investment and enhance competition, reliability, and resilience.

Overview:

MOOSE Net consists of 531 miles of 144 count fiber with 9 colocation huts, and lit services infrastructure consisting of Dense Wavelength Division Multiplexing (DWDM) foundation, Carrier Ethernet electronics, and 10 Gbps – 400Gbps optical modules – scalable for future growth. The two Points of Presence (POPs) connect at two University of Maine campuses – providing path diversity for redundancy and high availability of the fiber. Each POP features co-locations and interconnections from the Northern New England Neutral Internet Exchange for peering and house content delivery network caches – for high performance on-net connectivity to common Internet services.

Networkmaine, a unit of UMS, will operate MOOSE Net and functionally integrate it into its Research and Education Network (MaineREN) enabling use of its Network Operating Center (NOC) to monitor and take corrective action as needed to maintain high availability and reduce traffic congestion.

MOOSE Net is expected to cost \$53.4 million, funded with \$23 million of in-kind contribution from MCA and its partners, and built over 2 years.

MOOSE Net is needed to reach the un(der)served:

The Proposed Funded Service Area (PFSA) traversed by MOOSE Net includes Maine's most rural, unserved, and economically disadvantaged counties: Aroostook, Piscataquis, Washington, Franklin, and Somerset. These five counties cover 18,816 sq. miles with a population of 194,933, for a population density of just 10.4 persons per sq. mile (versus 93.8 nationally). The average median household income is \$45,547 (versus \$64,994 nationally). Unsurprisingly, these counties' low population density and household incomes correlate with low broadband penetration. Along our proposed routes in Somerset County, 56% of addresses are unserved; in Franklin, 50% are. Within 5-miles of MOOSE Net, 37% of addresses are underserved, lacking access to 100/20Mbps. Without the essential middle mile fiber that MOOSE Net will bring, internet service providers (ISPs) will not be able to meet the growing demand for broadband that is essential to the long-term viability of these rural communities.

MOOSE Net creates competitive options for communities and providers:

The marketplace for wholesale middle mile fiber in Maine is dominated by just two firms, FirstLight and [REDACTED] with a few smaller regional providers owning disparate middle mile strands. FirstLight's network consists primarily of the Three Ring Binder (3RB), built in 2010-12 with federal support, which under previous ownership demonstrated the value of new open access infrastructure in enabling competition and new last mile investment through densely populated portions of southern Maine and Aroostook County. Unfortunately, many areas still lack middle mile access, route diversity, and/or accessible interconnection, and the prices for wholesale service in served areas reflect the effective duopoly. This situation is expected to worsen with the expiration of the open access, non-discriminatory obligations for the 3RB in the next decade. As a public entity, MCA's purpose is to serve the public benefit. Accordingly, in MCA's financial forecast, MOOSE Net will offer lower costs required by ISPs to connect, significantly reducing transport costs and making LM access more affordable for ISPs (and ultimately their customers).

MOOSE Net increases resilience:

Once complete, MOOSE Net will enhance the overall reliability and resilience of Maine and northern New England, by providing a new, east-west route across the state. Located in the northeast corner of the continental U.S., Maine sends nearly all of its internet traffic along a limited set of coastal routes to reach the global internet (via Boston or NYC), with common potential points of failure. Though FEMA identifies the PFSA as very or moderately low for weather hazard risks, the proximity of these key points of failure to the coast and lack of east-west capacity, places Maine at greater risk, particularly from coastal storms (such as Hurricane Fiona which recently struck Atlantic Canada) that will grow in strength with the changing climate. MOOSE Net anticipates and prepares for such events with diverse, redundant paths, spares, backup strategy, and carrier class equipment – all monitored at the NOC for early warning and quick action. MOOSE Net will enhance the security of all of the State's interconnected last and middle mile networks, benefit and serve National Security interests of DOT and BIW/General Dynamics for the US Navy, and provide new direct internet connections to Canada.

MOOSE Net is "shovel ready":

MCA and its partners have developed a coordinated work plan to complete and light MOOSE Net in two years from contract award. While the project undergoes NEPA review, MCA will issue competitive RFPs for parallel construction and order necessary materials as soon as possible to reduce the risk of delays. Maine DOT and Maine Department of Environmental Protection will be prepared to accelerate

permitting and place fiber in DOT conduit and align construction with its schedule for I-395 extension leveraging the State's "Dig-Once Policy." MCA's partnership with [REDACTED] allows for an expedited build and coordinated utility pole make ready efforts. MCA's Highly Skilled Workforce Plan, part of its overall effort to scale Maine's broadband workforce, is in motion to train-up and deploy a range of skilled personnel, with appropriate licenses, registrations, and training.

MOOSE Net has broad support from across the State of Maine:

MOOSE Net is a model for state-led strategic investments in broadband infrastructure, bringing together Maine's financial institutions, health care providers, employers, education institutions, ISPs, local, regional, and tribal governments, and community based organizations to identify and address the need for new middle mile fiber. Over 35 entities provided letters of support, statements of interest, and commitments of capital, reflecting MCA's and its partners' extensive due diligence in planning and development, and the significant and unique benefits the project will bring to Maine.

MCA, founded in June 2021 through unanimous bi-partisan legislation, is Maine's broadband agency, charged by statute with ensuring that "high-speed connectivity be universally available in the State." MCA builds from Maine's 15 years of strategic broadband policy and practice, as the successor to the ConnectMaine Authority, which secured a \$28 million Broadband Infrastructure Program investment in 2021. Andrew Butcher, MCA's President, has an extensive background in community and economic development, including leading the Maine Broadband Coalition (MBC), a statewide network of community broadband champions, businesses, non-profit organizations, and government agencies, which serves as a hub for information, policy, and capacity building. At MCA, Mr. Butcher has assembled a seasoned, knowledgeable team of staff, partners, and contractors to develop and deliver MOOSE Net and implement Maine's overall broadband strategy. This well-rounded team, many of whom planned and built the 3RB (Networkmaine and [REDACTED] are in a strong position to fund, design, build, and operate the new network at scale and at an accelerated rate. MCA is uniquely positioned to focus on the long-term public good, work closely with other state agencies (including the transportation and education partners in this proposal), and identify and integrate broader community viewpoints into a holistic approach.

MOOSE Net will be financially sustainable:

To ensure a fiscally sustainable strategy, MCA engaged KPMG and Ben Dinovelli to conduct a detailed market analysis and financial projection for MOOSE Net, which evaluated the commercialization potential of the network, potential service offerings, and potential financial risks. KPMG's analysis concluded the project will generate at least \$4 million of run-rate annual revenues over the long-term. With an estimated annual opex of \$2 million, the project expects to yield a run-rate EBITDA of \$2 million.

To develop the cost estimate, MCA engaged [REDACTED] an experienced designer and builder of fiber infrastructure in Maine and across the United States, to conduct an extensive breakdown of project costs, working directly with vendors to understand the shift in materials costs given recent inflationary pressures. [REDACTED] estimated that the project will cost \$53.4 million, of which \$41.0 million are cash expenditures.

Both analyses include several key assumptions to mitigate risk, including contingencies (5% of total and 10% of construction costs), cash for operating cost overruns, and assuming slower revenue growth that

might be involved with an early-stage project.

MOOSE Net is made possible by MCA's unique statutory authority to proactively invest in Maine's internet ecosystem using diverse funding and financing. The \$23 million (44%) of non-federal investment in the project includes \$10 million of tax-exempt debt issued by the MCA, in partnership with the Finance Authority of Maine (Maine's conduit issuer), and \$954k from its private partners, for a total of \$11 million in cash. Networkmaine will contribute staffing, equipment, and existing IRUs to provide lit services (\$7 million of in-kind contributions) and Maine DOT will contribute access to its right of way, conduit, and technical time and expertise, as well as be a network user (\$5 million of in-kind contributions), for a total of \$12 million of in-kind contributions.

MOOSE Net is a springboard to achieve Maine's and the NTIA's mutual goal of delivering universal broadband, digital equity, and economic development to the most rural, underserved, and economically disadvantaged parts of Maine. The future-proof, all-fiber middle mile network will be financially sustainable, and built and maintained by the collaborative efforts of the public and private sector. This proposal, and the investment to follow, brings a diverse array of partners with complementary talents and skills for designing, building, operating, and maintaining networks. Building this network will create quality jobs, supported by fair labor practices and workforce readiness programs. MOOSE Net will be a national model for targeted investment in telecommunications infrastructure to promote last mile investment, unlock innovation and economic growth, and level the playing field for rural communities.

Level of Need

A description of the level of need in the proposed service area(s), including but not limited to communities considered unserved and/or underserved in the proposed service area(s), discussion of the competitive landscape in the area, variations among service areas if there are any, or the general economic conditions in the proposed funded service area.

This response is limited to 12000 characters as an open field narrative.

Maine faces several unique challenges that make it particularly in need of federal middle mile funding.

Rural: Maine has the highest percentage of rural residents in the nation (over 60%);

High poverty: Maine is home to six out of the ten most impoverished counties in New England;

Age: Maine has the highest median age of any state and is closely tied with Florida with greatest concentration of elderly as a percentage of the population

As a result, Maine has less existing middle mile infrastructure than its neighboring states. The Maine Connectivity Authority's cohesive, long-term strategy for universal broadband access in Maine is anchored by investments in strategic middle mile infrastructure, of which MOOSE Net will form the backbone. MOOSE Net is the culmination of a lengthy process to identify Maine's middle mile needs. That process identified critical gaps in Maine's infrastructure, most notably, along an east-west route through some of Maine's most rural regions, which have higher proportions of un(der)served locations

and deep economic challenges. MOOSE Net extends a new contiguous, high bandwidth, open access, middle mile fiber route, offering both dark and lit services to these communities, unlocking future public and private last mile broadband investment, and creating an economically viable and sustainable asset that enhances network competition, reliability, and resilience for Northern New England.

MOOSE Net is the culmination of a multi-year engagement process to identify Maine's middle mile needs, involving numerous stakeholders, such as internet service providers, state agencies, schools, hospitals, and large employers.

Shortly after formation, MCA's board identified ownership (or co-investment) in middle mile assets as a key objective, in order to maintain long-term access and public benefit from this shared infrastructure.

MCA developed and circulated a concept white paper for public comment that 1) provided an assessment of challenges in Maine's existing middle mile landscape; 2) advanced guiding principles to govern the MCA's approach to middle mile investment; and 3) identified actions that MCA proposed to address the identified challenges. These actions included investment in new long-haul fiber to connect with neighboring states or provinces, and new long-term dark fiber to serve un(der)served areas.

The MCA sought and received a diverse array of positive feedback galvanizing a more extensive, sophisticated effort to assess the market need and opportunity, and create a sustainable, fundable plan to develop middle mile, culminating in MOOSE Net. This effort included:

Over seventy 1-on-1 stakeholder conversations, including ISPs, cellular carriers, corporate end users, state and local governments, community anchor institutions and community groups.

Leveraging MCA's comprehensive geodatabase of broadband availability, and the next-generation interface developed by Maine-based VETRO, to identify "broadband deserts" of un(der)served locations, and CAIs.

Extending the VETRO database with data on existing middle mile fiber assets, and points of interconnection

Conducting an in-depth market sizing and commercial feasibility of potential routes with KPMG. MCA complemented this analysis with its own in-depth knowledge of the competitive landscape of Maine to further sort and analyze the data.

Using these inputs, MCA's team created a master list of potential routes, from which MCA selected routes that would 1) prioritize serving un(der)served, rural, and impoverished communities, 2) add resilience and competition to existing networks, and 3) present commercialization opportunities to ensure long-term sustainability. The resulting analysis identified seven priority routes that form MOOSE Net:

- 1) East-West Calais to Sandy Bay Township
- 2) East-West Montreal
- 3) Kingfield-Farmington
- 4) Farmington-Waterville
- 5) Norridgewock Ring Closure
- 6) Waterville to Damariscotta
- 7) Sherman-Houlton Ring Closure

These routes address high priority areas including Aroostook, Franklin, Piscataquis, Somerset, and

Washington Counties.

There are several critical gaps in Maine's existing middle mile infrastructure.

Maine's location in the northeast corner of the United States, bordered by just one other state, has led to peculiar internet geography. According to the Census Bureau, the targeted counties cover 18,816 sq. miles, with a population density of 10.4 persons per sq. mile (versus 93.8 nationwide). "You can't get theah from heah" is a classic Maine adage that captures the difficulty in traversing Maine's rugged coastline or mountainous inland - and also accurately describes Maine's existing middle mile infrastructure. Today, nearly all of Maine's internet traffic reaches the global internet by going south to Boston or NYC, along a limited set of routes with common potential points of failure and limited competition. Some smaller Maine ISPs lack redundant backhaul altogether due to cost or lack of diverse routes.

Moreover, the marketplace for wholesale middle mile fiber in Maine is dominated by just two firms, FirstLight and [REDACTED] with a few smaller regional providers owning disparate middle mile strands. FirstLight's network consists primarily of the Three Ring Binder (3RB), constructed in 2010-12 with federal support, which under previous ownership demonstrated the value of new open access infrastructure in enabling competition and new last mile investment through densely populated portions of southern Maine and Aroostook County. Unfortunately, many areas still lack middle mile access, route diversity, or accessible interconnection, and the prices for wholesale service in served areas reflect the effective duopoly. This situation is expected to worsen with the expiration of the open access, non-discriminatory obligations for the 3RB in the next decade. MOOSE Net is designed to solve this problem by providing a diverse, new east west path and introducing a new entrant into Maine's wholesale middle mile fiber landscape.

First, MOOSE Net will create new paths through—and out of—Maine. The proposed routes do not directly overlap with FirstLight or [REDACTED] existing middle mile, and in some parts (e.g., Somerset, Hancock, and Washington counties) there is no nearby middle mile at all. Indeed, [REDACTED] as a partner, has great interest in Route 7 to enhance its existing operations. Market research conducted by MCA's consultants indicates this new, low-latency, geographically diverse path through rural Maine is also likely to be attractive to hyperscalers, ISPs in Atlantic Canada (such as Xplore) and firms with data-intensive transport needs, especially those who have traffic coming overseas (via subsea cable landings in Halifax) to North America. Tapping into this demand will help generate additional revenue to sustain the project over the long-term, while enhancing the overall resiliency of Northern New England's network infrastructure.

Second, MOOSE Net will create more middle mile competition, with concurrent pricing benefits for wholesale and ultimately retail customers. Dark fiber services will be offered at existing 3RB tariff rates (\$16-30 per strand mile for most customers as of October 2018), indexed to inflation as is common industry practice. MCA's partnership with Networkmaine, will allow it to expand MOOSE Net's footprint by selling lit access across Networkmaine's existing 1,400-mile fiber network at competitive market rates. As a not-for-profit entity, the MCA will prioritize offering affordable rates to facilitate last mile deployment, while at the same time, charging enough to sustainably operate and maintain MOOSE Net. Consequently, in areas such as Bangor where there are more than a dozen providers to choose from, an additional wholesale middle mile provider will engender competition with those who

currently use the 3RB, leading to cheaper overhead that translates to better prices for end users. MOOSE Net extends the state's middle mile infrastructure to un(der)served, rural, and impoverished communities, to facilitate public and private investment in high-speed last mile broadband. MCA leveraged the state's extensive prior investment in mapping un(der)served areas and CAIs to design MOOSE Net to best support future last mile public and private investment. Within 5 miles of MOOSE Net, 37% of addresses lack access to available speeds of 100/20 Mbps. Routes 3 and 5 have the highest proportions of underserved, at 56% and 50%, respectively. The lack of access is corroborated by the MCA's community-based speed test reporting platform (<https://expressoptimizer.net/projects/Maine/speedtestmap.php>). Some regions that MOOSE Net will pass through, such as Routes 2 (to the Canadian border) and portions of 1, lack any existing fiber infrastructure, and have no internet service at all. Similarly, MCA has identified 366 CAIs needing connection within 1000' of the proposed routes, with sufficient interconnection points baked into the design to support each one.

Lack of broadband access in these communities correlates with other negative economic outcomes. MOOSE Net counties have an average median household income of \$45,547 (30% lower than the national median of \$64,994). Approximately 97% of the routes pass through census tracts designated as below 150% poverty level. 26% pass through census tracts that meet the criteria for a RAISE Persistent Poverty area, including Route 1 (which includes two of the poorest counties in New England, Somerset and Washington).

