

Application for Federal Assistance SF-424

Version 02

* 1. Type of Submission:

- Preapplication
 Application
 Changed/Corrected Application

* 2. Type of Application:

- New
 Continuation
 Revision

* If Revision, select appropriate letter(s):

* Other (Specify)

* 3. Date Received:

08/11/2009

4. Applicant Identifier:

5a. Federal Entity Identifier:

* 5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name:

Executive Office of the Commonwealth of Pennsylvania

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

23-6003107

* c. Organizational DUNS:

188655898

d. Address:

* Street1:

Commonwealth Avenue

Street2:

207 Finance Building

* City:

Harrisburg

County:

Dauphin

* State:

PA: Pennsylvania

Province:

* Country:

USA: UNITED STATES

* Zip / Postal Code:

17120

e. Organizational Unit:

Department Name:

Executive Office

Division Name:

Office for Information Tech

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

Prefix:

Mrs.

* First Name:

Brenda

Middle Name:

* Last Name:

Orth

Suffix:

Title: Deputy Secretary for Information Technology

Organizational Affiliation:

Same as Applicant

* Telephone Number:

717-787-5440

Fax Number:

717-787-4523

* Email:

borth@state.pa.us

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9. Type of Applicant 1: Select Applicant Type:

A: State Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

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

Department of Commerce

11. Catalog of Federal Domestic Assistance Number:

CFDA Title:

*** 12. Funding Opportunity Number:**

0660-ZA29

* Title:

State Broadband Data and Development Grant Program

13. Competition Identification Number:

Title:

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

Pennsylvania statewide; includes 67 counties and all congressional districts in PA

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

Commonwealth of Pennsylvania Broadband Mapping Initiative

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

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16. Congressional Districts Of:

* a. Applicant PA-017

* b. Program/Project PA-A11

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

17. Proposed Project:

* a. Start Date: 10/01/2009

* b. End Date: 09/30/2014

18. Estimated Funding (\$):

* a. Federal	3,993,048.00
* b. Applicant	0.00
* c. State	1,000,000.00
* d. Local	0.00
* e. Other	500,000.00
* f. Program Income	0.00
* g. TOTAL	5,493,048.00

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

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

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

Yes No

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

 ** I AGREE

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

Authorized Representative:

Prefix: Ms. * First Name: Brenda

Middle Name:

* Last Name: Orth

Suffix:

* Title: Deputy Secretary for Information Technology

* Telephone Number: 717-787-5440 Fax Number: 717-787-4523

* Email: borth@state.pa.us

* Signature of Authorized Representative: Luc Miron * Date Signed: 08/11/2009

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*** Applicant Federal Debt Delinquency Explanation**

The following field should contain an explanation if the Applicant organization is delinquent on any Federal Debt. Maximum number of characters that can be entered is 4,000. Try and avoid extra spaces and carriage returns to maximize the availability of space.

Project Abstract

The Commonwealth of Pennsylvania (“Commonwealth”), acting through the Department of Community & Economic Development (“DCED”) in partnership with the Governor’s Office of Administration (“OA”), submits a request for funding assistance under the State Broadband Data and Development Program administered by the NTIA in the amount of approximately \$4,000,000 for broadband mapping and \$500,000 for planning activities. DCED has been designated by the Governor of Pennsylvania as the entity authorized to apply on behalf of the Commonwealth of Pennsylvania. Pursuant to the BDIA, DCED is an eligible recipient of the State Broadband Data Program grant since it is an agency or instrumentality of the State.

The Commonwealth will build upon current broadband mapping efforts previously undertaken and required under state statute. Following completion of state compliant vendor procurement, the will enlist the assistance of qualified outside consultant(s) to collect and compile the data and information required by NTIA in conformity with Technical Appendix A as amended by subsequent NTIA Clarification. Certain select non-proprietary data layers will be made available in a public portal with a GIS interface and will be searchable at street address level. The Commonwealth will achieve substantial data collection efforts by February 1, 2010, and will provide complete data set by March 1, 2010. Pennsylvania mapping data will be updated on at least a semi-annual basis. Project duration is five years.

