ABSTRACT

Wisconsin Governor Jim Doyle has designated the Public Service Commission of Wisconsin (PSCW) as the single eligible entity in Wisconsin to receive a grant under the State Broadband Data and Development Grant Program. (Attachment A) The PSCW is an independent state commission within the meaning of Section V (A)(a)(iii) of the NTIA's Notice of Funds Availability (NOFA). In its capacity as the single eligible entity in Wisconsin, the PSCW sought competitive bids from vendors through a Request for Proposal (RFP) to provide broadband mapping and planning services according to the technical specifications of the NOFA. Among other things, RFP respondents were required to address the five evaluation criteria set forth in Section VII (A) of the NOFA. Thirteen (13) timely responses to the RFP were received and evaluated on the NOFA's Section VII (A) criteria. CostQuest Associates, representing the LinkAMERICA Alliance, was chosen as the winning bid.

The PSCW and LinkAMERICA (the project team) propose to accomplish the following:

1. Produce statewide accurate and verifiable data and maps of broadband availability according to the technical specifications and timelines set forth in the NOFA. These data and maps will, among other things:
   a. identify unserved and underserved areas within Wisconsin at a granular level; and
   b. be accessible online to customers, providers and policymakers, yet protect provider confidential information through the use of non-disclosure agreements (NDAs) and other security measures

   This work will build on and expand upon previous work of the PSCW to collect, analyze and publish supply and demand-side broadband availability and adoption data and maps for Wisconsin.

2. Through a collaborative process, conduct and implement a comprehensive broadband planning and demand-side assessment. The team's comprehensive broadband planning and demand-side assessment process will be implemented as four interrelated sets of tasks:
   - Implement a broadband **situational assessment** for Wisconsin.
   - Conduct qualitative and quantitative research to **assess current and future broadband uses and barriers** to adoption.
   - **Map broadband demand scenarios** that advance Wisconsin's priorities in distance learning, economic development, e-government, and telemedicine.
   - Facilitate **regional technology planning teams** to develop relevant local action strategies – including expanding computer ownership and Internet access programs funded by Broadband Technology Opportunities Fund (BTOP).

The 5-year total project budget consists of two components—costs attributable to LinkAMERICA ($3,137,521) for contractual services and the State of Wisconsin's matching contribution ($1,285,012).

LinkAMERICA was chosen to manage and execute this project because of our experience and technical expertise in broadband mapping and experience in managing federal and state contracts. The LinkAMERICA is comprised of four firms: CostQuest, EFRsource, Kimball, and e-Copernicus. CostQuest is recognized worldwide as an expert in geospatial, economic and network modeling. Its telecommunications models are used in more than 35 U.S. states, and 5 countries. EFRsource is a technology and research firm specializing in demand-side strategy formation in telecommunications and telehealth sectors. Their focus is to bridge the insights of strategic visioning with the action of strategic planning. Kimball is a large engineering firm with a deep GIS technical bench that includes the mapping conversion and production resources to deliver complex and demanding GIS data projects. e-Copernicus advises clients on a full range of governmental affairs, public relations and business development strategies. The firm specializes in interfacing with government and industry stakeholders, public safety services, associations, strategic partners and federal funding sources.
The timeline presents estimates given LinkAMERICA prior experience with these types of projects. Beginning with the first days of the project, the team will actively engage industry and stakeholders with open and honest dialog to establish ground-rules, expectations and processes that will ensure required data collection will be accomplished in a timely and efficient manner. Throughout the body of the narrative, mechanisms have been discussed for accomplishing: project portals, social networking, broadband mapping, active on the ground outreach and follow ups.

Executive Summary

Wisconsin Governor Jim Doyle has designated the Public Service Commission of Wisconsin (PSCW) as the single eligible entity in Wisconsin to receive a grant under the State Broadband Data and Development Grant Program. (Attachment A) The PSCW is an independent state commission within the meaning of Section V (A)(a)(iii) of the NTIA's Notice of Funds Availability (NOFA). In its capacity as the single eligible entity in Wisconsin, the PSCW sought competitive bids from vendors through a Request for Proposal (RFP) to provide broadband mapping and planning services according to the technical specifications of the NOFA. Among other things, RFP respondents were required to address the five evaluation criteria set forth in Section VII (A) of the NOFA. Thirteen (13) timely responses to the RFP were received and evaluated on the NOFA's Section VII (A) criteria. CostQuest Associates, representing the LinkAMERICA Alliance[1], was chosen as the winning bid. This grant application incorporates much of CostQuest's (LinkAMERICA's) response to the PSCW's RFP. (The PSCW's RFP is attached to this grant application.)

The PSCW and LinkAMERICA (the project team) propose to accomplish the following:

1. Produce statewide accurate and verifiable data and maps of broadband availability according to the technical specifications and timelines set forth in the NOFA. These data and maps will, among other things:

    a. identify unserved and underserved areas within Wisconsin at a granular level; and
    b. be accessible online to customers, providers and policymakers, yet protect provider confidential information through the use of non-disclosure agreements (NDAs) and other security measures.

    This work will build on and expand upon previous work of the PSCW to collect, analyze and publish supply- and demand-side broadband availability and adoption data and maps for Wisconsin.

2. Through a collaborative process, conduct and implement a comprehensive broadband planning and demand-side assessment. The team's comprehensive broadband planning and demand-side assessment process will be implemented as four interrelated sets of tasks:

    - Implement a broadband **situational assessment** for Wisconsin.
    - Conduct qualitative and quantitative research to **assess current and future broadband uses and barriers** to adoption.