MOOSE Net will also benefit Maine's tribal communities. The routes pass directly through Penobscot Indian tribal land and bring middle mile fiber much closer to several other reservations. MCA programming aims to give special consideration to any projects that serve these tribal entities. MCA's extensive stakeholder outreach identified multiple private providers who plan to leverage MOOSE Net to provide last mile service in these communities, as detailed in the letters of support. For example:

Axiom: Has current and planned projects in Central and Eastern Maine

GW: Can address service gaps in its footprint Montreal Route 2, 6, and the 3, 4, and 5 ring.

Premium Choice: Will expand last mile connectivity near Jackman on Route 201 with a mix of state, local, and private funding.

US Cellular: Can provide fiber backhaul to up to 95 additional wireless towers.

MCA's stakeholder outreach also identified ways to make MOOSE Net more valuable and accessible to Maine ISPs. Many providers indicated they could not take advantage of just dark fiber, and need a lit service offering. MCA's partnership with Networkmaine gives it the ability to provide lit services over MOOSE Net, as well as Networkmaine's existing DWDM and carrier ethernet based network.

Stakeholder outreach also showed MOOSE Net has the potential to increase speeds on existing networks, including those that have previously received federal funding. Average last-mile latency within 5 miles of MOOSE NET has averaged 52.6ms over the last 2 years (and was 44.6ms as of August 2022). MOOSE Net is expected to lower average latency to at least 20ms. Even though two areas along Routes 1, 2, 4, and 5 have previously received USDA broadband funding (one from the Broadband Initiative Program in 2010 and another from an ILEC loan in 2017), these funds only facilitated broadband speeds of 25/3 or 10/1 Mbps. Without open access fiber, Franklin, Penobscot, Somerset,

and Washington Counties - as stated in their letters of support - still have a need for middle mile fiber to support local service providers that offer affordable lit backhaul services and dark fiber leasing options.

As the letters show, new open access middle mile infrastructure will “unlock” areas previously inaccessible to these providers. MCA will supplement these private last mile initiatives with public investments supported by CPF and BEAD funding to facilitate service to un(der)served areas.

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State Collaboration Acknowledgement

NTIA strongly encourages prospective non-state applicants to coordinate and consult with the State Broadband Office or other coordinating body located in the jurisdiction in which the eligible entity proposes to deploy middle mile infrastructure to ensure that the proposal is consistent with the state’s broadband plan and priorities. Please confirm collaboration and consultation.

Do you confirm collaboration and consultation with the appropriate organization?

Yes

———
State and Local Collaboration Narrative

Please provide information on the applicant’s coordination with applicable State, Territory, Tribal, and local governments, including their awareness of the proposed project and any potential impact to respective service areas; and

Information regarding the applicant’s involvement and coordination with community organizations or other relevant partners in the proposed service area.

This response is limited to 6000 characters as an open field narrative.

Maine is one of the most forward thinking and innovative states for broadband deployment in the country despite a small, low-density population, challenging terrain, and limiting geography. First, Maine has a strong community driven planning process anchored in digital inclusion and equity. Second, Maine has invested in data systems to drive decision making. Third, Maine has embraced an “all solutions on the table - all partnerships welcome” approach to public private partnerships to leverage the unique strengths and capabilities of a range of expertise.

MOOSE Net demonstrates Maine’s approach in action. It is the result of a partnership of three state agencies: MCA, Networkmaine (a unit of the University of Maine System), and Maine DOT, in addition to over 30 government, tribal, and other community stakeholders to develop this plan.

Networkmaine already provides reliable, affordable internet to 1,000 K-12 schools, libraries, colleges and universities, research institutions, government, and other non-profit entities in Maine in its role as their connectivity provider. MOOSE Net will facilitate connectivity in areas where CAIs, as well as

consumers and businesses, have historically struggled to obtain access. Networkmaine is both an advisor to the project and the network operator of MOOSE Net.

Maine DOT, the largest cabinet-level state agency, has insight into traffic trends (a proxy for future broadband needs) and route conditions, including infrastructure, environmental, cultural and historical concerns, and right-of-way availability. Maine DOT is contributing significant right-of-way usage and its expertise to facilitate the network design and construction and will be a large user of fiber and broadband services to meet Maine's transportation management needs.

MCA and DOT also are initiating an interagency Broadband Working Group as a component of the Governor's Infrastructure Task Force to ensure targeted and consistent coordination with relevant state agencies including the Department of Economic Community Development, The Office of Information Technology, The Public Utilities Commission, The Department of Environmental Protection, and others.

MCA and Networkmaine have working relationships with dozens of community, regional, and issue based stakeholders, including Maine Broadband Coalition (MBC), a hub of information, policy support, and capacity building around broadband in Maine. MBC serves as a voice for internet users across the state reflecting community organizations, issue advocates, service providers, institutions, and local government. The MBC is a crucial way to actively involve communities, especially regarding funding opportunities facilitated through the Capital Projects Fund and BEAD.

Through these partnerships, MCA has developed an awareness of all the regional and town-based broadband working groups, advisory committees, broadband utility districts, and private projects. Accordingly, MCA received letters of support from a number of these entities, including, but not limited to, local governments and economic development groups representing regions along the route, such as Aroostook, Franklin, Somerset, and Washington counties. Additional representation from MBC, Downeast Utility Broadband and Waldo Broadband Corporation (Broadband Utility Districts), Four Directions Development Corporation, Island Institute, MaineHealth, Bangor Savings Bank, Bath Iron Works, and the Passamaquoddy Tribe at Indian Township demonstrate the depth and diversity of the need for better middle mile infrastructure and clear support for the vision that these routes implement. By providing these localities a closer on-ramp to a state connectivity backbone, MOOSE Net will enable these localized strategic plans to focus on last-mile delivery instead of allocating resources to exploring options for middle mile connections.

Digital Equity is also a major priority driving the development of MOOSE Net. MCA has amassed a Digital Equity Task Force of 35 members to effectively engage with Maine's people and communities. This Task Force is made up of organizations representing disadvantaged groups, such as Maine Veteran Services, Maine Immigrant and Refugee Services, Maine Council on Aging, Two Bridges Regional Jail, Disability Rights Maine, Maine Immigrant Rights Coalition, and AARP Maine. MCA believes it is imperative to give a voice to each of these groups in order to align state goals and priorities with those who require special considerations and more targeted approaches. This Task Force is part of an initiative spurred on by planning funds obtained in July 2022 through the NTIA's Digital Equity Planning Grants. MCA will begin a year-long planning process starting at the end of 2022. More information on this Task Force is contained in the section "Advancing Workforce Development Objectives."

To supplement this community capacity building, the MCA has expanded our Broadband Intelligence

Platform (BIP) to help to include over 39,000 speed tests crowd sourced through the Maine Speed Testing Initiative and supplementary interactive map reflecting broadband availability, digital equity needs, and strategies for addressing the gaps.

All of these stakeholders provided instrumental insight and input as the application team has designed and developed MOOSE Net. This is a unique funding opportunity and the MCA is focused on deploying the funds strategically to achieve a number of goals: not only providing middle mile connectivity but creating infrastructure that will be used to advance strategic local development and digital equity objectives.

Will the project connect middle mile infrastructure to last mile networks that provide or plan to provide broadband service to households in unserved areas?

Yes

Is the project connecting non-contiguous trust lands?

No

Please describe:

A

Do you commit to offering wholesale broadband service at reasonable rates on a carrier-neutral basis?

Yes

The eligible entity adopts fiscally sustainable middle mile strategies. This strategy should be described in the Budget Narrative.

Do you attest to this?

Yes

The eligible entity commits to offering non-discriminatory interconnect to terrestrial and wireless last mile broadband providers and any other party making a bona fide request. This policy will be described in the Interconnect Policy.

Do you attest to this?

Yes

The eligible entity identifies specific terrestrial and wireless last mile broadband providers that have(i) expressed written interest in interconnecting with middle mile infrastructure planned to be deployed by the eligible entity; and ii) demonstrated sustainable business plans or adequate funding sources with respect to such interconnection. This may be demonstrated in the Level of Need narrative of the Exec Summary.

Do you attest to this?

Yes

— — —

The eligible entity has identified supplemental investments or in-kind support (such as waived franchise or permitting fees) that will accelerate the completion of the planned project. Such acceleration may be described in the Project Timeline narrative.

Do you attest to this?

Yes

— — —

The eligible entity has demonstrated that the middle mile infrastructure will benefit national security interests of the United States and the Department of Defense. The benefits may be explained in the Benefitting National Security Interests Narrative.

Do you attest to this?

Yes

— — —

Please describe:

MOOSE Net will serve as a new backbone for CAIs, last-mile providers, and the State, including Maine DOT's IoT network for highway monitoring and operations and Bath Iron Works Corporation – part of General Dynamics, a shipyard specializing in the design, building, and support of complex surface combatants for the U.S. Navy. It will create route diversity and resiliency for existing middle mile and shorten paths by up to 55%, reducing latency and interconnection costs.

MOOSE Net brings Maine's middle-mile infrastructure to the Canadian border at four separate Customs and Border Protection ports, filling the need for redundancy and high capacity.

Today, to reach the broader internet, many Maine-based companies can only transit data south through Boston or NYC, resulting in increased risk due to common potential points of failure and higher costs from less competition. MOOSE Net will enable robust connection of Maine's networks to Canada's internet infrastructure, in the same fashion that Maine's power grid is connected to Canada to withstand a cascading outage of ISO-New England. This connectivity will add redundancy and resiliency to better withstand natural disasters or potential cyberattacks against major U.S. Internet

hubs. The July 2022 outage of Rogers Telecommunications in Canada, disrupting financial services, 911, voice, cellular and Internet services demonstrates the need for the diverse and resilient infrastructure MOOSE Net will bring.

The Cybersecurity and Infrastructure Security Agency identifies the communications sector as critical infrastructure and warns that foreign state-sponsored adversaries target telecoms and network service providers, hunting vulnerabilities and misconfigurations to exploit for further compromise. MOOSE Net will be integrated into Networkmaine's Network and Security Operations Centers to actively monitor for anomalies and detect and defend this infrastructure against intrusion attempts, DDoS attacks, and other threats.

Project

Duration

Number of Years

2

Project Timeline Narrative

The narrative requires the Applicant to describe a project with critical path, including key milestones for implementation of the project, preparations, and risk factors; and a capital investment schedule evidencing that the applicant will complete build-out and the initiation of service within five years of the date on which the entity receives the grant and will meet interim buildout requirements set forth herein and in any other binding document.

If the project is able to be accelerated with supplemental investments or in-kind support to meet a statutory purpose, this should be explained.

This response is limited to 6000 characters as an open field narrative.

The MCA will build 531 miles of middle-mile network and nine colocation huts over 24 months to create MOOSE Net. To develop the timeline, MCA carefully considered interdependencies among routes and colocation huts, potential for supply chain delays, and workforce resources required for construction.

This led to the plan of using separate RFPs to select contractors to build colocation facilities and to deploy/test fiber, providing the right mix of skills and crew availability. MCA also balanced the fiber deployments based on anticipated crew availability.

MCA has developed strategic partnerships with Maine DOT, Networkmaine, and [REDACTED] to accelerate the project. Through in-kind contributions, the project saves considerable resources that accelerate the project timeline.

DOT will provide ROW allowances to accelerate the permitting process, often a major source of delay. DOT is also providing engineering and staff support.

Networkmaine will provide an existing operations staff with appropriate technical and management expertise that can be utilized on Day One. They also have relationships with multiple vendors and advisors that can be relied upon during construction and operations.

█ will provide IRUs for 24 fibers with a rapid build by overlashing to their existing plant, largely independent of the rest of the project.

MCA treated hut construction and fiber deployment as separate but interrelated phases. Exact build sequences will be determined after further estimates of make-ready timeframes are complete for each route.

A major goal is to ensure that colocation huts are in place with ample time to make fiber connections, install, and test equipment. MCA intends to perform as much preparatory non-construction work on both the huts and fiber as possible, such as vendor selection, workforce development, site acquisition, engineering, and purchasing, formalization of DOT and █ agreements, and (when allowable) submitting make-ready applications during the first 6 months while National Environmental Policy Act (NEPA) reviews are being conducted. This will allow immediate transition to construction activities once approvals are received.

Similarly for the fiber construction, MCA intends to use the first 5-6 months of the project to complete all the non-construction planning activities possible. These include vendor selection, contracting and workforce development, formalization of agreements with Maine DOT and █ updating the network designs, ordering fiber, materials, and equipment, and when allowable submitting make-ready applications.

DOT's I-395 Extension Project is a key piece to connect sections of the Route 1 build. MCA has aligned the project schedule with the completion of civil milestones for the project. MCA also has resources in place working directly with the DOT team to troubleshoot potential delays.

Based on planning to date, the critical path for the project runs through NEPA review, make-ready, completion of I-395 extension, fiber deployment, then testing and turnover. If supply chain issues are more severe than anticipated, it is possible that hut or Outside Plant materials acquisition become a critical path item. MCA's intent is to order huts and other materials as early as possible to reduce risking project delays.

Below are quarterly project milestones, starting from the month following confirmation of award. We note that the total \$ spend figures below (\$41.0 million) exclude the \$12.4 million of in-kind contributions.

Q1 (\$7.2 million; 18% cumulative spend)

RFP for OSP design and engineering firm

RFP for fiber construction contractors

Start NEPA/SHPO reviews

Start engineering and design for huts and hut sites

Finalized network equipment engineering

Start OSP design and engineering for Routes 1-6

Start site surveys and pole walkouts for Routes 1-6

Order bulk of construction materials for Routes 1-6

Q2 (\$3.7 million; 27% cumulative spend)

Complete engineering and design for huts and hut sites
RFP for contractor to construct nine colocation huts
Place orders for precast hut buildings
Place orders for network equipment
Complete OSP design and prints for Routes 3-5
Make-ready applications for Route 1-6 submitted
Q3 (\$7.1 million; 44% of total)
Order additional construction materials
Start site prep and construction for Group 1 hut sites
█ starts construction Route 7
Secure building permits for all hut sites
Complete OSP design and prints for Routes 2,6
Q4 (\$9.3 million; 67% of total)
Complete site prep and construction for Group 1 hut sites
Route 7 construction, splicing and testing
Establish regional materials laydown yards with DOT
Start to receive OSP construction materials
Receive and place huts for Group 1 sites
Complete OSP design and prints for Route 1
Q5 (\$6.0 million; 81% total)
Install and light active network equipment for Route 7
Start site prep and construction for Group 2 Hut sites
Finalize Group 1 Hut sites – Complete final deliverables/sign off
Continue to receive OSP construction materials
Receive and place huts for Group 2 sites
Start construction for Routes 1, 3-6
Q6 (\$3.7 million; 90% of total)
Routes 3-5 – Construction, splicing and testing will be completed
Finalize Group 2 Hut sites – Complete final deliverables/sign off
Install and light active network equipment for Route 3-5
Start construction for Route 2
Start site prep and construction for Group 3 Hut sites
Q7 (\$3.1 million; 98% of total)
Routes 6 – Construction, splicing and testing completed
Complete site prep and construction for Group 3 hut sites
Receive and place huts for Group 3 sites
Install and light active network equipment for Route 6
I-395 Ext – All civil work and conduit have been placed
Q8 (\$0.8 million; 100% of total)
Routes 1 & 2 – Construction, splicing and testing completed.
Finalize Group 3 Hut sites – Complete final deliverables/sign off

Install and light active network equipment for Routes 1 & 2
Finalize all prints and deliverables

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Project Timeline File

Applicants are asked to upload a template which will denote key milestones for implementation of the project, including but not limited to field survey, network design, equipment/material procurement, environmental assessment, permitting, construction, network testing, network activation and completion.

MCA Middle Mile Construction Timeline_v5-09-28-2022 07-14-Maine Connectivity Authority-GRN-000174.pdf

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Is an extension being requested?