This project also includes a planning and collaboration component aimed at encouraging adoption by select constituents and more vulnerable communities through implementation of state broadband plan, inter-agency participation, and engagement of various stakeholders.

Commonwealth of Pennsylvania
State Broadband Data and Development Program

PROGRAM NARRATIVE

Executive Summary

The Commonwealth of Pennsylvania (“Commonwealth”), acting through the Department of Community & Economic Development (“DCED”) in partnership with the Governor’s Office of Administration (“OA”), submits a request for funding assistance under the State Broadband Data and Development Program administered by the NTIA in the amount of approximately \$4,000,000 for broadband mapping and \$500,000 for planning activities. DCED has been designated by the Governor of Pennsylvania as the entity authorized to apply on behalf of the Commonwealth of Pennsylvania. Pursuant to the BDIA, DCED is an eligible recipient of the State Broadband Data Program grant since it is an agency or instrumentality of the State.

The Commonwealth will build upon current broadband mapping efforts previously undertaken and required under state statute. Following completion of state compliant vendor procurement, the will enlist the assistance of qualified outside consultant(s) to collect and compile the data and information required by NTIA in conformity with Technical Appendix A as amended by subsequent NTIA Clarification. Certain select non-proprietary data layers will be made available in a public portal with a GIS interface and will be searchable at street address level. The Commonwealth will achieve substantial data collection efforts by February 1, 2010, and will provide complete data set by March 1, 2010. Pennsylvania mapping data will be updated on at least a semi-annual basis. Project duration is five years.

This project also includes a planning and collaboration component aimed at encouraging adoption by select constituents and more vulnerable communities through implementation of state broadband plan, inter-agency participation, and engagement of various stakeholders.

1.1 Introduction & Background

The Commonwealth of Pennsylvania (“Commonwealth”), acting through the Department of Community & Economic Development (“DCED”) in partnership with the Governor’s Office of Administration (“OA”), submits a request for funding assistance under the State Broadband Data and Development Program administered by the NTIA. DCED has been designated by the Governor of Pennsylvania as the entity authorized to apply on behalf of the Commonwealth of Pennsylvania. Pursuant to the BDIA, DCED is an eligible recipient of the State Broadband Data Program grant since it is an agency or instrumentality of the State and DCED is the single eligible entity in the State that has been designated by Pennsylvania Governor Edward G. Rendell to receive a grant under this program. A copy of the Governor’s designation letter is attached to and part of this application.

The Commonwealth's lead agency in terms of broadband mapping is the Department of Community & Economic Development (DCED). DCED is responsible for the implementation and maintenance of the state broadband mapping inventory enacted under Act 183 of 2004 ("Act 183"), more commonly referred to as the reauthorization of Chapter 30 of state Public Utility Code (66 Pa. C.S. P.L. 1398). Pennsylvania's legislatively mandated broadband mapping inventory was one of the first such enactments in the country, if not the first. Since that time, best practices have emerged in terms of data collection and data display. Additionally, the convergence of:

- policy formulation and public infrastructure investment which requires reliable data;
- federal involvement in the broadband mapping arena (Broadband Data Improvement Act; State Broadband Data and Development Program; and FCC National Broadband Strategy);
- broadband stimulus funding programs that require documentation of unserved and underserved communities; and
- increasing public demand for coverage information

emphasizes the need for better broadband mapping information both in terms of quality and quantity.

The Governor's Office of Administration, Office for Information Technology (OA/OIT) is the executive agency responsible for leading and coordinating information technology services in the Commonwealth of Pennsylvania and providing enterprise-wide technology, policy, standards, architecture, information, and solutions to enhance system interoperability, security, and cost effectiveness.

1.2 Current PA Mapping Inventory & Capability

Act 183 requires DCED to maintain and periodically update an inventory of coverage data for broadband services. § 3014(m) of Act 183 specifies that DCED must collect *general* coverage information from all telecommunications providers, regardless of technology used (copper, fiber, cable, wireless, etc.) that it must publish this statewide inventory and map on governmental website (available at www.broadbandinpa.com). A variation worth noting - "broadband" is defined in state Act 183 as "a communication channel using any technology and having a bandwidth equal to or greater than 1.544 megabits per second (Mbps) in the downstream direction and equal to or greater than 128 kilobits per second (kbps) in the upstream direction."