[1] The LinkAMERICA Alliance (hereinafter LinkAMERICA) is comprised of the following entities: CostQuest Associates, EFRsource, Inc., e-Copernicus, and L. Robert Kimball & Associates, Inc. A description of these entities can be found in the organizational capabilities section of this grant application. Hereafter LinkAMERICA Alliance is collectively described as the team or project team.

- **Map broadband demand scenarios** that advance Wisconsin's priorities in distance learning, economic development, e-government, and telemedicine.
- Facilitate **regional technology planning teams** to develop relevant local action strategies – including expanding computer ownership and Internet access programs funded by Broadband Technology Opportunities Fund (BTOP).

As more fully described in the program narrative of this grant application, the combined capacity, knowledge and experience of the project team will ensure timely and cost effective fulfillment of these proposed accomplishments.

The 5-year total project budget consists of two components—costs attributable to LinkAMERICA ($3,137,521) for contractual services and the State of Wisconsin's matching contribution ($1,285,012).

As soon as NTIA approves the PSCW's grant application, the PSCW and LinkAMERICA will enter into a contractual relationship conditioned on the actual receipt of federal funding.

1. Data

(a) Data Gathering.

Technical Appendix A represents a thorough and complex set of data. Roughly speaking the appendix envisions data acquisition in four major areas: Broadband Service Availability, Broadband Service Pricing, Broadband Service Infrastructure and Community Anchor Institutions.

As the Data Gathering portion of this narrative evolves, it is important to consider how each of these critical elements will develop. It is equally important to consider the importance of factors addressed elsewhere-such as confidentiality protections, verification methodologies and project management/feasibility. For the purpose of this discussion those critical factors will be assumed to be adequate and in place. This section will focus on data gathering, only.

The primary method to obtain broadband availability, service pricing, infrastructure locations and community infrastructure status will be through the use of surveys. The survey process will first be described, and then methods for tailoring the survey specifically to each requested data element of Appendix A will be addressed.

The NOFA does not provide a means to compel compliance with LinkAMERICA's data requests. However, the PSCW has state statutory authority over some, but not all, broadband providers in Wisconsin to compel discovery. The PSCW is prepared to exercise that authority as a last resort if cajoling providers to return the requested data in an expedient manner fails. The desire, however, is to work with providers, even those the PSCW does not regulate, to gather and deliver data expeditiously. Because there will be a number of data gathering methods, the team will rely on a tapestry approach to gather information. This approach includes surveys, outreach, engineering estimates, correction cycles and public review. How each of these methods will be used is described below.

The Tapestry Approach

In a perfect world without resource or time constraints, all data requested in Technical Appendix A would be available. Based upon prior experience, this is unlikely. Rather, the team organizes data gathering efforts around the metaphor of a tapestry. A tapestry is composed of individual threads, the composite of each stronger and more useful than the individual.

The advantage of the tapestry approach to gathering data is that a number of individual data gathering methods will be combined. For a given provider or for a particular element of data or even within a particular area a certain method may work well or it may not even work at all. The critical point is that the combination of these data gathering methods will be what produces the composite of information necessary to satisfy Technical Appendix A.

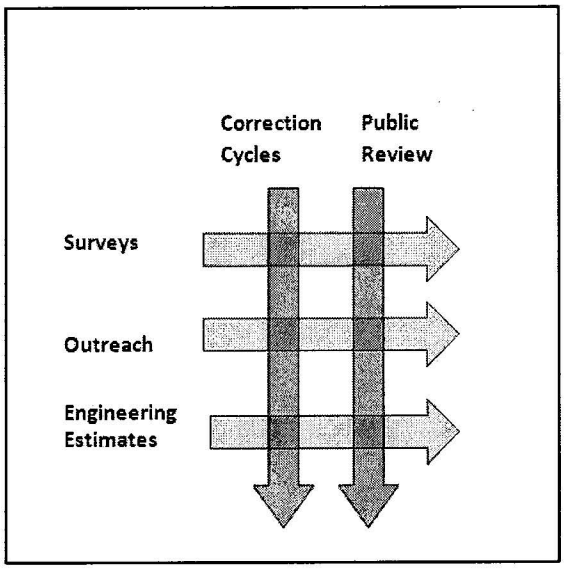

Figure 1 – Tapestry Illustration

Two final notes on the Tapestry Approach....first, it is important to note alignment between how data will be gathered and verified with the overall project plan. As demonstrated in Expedient Data Delivery section, the team has taken great care to align methods of gathering data with this project's extremely aggressive deadline. Second, different work efforts in the project will support multiple sections of this project narrative. For example part of the discussion of accuracy and verification methods will actually enhance the quality of the underlying data. Part of providing public access will feed into the accuracy and verification process. Part of public accessibility will be used to shorten data gathering cycles and improve transparency. The methodology is intentionally integrative and self-correcting.

Stakeholder Audience

Experience has also demonstrated that there is no cookie cutter approach to data gathering. It will likely differ from state to state to reflect how 'business is done' as well as the regional priorities and the personalities/culture of those doing the work.

The first critical data gathering step is defining to whom the team needs to address data gathering requests to. In other words, for a given element of the tapestry, there is a need to understand who may hold this data, to whom questions should be addressed to and who may be helpful in leveraging the work efforts.