No

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Special Rules for Tribal Governments and Native Entities

The Infrastructure Investment and Jobs Act permits the Assistant Secretary, in consultation with Tribal governments and Native entities, to waive, or specify alternative requirements, in connection with most directives governing the MMG Program if the Assistant Secretary finds that waiver or modification of the requirement is necessary for (a) the effective delivery and administration of middle mile grants to Tribal governments or (b) the construction, improvement, or acquisition of middle mile infrastructure on trust land.

Is a waiver or alternative requirements requested?

No

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Fair Labor Practices

Applicants must have a demonstrated record of and plans to be in compliance with federal labor and employment laws as described in III.H in the NOFO. This will help ensure that projects are carried out in accordance with the law, assist NTIA in ensuring that a prospective awardee is capable of carrying out activities funded by an award in a competent manner in compliance with all applicable federal, state, and local laws; and promote the effective and efficient completion of high-quality middle mile broadband infrastructure projects by ensuring a reliable supply of skilled workers and minimizing disruptive and costly delays.

This response is limited to 6000 characters as an open field narrative.

The Maine Connectivity Authority (MCA) and its partners Networkmaine and the Maine DOT, as organizations created under the Executive Branch of the State of Maine, have a demonstrated record of adhering to labor policies in accordance with Maine Statutes Title 26, Chapter 7: Employment Practices, as well as those set forth by the State of Maine Department of Labor (Maine DOL) and the Fair Labor Standards Act (FLSA) and plan to be in compliance with federal labor and employment laws as they evolve.

The MCA is committed to practicing strong labor standards and keeping a safe, civil, and equitable workplace for its employees. At minimum, the MCA offers wages at or above the prevailing industry standards for similar job levels, and does not discriminate on the basis of sex, race, color, creed, national origin, age, religion, sexual orientation, gender identity, gender expression, pregnancy, genetic information, veteran status, disability, or any other characteristic protected by applicable federal, state, or local laws in employment with or treatment once employed in the company. MCA also abides by the project labor agreements for public works projects set forth in Title 26 §3601, upon discretion on a project-by-project basis that it is necessary and beneficial to do so. A certification attesting to this can be seen in the attached.

As MCA has grown its staff since its creation in 2021, the MCA has been proud to offer its new employees highly competitive wages compared to industry standards, as well as options for comprehensive benefits plans. Since the timing of the MCA's formation coincided with the rapid changes to workplace practices brought on by the COVID-19 pandemic, MCA offers hybrid work options and competitive paid time-off, sick leave, and vacation time. Also spurred by the Economic Administrations Good Jobs Challenge, MCA encourages the continued education of employees even beyond the duties of their committed role to the MCA. MCA is committed to engendering a highly-skilled workforce, starting with employing a Workforce Development Manager in October 2022 who will be focused on team oversight, building relationships with state agencies, business and higher education institutions, and developing workforce development programs with the focus of enabling workforce equity and combating the exodus of highly-skilled professionals that look for opportunity outside of their home state.

Additionally, for projects such as the proposed MOOSE Net, MCA will employ subcontractors in a competitive process to ensure fairness. Through the RFP selection process, MCA will pick the most suitable candidate that also conforms with the State's labor standards. MCA will also be forthcoming in its subcontractor compensation practices, especially pertaining to Davis-Bacon and Related Acts that dictate wages and workplace ethos. MCA will determine the applicability of Davis-Bacon to a contract when developing its RFPs and will include the appropriate terms to ensure compliance with state laws and the requirements of the Middle Mile Grant. This ensures that laborers and mechanics employed under the contract are compensated for no less than the locally prevailing wages and fringe benefits for corresponding work on similar projects in the area. For prime contracts in excess of \$100,000 (which will likely apply to this project in various capacities), contractors and subcontractors will also, under the provisions of the Contract Work Hours and Safety Standards Act, as amended, pay laborers and mechanics, including guards and watchmen, at least one and one-half times their regular rate of pay for all hours worked over 40 in a workweek. The overtime provisions of the Fair Labor Standards Act may also apply to DBA-covered contracts.

For all employees, MCA ensures safe working conditions. Specifically for construction employees, MCA acknowledges its responsibility in the oversight of making construction sites safer to alleviate construction fatalities. Employees have the right to personal protective equipment such as safety gloves, eye shields, helmets, and earmuffs. MCA and its subcontractors will ensure that equipment is working properly. Employees have the right not to work at an unsafe construction site until the MCA and its contractors makes the site safer. Construction employees also have the right and responsibility of reporting unsafe working conditions. Employees can report to the site supervisor or employer for the construction site to be made safer. MCA encourages employees to submit an inspection request to the Occupational Safety and Health Administration (OSHA) to inspect the construction site, if the supervisor or employer fails to make the site safer. Upon reporting to OSHA, an employee has the right to freedom from retaliation. Additionally, MCA and its subcontractors ensure employees working in a construction site have the right to information about the imminent hazards in the work site. This is regulated by OSHA Hazard Communication Standards, which require that an employer provide information about workplace risks and the preventive measures to be taken. Employees have the right to know about any dangerous chemicals in the construction sites, the imminent dangers posed by equipment and the health risks associated with working at a construction site. MCA will ensure appropriate oversight in all elements of these projects, as well as organizational policies, to maintain continued compliance to these principles.

Officer Certification

In order for NTIA to evaluate an applicant's demonstrated record of and plans to be in compliance with federal labor and employment laws, each applicant must provide examples of items described in III.H in the NOFO. Applicants are asked to upload a Certification from an Officer/Director-level employee (or equivalent) of the applicant evidencing consistent past compliance with federal labor and employment laws by the applicant, as well as contractors and subcontractors.

MCA Certification of Fair Labor Practices - s-09-29-2022 05-54-Maine Connectivity Authority-GRN-000174.pdf

Highly Skilled Workforce

To ensure that applicants have the technical and operational capacity to carry out the project, applicants must submit a plan for ensuring that the project workforce will be an appropriately skilled and credentialed workforce (including by the applicant and each of its contractors and subcontractors). The plan for a highly skilled workforce should include the information described in III.I in the NOFO.

This response is limited to 6000 characters as an open field narrative.

MCA's professional management team will manage the highly skilled workforce plan to ensure that all partners adhere to MCA policies and NTIA guidelines and that the project workforce will be an appropriately skilled and credentialed one. Maine is a large state geographically, but small interpersonally. The State of Maine agencies, along with consultants, gained experience throughout various federally and state funded grant projects, specifically the Three Ring Binder: a 1,100-mile fiber optic network. Those experiences have given The partners MCA, Networkmaine and Maine DOT a talent pool of technical and operational staff to operate the MOOSE Net project with a lean management team that oversees the contracted skills needed to fulfill the project scope.

MCA has signed a contract with Camoin Associates to conduct a comprehensive Broadband Workforce Analysis which will be completed in December 2022. The resulting report will outline recommendations and a strategy for meeting broadband workforce needs, including those presented by MCA Middle Mile activities. MCA has also hired a Workforce Development Manager who starts in October 2022, whose primary responsibility will be to implement an equitable workforce development strategy that ensures the hiring and training of skilled workers to meet the State's broadband needs, as well as its labor demand. Concurrently, a partnership with the Maine Community College System (MCCS) is adapting and rolling out targeted training programs at multiple campuses throughout the State. For operations of the project, Networkmaine will need to add personnel capable of oversight and maintenance of this network. It is crucial that this additional staff have experience in selling and provisioning both dark and lit fiber services.

For physical construction of the project, MCA will issue a competitive RFP for contractors who have favorable experience. MCA will request confirmation of registered apprenticeships, licensure, safety training, technical training and/or certification for relevant activities. The certifications listed here are defined and administered by the Fiber Optic Association, Inc. but analogous certifications will be considered, especially those through ETA International. Additionally, as a selection criteria, MCA will require a description of staff qualifications, and installation and safety training processes. During project build, MCA will periodically ensure that its selected partners follow state and federal OSHA regulations.

Role/Description/Certification and Experience/#

Business Ops

Project Managers

Manages multiple projects, tasks, and resources to meet target timelines

Bachelor's degree preferred. Understanding of the telecom industry and principals

PMP

2 (plus contractors)

OSP Engineer

Provide engineering designs with associated cost estimates as part of the design process. Design in GIS Fiber systems, and CAD systems as needed. Design fiber routes, structural design for the strand, down

guys, anchors. Meet or exceed a NESC for fiber communication engineering. Prepare network schematics and splice diagrams.

Bachelor's and P.E. designation required. Understanding of the telecom industry and principals. Advanced knowledge of NESC construction practices and engineering standards.

OSHA 30

1 (plus contractors)

Field Ops

Equipment Field Tech

Maintains/services equipment, completes customer installs

CFOT and CFOS/O

OSHA 10

Multiple Contractors

Aerial Telcom Lineman

Aerial construction, including make ready requirements, strand placement, cable placement, lashing, over-lashing, guying and other aerial telecom construction workflows.

Responsible for safe operation of all aerial bucket trucks and equipment

Ability to operate equipment, including, but not limited to aerial bucket truck, lashing equipment, and other equipment

3+ years' experience working on an aerial telecom construction crew

Valid US Driver's License with no major violations in the past 3yrs, CDL preferred

OSHA 10/30

Multiple Contractors

Fiber Splicer

Splice fiber optic cables, including loose tube and ribbon cables, and high count ribbon fiber of 864 count or higher, construct proper splice cases and fiber termination panels

Operate technical equipment, including but not limited to computer, OTDR, power meters, fusion splicing equipment, and understand the functions

Reading and interpreting work prints and splice diagrams

Installation and dressing of fiber optic cabling

Valid US Driver's License with no major violations in the past 3yrs

The ability to work safely, with or without supervision

3+ years' experience working as a splicer. CFOT, CFOS/O, CFOS/S and CFOS/T preferred.

OSHA 10

Multiple Contractors

Fiber Splicer Foreman

Responsible for working alongside the fiber splicing crews and coordinating task objectives and

workflows with the Construction Manager as well as providing daily supervisory oversight of fiber splicer

Operate technical equipment, including but not limited to computer, OTDR, power meters, fusion splicing equipment, and understand the functions

Minimum 5 years' splicing experience. CFOT, CFOS/O, CFOS/S and CFOS/T preferred.

Experience leading crew members

Strong work ethic and desire to be a leader

The ability to work safely, with or without supervision

OSHA 10/30

Multiple Contractors

Construction Manager

Oversee construction field operations with supervision and oversight of in house crews, subcontractors and inspection activities

This position leads and manages a team of employees and resource allocation for direct construction activities for the company

Oversees all aspects of line construction. Fiber installation, as built, close out packages and work schedules

Maintain a safe environment and ensure all safety standards are met

Previous 5 years of direct experience directing and managing large scale fiber construction or project builds

OSHA 10 or higher required

1 (plus contractors)

Total

4 + Multiple Contractor

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Advancing Workforce Development

A skilled workforce is critical to meeting infrastructure buildout timelines under the Infrastructure Act and connecting households across the country to reliable, affordable, high-speed broadband. A well-trained workforce will also allow for the safe deployment of sustainable networks. To meet the workforce needs of the MMG Program, applicants must make appropriate investments to develop a skilled, diverse workforce. Each applicant must provide as part of its application examples of items described in III.J in the NOFO.

This response is limited to 6000 characters as an open field narrative.

Maine is taking active efforts to build a more diverse and sustainable economy and added opportunities for Mainers to compete for skilled jobs in an ever-changing economy. The MCA is actively implementing a multi-pronged workforce development initiative to enable both Middle Mile and other telecommunications infrastructure deployment in Maine that links to both the state's digital equity and inclusion strategy as well as plans for a surge of infrastructure investments and the resultant education, training, and employment opportunities.

Several components of the telecommunications-specific initiative are underway, including:

First, MCA has recently hired a Workforce Development Manager (WDM) that will:

Collaborate with other MCA staff and teams to establish, lead and manage workforce programming for MCA on behalf of the State

Cultivate and maintain relationships with external partners and networks in the workforce development field, including and not limited to the Maine State Workforce Development Board, educational institutions, and relevant state agencies

Serve as the lead MCA point of contact with workforce partners at state agencies to align goals and initiatives and collaborate to achieve them

Oversee the production of a market analysis to identify opportunities and critical needs in the broadband workforce and education and training field

Inform and help develop budgeting in support of workforce development programs

Help manage grants and technical assistance to communities, regions, nonprofit partners and others to build workforce capacity

Design and manage educational and outreach programs to build the broadband workforce pipeline in partnership with internal and external partners, with a particular focus on recruiting underrepresented populations into the broadband workforce

Convene industry partners and develop ongoing structure to effectively understand, promote, and advocate for strategic workforce solutions

Ensure issued RFPs detail the appropriate compliance with NTIA's policies regarding the contingent activities, as well as confirming contractor and subcontractor compliance with those policies communicated by MCA

Second, MCA has selected a consultant - Camoin Associates - through a competitive RFP process, which will conduct a comprehensive workforce assessment and analysis to identify the size and scope of the need for additional workers and the existing and potential educational and training programs and partnerships that could meet that need. The consultant will make a set of initial recommendations, which will then be used by the WDM to design a strategy. The consultant's scope of work includes exploring other states' models for building the broadband workforce and making specific recommendations about how to engage underrepresented people in the workforce. Additionally, this consultant will help the WDM identify additional necessary resources to pursue activities related to the completion of this project and ensure that any RFP related to activities funded by this opportunity are in full compliance with the principles set forth by the NTIA's MMG NOFO.

Third, MCA has begun planning a pilot workforce development training program in partnership with

the Maine Community College System (MCCS). The MCCS has developed a specific proposal which is included in MCA's BEAD planning grant request. Next steps include convening industry partners to review and provide feedback on a curriculum; this is expected to take place in the fall of 2022. It is anticipated that this MCCS program will also include partnerships with the Maine Department of Education Adult Education and Apprenticeship programs; MCA has met with the staff of several state agencies including Department of Education, Department of Labor, and the Maine State Workforce Investment Board to begin work on these partnerships. Further, the MCA is functionally working with the Department of Labor Workforce Investment Boards to pursue grants in order to develop a strategic plan for workforce digital skills and engagement.

In addition to the Workforce Development Initiative, MCA has also established a 35-member Digital Equity Taskforce to help guide the development of the state's digital equity plan. The Taskforce represents and serves the covered populations named in the Digital Equity Act, including: low income households and families, people of color, tribal communities, older people, people in rural communities, veterans, English-language learners, people with disabilities, and others who face barriers to accessing and adopting broadband services. Several state agencies are represented on the Taskforce, including the Department of Economic and Community Development, Department of Health and Human Services, Department of Labor, Department of Education, and the Bureau of Veterans Services. MCA intends to create collaboration and communication between the workforce initiatives and the taskforce, to ensure that programs developed targeted un(der)served populations, create opportunities for a diverse pool of workers, and include wrap-around services to support workers. Equitable practices and incentives for Mainers to be involved with their State's efforts will inform the WDM's pursuit of qualified contractors and subcontractors by ensuring that they have goals that align with MCA's own. MCA will take all necessary affirmative steps to assure that minority businesses, women's owned enterprises and labor surplus area firms are used when feasible, as well as implement strategies to ensure that populations facing structural barriers to participate in the labor market have full and reasonable access to the job opportunities created by a successful award of this project. The newly hired WDM will ensure MCA compliance with NTIA principle, as well as contractor and subcontractor compliance with both NTIA and MCA principles.

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Climate Resiliency

Please demonstrate that the applicant has sufficiently accounted for current and future weather- and climate-related risks to new MMG Program infrastructure projects. In particular, each applicant should clearly demonstrate how it is conducting the items listed in III.K in the NOFO.

This response is limited to 6000 characters as an open field narrative.

In an effort to account for, mitigate, and avoid climate risks, the MCA reviewed reports and maps from NOAA, FEMA, and the State of Maine's Climate Action Plan (Maine Won't Wait) when assessing its proposed network design. The impacts of climate change will be pronounced in Maine impacting legacy industries such as fisheries, forestry and agriculture as well as pressuring land use demand as Northern New England becomes a pronounced destination for climate refugees. These pressures alone will drive demand for more access to resilient and resilient middle mile infrastructure.