The pictures below (screen captures from public mapping portal) depict statewide views of broadband availability through DSL, cable, and limited wireless coverage data as reported by providers to DCED. Users may search by county or zip code to obtain a listing of providers. The inventory currently does not have street-level search capability, and is limited in terms of its functionality. The information collected by the state does not contain any of the elements required under Technical Appendix A, as amended by Clarification issued by NTIA on August 7, 2009. The statute is vague as to provider obligations, lacks specificity as to required granularity of information, omits frequency of

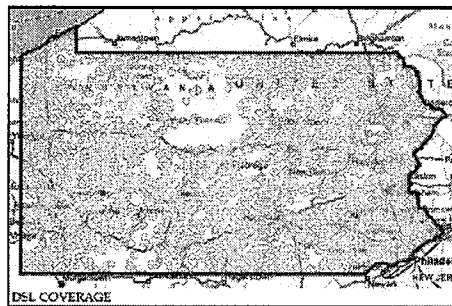
reporting, and does not contain enforcement and compliance provisions. The Pennsylvania Public Utility Commission (PUC) is responsible for oversight and regulation of Incumbent Local Exchange Carriers (ILECs), Competitive Local Exchange Carriers (CLECs) and Competitive Access Providers (CAPs) only. The Federal Communications Commission (FCC) is responsible for oversight and regulation of cable, cellular, and wireless providers.

In support of its Act 183 mapping requirements, the Commonwealth has maintained a relationship with iMapData, Inc., a Virginia-based company. Additionally, this vendor has created the Pennsylvania Technology Investment Map (PTIM) which is an internet-based interactive map that allows government and private sector partners to view detailed maps of the Commonwealth's telecom infrastructure. At its core, the mapping and report system provides a visual depiction of broadband infrastructure and availability in relation to other data elements such as: detailed population demographics, business demographics, schools, hospitals, government facilities, and a myriad other interdisciplinary data sets compiled by DCED and other peer Commonwealth agencies. In support of the homeland security mission, iMapData has produced extremely detailed datasets for physical infrastructure including telecommunications, education facilities, transportation infrastructure, and so forth. This project will seek to build upon data elements already collected by the Commonwealth and leverage prior investments made by the Commonwealth in developing the current mapping application.

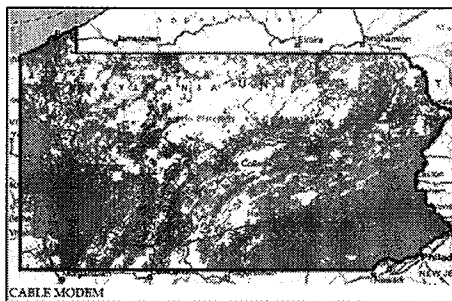
1.3 Current Data Collection and Mapping Methodology

Lengthy negotiations in 2005 and 2006 with the two largest state industry associations (Pennsylvania Telephone Association and the Broadband Cable Association of Pennsylvania) and the execution of Non Disclosure Agreements ultimately led to delivery of proprietary data points (eg. remote terminals and DSLAM). From this information, the Commonwealth derived coverage as depicted on the maps below.

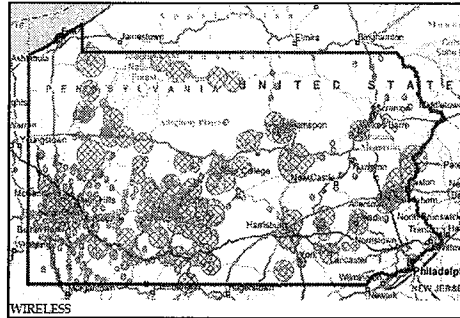
DSL Coverage – DCED collected Central Office locations and Remote Terminals from all ILECs in Pennsylvania and depicted crop circles for deployed facilities spanning 16,000 feet around wire center boundaries to create the DSL coverage map to the right. ILECs providers supplied remote terminal information once assured that street level search would not be available



Cable Modem Coverage – DCED collected broadband coverage information from all cable operators in Pennsylvania at the census block level. Census block level was supplied only when cable operators were satisfied that street level search would not be available.