For each required data element, the team must understand the stakeholders. A preliminary stakeholder-to-data relationship matrix is shown below. This will, of course, be modified, expanded and revised throughout the course of the project. At the project kickoff, stakeholder meetings, community or regional outreach meetings will be reviewed and scheduled. Communication will be essential for achieving project milestones and collecting the necessary information to build a successful broadband mapping infrastructure. The project web portal discussed in this narrative will be discussed within meetings with stakeholders and communities as a key communication tool. There will be explanations of what information will be accessible and what information can be submitted through the portal either through pages accessible to the public or other secured portal tools.

Table 1 – Stakeholder's and NOFA Data Elements

Stakeholder	Appendix A Data Element
Data Stewards-State Geospatial Officers	Anchor institutions and Infrastructure
Taxing or Business Licensing Authorities	Infrastructure
Regulatory Authorities	Infrastructure
Community Leaders	Anchor Institutions and Infrastructure
Private and Public Providers of Broadband Service	Advertised Service Boundaries, Infrastructure, Pricing
Service Consumers	Service Take rates
Third party data sources	Infrastructure, take rates, service areas

General Survey Methods

As the team defines who owns or influences a specific data element, that party will be put on the survey list. In summary, the survey approach relies on the following methods

a) Identify the appropriate party to be surveyed
b) Distribute the survey electronically and in paper. Emphasize electronic documents to increase response speed. Electronic document flow will rely on our public portal discussed in section (c) below.
c) Follow up on initial delivery. Provide technical support for questions and concerns
d) Follow up bi-weekly.

In the past, a detailed survey has been used, in Microsoft Word and, Excel format, for each provider of broadband services. The provider survey requests data elements such as:

- Broadband Service Area
- Infrastructure Location
- Infrastructure Interconnection
- Pricing Tiers

- Advertised Speeds
- Customer Locations

Although it is under refinement to address NOFA revisions (order released 8/7/09), the team expects to use a similar survey approach. The survey will move from a desktop approach to a secured web-centric approach. Survey documents will be posted electronically and can be filled out online. The team will work to make data flow with minimal human intervention.

Based upon past experience if a comparable survey method is used and the team is aggressive with respect to outreach and support, a large number of responses is expected.

Stakeholder Outreach

Even though a survey is a helpful method to gather information, it will not be entirely adequate to gather all data elements described in Appendix A.

Especially in the case of smaller providers there will need to be particular assistance gathering and integrating survey information. This will take the form of the following:

a) Technical support via e-mail and phone. Regardless of the size of the company, having adequate staffing to provide phone and e-mail support is critical. In the case of a smaller provider, getting to the right person at the right time is critical. When that person is ready to sit down and talk is the time to be ready to help. An outreach network that is automated without human interaction will be marginally helpful. In the case of larger companies having resources that can support project teams or multiple levels of administration (e.g. government relations, information systems and subject matter experts) is necessary, too.
b) Face to face discussions and kick off meetings. Sometimes there is no substitute for human contact and sitting around a table to ensure that requests are understood and resources are available.
c) Assistance with geo-referencing plant elements. A provider may have broadband service information stored on paper or in a CAD application and there is no relationship between how the data is drawn and where that information actually exists.[2]
d) Assistance with geo-referencing coverage information. Frequently for wireless ISPs, coverage information is presented as an image but that image has not been geo-referenced into a form easy to share. The team will need to devote efforts to take the data which does exist, at the accuracy at which it was computed, and put that into a form useful for Appendix A.
e) Human investigation, phone calls, web queries and/or spider programs[3] to harvest retail service pricing.

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[2] This is not uncommon. Think of an engineer designing a building. What is most important is where each element will be inside that building. What is less important is where that building is precisely located on the surface of the Earth. For the most part, what is important to the designer is the accuracy of the data that they are designing, not data outside of their design. That data is important only to the extent that it influences the elements within their design.

[3] A spider program is an application that harvests information from web sites.

f) Reliance on the symbolism and importance of the ARRA as well as the status of local project champions. The broadband stimulus is a historic endeavor; when communicating with stakeholders the team will use the symbols and name recognition of this program to convey importance. The team will also use identified local leaders and broadband champions to convey the importance of working with the program.

As Technical Appendix A migrated from a definition of broadband service with respect to addressed structures (as released) to a definition more in terms of Census geography (as modified on 8/7/09), assistance with Geographic Information Systems will likely gain importance. It is one thing to have engineering information or customer address information; it is likely more complicated for many providers to get this information into a census geography. In the team's opinion, GIS support will take on an increasingly important portion of data gathering efforts.

Engineering Estimates

In any given area there will be a certain number of stakeholders who will be unresponsive to survey and outreach efforts. In this case the project team is faced with the dilemma of either allowing a data gap to exist or developing some reasonable estimate of the service area.

If confronted with this situation, the team's response will be to develop engineering estimates likely based upon public domain or third party sources of purchased information. In the past, the types of engineering estimates the team has generated included the following:

a) Development of road based service areas based upon engineering practice. For example some broadband services are distance sensitive—like DSL (Telco) and DOCSIS (Cable). If a source of their fiber nodes locations is available, it is possible to compute engineering service areas based upon calculating road paths back to the serving node which don't violate a distance constraint.
b) In other cases some providers must publish engineering information to comply with regulatory requirements. In some cases it is possible to use this information to 'back into' service boundaries or at least develop a reasonable first approximation.
c) Licensing filings at the FCC help pinpoint spectrum in use and counties covered.
d) As part of their advertising efforts, many broadband providers publish covered cities, towns or zip codes. Mapping these self described coverage areas is another means of estimation
e) Several third party data providers exist that can supply broadband coverage. This could range from a commercial database of towers owned or occupied by a particular wireless carrier to a provider of coverage information used by companies trying to find roaming partners.

