Infrastructure Grant Audit Form

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The ConnectMaine Authority awards infrastructure grants to support investments in expanding the availability of broadband service. Before ConnectMaine releases final award funds, the applicant must submit a completion report that demonstrates compliance with infrastructure grants program requirements, and an audit form that supports the validation process of the infrastructure grants program.[[1]](#footnote-1) For assistance with reports, please contact ConnectMaine staff.

**Instructions**

On behalf of ConnectMaine Tilson Technology and VETRO are performing independent audits, as part of the validation process of the infrastructure grants program that helps ensure projects meet requirements of the ConnectMaine rule and contractual agreements. In order to conduct these audits, applicants are required to provide all requested information that is necessary to evaluate project compliance and completeness. Please refer to the list of required documents in this audit form.

The desktop audit will be performed for all funded projects. Field verifications will be performed across randomly selected projects. There are five audit segments: Proposed Funded Service Area Audit, Technical Audit, Spending Analysis, Field Verification and Customer Connection Validation. During the audits, any identified irregularities or deficiencies will be communicated to the applicant for remediation. Upon completion of all five audit segments, and remediation of any irregularities or deficiencies, a final report will be generated, detailing the audit findings and any remediation efforts.

Grant recipients must submit reports, including infrastructure grant tracking for five years, which include accurate mapping, cost and speed-level data; address-specific, availability data of actual speeds; and verification of performance criteria by submitting the information requested. Please note that additional information may be requested by ConnectMaine acting in coordination with Tilson and VETRO. Please contact ConnectMaine staff for any assistance needed.

**Please submit the audit form, list of required documents, and your completion report within one year of when the grant was awarded by emailing** [**Connect.ME@maine.gov**](mailto:Connect.ME@maine.gov) **with the subject heading Project Completion.**

1. **Applicant Information**

Applicant Signature:

Date Submitted:

1. **Applicant**

Name:

Title or Role:

Mailing Address:

Phone Number:

Email Address:

1. **Point of Contact, if different**

Company Name:

Point of Contact Name:

Title:

Phone Number:

Email Address:

1. **Project Title**

Community-driven or provider expansion project:

Communities affected:

1. **Proposed Funded Service Area Audit**

This audit consists of ensuring applicants have met their obligations to pass and make serviceable, upon request, all locations in unserved areas of the awarded project areas, which were included in contract agreements. To “pass” a location means that distribution cable is constructed to the utility pole or pedestal, within a right of way, easement or on the roadside, that services the area’s utility connections. Tilson or VETRO performs this analysis, using Google Earth, by comparing the outside plant or coverage areas to the awarded proposed design.

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| **Proposed Funded Service Area Audit Requirements** | | |
| **Requirement** | **🗸** | **Comment** |
| Entire project design maps, as built in SHP (preferred) or annotated KMZ format. (PDFs and non-electronic formats will not be accepted) |  |  |
| Plant maps must contain the following items: |  |  |
| * Service locations |  |  |
| * Fiber or HFC routing |  |  |
| * Fiber or HFC counts/sizes |  |  |
| * Splice points |  |  |
| * MST/Coaxial taps |  |  |
| * Optical splitters (centralized or distributed architecture) |  |  |
| * CO, Headend and Hub Locations (notated where OLTs and CMTS are placed) |  |  |
| * OLT and/or HFC Node service boundaries |  |  |
| * FDH (field cabinets) |  |  |
| Plant maps must be prepared under the review of one of the following: |  |  |
| * A P.E. |  |  |
| * An engineer with substantial demonstrated experience designing cable or fiber networks whose credentials are submitted along with the design |  |  |
| If existing plant already serves areas within the awarded proposed service areas, SHP (preferred) or KMZ maps must include that plant along with the details outlined above. This includes any existing coaxial and fiber plant. |  |  |
| **All above requirements submitted to ConnectMaine** |  | **Signature:** |

1. **Technical Audit**

This audit consists of confirming the overall architecture and design, materials selection, plant quality and performance meet applicable manufacturers’ and generally accepted industry standards, and can provide simultaneous data speeds and throughput consistent with the contract agreement.

1. **Analyses**

This audit consists of multiple analyses, including:

1. Reviewing OSP and network access materials and equipment selection vis-à-vis their intended use and performance requirements;
2. Calculating the lengths of the longest optical links and confirming they project to perform to manufacturers’ and international standards body standards, such as ITU G.984.2 for GPON;
3. Reviewing any IP network design and equipment selection for predicted bandwidth, speed and throughput performance;
4. Examining randomly selected fiber optic Optical Time Domain Reflectometer (OTDR) scans of fiber links for construction and splicing craftsmanship issues, product incompatibilities and overall link performances.