Wireless Coverage – A few small fixed wireless providers provided location of facilities, beam radius, azimuth and coverage range. Despite many requests, none of the large mobile and cellular providers have contributed any information to the Commonwealth. As such, wireless mapping information is particular deficient in a relative sense.



This has given Pennsylvania a good start and a better appreciation of the location and extent of the digital divide. However, there is room for improvement in terms of data collection, accuracy, consistency, maintenance, and information submission. As previously noted, some segments of the industry, the wireless and cellular carriers, in particular, have been resistant to providing critical mapping information to Pennsylvania state government notwithstanding their statutory obligation to do so under state Act 183.

The highly prescriptive nature of the Notice of Funding Availability (NOFA) and clarity related to data collection requirements, the substantial resource allocation by the federal government, and the possibility of FCC involvement will help alleviate the current challenges of ambiguity, sustainability and compliance, respectively.

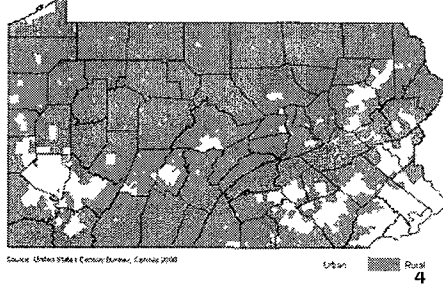
1.4 Demographic and Geographic Considerations

Pennsylvania is home to nearly 12,500,000 residents, and is the 6th most populated state in America. It measures 283 miles east to west, and 160 miles north to south – a total of 46,058 square miles – making it the 33rd largest of the 50 states. The Commonwealth has the nation’s third largest population over age 65 (behind Florida and West Virginia) and the third largest rural population (behind Texas and North Carolina) in the United States.

Pennsylvania is topographically diverse. Pennsylvania’s mountains, forests, and winding river valleys present significant challenges to broadband deployment. Over 50% of the state is still covered by forests. Much of the level land is primarily rural, as evidenced by the 63,000 farms in the state.

According to the Center for Rural Pennsylvania, in 2007, nearly 3.4 million people, or 28 percent of the state’s residents, lived in Pennsylvania’s 48 rural counties. About 9 million people, or 72 percent of the state’s population, lived in the state’s 19 urban counties. The map to the right reflects this urban-rural reality in Pennsylvania.

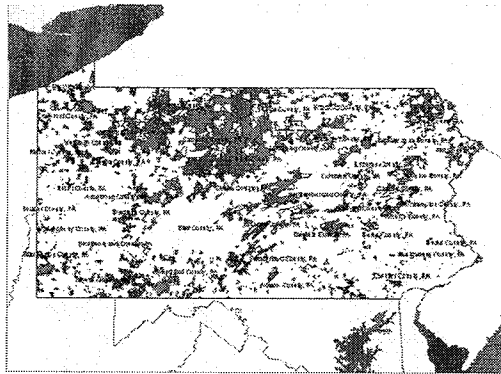
Pennsylvania’s Rural Municipalities



1.5 Prioritization of Unserved and Unserved Areas

The Delaware River establishes the state's eastern border and features relatively level terrain in the populated Philadelphia metropolitan area. Progressing east to west, the state has rolling hills, irregular lowlands, and occasional mountains. These rise into the forested, mountainous Appalachian Plateau which dominates the northern and western regions except for the lowlands along the Lake Erie shore. The highest preponderance of the digital divide in Pennsylvania is in the northern tier/north central region that lies in the east-west corridor between Interstate 80 and the Pennsylvania-New York State border. This is corroborated by the Act 183 coverage maps depicted above. In the wake of the joint release of the NOFA by NTIA/RUS, Pennsylvania has modeled suspected unserved/underserved regions which, as depicted below, once again coincide with the northern tier and north central region of Pennsylvania.

Consequently, for both its deployment and mapping efforts, the state will prioritize the northern tier/north central portion of Pennsylvania.