As data gathering efforts have progressed from receipt of service provider data to estimates, it is important to examine methods for assessment and verification. An entire section will be devoted to these topics.

Before closing the discussion of data gathering it is critically important to outline how gathered data will be managed and organized so as to efficiently produce Appendix A's requested deliverables.

Data Management

Clearly the quality of output will be driven by the quality of input data. The intent of the tapestry approach is to have multiple input sources to self-correct and reinforce. In holding this tapestry together it is also important to consider how data gets conveyed into the formats necessary for use in the State broadband map and NTIA deliverables. Documented below is the information that will demonstrate the team's process.

The data gathering process will be multi-faceted because there is going to be data provided by many different sources in many different formats. Because of the expedient timeline, processes need to be implemented to streamline different aspects of the data gathering.

As described in the Accessibility section (c) below, the development of a broadband web portal for the State is an approach to foster transparency and communication but it will also have a critical data management role. A secure and confidential section of the portal will enable broadband service providers to login and upload any data files or completed surveys as part of the data gathering process. This would make exchange timely between providers and the project team. Each provider will have their own unique login and portal section where they can monitor data that has been uploaded and requests that are outstanding. Where data is being collected through online survey within the portal, the data is entered and stored directly in a back end database developed according to the database designs necessary to adhere to the specifications outlined in Technical Appendix of the NOFA. This removes the need for any survey to be re-entered into another database once data is collected.

All workflows and data gathering tools within the web portal or other data collection methods are designed to flow efficiently into a project data repository that has GIS data, databases and tables that adhere to the specifications outlined in the Technical Appendix of the NOFA. The data repository will be designed to allow for all tabular data and GIS data to be easily delivered to NTIA in the formats outlined by the NOFA.

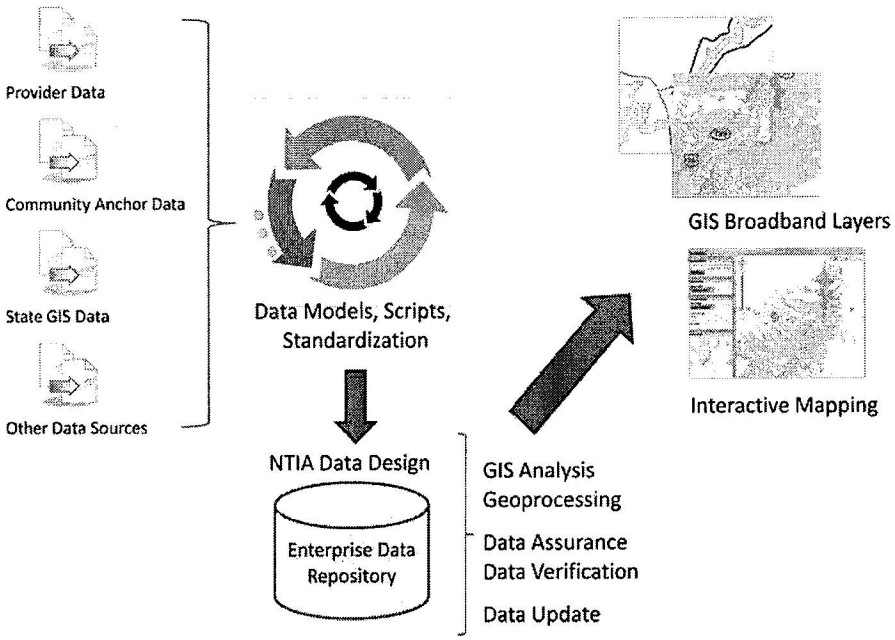


Figure 2 – Enterprise Data Repository

All GIS data will be stored in a secure Enterprise GIS geodatabase to take advantage of streamlined geoprocessing routines that can be executed much more efficiently in that environment. If required the GIS data can be then exported to any digital data format at any point during the project. The entire data management process is designed to allow for a simple transition from initially a complete data gathering mode in the first months of the project to an update process as is transition into the semi-annual updates required by the NOFA.

It is anticipated that data will be collected from providers and other sources in various formats ranging from digital database tables, spreadsheets, text files, GIS maps and paper maps. The first step will be to assemble an accurate base map for the State using existing GIS data. By collaborating with state agencies, especially the state GIS department, existing base map data such as digital orthoimagery, and statewide GIS vector layers that would provide ground reference for the data creation and conversion of broadband infrastructure and coverage information collected through the data gathering process will be pulled together to form the base map.

Along with provider information, community anchors will be mapped to show location of these institutions such as K-12 schools, higher education, healthcare, libraries, community centers, public safety buildings, etc. This data can be collected from a number of sources and these data sources will be reviewed at the project kick-off. The preferable choice would be to use a statewide layer that is currently in GIS format, accurate and being maintained by a specific department or agency. Other sources that could be used are secondary source GIS layers from commercial datasets that can then be verified using local knowledge, other databases to cross-reference and the GIS base map to reference against. Address listings for each of these community anchors could also be provided and geocoded against the address ranges of the street centerline layer being used as part of the base map. Once these community anchor institutions

are mapped they will be attributed with the appropriate broadband service information as outlined in the Technical Appendix of the NOFA.