By 2050, climate models suggest that the state of Maine may warm by 2–4 degrees Fahrenheit if no further action is taken to reduce greenhouse gas emissions. The proposed middle-mile network's climate resiliency plan focuses on the impacts to Maine's interior forests and coastal areas. Should additional routes be added through future funding and expansion efforts, MCA and Networkmaine will require an update to the climate resiliency plan accordingly.

FEMA's risk assessment map categorizes Maine in the very low and moderately low categories for weather hazard-type risks. FEMA's SoVI (Social Vulnerability Index), which considers the socioeconomic and demographic factors that contribute to a community's ability to prepare for, respond to, and recover from a hazard, rates Maine as slightly more vulnerable with a score of 40.13 versus the national average of 38.35. This is due in part to an aging population and unreliable access to communication infrastructure. Both of these factors were taken into account as MCA considered its climate resiliency plans.

The major impact of the temperature rise is expected to cause Maine to become both wetter, with more frequent storms of 2 to 4 inches of rain increasing the risk of flooding, as well as more prone to periods of drought, which impacts forests and increases risks of wildfire and disease. In addition to the drought and wildfire risks, Maine is also subject to wind, snow, and ice-storms that may put heavy loads on aerial fiber installations. Nor'easters and hurricanes are capable of impacting Maine and its surrounding areas with high winds and large amounts of rain, as recently seen by the damage wrought from Hurricane Fiona. Storms of this severity will only become a more common occurrence as climate change progresses. In partnership with The Governor's Office of Policy and Innovation for the Future - MCA will produce a climate impact and mitigation report with recommendations for the entire middle mile network, implement the appropriate recommendations, and update its climate impact study at least every five years for the life of the network.

MCA has designed the network to mitigate the foreseeable impacts of climate change by maximizing diverse aerial paths to minimize the impact of single-point-of-damage events from all causes. MOOSE Net's aerial fiber network will be primarily constructed using strand and lash installation on poles, and will avoid excessively long spans to ensure a higher margin of safety for resisting wind load and ice accumulation. MOOSE Net will have multiple diverse paths to interconnect with existing middle-mile providers and the Networkmaine core and backbone network. MOOSE Net will provide new connectivity paths to Canada in multiple locations which will be used to access internationally and geographically diverse internet infrastructure.

The nine new MOOSE Net colocation hut sites will consist of sturdy, weatherproof, precast concrete structures that are designed to resist hurricane force winds of up to 150 mph, with earthquake

resistance (Seismic Zone 4 rated) and fire rated for 1.5 hours. The huts will not be located in flood zones and will be continuously monitored for environmental conditions. They will have multiple physically diverse fiber cable entrance paths, dual HVAC systems, sump pumps where needed, battery and backup generator systems with a minimum of 72-hours of fuel; all best practices to minimize the risk of network outages from single point failures due to severe snow, wind, rain, or wildfire conditions. In addition to the MCA implementing strong construction and best practices procedures for climate resiliency, the MCA will coordinate and collaborate with state, local governments, and industry stakeholders. Using “soft options” such as education, public awareness, planning, political articulation, financial incentives, and insurance assistance are probably some of the strongest forms of mitigation that can be implemented with the least amount of cost.

Public works projects are another form of mitigation which can have an impact on the sustainability of the network. Engaging in discussions with agencies, the MCA can make recommendations for future public works projects to ensure that network infrastructure, reliability and survivability factors are considered as part of the project design and implementation. These solutions all require more coordination and are longer term, but when planned properly can have the biggest impact on the future hardening of the network.

With MOOSE Net’s infrastructure and features supplementing existing Maine networks, the overall resilience of the state and its internet infrastructure will be vastly improved.

Civil Rights and Nondiscrimination Law Compliance

Prior to distributing any MMG Program funding to a prospective awardee, NTIA will require the prospective awardee to agree, by contract or other binding commitment, to abide by the non-discrimination requirements set forth in III.J in the NOFO.

Do you agree to abide by the non-discrimination requirements?

Yes

Certification of Technical Capability

Each applicant must supply a certification attesting that it is technically qualified to complete and operate the proposed project.

MCA Certification of Technical Capability - s-09-27-2022 07-12-Maine Connectivity Authority-GRN-000174.pdf

Interconnect Policy

The Applicant must describe in detail the nondiscrimination, interconnection, and network management practices that would be adopted for the project facilities. The Applicant should

describe how it will comply with nondiscrimination and interconnection obligations, particularly with connectivity to the public Internet and physical interconnection for the exchange of traffic. In addition to describing network management practices, the Applicant should disclose any practices in place to block access to illegal or harmful content.

This response is limited to 6000 characters as an open field narrative.

The Maine Connectivity Authority (MCA) shall offer, on an open access basis, non-discriminatory carrier-neutral interconnection in perpetuity to potential terrestrial and wireless service providers including, public, private, non-profit and other parties making a bona fide request for interconnection for any network segments funded by the Middle Mile Grant (MMG). MCA's policy is to allow interconnection on the MMG funded routes at any point where commercially and technically feasible without adverse impact to the network and where sufficient excess capacity exists, or where prior contractual obligations that govern the use of infrastructure exist. Parties wishing to interconnect or co-locate must sign an interconnection/colocation agreement with MCA and abide by all applicable engineering and technical standards.

MCA shall review each request and provided that such access does not exceed current or anticipated capacity limitations, or have other adverse impacts on the network's reliability, financial viability, or operations, and that the party requesting interconnection is in good standing with MCA, MCA shall allow the interconnection.

Rates and terms for interconnection and colocation in network shelters, including one-time and ongoing charges, to the MMG funded network shall be commercially reasonable and nondiscriminatory. MCA may offer network peering or connection to the Internet at one or more locations. If it does so, such inter-exchange shall be on commercially reasonable terms and a non-discriminatory basis. If a party requests to interconnect with MCA's network where no point of interconnection or splice points currently exist or were preplanned for interconnection purposes, the requesting party shall bear all reasonable costs to improve the facilities to allow for interconnection. MCA shall contract with a network operator to manage the network, the sale of dark fiber via IRU, and lit services to service providers for the transport of telecommunications and networking data through the means of optical waves, circuits, or bandwidth backhaul. The operator contract shall bind the operator to the terms of this Interconnection policy.

Portions of the network operated by MCA's operator may be subject to network neutrality provisions. MCA's policy in offering lit services is to not give preference to any lawful content over any other either by source or destination, network protocol, or content.

MCA's Open Access, Interconnection and Network Nondiscrimination policies are subject to the needs of law enforcement and reasonable network management. As such, MCA may employ generally accepted technical measures to provide acceptable service levels such as caching and application-neutral bandwidth allocation, as well as commercially reasonable technical measures to prevent spam, denial of service attacks, illegal content, and other harmful activities. MCA's policy may be found at maineconnectivity.org/policies.

Note, MCA will account for and satisfy the following authorities: Parts II and III of Executive Order

11246, Executive Order 13166, and Executive Order 13798, to the extent applicable.

Technical Overview

Please describe targeted last mile service objectives, including last mile service provider letters of commitment, agreements, or contracts; and a description of the proposed service offerings, including the pricing of the services to be offered over the proposed facility.

This response is limited to 6000 characters as an open field narrative.

MOOSE Net will consist of three components: a 531-mile middle mile dark fiber backbone, nine Colocation Huts, and a lit services network. MCA will offer dark fiber via leases or IRUs, and lit service offerings in areas the route traverses. MOOSE Net will pass 11,162 un(der)served dwellings and 366 CAIs.

MOOSE Net is specifically designed to complement, leverage, and enhance Maine's original BTOP funded open access fiber network, the Three Ring Binder (3RB), by adding new routes that bisect and shorten existing paths, adding dark middle mile fiber into identified areas of need for un(der)served last mile, to maximize the long-term commercial potential of the network with route diversity from other networks, and include options for dark fiber connectivity to Canada.

Fiber Backbone

The 531 miles of new construction will extend open access middle mile fiber to 131 communities in Maine, including some of Maine's most un(der)served communities, averaging 59% un(der)served across the census tracts of the entire project. The seven network segments will use single mode 144 count fiber cable. The network will be built primarily on existing statewide pole infrastructure owned by power and telephone companies.

MOOSE Net will have multiple junctions with the 3RB, allowing Networkmaine and other service providers to connect rural and un(der)served communities to the broader internet. Additionally, the new junctions create options for new fiber rings to provide fault tolerant backbone connections, and reduce the mileage needed to ring protect some segments by up to 55%, lowering latency and costs.

Colocation Huts

Nine carrier-neutral colocation sites with facilities to house in-line amplification (ILA) and other network equipment will be constructed to meet the needs of telecom carriers and ISPs to utilize MOOSE Net.

Huts will be spaced about every 100 km along the route, consisting of 12x20 foot concrete precast buildings, with security fencing and individually controlled building access. Huts will be monitored 24x7 by the NOC, via a secure, private in-band and out-of-band operations and maintenance network. NOC will alert for site security, environmental parameters, power systems, and network status for all MOOSE Net services.

Huts will have dual redundant HVAC systems. Lockable cabinets will be available for lease, each with 30 amps of available industry-standard DC dual-power supplies with 8 hours of battery, backed by a power generator able to operate for 72 hours. There will be diverse fiber cable points of entry at

opposite sides of the huts, and MCA owned east and west cables shall not share any common pole or conduit into the hut.

Lit Core and Backhaul Network

As part of the project, Networkmaine will contribute 50% of their existing network capacity. The Networkmaine network will be expanded to include the nine colocation huts built for this project. Networkmaine will provide lit transport, interconnection/peering, and colocation services to CAIs and last mile providers across both the new MOOSE Net fiber and its existing footprint, tripling the reach of this project.

Networkmaine's existing statewide long-haul network currently supports optical DWDM and Carrier Ethernet transport with 4.8THz of spectrum, to deliver speeds ranging from 10Gb/s to 400Gb/s. Segment Routing will be used to (i) offer Metro Ethernet Forum compliant carrier Ethernet services and service levels and (ii) provide fast reroute capabilities in the event of a fiber cut. All routers and switches, core and aggregation, will be equipped with both 10 and 100-gigabit optics modules, and are upgradable to meet future needs.

This network has two primary Points of Presence (POPs) in Orono and Portland, Maine.

The Orono POP is located in a tier 3 data center at the University of Maine System's flagship campus, with path diverse, high capacity fiber routes off campus to 3RB and MOOSE Net. The data center also features on-net separate commercially available fiber lit services from [REDACTED] FirstLight, GoNetSpeed/OTELCO, and Charter/Spectrum.

The Portland POP is located at the University of Southern Maine campus, with path diverse, high capacity fiber routes off campus to 3RB, MOOSE Net, and 340 Cumberland Avenue in Portland, the state's only telecom carrier hotel, housing assets from Verizon, Charter, Spectrum, [REDACTED] FirstLight, GWI, Hurricane Electric, Crown Castle and others. Portland is also connected to New Hampshire and Boston via DWDM on leased fiber.

Both primary POPs feature collocations and interconnections from Maine's Internet Exchange for peering, and house a number of content delivery network caches, providing high performance on-net connectivity for common internet services.

In addition, Networkmaine has 20 existing regional POPs around the state where it supports local interconnection and transport services. MCA will look to strategically expand POPs leveraging Capital Projects Funding aligning CAI improvements that correspond with MOOSE Net routes.

The MCA will offer dark fiber lease and lit transport services pricing that is competitive to existing market prices. Dark fiber will be priced based on the existing 3RB tariff rates (\$16-30 per strand mile as of October 2018), indexed to inflation as is common industry practice. Lit transport services will also be offered at competitive market rates. As a not-for-profit entity, the MCA will prioritize offering affordable rates to facilitate last mile deployment that are also financially sustainable for the project. Attached to this section are multiple letters of support from last mile providers who have demonstrated interest in MOOSE Net, such as Axiom, GWI, Premium Choice Broadband, US Cellular, among others. Also, please see the attached State Coordination narrative for more references to the supplemental CAI letters of support.

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Applicants are encouraged to upload supplemental documentation.

Bangor Savings-09-29-2022 06-54-Maine Connectivity Authority-GRN-000174.pdf, Maine DOT-09-29-2022 06-56-Maine Connectivity Authority-GRN-000174.pdf, Unitel Direct Communications-09-29-2022 06-57-Maine Connectivity Authority-GRN-000174.pdf, _Governor Janet Mills-09-29-2022 06-54-Maine Connectivity Authority-GRN-000174.pdf, NETC letter of support (1)-09-29-2022 06-56-Maine Connectivity Authority-GRN-000174.pdf, US Cellular-09-29-2022 06-57-Maine Connectivity Authority-GRN-000174.pdf, EMDC LOS-09-29-2022 06-55-Maine Connectivity Authority-GRN-000174.pdf, Greater Franklin LOS-09-29-2022 06-55-Maine Connectivity Authority-GRN-000174.1.pdf, Maine State Library-09-29-2022 06-56-Maine Connectivity Authority-GRN-000174.pdf, Aroostook County-09-29-2022 06-54-Maine Connectivity Authority-GRN-000174.pdf, MCD Global Health-09-29-2022 06-56-Maine Connectivity Authority-GRN-000174.pdf, Axiom LOS-09-29-2022 06-54-Maine Connectivity Authority-GRN-000174.pdf, ██████████ LOS-09-29-2022 06-54-Maine Connectivity Authority-GRN-000174.pdf, Four Directions-09-29-2022 06-55-Maine Connectivity Authority-GRN-000174.pdf, Premium Choice-09-29-2022 06-57-Maine Connectivity Authority-GRN-000174.pdf, University of Maine System Letter of Support -09-29-2022 06-57-Maine Connectivity Authority-GRN-000174.pdf, Downeast Broadband-09-29-2022 06-54-Maine Connectivity Authority-GRN-000174.pdf, General Dynamics BIW-09-29-2022 06-55-Maine Connectivity Authority-GRN-000174.pdf, GWI-09-29-2022 06-55-Maine Connectivity Authority-GRN-000174.pdf, Matrix-09-29-2022 06-56-Maine Connectivity Authority-GRN-000174.pdf, National Digital Equity Center-09-29-2022 06-56-Maine Connectivity Authority-GRN-000174.pdf, SEDC- MCA Letter of Support-09-29-2022 06-57-Maine Connectivity Authority-GRN-000174.pdf, Island Institute LoS - MOOSE Net-09-29-2022 06-55-Maine Connectivity Authority-GRN-000174.pdf, Passamaquoddy Tribe-09-29-2022 06-56-Maine Connectivity Authority-GRN-000174.pdf, Waldo Broadband-09-29-2022 06-57-Maine Connectivity Authority-GRN-000174.pdf, LCI-09-29-2022 06-55-Maine Connectivity Authority-GRN-000174.pdf, Maine OIT-09-29-2022 06-56-Maine Connectivity Authority-GRN-000174.pdf, MaineHealth-09-29-2022 06-56-Maine Connectivity Authority-GRN-000174.PDF, Trailrunner LOS-09-29-2022 06-57-Maine Connectivity Authority-GRN-000174.pdf, Atlantic IXPs-09-29-2022 08-04-Maine Connectivity Authority-GRN-000174.pdf, State Coordination Narrative-09-29-2022 08-17-Maine Connectivity Authority-GRN-000174.pdf, Maine Public - LOS-09-29-2022 09-16-Maine Connectivity Authority-GRN-000174.pdf, MCA NTIA LoS_Xplore Inc DS-09-30-2022 01-52-Maine Connectivity Authority-GRN-000174.pdf, MCA - Support-09-30-2022 03-42-Maine Connectivity Authority-GRN-000174.pdf, Maine Broadband Coalition LoS - MOOSE Net-09-29-2022 06-55-Maine Connectivity Authority-GRN-000174.pdf, Sunrise County Economic Council-09-29-2022 06-57-Maine Connectivity Authority-GRN-000174.pdf

Competitive Landscape

The Applicant should describe existing middle mile offerings in the area, if any, including competitor data if applicable. This should include a description of the proposed service offerings, including the pricing and technology of the services to be offered over the proposed facility. Where possible, Applicant's project should be able to demonstrate a decline in middle mile costs that are likely to

flow through to consumer broadband prices.

This response is limited to 6000 characters as an open field narrative.