[Red=unserved; Yellow=underserved]

1.6 Compliance with State Broadband Plan

The Commonwealth recently published a State Broadband Plan which contains certain key Guiding Principles, including "Goal 2 – Information and Mapping". In particular, Goals 2.2 and 2.4 include:

2.2 – Expand existing broadband inventory mapping initiative to achieve compliance with statutory mandates such as Act 183 of 2004 and in the pursuit of federal stimulus objectives and the Broadband Data Improvement Act

- Prepare comprehensive data and imagery (e.g. mapping) reference materials on existing telecommunication infrastructure, providers, demographics, and critical broadband consumers (businesses, healthcare providers, educational

institutions, public safety agencies, etc.). Include identification of Last Mile, Middle Mile, and Long Haul/Backbone infrastructure, availability and type of broadband service to communities and critical anchors (schools, libraries, etc.), the location of communications (cell) towers, and other applicable assets that can help identify broadband coverage deficiencies.

- Explore opportunities and benefits of collaboration with other public service information and mapping initiatives, such as county-level assessment and 911 systems.

2.4 – Facilitate broadband awareness and education programs that will increase adoption and sustainability

- Facilitate efforts by Commonwealth departments to obtain basic information about broadband and its value to the agency and its constituents, promote awareness of broadband initiatives of use to the agency, and encourage the agency to identify opportunities to integrate broadband into its policies, projects, and programs.
- Encourage broadband training and awareness initiatives for “user groups” (including, but not limited to local and county government, regional public service providers, distressed and vulnerable populations, public safety agencies, hospitals, schools, and senior citizens).
- Facilitate efforts to make broadband providers aware of unserved and underserved areas through introductions to local stakeholders, promotion of applicable broadband assistance websites, agencies, programs, and related strategies.
- Acknowledge and promote successful, replicable broadband projects, including illustrations of “Best Practices” (models) and Exemplars (role models).

Section 2 NTIA Review Criteria

This section of the Commonwealth’s Project Narrative addresses the 5 distinct NTIA Review Criteria:

- 1) Data
- 2) Project Feasibility
- 3) Expedient Data Delivery
- 4) Repeated Data Updating
- 5) Planning and collaboration

Formatted: Bullets and Numbering

Vendor Procurement Considerations - This project application is being submitted by the Department of Community & Economic Development (DCED) in partnership with the Governor’s Office of Administration on behalf of the Commonwealth. The state intends to outsource the data collection, verification, maintenance and hosting functions of this project to an outside vendor subject to applicable Commonwealth procurement considerations. Outside partner(s) will be selected prior to project commencement and

Commonwealth will advise NTIA of any selected outside contractor(s) and will provide evidence of credentials and approved scope of work. This vendor selection will be an augmentation of the current Act 183 mapping services provided by iMapdata, Inc.

In anticipation of this project, the Commonwealth has undertaken the process of identifying potential vendors that may be in a position to provide the necessary services and consulting skills to carry out the necessary tasks that align with the NOFA. Some of these entities include: CostQuest, Connected Nation, L.R. Kimball & Associates, iMapdata Inc, Apex Covantage, Telogical Systems, Rolka Loube Saltzer, eCopernicus, and ESRI to name but a few. Related to the implementation of this project, the Commonwealth is contemplating the selection of a qualified vendor from competitive state procurement process called Invitation to Qualify (ITQ). The Commonwealth will issue a Request for Qualifications (RFQ) which will contain a Scope of Work that is consistent with this grant submission and with the NOFA requirements, as amended.

The remainder of the Commonwealth's submission to NTIA will address Review Criteria enumerated in the NOFA for the State Broadband Data and Development Program.

1. Data:

(a) Data Gathering.

The first phase of the project will relate to identification of providers, development of the base map parameters, and the collection and compilation of broadband availability data either in the form of address-specific data as described in the original Notice and subject to Clarification issued by NTIA on August 7th providing for an alternative collection method of census blocks and/or street segments with address ranges for wireline providers, and availability by shapefile for wireless services not provided to a specific address, technology, speed, infrastructure, , and spectrum used for wireless broadband. This will support the creation of a consistent, best-available data set of broadband coverage and provider information that is to be provided to the NTIA and to the FCC in support of the data standards and requirements outlined in *Technical Appendix A* as amended by subsequent Clarification issued on August 7, 2009.