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| **Technical Audit Requirements** | | |
| **Requirement** | **🗸** | **Comment** |
| *Proposed Funded Service Area Audit documents submitted and accepted* |  |  |
| OTDR traces (from OLT or CMTS to end location) with event logs. Trace reports should include: |  |  |
| * Measurement wavelengths (trace 2 of the following: 1310nm, 1490nm, 1550nm, 1625nm) * Measurement distance, total link loss, splice losses, micro/macro bend losses, link’s Optical Return Loss (ORL) for the distribution and feeder cable * Must provide identification of the specific fibers being tested |  |  |
| * File format must be one of the following: CSOR, SOR produced PDF, or OTDR produced PDF |  |  |
| * At a minimum, 12 fibers for small projects of 10 miles or less, 24 fibers for projects between 11 and 30 miles, and 96 fibers for projects over 30 miles[[2]](#footnote-2) |  |  |

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| **Technical Audit Requirements (continued)** | | |
| **Requirement** | **🗸** | **Comment** |
| Manufacturer’s specification information for all substantive equipment purchased for the project including but not limited to: |  |  |
| * Purchased fiber optic cable (must include and identify cable model numbers and losses at 1310nm, 1490nm, 1550nm, 1625nm) |  |  |
| * Optical Equipment, including transmitters, receivers, EDFAs, OLTs and SFPs |  |  |
| * Splice Enclosures and MSTs (*If MSTs are not used*, state so in a network overview in the format of a simplified, graphical diagram) |  |  |
| * Customer Premise Equipment, such as ONTs, ONUs, and DOCSIS modems |  |  |
| * Fiber Management Equipment, such as pretermination shelves and fiber distribution hubs |  |  |
| Engineering Documentation and calculations that provide: |  |  |
| * A high-level edge/core/transport/access logical diagram of the IP and OLT network showing hub names consistent with the system maps and predicted data throughput (both upstream and downstream) |  |  |
| * An overview of the project technology (GPON FTTP, AE FTTP, RFOG FTTP, HFC, etc) |  |  |
| * *If GPON, EPON or RFOG*: an overview of the splitter architecture (i.e. centralized, distributed, both, etc) and the splitter configurations (1:32, 1:64, 1:8 to 1:4 field splits, etc) |  |  |
| * *For HFC projects or sections*: Maximum and minimum tap output levels and end of line performance calculations for Composite Intermodulation Noise (CIN) |  |  |
| **All above requirements submitted to ConnectMaine** |  | **Signature:** |

1. **Spending Analysis**

This audit segment consists of reviewing each expenditure for appropriateness to the project, industry consistent pricing, volume and consistency with the grant recipient’s Technical Audit results; grouping purchases by type—plant, labor, materials, equipment, etc.; generating a spending analysis report; and comparing category spending to industry norms, project scope and the awarded budget.

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| **Spending Analysis Requirements** | | |
| **Requirement** | **🗸** | **Comment** |
| Line item spending report in MS Excel format that includes items purchased, date, invoice number, vendor, description and amount**[[3]](#footnote-3)** |  |  |
| Proof of purchase and payment (in pdf format) for: |  |  |
| * Fiber optic cable |  |  |
| * Network electronic elements (including, but not limited to: OLTs, CMTS, routers, switches and transport) that individually exceed $5,000 |  |  |
| * ONTs |  |  |
| * Makeready |  |  |
| * Project related contractor labor |  |  |
| * In-house labor records |  |  |
| * MSTs, splice enclosures, FDHs, vaults and pedestals |  |  |
| * All other grant related purchases that exceed $5,000 per item or $10,000 collectively for an appurtenance[[4]](#footnote-4) |  |  |
| **All above requirements submitted to ConnectMaine** |  | **Signature:** |

1. **Field Validation**

This audit segment consists of an on-site visit to visually inspect and examine the outside plant, central office, hub and subscriber installation deployments; observe craftsmanship; verify consistency with the project scope and verify that any deficiencies identified in the Proposed Funded Service Area Audit, Technical Audit or Spending Analysis have been remediated.

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| **Field Validation Requirements** | | |
| **Requirement** | **🗸** | **Comment** |
| All Proposed Funded Service Area Audit, Technical Audit, and Financial Analysis requirements met |  |  |
| *If deficiencies were found in the Proposed Funded Service Area Audit, documented proof of remediation must be provided* |  |  |
| *If deficiencies were found in the Technical Audit, documented proof of remediation must be provided* |  |  |
| *If discrepancies were found in the Spending Analysis: documented explanations, updated documents, and/or clarifications must be provided and accepted* |  |  |
| **All above requirements submitted to ConnectMaine** |  | **Signature:** |

1. **Customer Connection Validation**

This audit segment consists of verifying active internet connection to previously unserved customers who subscribe to internet service as a result of the newly expanded broadband infrastructure.

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| **Customer Connection Validation Requirements** | | |
| **Requirement** | **🗸** | **Comment** |
| Provider documentation of service: |  |  |
| * *If GPON, EPON or RFOG*: Image of OLT and ONT |  |  |
| * *For HFC projects or sections*: Image of CMTS and Modem showing both ends active |  |  |
| * Image of billing statement excluding identifying information of customer, but must include address |  |  |
| **All above requirements submitted to ConnectMaine** |  | **Signature:** |

1. Evaluation of projects is conducted in accordance with the ConnectMaine rule: <https://www.maine.gov/connectme/about/statutes-rulemaking> [↑](#footnote-ref-1)
2. Scans should be included to represent all geographic areas and fiber sheathes of the project. [↑](#footnote-ref-2)
3. All project spending, including spending not yet submitted to ConnectMaine or pending payment, and the financial commitments contributed to the total project cost as described in the applicant’s budget, are to be included in the spending detail. [↑](#footnote-ref-3)
4. For instance, individual line items of a purchase totaling $10,000 or more which combined make up an appliance or appurtenance. [↑](#footnote-ref-4)