Middle mile networks typically connect major metro areas, where many end users and data centers are located, justifying the large amount of private capital investment needed to build. Maine has few large cities and no major data center markets. As the only state in the contiguous U.S. with only one neighboring state, Maine is not the beneficiary of networks that happen to traverse it to reach large metros located elsewhere, which is among the reasons it still has limited or no middle mile infrastructure, especially in MOOSE Net's PFSA. Maine is as large as the rest of New England yet has a significantly smaller metro and long haul fiber footprint than its peers.

To design MOOSE Net, MCA consulted almost every carrier and ISP in the state, collecting data on their existing owned and leased networks. Per the attachment, Maine's existing middle mile is primarily owned by two for-profit firms: FirstLight and [REDACTED]. FirstLight's network largely consists of the BTOP funded Three Ring Binder (3RB). [REDACTED] has a statewide footprint made up of legacy Verizon assets, built in the 1990s and early 2000s with a 30 year projected lifespan. There are some regional providers with limited footprints of middle mile in networks throughout the state, often consisting of older fiber with lower strand count and near the end of its projected lifespan. Of all these networks, only FirstLight has any obligation to provide open access, and that is only on the original 3RB routes. Based on consultations, there are no known plans to invest in new middle mile networks in MOOSE Net areas without government subsidies.

According to research by KPMG, as well as MCA's own investigations, private providers in Maine typically offer dark fiber leases at \$40-60 per route mile/month. Due to the conditions imposed on BTOP-funded networks, Firstlight offers lower pricing on 3RB-portions of its network, but this will only last for the next decade. Once those obligations expire, it is likely that prices will rapidly rise as private owners seek to leverage their assets.

Because Maine's ecosystem will not easily support multiple private networks, especially in the rural and less densely populated areas, it is essential for any new middle mile in Maine to be publicly owned to ensure lower costs for dark fiber and subsequent lit services for the long-term. Privately owned grant recipients are incentivized to charge higher prices to maximize their returns. Because access to broadband is essential to communities, with limited competition CAs and end users are forced to either pay the higher rates or go without. Even when a private owner is obligated to federal pricing requirements, it can – by creating new private lateral and last-mile routes – charge higher prices on those essential segments to get to the federally funded open-access routes, making it difficult for end users to actually benefit from the subsidized middle mile assets.

Without MOOSE Net, the few future projects that do move forward in these areas will likely only occur at higher consumer prices.

One example is Premium Choice Broadband (PCB), who provided a letter of support. PCB wants to invest in the last mile along Route 201. To justify an investment, PCB has to target a certain financial return. Without MOOSE Net, PCB would have to pay for 30 miles of pole attachments, strand and middle mile fiber construction from Jackman to the communities. At a cost of \$60,000 per mile, this

implies PCB would have to spend \$1.8 million to just reach the outskirts of these towns, let alone connect homes at the last mile. This \$1.8 million has to be recouped through higher consumer prices, estimated to be an additional \$210k/year to earn a 10% return over a 20-year life asset period. With a total of just 1,821 households in the service area (assuming a 50% take rate) each consumer will have to pay an additional \$230 per year, or almost \$20/month for PCB to justify this expenditure. With MOOSE Net, PCB can lease middle mile access and strand overlash attachment rights from the MCA. While leasing will result in a slightly higher operating cost for PCB, PCB will have invested far less capital and thus can more easily achieve their targeted return at a lower consumer price.

There are similar dynamics for multiple communities along this route. MOOSE Net will lower the upfront costs required by internet service providers to connect the last mile, making it much more feasible to provide service at an affordable cost.

Unlike a traditional private provider, the MCA is incentivized to price network services at the rates that best facilitate broadband expansion and serve the needs of communities and CAIs. MOOSE Net's public sector owner (MCA) and experienced public-benefit operator (Networkmaine) are well positioned to offer services at prices that financially sustain the network without needing to maintain a high profit margin. Given the centrality of this infrastructure, such pricing incentives are crucial to promoting a competitive broadband ecosystem. MCA will measure success by CAIs connected and last-mile un(der)served locations addressed, not by the profit earned.

Specifically, for MOOSE Net's dark fiber offering, MCA plans to offer prices comparable to the Maine Fiber Company 3RB tariff rates, indexed to inflation. As shown in the financial forecast, MOOSE Net dark fiber rates are assumed to be closer to \$30 per mile (or about half of current market rates) which should significantly reduce transport costs. Similarly, for MOOSE Net's lit services offerings, the MCA plans to offer both lower pricing and higher capacity services than are currently available in the PFSA. Given MCA's strategic positioning as the state broadband office, the MCA will work closely alongside last mile providers to best address the state's broadband goals: universally accessible connectivity that is affordable, reliable, and future-proof.

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Applicants are encouraged to upload supplemental documentation.

Competitive Landscape Supporting Documentatio-09-29-2022 09-20-Maine Connectivity Authority-GRN-000174.pdf

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Type of technology to be used in proposal:

Fiber Optic Technology

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Each applicant of an award to build middle mile infrastructure using fiber optic technology shall certify that the proposed project, upon completion, will include direct interconnection facilities that will facilitate the provision of lit broadband service, at speeds not less than 1 Gigabit per second for downloads and 1 Gigabit per second for uploads to anchor institutions located within 1,000 feet of the middle mile infrastructure, as detailed in the Template CAI below.

Do you agree to certify to the above?

Yes

Upload Template CAI. Required for Fiber Optic Technology, optional for Wireless or Other.

MCA MMG Community Anchor Institution Final-09-29-2022 06-29-Maine Connectivity Authority-GRN-000174.xlsx

An eligible entity applying for a middle mile grant may seek, and the Assistant Secretary may grant, a waiver of the requirements set out in the previous paragraph, in full or in part, to the extent the eligible entity demonstrates that the requirement is not technically or economically feasible.

Do you plan to apply for a waiver? If yes, please attach the waiver application in the Application Workspace, the Application Information section, Required Documents under Required Document Question 4 "Additional Waiver Upload".

No

Network Route Maps

Applicants should provide a physical network map that includes the following (if applicable):

The Project Area and those unserved and underserved areas which it will enable.

Applicant's pre-existing service area that demonstrates current service levels.

The physical path of the network's transmission medium (e.g., backbone and lateral cable routes, microwave links), transmission type, technology, operating bandwidth, capacity (e.g., dark vs. lit strand count), and cable placement (e.g., aerial, burial) should be displayed.

Points of interconnection (purely passive and non-environmentally controlled nodes, e.g., splice points are optional):Provider Facilities

Collocation Facilities

Private Interconnection Points with partnering service provider/private network

Wireless towers and associated coverage areas.

Anchor institutions within 1,000 feet, if desired.

Additionally, the maps should delineate between network and facilities that are:Part of the Applicant's/key partners' existing network;

Proposed as part of this project;

Leased from a third party;

Utilized under some alternative arrangement; or

Relevant to interconnection with either Last Mile or Middle Mile service providers.

PLEASE NOTE: Only ESRI Shapefiles will be accepted and uploaded.

MCA NTIA MMG SHP Package Complete-09-29-2022 09-31-Maine Connectivity Authority-GRN-000174.zip, remapstateofmainemiddlemilegrn000174-04-07-2023 05-03-Maine Connectivity Authority-GRN-000174.zip

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Data Submission Specification

There is a template “Upload Template Data Submission Specification” which shall be uploaded. Applicants must complete the table with information for all interconnection points proposed for the network. This table has three required fields: Point Name, Latitude and Longitude. This should accommodate all of the points of interconnection (passive, non-environmentally controlled points of interconnection, e.g., splice points, may be excluded), collocation facilities, central offices, head ends, and other centralized facilities, network access points to Last Mile service providers, Internet peering points, and towers.

MCA NTIA MMG Interconnection Points-09-27-2022 07-14-Maine Connectivity Authority-GRN-000174.csv.xlsx, InterconnectionPointsMooseNet (2)-04-07-2023 04-19-Maine Connectivity Authority-GRN-000174.xls, Interconnection Points SHP - NTIA MMG MOOSE N-04-07-2023 04-19-Maine Connectivity Authority-GRN-000174.zip, remapstateofmainemiddlemilegrn000174-04-07-2023 04-15-Maine Connectivity Authority-GRN-000174.zip

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Network Diagram

The Applicant must provide a high-level network diagram to be uploaded for the project that is a representation of the network, capacities, and facilities. The diagram must clearly denote which of the network elements already exist. The diagram should show:

The links between the network nodes. The types of facilities used in connecting the network elements (fiber, wireless microwave, etc.).

The points of interconnection and collocation facilities, including Internet peering points, access to local exchange carriers, central offices, or cable head ends.

The proposed aggregation node facilities that will provide the egress point(s) from the broadband backbone to the networks of the selected service provider(s), named Last Mile service providers, and the selected named Internet Service Provider(s) in the new infrastructure.

The Applicant should show which technologies are used and include bandwidth capacity constraints.

MCA_Middle_Mile Network Diagram_V1-09-29-2022 06-44-Maine Connectivity Authority-GRN-000174.10.pdf

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Environmental Narrative

Any project-related activity that may adversely affect the environment must not be undertaken prior to the completion of the environmental review process prescribed by NTIA. Doing so may jeopardize consideration of the application.

All Applicants for MMG projects must comply with the National Environmental Policy Act, the National Historic Preservation Act, and the Endangered Species Act, and other applicable environmental regulations.

Please provide a service-area environmental description that describes the physical project area and its surroundings (e.g., disturbed or developed land vs. open space; adjacent natural resources, such as rivers, wetlands, or forestlands; and any protected lands or resources in or near the project area), including site photographs and aerial photographs (e.g., Google Earth or Google Maps images), if the project includes construction and/or ground disturbing activities.

This response is limited to 12000 characters as an open field narrative with image files to be uploaded.

MOOSE Net has ten main areas where undisturbed ground disruption activities are anticipated. The Maine Connectivity Authority (MCA) plans to build nine colocation hut sites. Until final site engineering, MCA is screening a 10 mile by ½ mile section of the route to assess the potential environmental impact. Outside of the MCA's site construction, there is an 8-mile section along Route 9 where the MCA expects to construct a new pole line. All this work will be done on undisturbed ground, and extra precautions will be taken.

Please see attached map documents for all ten areas, highlighting the following summaries below.

Underground construction in disturbed ground areas

There are two locations where MCA expects to complete directional boring.

Colby College, Waterville - There are no aerial facilities on the college campus.

Lincoln St., Waterville - Planning on directional boring 2000' along this street to build the diverse route leaving Colby College. There is also a critical need to pickup two community anchor institutions that fall along this route as well.

For both areas, MCA expects this work will occur in pre-existing ROWs. The buried plant will consist of fiber optic cables placed in conduit at a minimum depth of 36-42 inches below the surface along established streets, roadways, or travel routes in town areas. Cable installed adjacent to road ROWs

will generally be within 10 feet of the edge of the pavement. If, for any reason, there are any cases of cultural, historical, or environmental concerns, all parties will fully comply with state, federal, and local regulations and requirements.

Environmental / Protected Areas Review

Reviewing available datasets provided by state and federal agencies, MCA has compiled a summary by impact area to highlight areas that could be affected by network construction and steps to mitigate any local environmental impact.

Wetlands

Maine has a significant amount of land area classified as wetlands. According to Maine's Department of Environmental Protection, roughly 25% of total land mass is classified as wetland, more than any other state in New England. From the data downloaded from the U.S. Fish and Wildlife Service's National Wetland Inventory website, there are some wetlands in the proposed project areas. Generally, stream crossings will be via aerial traverses. Where applicable, the MCA will coordinate with the Maine DOT to access spare conduits to cross. Alternatively, the MCA will bore under the streambed, if necessary. All construction activities will avoid or minimize impacts on wetlands, floodplains, and riparian drainage.

Critical Habitats / Endangered Threatened and Special Concern Wildlife

MCA pulled habitat and wildlife data from two sources. Critical habitat data came from the U.S. Fish and Wildlife Service. Endangered Threatened and Special Concern Wildlife data came from the Maine Department of Inland Fisheries and Wildlife.

In the State of Maine, these are the main species for critical habitats: Atlantic Salmon and Canadian Lynx. The Atlantic Salmon habitat is mainly around Maine's coastal areas but also extends inland due to Maine's rivers and streams. The Canadian Lynx habitat is primarily in northeast Maine. Both habitats overlap with the project builds. In southern Maine, the builds will cross over bridges, streams, and rivers where salmon are present. The Canadian Lynx is in the nearby forest in the northern portion of the state. All of the proposed routes are located on previously disturbed rights-of-way and MCA does not anticipate any disturbance to any threatened or endangered species.

Goldbrook Storage Yard – This yard currently resides within a critical habitat area. During construction, the necessary precautions will be taken to protect any species and take additional steps to not disturb the local habitat.

NRHS / Tribal Lands / NRAS

Maine's storied past and abundance of historical, archaeological, and tribal sites required the MCA to check the National Register to ensure that there were no impacts on the proposed routes and hut sites. Due to the proposed routes being in previously disturbed rights-of-way, the project does not anticipate any disturbance to either historical or archaeological sites. This will be confirmed through consultation with the State Historical Preservation Office during the NEPA review.

Coastal Management Areas

In total, there are 34 miles within existing coastal management areas. There are 16 miles west of Calais along the St. Croix River and Narrows, with a section going through the Penobscot River area in downtown Bangor. There are 18 miles of the route going from Damariscotta to Jefferson.

The project does not anticipate any disturbance of existing ground as all proposed routes are in previously disturbed rights-of-way. MCA plans on following all best practices and techniques

recommended by NOAA and FEMA.

Conserved Lands / Protected Lands

MCA pulled data from the Maine Department of Agriculture, Conservation, and Fishery to identify potential conflicts. Overlaying Maine's conserved lands layer, MCA identified an 8 mile section of new pole construction along Route 9 in Washington County, Maine where MCA may need to provide mitigation to avoid negative environmental impacts. This section of highway currently goes through the following areas.

Wetland areas: Present on the north and south side of the highway.

Critical habitat areas: In the streams that pass under the highway

Conservation Easements: Machias River tributaries

When working in this area MCA will rely on guidance provided from consultants, local, federal, and state agencies to mitigate and limit any adverse impacts to the environment. With the information, MCA will mandate all construction contractors working on this project to adhere to the guidance provided by these agencies.

Upload Map Images:

MCA Environmental Assessment Maps 1-10-09-29-2022 06-40-Maine Connectivity Authority-GRN-000174.pdf

Template Table of Funded Partners and Unfunded Collaborators

List all funded and unfunded project collaborators, including partners, subrecipients, match providers, major contractors/supplies, details on role/scope of work for project. A fillable Template of Funded Partners and Unfunded Collaborators can be found in found in the MMG ZIP folder.

MMG Template Table of Funded Part-09-30-2022 04-30-Maine Connectivity Authority-GRN-000174. and Unfunded Collaborators Final.xlsx

Certificate of Operational Capability

Each applicant must supply a certification from an officer-level employee (or individual of comparable rank) attesting to the applicant's operational capability to complete and operate the proposed project.

If the applicant has provided a voice and/or broadband internet access service, it must supply a certification from an officer-level employee (or individual of comparable rank) attesting that it has filed FCC Form 477s and the Broadband DATA Act submission, if applicable, to the extent required during this time period and otherwise complied with the Commission's rules and regulations. Alternatively, the applicant must explain any pending or completed enforcement action, civil litigation, or other matter in which it was alleged to have failed to comply with Commission rules or

regulations.

If the applicant has operated only an electric transmission or distribution service, it must submit qualified operating or financial reports that it has filed with the relevant financial institution for the relevant time period along with a certification that the submission is a true and accurate copy of the reports that were provided to the relevant financial institution.

If applicable, the applicant must submit a certification from an officer-level employee (or individual of comparable rank) that it has operated a middle mile broadband network for at least two years or that it is a wholly owned subsidiary of such an entity and must specify the number of years the applicant or its parent company has been operating.

MCA Certification of FCC 477 and BDC Data Fil-09-28-2022 07-19-Maine Connectivity Authority-GRN-000174.pdf, MCA Certification of Operational Capability --09-28-2022 07-19-Maine Connectivity Authority-GRN-000174.pdf

Certification of Financial Capability

Each applicant must supply a certification from an officer-level employee (or individual of comparable rank) attesting that it is financially qualified to meet the obligations associated with a project, that they will have available funds for all project costs that exceed the amount of the grant, and that they will comply with all MMG Program requirements, including service milestones.