Due diligence will be performed to first document the Data Workflow Methodology and data design including, but not limited to, geospatial domain rules, topology rules, security measures, and data storage requirements needed to support the data standards outlined in *Technical Appendix A*. The Data Workflow Methodology will include, but not limited to, mechanisms for data collection, transfer and sharing (how the data will be provided / received), where the incoming data will be stored, how the data will be stored, how the data will be secured, QA/QC measures, data verification processes, how the data will be managed and administered, data storage requirements, and how the data will be provided to the federal government.

Consideration will be given to the feasibility of linking / integrating the collected broadband data with existing Commonwealth GIS data assets and with Community

Anchor Institutions (i.e. schools K-12, hospitals, etc.). This will provide for a seamless integration between broadband data and Community Anchor Institutions within Pennsylvania, while enhancing and leveraging Commonwealth existing data assets.

Throughout the Data Gathering phase, various types of broadband data will be gathered in accordance with *Technical Appendix A*, as amended by clarification issued by NTIA on August 7, 2009, and the data will be incorporated into a common database that adheres to the standards outlined in the guidelines published by the NTIA for *State Broadband Data and Development Grant Program*.

The Commonwealth is currently working with a legislative House Committee to amend a state bill (HB192). If successful, this amendment would incorporate the data collection requirements of this NOFA, including the particulars of Technical Appendix A. It is the Commonwealth's expectation that the Pennsylvania House of Representatives will consider this amendment during the fall legislative session which is scheduled to begin in September 2009.

i. Data Gathering - Administrative

The vendor(s) selected by the Commonwealth will be expected to perform critical data gathering tasks. For instance, a list of broadband providers within Pennsylvania will be developed forming the starting point to obtain their information and service boundaries. Since some carriers are regulated at the federal and some at the state level, the licensed broadband providers and operators will be identified through several public data sources, such as:

- Pennsylvania PUC lists ILECs, CLECs, Interexchange resellers and toll facilities based carriers, Competitive Access Providers:
http://www.puc.state.pa.us/telecom/telecom_tariffs.aspx
- FCC Form 477 provides standardized information about subscribership to high-speed services, including advanced services, from wireline telephone companies, cable system operators, terrestrial wireless service providers, satellite service providers, and any other facilities-based providers of advanced telecommunications capability
<http://www.fcc.gov/Forms/Form477/477systemguide.pdf>
- FCC list of Cable Operators in PA
<http://www.fcc.gov/mb/engineering/list/PA.xls>
- FCC list of Wireless Broadband PCS
http://wireless.fcc.gov/services/index.htm?job=service_home&id=broadband_pcs

It will be essential to nurture and develop relationships with the service providers and industry associations during this project phase in order to acquire the necessary customer data from each service provider. This will be completed by leveraging existing broadband service provider relationships created under

the Act 183 process and establishing new ones through a series of regional meetings held across the state, in addition to one-on-one meetings as necessary. This will involve dialogue with the Pennsylvania Telephone Association, the Broadband Cable Association of Pennsylvania, and the Pennsylvania Wireless Association. Unlike the telephone and cable industry groups, the latter is a looser ad hoc consortium of wireless and cellular providers.

Non-Disclosure Agreements (NDA) and/or Data Sharing Agreements will be drafted and negotiated by the vendor in order to meet the data collection requirements and to adhere to the NOFA and to the *Technical Appendix A*, as amended by clarification issued by NTIA on August 7, 2009. Commonwealth Legal Counsel may assist with drafting and with negotiation of the terms and conditions contained within NDAs / Data Sharing Agreements. The NDAs / Data Sharing Agreements will be the foundation for protecting the proprietary and competitively sensitive information and will allow service providers to understand how their data will be utilized without compromising the location of key infrastructure or concerns for public safety, as well as proprietary business data of service providers.

The Commonwealth's Right-to-Know and Records Management Officers can also be made available as a resource to assist in ensuring that the data under this project remains protected as deemed appropriate through Commonwealth processes, directives, and/or laws.

Base Maps will be developed upon which the broadband provider and coverage data will be overlaid. These base maps will include layers such as street data, census data, political boundaries, and Public Buildings and Community Anchor locations such as schools and colleges, public buildings, libraries, and hospitals.