An important component will be the GIS street centerline layer and any other GIS addressing information that might exist such as structure addresses. These layers will assist in pinpointing address information to ground locations on the GIS map. For a statewide GIS road centerline layer, the focus will be on the best source for highest level of spatial and attribute accuracy as well as completeness given the available licensing terms. Typically this can involve a combination of existing state or local addressing information and commercial datasets such as TeleAtlas, Google or ESRI. Other existing layers will be gathered for the GIS mapping such as census block features and associated demographic data, any existing telecommunications data from agencies such as public utility commissions or other state or private entities, any existing community anchor information. As all of this data is collected, it is important to understand the accuracy and source of the information, therefore any associated metadata will be examined very closely. It is important to understand the current spatial and data accuracy for any data layers within the base map that will be used for further geoprocessing, data conversion or as part of a deliverable.

Once the GIS base map is established at the beginning of the project, data being gathered from the providers can then be processed using multiple means against the base map. For example:

1) Computer Aided Design (CAD) files can be converted to ESRI format through existing data models developed as part of the database design for the project and if not locationally accurate, the files can be geo-referenced against the base map
2) If paper maps are collected, they can be scanned and geo-referenced to the base map then digitized into the data repository by using ground features of the base map to verify positional accuracy
3) Any spreadsheets, tables or text files that include address information can be geocoded against the addressing information established in the base map. These addresses are assigned geographic locations on the map through the geocoding process which compares addresses to structure addresses or road centerline address ranges. Other GIS layers and digital orthoimagery can be used for reference and positional verification for specific address locations that might not have been geocoded successfully.
4) Spreadsheets and tables with latitude and longitudinal information can be converted into map features on the base map and verified for positional accuracy.

Once data is processed from the collected raw data into the standardized database design of the data repository using the applicable data conversion tools and data models, it can easily be integrated into the workflows for GIS analysis, visualization, data verification, repeated data update, and interactive mapping as described in the sections below.

Experience has shown the team that having a solid data management and processing plan is a necessary component of project success.

Consumer Surveys

Several attributes of NOFA definitions require data regarding broadband service take rates and usage patterns. The team will utilize structured surveys at a regional level to gain this information. Surveys will differentiate between urban and rural populations.

b) Accuracy and Verification

Generating data is of little benefit if there is doubt as to the accuracy and methods by which the data were created. The team intends to use a series of verification methods each designed to efficiently test aspects of provided or estimated information.

It is important to note that because submissions can now take the form of polygons (for mobile wireless products), covered census blocks (if less than 2 sq mi in area) or covered road segments (when a census block is greater than 2 sq mi), assessment and verification methods will need to change from an address verification standard (as originally published) to a covered area verification standard (as revised on 8/7/09). It is thus uncertain what data will be received. There will be a bit of a chicken and the egg problem in so far as establishing a definitive verification process, rather in this section outlining the methods planned for verification first and then describing how the results will be published to allow users to assess the relevance of the results to their broadband expectations. The team will close with a brief description of how it documented its methods so as to allow for users to understand data creation steps.

Methods for Verification

Described below are some of the methods to be used. The goal is to perform testing at a level consistent with the results of planning and policy guidance as described in our response to section 5. In most cases, the team establishes between 6 and 10 regional planning zones per state. The goal is to make the verification information actionable for this regional planning level.

Data assurance is clearly an important component of this project and prescriptive in the Broadband Data and Development NOFA.

In regard to verification, the team and the state first must agree on what is to be verified. Certainly, the team cannot verify the existence of broadband to each and every customer. However, verification of the provider data and the availability at higher geographic levels can be done.

The team presents several methods used for the Data Assurance methods and will work to implement the optimal approach for Wisconsin. On many projects, data assurance tasks can be as expensive as data production. LinkAMERICA tries to be clear with the efforts and reasonable with the approaches. It isn't fair to anyone to apply a tremendous amount of resources in an area which may exceed the value placed upon it by stakeholders.

With that said, LinkAMERICA recommends application of a staged assurance method that is geared to the geographic area at hand. For example, in rural areas multiple stages may be employed while in urban areas the team may simply rely on vendor cross verification. As is expected, some methods are dependent on provider cooperation and their scope will be driven by the results from the project analysis phase.

Stage 1: With respect to submitted broadband coverage data – the team requests both a serving area boundary and the equipment location and type that support this boundary (i.e., the last mile infrastructure). This helps to judge if there is broadband equipment available to serve the reported coverage area. Using the equipment location, the team can use industry engineering criteria to create theoretical service areas. Comparing the two, a lack of equipment or significant mismatch in the provided service area as compared to the theoretical serving area would raise questions about broadband coverage quality and/or accessibility. Data which clearly fails this test will be returned to the provider for review.

Stage 2: The team will implement a state specific speed test in which customer address, type of service, and other information can be determined. This site will be advertised and residents will be requested to log in, submit information and provide feedback.

Stage 3: As part of the consumer survey for take rates, barriers, and demographics, the team will also request information on broadband availability.

Stage 4: In areas that are of concern, the team will request verification of billing records indicating broadband retail service in the area of question.

Stage 5: The team will request "white page" data from providers in areas of concern. These customers will be contacted to gather information about service availability, experience and quality.

Stage 6: In areas of concern, the team will select sample areas and request providers to provide internal 'line' qualification testing of selected addresses to verify coverage and service attributes.

Stage 7: The team will perform limited on-the-ground sampling of coverage. This is the most expensive type of data assurance and potentially the most difficult information to collect. If required, the team will select sample areas and verify the presence and attributes of the provider's service (both landline and wireless). This may involve both a rural and urban sampling and determination of serviced addresses or serviced points relative to the presence of provisioning equipment.

Stage 8: The team will perform projects related to verification of provider data as well as spectrum use, availability, and allocation. A multi-source field testing, sampling and survey approach will provide data required, but which some carriers cannot or will not provide, as well as independent verification of carrier-provided data needed as a second-source verification of carrier-provided data.