MCA Certification of Financial Capability - s-09-28-2022 07-17-Maine Connectivity Authority-GRN-000174.pdf

Letter of Credit

During the application process, each applicant must submit a letter from a bank meeting eligibility requirements consistent with those set forth in 47 C.F.R. § 54.804(c)(2) committing to issue an irrevocable stand-by letter of credit, in the required form, to the applicant. The letter shall at a minimum provide the dollar amount of credit offered and the issuing bank's agreement to follow the terms and conditions of NTIA's model letter of credit. NTIA shall publish on its website a model letter of credit substantially similar to the model letter of credit established by the Federal Communications Commission in connection with the Rural Digital Opportunity Fund (RDOF - Rural Digital Opportunity Fund Order, 35 FCC Rcd at 773-77, Appx. C.).

NTIA will ensure, prior to issuing a middle mile grant award, that each eligible entity obtains an acceptable, irrevocable standby letter of credit in a value of no less than 25 percent of the award amount.

Each eligible entity shall provide with its letter of credit an opinion letter from its legal counsel

clearly stating, subject only to customary assumptions, limitations, and qualifications, that in a proceeding under Title 11 of the United States Code, 11 U.S.C. § 101 et seq. (the “Bankruptcy Code”), the bankruptcy court would not treat the letter of credit or proceeds of the letter of credit as property of the winning bidder’s bankruptcy estate under Section 541 of the Bankruptcy Code.

MCA NTIA letter signed - CNB-09-28-2022 07-18-Maine Connectivity Authority-GRN-000174.pdf, MMBB - Signed Commitment Letter for the Lette-09-28-2022 07-18-Maine Connectivity Authority-GRN-000174.pdf, Androscoggin Bank Letter of Support for MCA's-09-30-2022 10-17-Maine Connectivity Authority-GRN-000174.pdf, FAME letter-for-mca-ntia-middle-mile-project -09-30-2022 10-17-Maine Connectivity Authority-GRN-000174.28.2022.pdf, CNB_MCA NTIA letter 4-14-23-04-14-2023 03-43-Maine Connectivity Authority-GRN-000174.pdf

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Audited Financial Statement (Previous 3 Years)

Each applicant shall submit financial statements from the most recent fiscal year that are audited by an independent certified public accountant. If the applicant is not audited in the ordinary course of business, in lieu of submitting audited financial statements it must submit unaudited financial statements from the three prior fiscal years and certify that it will provide financial statements from the three prior fiscal years that are audited by an independent certified public accountant by an NTIA specified deadline.

***You must provide 3 years of audited financial statements.**

2019-CNSL-Annual-Report-10K-Shareholder-Ltr-c-09-29-2022 09-02-Maine Connectivity Authority-GRN-000174.pdf, 2020-CNSL-Annual-Report-10K-Shareholder-Ltr-c-09-29-2022 09-02-Maine Connectivity Authority-GRN-000174.pdf, 2021-Annual-Financial-Report-Accessible-09-29-2022 09-04-Maine Connectivity Authority-GRN-000174.pdf, 2021-CNSL-10K-Annual-Report_final (1)-09-29-2022 09-03-Maine Connectivity Authority-GRN-000174.pdf, CME Audit FY21-09-29-2022 09-03-Maine Connectivity Authority-GRN-000174.pdf, ConnectME Authority Financial Report YE 6-30--09-29-2022 09-03-Maine Connectivity Authority-GRN-000174.pdf, 2019-Annual-Financial-Report-Accessible-09-29-2022 09-03-Maine Connectivity Authority-GRN-000174.pdf, 2020-Annual-Financial-Report-Accessible-09-29-2022 09-03-Maine Connectivity Authority-GRN-000174.pdf, acfr2019-09-30-2022 01-57-Maine Connectivity Authority-GRN-000174.pdf, acfr2020v2_0-09-30-2022 01-57-Maine Connectivity Authority-GRN-000174.pdf, acfr2021-09-30-2022 01-57-Maine Connectivity Authority-GRN-000174.pdf

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Historical Financial Statements (Previous 3 Years)

Each applicant shall submit financial statements from the three prior fiscal years that are audited by an independent certified public accountant. If the applicant is not audited in the ordinary course of business, in lieu of submitting audited financial statements it must submit unaudited financial statements from the three prior fiscal years and certify that it will provide financial statements from

the three prior fiscal years that are audited by an independent certified public accountant by an NTIA specified deadline.

***You must provide 3 years of historical financial statements.**

FY2022 Maine Connectivity Authority Financial-09-29-2022 09-02-Maine Connectivity Authority-GRN-000174.pdf, MCA Financial Statement Letter - MMG - signed-09-30-2022 08-15-Maine Connectivity Authority-GRN-000174.pdf

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Budget Narrative

Applicants will create and submit a budget narrative that adequately describes all proposed activities and costs for their grant-funded project. Applicants must complete the file template, fill in all required information, and upload the file

. The file must be uploaded as a Word file, and not converted to a PDF. You can find additional guidance in the MMG Application Guidance.

MMG MCA MOOSE Net Budget Narrative Final-09-30-2022 04-52-Maine Connectivity Authority-GRN-000174.docx, MMG MCA MOOSE Net Budget Narrative Final-11-0-11-08-2022 12-15-Maine Connectivity Authority-GRN-000174.docx

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Template Detailed Budget Justification

The Detailed Budget Justification spreadsheet must reflect the cost categories that appear on the SF-424 and SF-424C and include itemized calculations for each cost placed under those categories. A fillable Template Detailed Budget Justification can be found in found in the MMG ZIP folder.

MMG Template Detailed Budget Justification Fi-09-30-2022 04-56-Maine Connectivity Authority-GRN-000174.xlsx

— — —

Any other funding provided for this project?

Yes

— — —

Please describe.

Connections to MOOSE Net, not funded under this proposal, are expected to directly benefit these areas.

In 2022, Maine received \$28.1M from NTIA BIP for LM projects in rural areas in NE Maine which can potentially utilize MOOSE Net for diverse middle mile.

MCA has received \$150M from CPF and the Maine Jobs and Recovery Plan. \$30M is reserved to develop additional middle mile to enable LM fiber. MCA plans to expand MOOSE Net to areas funded

by BIP, and to facilitate other strategic LM projects that are ineligible for MMG funding or covered by this proposed project.

\$90M of CPF funds are reserved for LM and/or line extensions, some of which can use MOOSE Net to reach areas currently not feasible with purely private funding. The other \$30M is reserved to support community efforts, such as broadband utility districts that will also benefit from access. Use of CPF will be critical to leverage existing resources being contributed by Networkmaine, to invest in additional optical networking equipment to put into the huts to extend initial MOOSE Net lit services to the entire MM service area.

Maine will receive BEAD funding to primarily fund LM service to un(der)served locations. The exact amount is unknown (but it will be at least \$100M and likely \$200-300M).

To sustain MCA efforts beyond federal funds, an annual impact assessment fee is assigned to MCA via the ConnectME Fund. This will provide about \$2M/year to MCA which will complement MOOSE Net, CPF, and ARPA investments enabling viable projects, partnerships, and sector building initiatives.

Utilizing MCA's borrowing and financing authority, the debt issued to initiate MOOSE Net, once paid down, will serve as an effective vehicle to establish a new revolving loan fund with key financial institutions in ME to further expand, maintain, and upgrade LM investments.

This grant lays the foundation to ensure that new digital infrastructure can be made available to all areas of Maine more swiftly and efficiently.

Template Pro Forma

Pro forma financial projection and analysis related to the project's sustainability, inclusive of subscriber (e.g., last mile network connections, other wholesale services), across an eight-year forecast period. A fillable Template Pro Forms can be found in the MMG ZIP folder.

MMG Template Pro Forma - MOOSE Net-09-30-2022 02-59-Maine Connectivity Authority-GRN-000174.xlsx

MMG Budget Narrative – Maine Connectivity Authority MOOSE Net Project

Applicant Name: **Maine Connectivity Authority**

Applicant Type: **State Government**

Proposed Period of Performance: **March 15, 2023 – March 12, 2025**

Total Project Costs: **\$53,353,132.12**

Total Federal Grant Request: **\$30,016,472.13**

Total Matching Funds (Cash): **\$10,954,558.99**

Total Matching Funds (In-Kind): **\$12,382,101.00**

Total Matching Funds (Cash + In-Kind): **\$23,336,659.99**

Total Matching Funds (Cash + In-Kind) as Percentage of Total Project Costs: **43.74%**

The total project costs are summarized by category in the following table and each category is explained further in the sections that follow. No indirect or ineligible costs have been included in the project budget.

Category	Total Cost	Federal Funds Requested	Cash Match Amount	In-kind Match Amount
1. Administrative and Legal Expenses	\$ 935,150.00	\$ 698,196.00	\$ 236,954.00	\$ -
2. Land, Structures, Rights-of-Way, Appraisals, etc.	\$ 18,062,453.00	\$ 5,569,911.00	\$ 2,036,139.00	\$ 10,456,403.00
3. Relocation Expenses and Planning	\$ -	\$ -	\$ -	\$ -
4. Architectural and Engineering Fees	\$ 3,427,803.00	\$ 2,510,180.00	\$ 917,623.00	\$ -
5. Other Architectural and Engineering Fees	\$ 168,000.00	\$ 123,027.00	\$ 44,973.00	\$ -
6. Project Inspection Fees	\$ 252,000.00	\$ 184,539.00	\$ 67,461.00	\$ -
7. Site Work	\$ 1,800,000.00	\$ 1,318,140.00	\$ 481,860.00	
8. Demolition and Removal	\$ -	\$ -	\$ -	\$ -
9. Construction	\$ 23,757,064.81	\$ 17,397,298.00	\$ 6,359,766.81	\$ -
10. Equipment	\$ 1,547,780.00	\$ 164,768.00	\$ 60,232.00	\$ 1,322,780.00
11. Miscellaneous	\$ 602,918.00	\$ -	\$ -	\$ 602,918.00
12. Sub-Total	\$ 50,553,168.81	\$ 27,966,059.00	\$ 10,205,008.81	\$ 12,382,101.00
13. Contingencies	\$ 2,799,963.31	\$ 2,050,413.13	\$ 749,550.18	\$ -
14. Sub-total with Contingency	\$ 53,353,132.12	\$ 30,016,472.13	\$ 10,954,558.99	\$ 12,382,101.00

1. Administrative and Legal Expenses - Total Cost: \$935,150 Federal Share: \$698,196

	Unit Type	Unit Cost	No. of Units	Total Cost	Federal Funds Requested	Cash Match Amount
1. Administrative and Legal Expenses						
Legal Expenses	Hour	\$250.00	800	\$200,000.00	\$146,460.00	\$53,540.00
Project Manager - Salary	Other	\$115,000.00	2	\$230,000.00	\$168,429.00	\$61,571.00
Project Manager - Fringe	Other	\$34,500.00	2	\$69,000.00	\$50,529.00	\$18,471.00
Director of Broadband Impact - Salary	Other	\$22,500.00	2	\$45,000.00	\$32,954.00	\$12,046.00
Director of Broadband Impact - Fringe	Other	\$6,750.00	2	\$13,500.00	\$9,886.00	\$3,614.00
Accounting, Compliance & Reporting Manager - Salary	Other	\$44,000.00	2	\$88,000.00	\$64,442.00	\$23,558.00
Accounting, Compliance & Reporting Manager - Fringe	Other	\$13,200.00	2	\$26,400.00	\$19,333.00	\$7,067.00
Grants Manager - Salary	Other	\$21,250.00	2	\$42,500.00	\$31,123.00	\$11,377.00
Grants Manager - Fringe	Other	\$6,375.00	2	\$12,750.00	\$9,337.00	\$3,413.00
Staff Skills and Certifications training	Hour	\$125.00	400	\$50,000.00	\$36,615.00	\$13,385.00
Subject Matter Expert Consulting Support	Hour	\$250.00	432	\$108,000.00	\$79,088.00	\$28,912.00
Costs expended in preparation of the Grant Application	Item	\$50,000.00	1	\$50,000.00	\$50,000.00	\$0.00

In developing the administrative and legal estimates, MCA worked with Networkmaine, [REDACTED] and KPMG to determine the amount of internal MCA administrative resources that would be required to execute and oversee the project. These costs break down as follows:

- Legal expenses = \$200,000
 - 400 hours per annum for two years = 800 hours total @ average cost of \$250 per hour
 - Average rate is all-inclusive, including benefits
 - Legal hours will be used for the middle mile program only
 - Selection process - follow MCA's Procurement Policies, including issuing a competitive RFP unless single source contract is deemed eligible and appropriate
 - Contractor's rates will be required to be all inclusive.
 - The contract amounts will be determined using a budgetary cost estimate based on the number of hours anticipated required for the scope of work, and based on an average hourly rate that is expected to be ~\$250.
 - Areas of legal support needed
 - Documentation expenses for creating the entity and partnerships, vetting RFPs and other documents, handling contracts with relevant counterparties and any pre-sale revenue contracts and other matters as may arise during the course of the project.

- Project Manager = \$299,000
 - Salary = \$230,000 (2 years @ \$115,000 salary @ 100% allocation)
 - The Project Manager position will have a salary of \$115,000 per year.
 - This position is currently unstaffed
 - The position duties will be focused on oversight and management of the project on a day to day basis.
 - Fringe = \$69,000 (assumed approximately 30% of salary) - the fringe benefit rate is assessed against salaries. Fringe benefits for this position include health/dental/vision care, life insurance, long-term disability, retirement, and workers compensation.
- Director of Broadband Impact = \$58,500
 - A portion of existing Director of Broadband Impact's time will be dedicated to providing higher-level oversight and support to the project (18% of a full time equivalent employee over two years)
 - The Director of Broadband Impact position has a salary of \$125,000 per year
 - Salary = \$45,000 (2 years @ \$125,000 salary @ 18% allocation)
 - Fringe = \$13,500 (assumed approximately 30% of salary) - the fringe benefit rate is assessed against salaries. Fringe benefits for this position include health/dental/vision care, life insurance, long-term disability, retirement, and workers compensation.
- Accounting, Compliance & Reporting (AC&R) Manager = \$114,400
 - A portion of AC&R Manager's time will be dedicated to providing higher-level oversight and support to the project (40% of a full time equivalent employee over two years)
 - Salary = \$88,000 (2 years @ \$110,000 salary @ 40% allocation)
 - The AC&R Manager position will have a salary of \$110,000 per year.
 - This position is open and actively being hired
 - The position duties will be focused on ensuring that the organization has the proper accounting, compliance, and reporting structure and capacity, plus includes reviewing certified payrolls or other proof related to payment of prevailing wages or higher
 - Fringe = \$26,400 (assumed approximately 30% of salary) - the fringe benefit rate is assessed against salaries. Fringe benefits for this position include health/dental/vision care, life insurance, long-term disability, retirement, and workers compensation.
- Grants Manager = \$55,250
 - A portion of the existing Grants Manager's time will be dedicated to providing higher-level oversight and support to the project (25% of a full time equivalent employee over two years)
 - Salary = \$42,500 (2 years @ \$85,000 salary @ 25% allocation)
 - The Grants Manager position will have a salary of \$85,000 per year.
 - The position creates, adapts, manages, and coordinates grant processes for broadband access/assistance programs.
 - Grant process includes application, follow-up communications, review, disbursement, reporting, and follow-up compliance/impact data collection.
 - Management of efficient and effective grant processes, while ensuring compliance with federal and state regulations
 - Will aid in the outreach of broadband access to meet the State's connectivity goals.
 - Fringe = \$12,750 (assumed approximately 30% of salary) - the fringe benefit rate is assessed against salaries. Fringe benefits for this position include health/dental/vision care, life insurance, long-term disability, retirement, and workers compensation.

- Training = \$50,000
 - MCA is budgeting to support staff development and training related to specific areas of the middle mile grant
 - 200 hours per annum for two years = 400 hours total @ average cost of \$125 per hour (an all inclusive rate)
 - Selection process - follow MCA's Procurement Policies, including issuing a competitive RFP unless single source contract is deemed eligible and appropriate
 - MCA will issue a competitive RFP process for training services. Contractor's rates will be required to be all inclusive.
 - The contract amounts will be determined using a budgetary cost estimate based on the number of hours anticipated required for the scope of work, and based on an average hourly rate that is expected to be ~\$125.