Quality Assurance / Quality Control plans will also be established within the Data Workflow Methodology to ensure planned data gathering activities are adequate to meet project objectives and to provide for data evaluation activities that will verify pre-defined requirements for quality.

ii. **Data Gathering – Technical**

Preliminary research conducted by the Commonwealth indicates that some of the data required to be collected under *Technical Appendix A* as amended by subsequent Clarification resides in multiple formats ranging from basic and simplistic hand drawn maps to sophisticated information technology systems where Extensive Markup Language (XML) data transfers could potentially be established to broadband data already existing in geospatial data format. To succeed, this project must employ several mechanisms for data / information exchange in order to capitalize on achieving the greatest possible outcome for this project investment. These include:

1. **Meetings** will be facilitated with each provider by setting up regional meetings to include all local service providers within a regional landscape. Necessary follow up will also be conducted via telephone interviews to acquire any missing information or incomplete information from each service provider.
2. **Face-to-Face Survey Interviews** will be scheduled to gather all pertinent data necessary with each respective service provider that could not attend one of the regional meetings. The face-to-face surveys would allow for the categorizing of each service provider as to their service footprint and infrastructure in terms of broadband speed and rates.
3. **Web Technologies** will provide a means to gather information from service providers in the form of electronic surveys and communications. Service providers could login to a website securely and provide information through on-line surveys or submit electronic survey documents where all data is collected efficiently through backend databases resulting in more timely reports and information back to the Commonwealth of Pennsylvania.

Citizens could fill out a web form containing broadband usage questions and submit the information for analysis. The web form could be made publicly available or targeted to authenticated users. A web mapping interface could also be used for collecting data as well as publishing finished data.

A project collaboration website will be developed to allow for more timely acquisition and dissemination of data / information exchange to and from service providers, consumers, and stakeholders. Collaboration websites have been found to be an invaluable tool in efficient data / information exchange, especially under tight project schedules. Service providers that possess file-based information such as maps or other documents can use a web interface to upload those files for use in building the geodatabase.

Service providers that possess file-based information such as maps or other documents can use a web interface to upload those files for use in building the geodatabase. Robust and scalable tools could be built to upload files of any size from the user's browser to a central location for later processing, in addition to establishing a standard XML data / information exchange model for broadband mapping data exchange. Files could also be made available for downloading through the same interface, if desired. This functionality would be secure and available to authenticated service providers.

4. **Digitizing** will occur when service providers supply hardcopy maps, scans and/or drawings. Digitizing will leverage prior federal and state investments in PA Imagery and LiDAR (elevation) data, in addition to other base mapping data available within the Commonwealth's extensive GIS data repository.
5. **Geocoding** will occur when service providers supply street level addresses. Existing Commonwealth geocoding services and tools can be leveraged for this project.

GIS Data Creation will occur once the data / information is gathered, assessed, and verified for accuracy through quality assurance / quality control measures. The GIS data will provide the basis for the spatial analysis assessment to determine better accuracy for the unserved and underserved areas in Pennsylvania. Leveraging existing Commonwealth GIS data assets (including data elements contained in the enterprise TANA license), obtaining or creating infrastructure information such as towers, fiber nodes, building locations, etc. is vital as service providers, state, and federal government look at how the broadband gaps can be closed.

Metadata Creation will follow the Commonwealth's Geospatial Metadata Standards, which mimic the Federal Geographic Data Committee (FGDC) standards. FGDC compliant metadata will be created for each broadband mapping data layer that will be delivered through this project, and provided to NTIA along with the GIS broadband data in support of the National Broadband Map.

- (b) *Accuracy and Verification.* Applicants must provide a description of what methods the applicant intends to employ to verify data accuracy.

Service providers often will not willingly share this information because of concerns related to competitive vulnerability. Additionally, provider centric mapping will invariably inject provider bias, incomplete/inaccurate information, and lacks transparency. So the optimal solution will entail a hybrid model comprised of carrier-provider data but verified through external, additional sources including consumer-supplied data points. Therefore, a scientific, defensible methodology including field-validation of provider-supplied data is essential

The assessment and inventory must clearly incorporate mechanisms or processes for verification and for periodic updates to the datasets. Related activities may consist of:

Assistance from state entities (Public Utility Commission and Office of Consumer Advocate) and verification and validation by stakeholders (eg.