Stakeholder Review Process

As indicated in the data gathering section, in some cases the team will rely upon engineering estimates of a provider's broadband service area. In these circumstances the team will turn back a review version of the estimate to the provider in question. As described in the expedient data delivery discussion, the provider will have an amount of time to feedback and provide corrections. If no feedback is received, the estimate will be used for statewide data and map creation.

Community Review Process

One particularly important feature is enabling map reviewers to provide input as to the perceived accuracy of the broadband served areas map. The team refers to this as the establishment of a confidence layer. The concept is simple and borrowed from many online experiences.

In online maps, the team will give viewers the ability to rate their broadband experience. They may be able to feedback that they can't get broadband or their service is too slow or that they have no problems in this area.

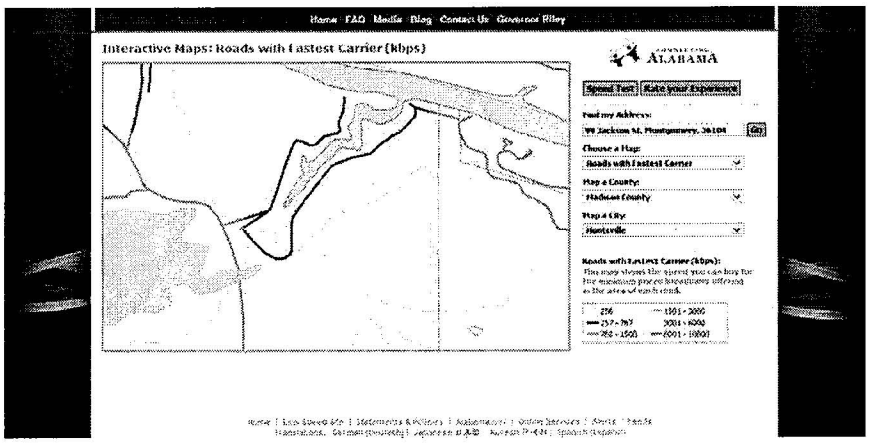


Figure 3 – Example of a Map with Consumer Review Features

The goal is to allow the aggregated consumer feedback to be displayed alongside the map. Over time this feedback could be used to allow the map to self maintain, it may also be a way to discover trouble areas. As this data is also a reflection of consumer perceptions it may also be useful for policy makers to view aggregate consumer broadband experiences as well as advertised or technical feasibility.[4]

c) Accessibility

A critical component of project success will be information accessibility. The team looks at accessibility across three dimensions. The first is accessibility to a statewide map and public resources. The second is accessibility by researchers. The third is accessibility to providers so as to decrease the time and effort necessary to receive and review information.

The map itself will be one component of an overall information portal. The portal will function as a one stop information store for all components of broadband data. It will also have the ability, if desired, to protect sensitive information. This protection function will be important to allow providers to post survey responses and provide feedback on map deliverables.

[4] The team receives a good deal of feedback when a consumer is unhappy with their High Speed provider. There may be a disconnection between what a consumer feels they should be paying and what they are getting. This is not an issue of technical feasibility but it is an issue of what the consumer expects relative to what they are paying for.

Statewide Map Plan

The objective is to develop an online, interactive geographic visualization of broadband service areas compliant with the NOFA Technical requirements.

Before discussing the visualization approach, first a discussion is needed on how the data will be normalized across providers to generate the map.

Normalization accomplishes two things. It allows the combination of multiple datasets and control for inconsistencies among them. Second, it provides a way to group technology types, speed and price tiers.

To develop and assess the presence of broadband supply and infrastructure, the team proposes to begin with an appropriately granular sampling method to determine where coverage exists. The approach is grounded in a survey across service providers, which allows receipt of coverage back in a number of analog and digital formats to make the data collection process as easy as possible for a wide range of providers – while still achieving the policy objectives at hand. It is important to understand that formats will not be consistent and accuracy will vary amongst the submissions. For this reason, the team treats each response distinctly and uses a sampling mechanism to standardize the coverage. For example in Alabama, the team used 100m grid cells within each county to analyze the existence of broadband coverage.

Given the sampling cells as well as the existence of Census Block data the team can quickly determine if a sampling cell is covered, what the Census characteristics of that cell are and what types of broadband coverage exist in that cell. In this way, the team can determine at a very granular and standardized level a number of key metrics. This same sampling process is used for each speed-coverage layer that has been provided.

The following exemplifies the normalization approach. The first figure shows a sample CAD diagram from a broadband provider.

Figure 4 – Distribution Cable (basemap (c) Microsoft Bing Maps)

The yellow utility lines in the infrastructure diagram are not linked to typical census information (e.g., roads, census blocks, etc) nor are they consistent with a broadband coverage polygon provided by another carrier. To put the received information into a consistent and uniform format the team samples the provided information into a standard grid size.

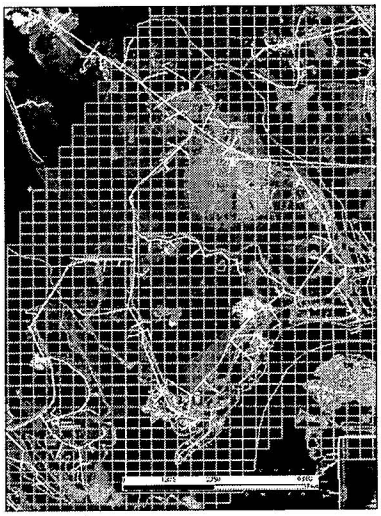


Figure 5 – Grid (basemap (c) Microsoft Bing Maps)

If the grid shows coverage (yellow segment within), the team "lights" the entire grid and the roads within (i.e., the area is marked as "served").