- Subject Matter Expert Consultants = \$108,000
 - MCA is budgeting for support from subject matter experts on issues that may arise periodically during the course of the project on matters of construction, environmental or cultural concerns post NEPA review (NEPA preparatory costs are budgeted as a separate line item), network equipment and configuration, permitting, tribal interactions, or other areas as may be necessary.
 - 216 hours per annum for two years = 432 hours total @ average cost of \$250 per hour (an all inclusive rate)
 - Selection process - based on MCA's Procurement Policies, including issuing a competitive RFP unless single source contract is deemed eligible and appropriate
 - Contractor's rates will be required to be all inclusive.
 - The contract amounts will be determined using a budgetary cost estimate based on the number of hours anticipated required for the scope of work, and based on an average hourly rate that is expected to be ~\$250.

- Grant Application Preparation = \$50,000
 - Advisory costs expended in preparation of the grant application after issuance of the NOFO
 - Preparation costs will cover a portion of expenses already incurred to engage [REDACTED] and KPMG as consultants to support this application, for a total all inclusive consulting cost of \$250,000

2. Land, structures, rights-of-way, appraisals, etc. - Total Cost: \$ 18,062,453 Federal Share: \$ 5,569,911 In-kind Contribution: \$ 10,456,403

2. Land, Structures, Rights-of-Way, Appraisals, etc.	Unit Type	Unit Cost	No. of Units	Total Cost	Federal Funds Requested	Cash Match Amount	In Kind Contribution Value
Make Ready- Telco / Elco Average per pole all-in costs	Item	\$400	13,740	\$5,496,000	\$4,024,721	\$1,471,279	
Pre-Cast Fixed Mold Huts Delivered & Installed	Item	\$234,450	9	\$2,110,050	\$1,545,190	\$564,860	
DOT Right-of-Way Contributions	Item	\$4,940,000	1	\$4,940,000	\$0		\$4,940,000
Networkmaine Contributed IRUs	Item	\$5,516,403	1	\$5,516,403	\$0		\$5,516,403
Sub-Total				\$18,062,453	\$5,569,911	\$2,036,139	\$10,456,403

Route conditions were carefully assessed by [REDACTED] an engineering firm that has done a number of fiber optic deployment projects similar to this proposal. In assessing the work necessary for this project, [REDACTED] identified the following items for inclusion in the budget of the grant:

- **Aerial - Make Ready** – [REDACTED] assessed the condition and usage of the poles along the route to determine a reasonable make-ready cost/pole. These costs are influenced heavily by an allocation between the pole owner and the attachor based on whether or not there is a violation of safety or installation standards on the pole. [REDACTED] observed that a high number of poles along the route were very old and/or had obvious violations. As a result of this assessment and its prior experiences in Maine, [REDACTED] determined that an average cost of \$400 per pole (for 13,740 poles) and an average span length of 200' between poles was reasonable for the routes included in the grant. This cost is an all-in number which accounts for initial ride-outs to prepare make ready estimates, any pole swaps at MCA's expense, and all engineering, labor, and attachment relocation and inspection work during the Make Ready process. The \$400/pole number is reasonable based on MCA's and [REDACTED] prior experiences in Maine, the fact that portions of the route may be subject to one-touch make-ready and/or allow installation below the telco lines, and the fact that many of the poles in the area are known to be past their useful expected life and will therefore have to be replaced at the pole-owners expense.
- **Precast Fixed Mold Hut Buildings** – [REDACTED] network design identified a need for nine new huts for Inline Light Amplification, core network equipment support, and to provide opportunities for ISP's to collocate equipment to use the network without having to build their own facilities. [REDACTED] requested an estimate from a major supplier of this type of building and whose pricing is representative of the industry and received a quote that each hut will cost about \$234,450. This cost also includes delivery and installation of the structure at the site. Site preparation is covered under a different budget item. Selection process will follow MCA's Procurement Policies, including issuing a competitive RFP unless a single source contract is deemed eligible and appropriate. Contractor's rates will be required to be all inclusive.
- **DOT Right of Way Contributions** – will facilitate rapid deployment of these routes, which it will be able to leverage in support of its facilities and Intelligent Traffic Systems. Maine DOT's contribution is in the form of access and occupancy to DOT Right of Way without fees; the use of employee time and assistance; engineering review of construction/installation plans and equipment specifications for consistency with transportation needs and infrastructure; and access to conduit on the Route 9 Connector, a new road that is being built during the construction period of this project. Maine DOT determined the total value of its contribution by conservatively estimating the value of MCA's needed ROW access and by estimating consultant time saved through DOT administrative and technical support using approximations provided by consulting partners. ROW access value was calculated using monthly lease prices that were bid for a recent solar utility project, which also included energy bill credits in total contract value. Energy credit value made up almost 93% of total project value and ROW leasing accounted for the remaining 7%, so it was concluded that this ROW access value estimate was very conservative. Consultant time for tasks that Maine DOT staff could assist with was estimated to be \$2/foot by consultant partner and Maine DOT expects that its staff could complete at least 10% of that work leading to a saved value of \$.20/foot. Documentation of specific estimation calculations and methods can be provided upon request.
- **Networkmaine Contributed IRUs** – Networkmaine is making 50% of the capacity of its existing lit fiber IRUs along the BTOP funded Three Ring Binder routes and a route that roughly follows the I-95 corridor between Orono and Portland available to MCA through its partnership in this project. MCA valued the contribution from Networkmaine based on the market value (the value to lease approximately 1,150

miles at the Maine Fiber Company tariff rate, adjusted for inflation). The Maine Fiber Company tariff rate was \$16.25 as of October 2018. Adjusted for inflation, this implies a lease price of approximately \$19 per strand mile per month. This rate was applied to the remaining value of the IRUs and discounted at 7.5% to calculate the net present value. This valuation method is conservative as the inflation-adjusted Maine Fiber Company tariff rate is well below rates that MCA could obtain commercially in the New England area (based on input from KPMG and MCA's discussions with private providers).

3. Relocation expenses and payments – None.

4. Architectural and engineering fees - Total Cost: \$ 3,427,803 Federal Share: \$ 2,510,180

4. Architectural and Engineering Fees	Unit Type	Unit Cost	No. of Units	Total Cost	Federal Funds Requested	Cash Match Amount
Hut Engineering	Item	\$ 10,000	9	\$90,000	\$65,907	\$24,093
Fiber Route Engineering	Foot	\$1.38	2,418,698	\$3,337,803	\$2,444,273	\$893,530

MCA has budgeted for the engineering work needed for installation of huts and fiber during the project. These costs break down as follows:

- Hut Engineering – MCA has identified a need for nine new huts along the route to support Inline Light Amplification, other core network equipment, and carrier-neutral colocation of ISP equipment. There is minimal engineering effort in the huts themselves as they are pre-formed structures commonly used in the industry. There is, however, engineering required for site work, in-hut rack configuration, and interconnection of the huts to the network and power grid. MCA has estimated this amount as averaging \$10,000 per site based on typical Maine rates and MCA hiring a construction contractor whose engineer will perform this work.
- Fiber Route Engineering – The vast majority of the fiber route is aerial, with under 3% underground construction (most of which will be in existing ducts). Being a provider of these services, [REDACTED] is very familiar with the engineering work required (preliminary designs, final designs, CADD plans, and as-builts) and the costs included by fiber contractors for this work in Maine. Using both its broad industry experience and local Maine experience, [REDACTED] estimates engineering effort will average \$1.38/foot for all engineering for the project that is not directly in support of make-ready (as those costs are captured in the cost/pole estimate for make-ready).

5. Other architectural and engineering fees - Total Cost: \$ 168,000 Federal Share: \$ 123,027

5. Other Architectural and Engineering Fees	Unit Type	Unit Cost	No. of Units	Total Cost	Federal Funds Requested	Cash Match Amount
Environmental & Cultural Consulting Support	Hour	\$ 180	400	\$72,000	\$52,726	\$19,274
GIS Support and Updates	Hour	\$ 200	480	\$96,000	\$70,301	\$25,699

MCA has included the following as additional architectural and engineering support based upon similar efforts currently being managed through NTIA's Broadband Infrastructure Program:

- Environmental & Cultural Consulting – Budgeted costs in support of the anticipated NEPA reviews and State Historic Preservation Office processes that MCA anticipates prior to construction getting underway. The estimate here is based on the all-inclusive hourly rate of \$180 recently paid to a consulting firm for similar work on other projects. Selection process will follow MCA's Procurement Policies, including issuing a competitive RFP unless a single source contract is deemed eligible and appropriate. Contractor's rates will be required to be all inclusive.
- GIS Support and Updates – MCA has invested heavily in GIS based tracking of fiber assets throughout the state as well as the analysis that such technology enables. MCA has contracted with VETRO (via a single source contract due to VETRO's specialized skill set) and created a Broadband Intelligence Platform to track and analyze broadband adoption and barriers to adoption in Maine. VETRO will be required to frequently update and report on the information contained in the GIS system as the project progresses as Maine will continue to extend the level of detail captured in its broadband tracking systems. The all-inclusive hourly rate of \$200 is based on the contractual rate between MCA and VETRO. Selection process will follow MCA's Procurement Policies, including issuing a competitive RFP unless a single source contract is deemed eligible and appropriate. Contractor's rates will be required to be all inclusive.

6. Project Inspection fees - Total Cost: \$ 252,000 Federal Share: \$ 184,539

6. Project Inspection Fees	Unit Type	Unit Cost	No. of Units	Total Cost	Federal Funds Requested
Field Construction Supervisor (contractor)	Hour	\$ 250	576	\$144,000	\$105,451
Final Validation & Punch List Closure (contractor)	Hour	\$ 250	432	\$108,000	\$79,088

MCA has budgeted for two specific project inspection costs beyond routine project inspection that will be incorporated into the requirements for the construction contractors. These costs are:

- Field Construction Supervisor – MCA will use a contractor with extensive hands-on experience in construction of fiber networks. This person will inspect the physical plant and construction processes at various times while construction is underway and will be present as much as practical when new underground construction is being undertaken as there is no reasonable way to verify compliance with code and contract once the work is buried. MCA based this estimate on a reasonable all inclusive hourly consulting rate of \$250 in Maine for a highly skilled construction supervisor and estimated the hours based on the amount of time reasonably required to visually inspect 500+ miles of geographically dispersed fiber, nine huts, and the roughly 12 miles of new underground expected during the project. Selection process will follow MCA's Procurement Policies, including issuing a competitive RFP (potentially including multiple service requirements) unless a single source contract is deemed eligible and appropriate. Contractor's rates will be required to be all inclusive.
- Final Validation & Punch List Closure – MCA will use contractors to perform a final independent validation of the installed network and the project documentation of that network. This inspection and validation will happen after the fiber is installed and during the project close-out period. It will ensure that all fiber was installed properly, that the MCA plant causes no code violations, that access points for CAIs were

properly placed, and that the project documentation (in the form of either red-lines or as-builts) reasonably matches the installed plant and facilities. MCA based this all inclusive hourly rate of \$250 on using experienced consultants and based the level of effort on the distances involved and the amount of effort needed to properly compare the installed plant with the engineering drawings. Selection process will follow MCA's Procurement Policies, including issuing a competitive RFP (potentially including multiple service requirements) unless a single source contract is deemed eligible and appropriate. Contractor's rates will be required to be all inclusive.

7. Site work - Total Cost: \$ 1,800,000 Federal Share: \$ 1,318,140

8. 7. Site Work	Unit Type	Unit Cost	No. of Units	Total Cost	Federal Funds Requested
50x50 Compound / All Inclusive Site Prep for Hut compound	Item	\$ 200,000	9	\$1,800,000	\$1,318,140

MCA has budgeted for site work for placement of nine network infrastructure and carrier-neutral colocation huts at strategic points along the new build of the network. The estimate for this work was prepared based on recent experience from [REDACTED] in deploying similar huts on a different project. The estimate includes all the work needed to establish a site suitable for a hut in a previously disturbed area. This includes obtaining permits, clearing and grading the land as needed, installing separate concrete pads for the hut, generator, and generator fuel tank, installing multiple conduits into the facility, creating a driveway and parking area, installing a security fence, connecting to the electricity grid, installing lights, motion sensors, cameras and other security devices, then landscaping the area as appropriate including planting trees. Delivery and installation of the huts is covered under a separate line in the budget. The estimate for this work was prepared based on recent experience from [REDACTED] in deploying similar huts on a different project and a conversation with that contractor in August 2022 to update pricing information. Selection process will follow MCA's Procurement Policies, including issuing a competitive RFP (potentially including multiple service requirements) unless a single source contract is deemed eligible and appropriate. Contractor's rates will be required to be all inclusive.

8. Demolition and removal – None.

9. Construction - Total Cost: \$ 23,757,064.81 Federal Share: \$ 17,397,298.00

9. Construction	Unit Type	Unit Cost	No. of Units	Total Cost	Federal Funds Requested
24x36 Vault	Item	\$422.00	26	\$10,972.00	\$8,035.00
4" HDPE Conduit	Foot	\$5.07	49,068	\$248,774.76	\$182,178.00
4" PVC Conduit	Foot	\$11.02	36,000	\$396,720.00	\$290,518.00
Anchor	Item	\$80.42	4,580	\$368,329.37	\$269,728.00
Down Guy	Item	\$20.00	4,580	\$91,601.43	\$67,080.00
Fiber Slack Loop	Foot	\$1.27	302,285	\$383,901.95	\$281,131.00
Fiber Snow Shoe	Item	\$73.73	2,748	\$202,610.04	\$148,371.00
Guy Guard	Item	\$25.00	4,580	\$114,501.79	\$83,850.00
Messenger Strand 1/4" (6.6 ehs) and Hardware	Foot	\$0.66	2,418,278	\$1,596,063.48	\$1,168,797.00
Splice Case (FOSC 450D)	Item	\$614.58	573	\$352,154.34	\$257,883.00

9. Construction	Unit Type	Unit Cost	No. of Units	Total Cost	Federal Funds Requested
Splice Case Fiber Tray (FOSC 450D)	Item	\$50.00	2,290	\$114,500.00	\$83,848.00
144 Loose Tube Fiber Cable	Foot	\$1.16	2,418,278	\$2,805,202.48	\$2,054,250.00
4" HDPE Conduit via Directional Bore	Foot	\$18.00	48,849	\$879,282.00	\$643,898.00
Anchor (PF3-5A)	Item	\$225.00	4,580	\$1,030,500.00	\$754,635.00
Butt Splice 1-24	Item	\$40.00	23,044	\$921,760.00	\$675,005.00
Cable Placement	Foot	\$0.94	60,849	\$57,198.06	\$41,886.00
Down Guy (PE1-3)	Item	\$55.00	4,580	\$251,903.94	\$184,469.00
Flaggers	Foot	\$0.45	2,418,278	\$1,088,225.10	\$796,907.00
Guy Guard	Item	\$25.00	4,580	\$114,500.00	\$83,848.00
Install Strand 1/4" (6.6 ehs) & Fiber	Item	\$2.40	2,357,429	\$5,657,738.00	\$4,143,162.00
Mechanical Trenching - 6" Width w/ Seed & Straw	Foot	\$22.00	12,000	\$264,000.00	\$193,327.00
PREP Splice Case 450 B,C,D	Item	\$270.00	573	\$154,710.00	\$113,294.00
Restoration/Access Snow Shoe & Slack Loop	Item	\$275.00	2,748	\$755,700.00	\$553,399.00
Vault Installation	Item	\$250.00	26	\$6,500.00	\$4,760.00
Construction Butt Splicing	Item	\$40.00	11,522	\$460,875.00	\$337,499.00
Attached Bridge Conduit - \$85 per LF for Bridge Attachment (1) 2" GRC	Foot	\$85.00	2,643.00	\$224,655.00	\$164,515.00
Highway Traffic Control <1000 LF @ \$50 + Traffic Control @ \$4 ft	Foot	\$54.00	401.00	\$21,654.00	\$15,857.00
Railroad Xing Traffic Control <1000 LF @ \$6.50 + Flaggers @ \$5 ft	Foot	\$11.50	1,148.00	\$13,202.00	\$9,668.00
Highway Traffic Control <1000 LF @ \$6.50 + Traffic Control @ \$4 ft	Foot	\$5.25	533.00	\$2,798.25	\$2,049.00
River / Bridge - Traffic Control <1000 LF Per Crossing	Foot	\$5.00	14,157.00	\$70,785.00	\$51,836.00
Other Fiber Deployment Construction Costs expected in bid pricing	Item	\$3,166,317.00	1	\$3,166,317.00	\$2,318,694.00
Route 7	Mile	\$26,398.00	73	\$1,929,429.82	\$1,412,921.00

This construction budget accounts for all costs associated with the cable placement, aerial attachment, and fiber splicing with the construction of proposed Routes 1-6, along with [REDACTED] costs associated with proposed Route 7. The individual line items do not, however, include the non-construction costs likely to be included in a bid by a construction contractor. Those costs are estimated separately as described below.