Local Development Districts, Intermediate Units, Local Governments, Technology Councils) that can help validate coverage information by virtue of knowledge of local conditions.

Field Audit Collections to validate provider-supplied broadband service data including location of terminating equipment, such as remote terminals, central offices and wireless towers, from which broadband service is made available. Additionally, this could include

- GPS readings
- Spectrum analysis for wireless connectivity speeds

Performance of speed tests

Review issuance of permits, Right-of-Ways, site acquisitions to confirm location of facilities, structures and backbones

Correction and Adjustment of datasets to include terrain-corrected and building-corrected transmission areas for fixed-wireless broadband providers (so that areas blocked from service by buildings, mountains, or hills are shown as not receiving service)

Market Intelligence including research/reports such as regulatory filings, consumer and business survey reports, and provider analytics.

Survey Instruments and questionnaires administered in select locations to provide statistical sampling that will validate or correct provider supplied data

A **Quality Assurance** plan will be established to ensure planned data gathering and maintenance activities are adequate to meet project objectives. The activities outlined in this plan will ensure the data gathering processes are defined and appropriate. It will primarily focus on the methodology, standards, and process elements of the project.

A **Quality Control** plan will be established containing data evaluation activities that will verify pre-defined requirements for quality. The activities outlined in this plan will focus on finding defects in specific project deliverables and to verify that data and functionality is not only correct, but useful.

Existing Commonwealth enterprise **Address Verification** and **Geocoding** tools will be used as a means of verifying street level addresses and assigning a latitude and longitude for accurate placement of the data on a map. The Commonwealth proposes to leverage:

- An **Address Verification** web service that provides access to the United States Postal Service (USPS) Quick Address Pro Web software and enterprise data for application address verification capabilities. The web service is used to verify addresses and uses the Quick Address Software Single Line engine.

Address verification data is provided specifically for the United States of America. Data is updated on a bi-monthly basis and data updates are performed in a timely manner due to expiration dates applied to the data sets as a requirement of the USPS data license.

- QAS Quick **Address Batch** software and enterprise data for **batch** address verification capabilities. This web service will be used to verify addresses in a **batch** file. Address verification data is provided specifically for the United States of America. Data is updated on a bi-monthly basis and data updates must be performed in a timely manner due to expiration dates applied to the data sets as a requirement of the USPS data license. The QAS Batch software is Coding Accuracy Support System (CASS) accredited. CASS is a software certification program designed to improve the accuracy of address data, including ZIP and ZIP+4 codes, on mail pieces. CASS certification is controlled by the US Postal Service and CASS-certified addresses are eligible for mailing discounts.
- **USPS Geocoding** web services that provide a single point of access for both address verification **and** geocoding to produce a postal-verified, geocoded response for a batch file of addresses. The USPS geocoding web service processes the request by first verifying the address provided and then geocoding the address point to provide a latitude and longitude for the verified addresses.
- Significant investments in **Pennsylvania Imagery** will also be leveraged to verify accuracy of the data points. The Imagery was created as a seamless, consistent, high-resolution set of digital, geospatial data products. The map was compiled from new high-resolution aerial photography and elevation data, and from existing digital map resources developed by state and federal agencies, counties, regional agencies, and municipalities.

The vendor(s) selected by the Commonwealth will be expected to abide by stringent Quality Assurance (QA) and Quality Control (QC) steps to ensure the spatial, attribute, and topological accuracy of the GIS data, and to guarantee data assurance and random validation of provider information.

(c) *Accessibility.*

The Pennsylvania broadband mapping data will be made publicly accessible to the greatest extent possible while adhering to protecting the proprietary and competitively sensitive service provider information as outlined in the to-be established Non-Disclosure Agreements. The publication of spatial information on the internet has become common and most internet users have become very familiar with the use of maps to convey information, in addition to having performance expectations as demonstrated with popular mapping sites such as Google Maps, Yahoo Maps, MapQuest, etc.