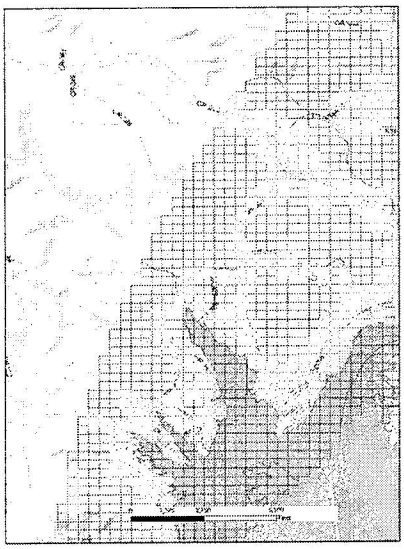


Figure 6 – Selected Grids (basemap (c) Microsoft Bing Maps)

If the providers provide the NOFA defined coverage data in tabular address level format, the data is converted into a spatial format. For the address data, this will start with a geocoding process to assign a latitude and longitude to each and every address record. Overlaying the grids, the team

can then determine which grid, preliminarily, will be "lit". With the proposed collection of other provider information (e.g., shapefile coverage maps), the team can identify potentially faulty geocoded data[5] and remove those points if appropriate. The team can also augment the grids identified by the geocoding process with grids lit from alternative provider sources (e.g., shapefiles of the broadband areas). As a note, it is through the collection of multiple sources of provider information that the team can add a layer of verification to the process.

Once the team completes this sampling across all provider data, the team now has a uniform data set for mapping and analysis. The team can now discuss the visualization approach and recommends the use of roads as the visualization layer. Roads are easily identifiable by consumers, represent where we live and how we commute, and allow the layering of other data sets. The following example shows the visualization of roads that we are using in the State of Alabama.

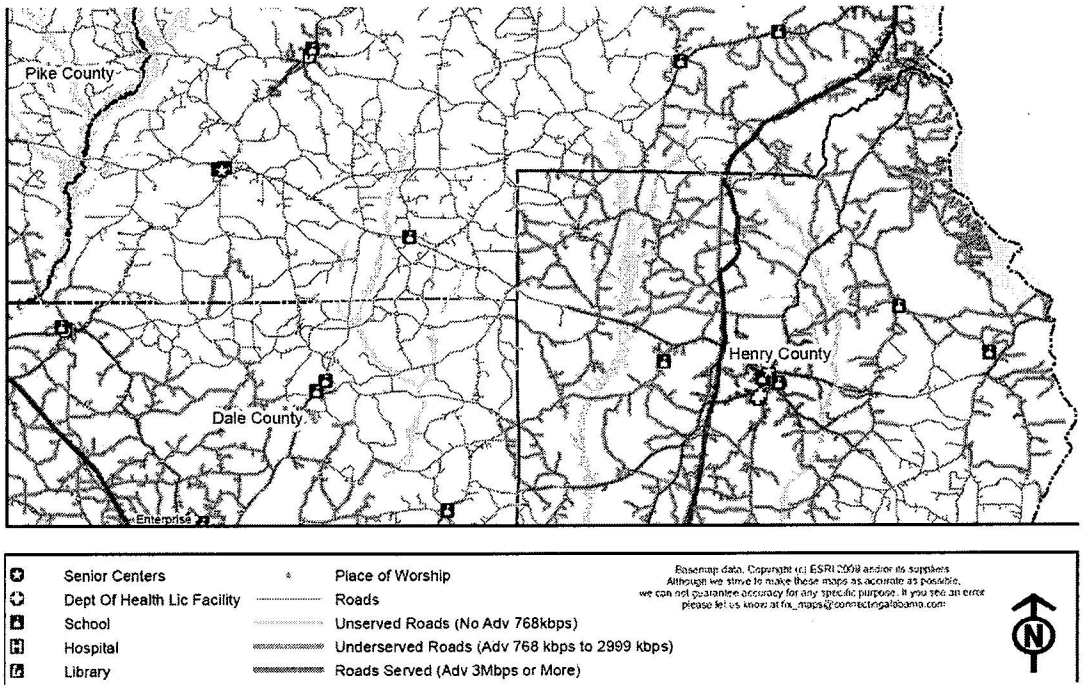


Figure 7 – Sample Maps

Beyond broadband information, the online map will also display the location of important reference areas (natural parks, tribal areas, key transportation routes) as well as community and anchor institutions.

[5] Geocoding may not always provide 100m street level accuracy. In some cases, the geocoded point will be at the center point of a much larger geography (referred to as a centroid point). While it is an accurate geocode, it is not an adequately precise identification of a served customer. As such, these points need to be discarded in the process.

State Map Design

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. The broadband coverage information can be published most effectively on a Web-based map interface that allows users to interact with the information. The public and other stakeholders will have an easy way to view the broadband coverage information and determine the coverage at their own location. The team will work to develop an interactive Web mapping display interface. The following describes the interactive mapping architecture and design options that can be leveraged through the GIS Web capabilities:

The site will be built around a set of HTML pages that organize the content in a logical way. The pages will be displayed within a layout designed to present the user with an attractive and functional framework for navigating the site content. The mapping interface will be the featured content but other supporting content can be integrated into the design. The site layout will be designed around a custom color scheme developed in cooperation with the State.