In developing the construction estimates, MCA worked with [REDACTED] to use advanced tools such as FOND (Fiber Optic Network Designer) and a wide range of GIS layers to put together a detailed analysis of the route. [REDACTED] has extensive experience in designing and building fiber optic networks such as proposed here. [REDACTED] used this initial design as the basis for conducting virtual and physical visual assessments of the route along with other GIS tools to identify sensitive habitats, river and stream crossings, bridges, highway crossings, and other areas of the network that would likely require special construction techniques or higher costs. The design was then

manually adjusted and tweaked to ensure that it reflected field conditions and placed slack loops and interconnection points at locations strategic to connecting CAI's and clusters of potential locations. Unless otherwise noted below materials pricing and labor productivity used in preparing these estimates were all based on [REDACTED] industry experience in multiple fiber deployment projects in the Northeast. MCA used Cumberland County (the highest in Maine) Prevailing Wage rates for fiber installers and splicers in estimating labor (even though the installations will be performed in counties with lower rates). [REDACTED] further compared these rates to those used on a USDA project in New York and as a result used a higher-than Prevailing Wage rate for fiber installers and splice technicians in these counties due to wages paid elsewhere and the anticipated demand on the limited pool of fiber installers and splicers in Maine over the next two years. Selection process will follow MCA's Procurement Policies, including issuing a competitive RFP (potentially including multiple service requirements) unless a single source contract is deemed eligible and appropriate. Contractor's rates will be required to be all inclusive.

- Routes 1-6: the average cost per mile will be roughly \$52,510 per mile.
- Route 7: the average cost per mile will be roughly \$26,398 per mile due to overlashng

Below is a breakdown of the methodology for each line item:

- 24x36 Vault – \$422.00 each - These vaults will be used at strategic interconnection points, underpass crossings of bridges and to transition underground to aerial facilities. Estimated need is based on the detailed virtual and physical route analysis and input from Maine DOT.
- 4" HDPE Conduit – \$ 5.07 per foot - This size conduit will be used during directional boring. Quantity is based on the limited directional boring required by the route.
- 4" PVC Conduit – \$11.02 per foot – Material cost for 4" Sched 40 PVC duct.
- Anchors – \$80.42 each – Screw anchor that is used to support utility poles carrying MCA fiber cables when required to be installed by the pole owners.
- Down Guy – \$20.00 – Materials cost of a down guy.
- Fiber Slack Loop – \$1.27 per foot – It is estimated that on average 6 slack loops @ 110' will be installed per mile to account for CAI access, future last mile interconnections and maintenance on the network.
- Fiber Snow Shoe – \$73.73 each- Part used to store horizontal cable slack along the aerial lines.
- Guy Guard – \$25.00 each – Safety warning device placed around aerials guy wires on power and telephone poles.
- Messenger Strand: \$0.66 per foot – Wire used as a strength member for the fiber cable to be attached between pole lines. ¼" was used for strength, including to support potential ice loads in Maine, and resistance to wear and tear from the elements.
- Splice Case (FOSC 450D) \$614.58 each– Splice enclosure that will be used with the deployment of the project. Splice enclosures will be deployed at one case per mile.
- Splice Fiber Tray – \$50.00 each – 4 FOSC 450D trays will go with each enclosure.
- 144 Loose Tube Fiber Cable – \$1.16 per foot – Unit cost 144 Ct. loose tube single mode fiber cable. This cable will be used on all seven routes proposed for this project. The footage estimate above excludes the [REDACTED] route as [REDACTED] will provide its own fiber. The estimate does not include additional fiber to support slack loops as that is in the next line item.
- 4" HDPE Conduit via Directional Bore – \$18.00 per foot – Labor rate to install 4" HDPE conduit via directional bore. This figure is using the assumption for softscape / reasonable volume for daily production.
- Anchor (PF3-5A) – \$225.00 per pole – Labor rate used in attaching any anchor materials required to be installed by MCA as a condition of placing our fiber on the utility pole.
- Butt Splice 1-24 – \$40.00 per splice – All in cost for splicing, troubleshooting and final testing.
- Cable Placement – \$0.94 per foot – Labor rate to place underground cable through existing conduit. This does not include labor for installing new duct. Estimate is based on [REDACTED] experience in the Northeast for productivity and higher labor rates than prevailing wage as described above..

- Down Guy (PE1-3)– \$55.00 each– Labor rate to install a PE1-3 down guy.
- Flaggers - \$0.45 per foot – Labor rate for traffic / safety control services for aerial placement crews during aerial / underground fiber installation.
- Guy Guard – \$25.00 each – Safety warning device placed around aerials guy wires on power and telephone poles.
- Install strand ¼" (6.6 ehs) & Fiber – \$2.40 per foot – Labor rate for aerial installation of fiber cable and strand wire strength member.
- Mechanical Trenching - 6" Width w/Seed & Straw - \$22.00 per foot – Labor base rate to dig conventional trench at 30" deep / 6" wide.
- PREP Splice Case 450 B,C,D – \$270.00 each – Labor rate to prep and install fiber cable inside the shell.
- Restoration / Access Snow Shoe - \$275.00 each – Labor rate to bring up and down the aerial slack snow shoe from the line.
- Vault Installation – \$250.00 each – Labor rate to install a new 24"x36" vault.
- Construction Butt Splices – \$40.00 per splice – All-in cost for splicing, troubleshooting and final testing.
- Attached Bridge Conduit - \$85 per LF for Bridge Attachment (1) 2" GRC (\$224,655) – Linear cost per foot to attach new 2" conduit across standard bridge crossing. 2643 LF identified.
- Underground - Highway Traffic Control 401<1000 LF @ \$50 + Traffic Control @ \$4 ft (\$21,654) – Linear cost per foot \$54.00 for traffic control along county and state highways, less than 1000' for underground construction.
- Aerial - Railroad Xing Traffic Control 159 LF @ \$6.50 + Flaggers @ \$5 ft (\$13,202) - Linear cost per foot \$11.50 for traffic control across railroads, less than 1000'.
- Highway Traffic Control <1000 LF @ \$6.50 + Traffic Control @ \$4 ft (\$2,798) – Linear cost per foot \$5.25 for traffic control along county / state highways.
- Aerial - River / Bridge - Traffic Control <1000 LF Per Crossing – Linear cost per foot \$5.00 for traffic control when crossing bridges.
- Other Fiber Deployment Construction Costs – This line item is an estimate of the additional costs that [REDACTED] expects to see included in a bid from a contractor on the project. This will cover areas of contractor costs not directly included in the materials and labor above, such as: bid, performance and payment bonds, insurance, permits and licenses, fuel, job accounting & billing, grants compliance, project management, scheduling, subcontractor contracting and management, unproductive employee time due to weather or other causes, job site and workforce travel, risk premium based on contract deadline penalties, warehouse and storage space for project materials, etc.
- As part of MCA's agreement with [REDACTED] has agreed to construct a new 73-mile route using a 144 Count single-mode fiber cable. [REDACTED] has provided a cost estimate of \$1,929,430 to build this new route at an average cost per mile of \$26,398. [REDACTED] will construct this new route by aerially lashing the cable to existing [REDACTED] facilities. Using a lashing construction technique drops construction costs significantly by reducing the need for make-ready and materials associated with attaching the cable to the pole line. [REDACTED] included all labor and material costs in the estimate listed above.

10. Equipment - Total Cost: \$ 1,547,780 Federal Share: \$ 164,768 In-kind Contribution: \$ 1,322,780

	Unit Type	Unit Cost	No. of Units	Total Cost	Federal Funds Requested	In Kind Contribution Value
10. Equipment						
Network Operational Monitoring Equipment for each hut	Item	\$9	25,000	\$225,000	\$164,768	
Networkmaine Contributed Equipment	Other			\$1,322,780	\$0	\$1,322,780

Network Operational & Monitoring (O&M) Equipment

All cost estimates are based on prior projects and vendor quotes obtained in 2022. MCA plans to configure all nine huts with the same equipment described below.

MOOSE Net huts will have a separate management plane network for all site operations and monitoring. Connectivity to the NOC will be via dedicated dark fiber (lit by this equipment), and also via a secure private virtual network mesh running over out-of-band cellular and back-up satellite Internet connectivity. The secure VPN system will feature an enterprise quality firewall with built-in IDS. All access will be recorded and require multiple factors of authentication. All critical site systems and MOOSE Net network equipment will be securely accessible out-of-band via a secure remote serial console server, in case of a disruption of O&M network or primary network transport equipment.

Each hut will feature a comprehensive remote monitoring package, including various indoor and outdoor environmental sensors to include a full weather station, HVAC operational status, leak detection, power systems monitoring, motion sensors, door closure sensors, and logs of the identity of individuals granted door access via secure keycard. Fixed and adjustable view security cameras will monitor the site interior and exterior approach and parking area, with off-site DVR storage. For on-site technicians and tenant convenience, a secure guest network for general Internet access (wired and Wi-Fi) will be available both inside and adjacent to the hut. Selection process will follow MCA's Procurement Policies, including issuing a competitive RFP (potentially including multiple service requirements) unless a single source contract is deemed eligible and appropriate. Contractor's rates will be required to be all inclusive.

Networkmaine Contributed Equipment

Networkmaine has valued its in-kind contribution as 50% of the remaining value of the asset based on the actual up-front cost and a straight-line depreciation of the DWDM equipment over 10 years and the Carrier Ethernet switches over a 7-year period.

Networkmaine's existing network is based on Ciena's 6500 packet-optical platform provisioned with FlexWave ROADMs and is able to support wavelengths up to 400 Gbps. On top of 6500s Networkmaine has deployed Ciena's 5171 Carrier Ethernet Switches supporting 1/10/25/100 GE service delivery along with dual 100/200 Gbps coherent DWDM uplinks. Networkmaine is making 50% of the lit capacity of its existing equipment along the BTOP funded 3RB routes and a route that roughly follows the I-95 corridor between Orono and Portland available to MCA.

11. Miscellaneous - \$Total Cost: \$602,918 Federal Share: \$0 In-kind Contribution: \$602,918

	Unit Type	Unit Cost	No. of Units	Total Cost	Federal Funds Requested	Cash Match Amount	In Kind Contribution Value
11. Miscellaneous							
Networkmaine Equipment Expenses	Item	1			\$0	\$0	\$602,918

The Networkmaine Equipment Expenses represent MCA's 50% share of the Net Present Value of the annual maintenance and support cost for the Ciena network equipment for eight and three quarter years.

12. SUBTOTAL (sum of lines 1-11) - \$ 50,553,168.81

The subtotal of project costs without contingencies is shown in the table below.

	Total Cost	Federal Funds Requested	Cash Match Amount	In Kind Contribution Value
12. SUBTOTAL BEFORE CONTINGENCY	\$ 50,553,168.81	\$ 27,966,059.00	\$ 10,205,008.81	\$ 12,382,101.00

13. Contingencies - Total Cost: \$2,799,963.31 Federal Share: \$2,050,413.13

13. Contingencies	Unit Type	Unit Cost	No. of Units	Total Cost	Federal Funds Requested	Cash Match Amount
Contingency for Make-Ready, Supply Chain, and Construction Overruns	Other	\$2,799,963.31	1	\$2,799,963.31	\$2,050,413.13	\$749,550.18

MCA is including a contingency amount of approximately 10% of the construction budget in its grant funding request. Any contingency requested will be used consistently with the requirements of the NOFO and relevant federal requirements. This contingency amount is determined based primarily on two major risk factors to the project budget, the potential for make-ready costs to exceed the amount used in the estimate, and the potential for construction contract bids to come in substantially higher than anticipated. In addition to these two major risks, there are a number of other foreseeable factors that could result in MCA's project going over the planned budget.

The cost of make-ready is a well-known risk in fiber deployment projects. While MCA has made every reasonable effort to predict make-ready costs based on past and current projects, recently allowed changes to permit one-touch make-ready and placing fiber below telecom, and the expertise of its consultants, it is impossible to predict the actual costs until the estimates are returned in response to applications for pole licenses.

Similarly, because MCA will be hiring a contractor through a competitive RFP process, it is impossible to predict the pricing that will be received from the contractor in advance. MCA has tried to reasonably estimate the likely bid range and reflect that in the construction costs, but with the influx of money from the Broadband Infrastructure Program, Capital Projects Fund, and eventually BEAD, fiber installation contractors will be in high demand and short supply. This is a recipe for higher prices.

Finally, there are a large number of other foreseeable issues that could impact the cost of the project sufficiently to require use of contingency funds. These include, without limitation, weather delays or damage, extended delays by pole owners in completing make-ready, strikes in other industries or areas that impact the project, supply chain delays beyond what has reasonably been anticipated, rapid rises in fuel prices or inflation, delays in environmental approvals or project permitting, and others.

14. SUBTOTAL (sum of lines 12-13) - \$53,353,132.12

The subtotal of project costs including contingency is shown in the table below:

	Total Cost	Federal Funds Requested	Cash Match Amount	In Kind Contribution Value
14. SUBTOTAL WITH CONTINGENCY	53,353,132.12	\$ 30,016,742.13	\$ 10,954,55.99	\$ 12,382,101.00

15. Project (program) income – None.

16. TOTAL PROJECT COSTS - \$53,353,132.12

	Total Cost	Federal Funds Requested	Cash Match Amount	In Kind Contribution Value
16. SUBTOTAL WITH PROGRAM INCOME	\$ 53,353,132.12	\$30,016,742.13	\$ 10,954,558.99	\$ 12,382,101.00

Covering Initial Operating Shortfall - Once operational, MOOSE Net will generate positive cash flow through dark fiber leases and colocation fees. The project is expected to be completed in 24 months, at which point the project will start to generate revenue. The MOOSE Net entity will be 100% owned by MCA, with no profit sharing agreements with other entities.

Because these projects take time to ramp up and build customers, we note that net cash flow (reflecting debt service payments and not non-cash depreciation) in the forecast will not be positive until year 5. To cover the initial shortfall between revenues and expenses until year 5, MCA is pledging up to \$3 million in assessment fee revenues (revenue that MCA collects quarterly from Maine-based communication service providers, which it has consistently received since 2007).

MOOSE Net is partially de-risked because it can generate modest revenues before construction is completed (\$52-105k). This is because MOOSE Net can start to sell lit services on the infrastructure contributed by Networkmaine as soon as it is granted the award. This network is currently not available to the market and based on our stakeholder conversations would be valuable to several carriers.

MOOSE Net will reduce financial ramp-up risk by utilizing Networkmaine's existing staff and administrative infrastructure for operations (rather than creating a brand new organization in the next 24 months). In exchange for Networkmaine's contribution of resources and equipment, MCA will pay Networkmaine an operator fee that is reflected in the forecast. As shown, MOOSE Net is expected to generate sufficient revenues to cover this and all other operating expenses starting in year 5. The model is fiscally sustainable as built out. Generated revenues will sustain and maintain infrastructure.

We separately note that the cash flows in our forecast shown do not reflect Route 007. Route 007 will be owned by [REDACTED] except for the 24 fiber pairs contributed to MCA. We believe that MOOSE Net can lease these 24 fiber pairs to generate additional revenue at minimal incremental cost.