The goal of the design will be to keep the interface clean, simple and accessible to users not familiar with GIS software. Functions such as the layer controls and search tools will be presented in dialog boxes that open on top of the map and can be dragged by the user. These boxes will not be pop-up windows but will be integrated directly into the page. The web site will be designed with a complete help system for all tools included within the mapping application.

The public site will be developed using the latest asynchronous technologies to provide a lightweight, responsive interface and the most comfortable user experience possible. The design will be tested on the most popular browsers and will not require the user to download plug-ins. The cartography will be designed to maximize display speed while still delivering attractive and easily interpreted maps.

The state map will be a hosted solution on a completely managed and redundant network with an established maintenance protocol for updating the published information on a scheduled basis. The hosted broadband mapping data will be served from an enterprise relational database system to provide maximum performance. Site usage statistics will be available for review when requested. The spatial data will be housed in an enterprise RDBMS environment to maximize performance, scalability and robustness.

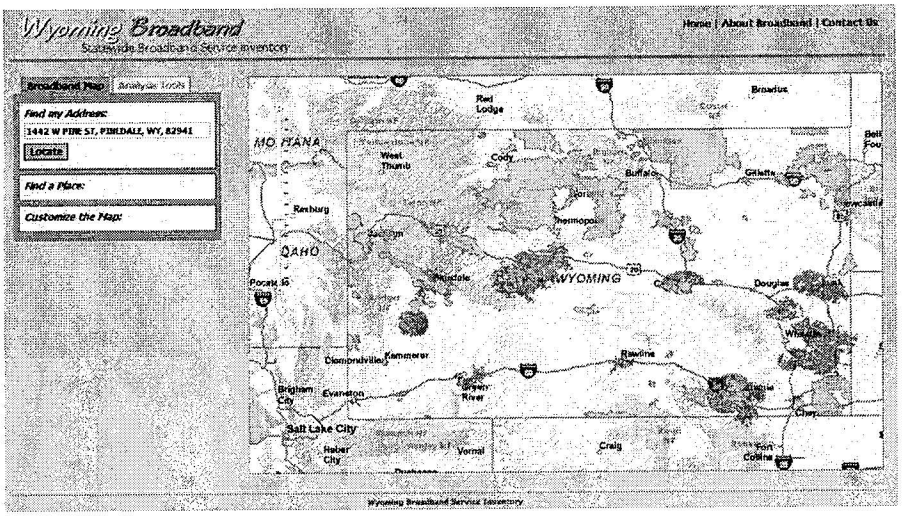


Figure 8 – Online Interactive Map

The interface will display GIS broadband data layers and information symbolized by specific attributes. Jurisdictional boundaries and general base mapping layers such as road networks, hydrology and available aerial imagery are displayed to help users relate to the information. Users will have the ability to customize the map display through a simple interface and see various types of broadband coverage information. Interactive information query requests can be carried out by clicking on the map to display detailed information about the location selected. The interactive site includes map navigation tools such as 'zoom in,' 'zoom out' and panning tools to move around the map. An overview window will display the location within the State that the user is viewing and a measure tool will allow the end user to perform simple measurement calculations on the map interface. A user-friendly interface will be developed to allow the user to navigate quickly to a specific location on the maps such as a county, city, zip code or address.

For advanced users, such as analysts and researchers, the map will include functionality that allows the end user to extract information that is more detailed by composing basic queries on the mapping data. Tools will be added to the interface to allow map printing and export to PDF files. Detailed metadata (source information descriptions) for each GIS layer will be available within the web site. This level will include basic reporting features to allow some of the GIS broadband layer information in specific geographic areas to be organized and sent to a report that can be exported or printed.

Researcher Accessibility

Because the team is unsure of the needs of the research community, the intent is to make the broadband service area data available to providers in SHP file format. This will be the same masked data which is used for visualization and display. Not the confidential data provided by service providers under NDA.

Provider Accessibility

Through a secure portal the team intends to allow providers to complete surveys, upload results and view map corrections online.

Stakeholders that possess file based information like maps or other documents may want to use the web interface to upload those files for use in building the database. Robust and scalable tools will be considered to upload files of any size from the user's browser to a central location for later processing. Files would be available for downloading through the same interface if desired. This functionality should only be available to authenticated users.

These are common information sharing features and they will be of great benefit to provide both a record of changes and communication with providers but also minimize some of the time lost to information exchange.

d) Security and Confidentiality

The team has in place mechanisms to handle confidential information. The team has worked with public and private clients on a large number of sensitive issues. In this project, the intent is to engage the public and private provider community to work together to reach clarity and consensus on why the maps are being developed, what data is required, how results will be displayed, who will be able to access the maps (including how maps will be made available to local, state and federal policymakers).

The team's method works very closely with the provider community beginning with the design of a relevant Non-Disclosure Agreement. Although under modification to meet NOFA compliance the NDA is balanced to help obtain and display information useful to consumers while protecting proprietary data.

The goal with regard to provider data is to obtain and present a realistic and informative view of broadband inventory and service areas:

- Without compromising the locations of key infrastructure with concern for public safety, and
- Without compromising the proprietary business data of service providers.

As part of the NDA, the team has developed a "Data Classification Scheme" that shows how the input data will be treated and shared by data type. The team also works closely with the providers at the start of the project to help them understand how the team will take their data submissions and create a derivative output. In the past, if providers understand exactly how their data will be used and displayed in the public domain, they are more likely to participate in the survey process. The NDA is the keystone to the data gathering effort.

The NDA has been used successfully in both Wyoming and Alabama.

2. Project Feasibility

(a) Applicant Capabilities – budget and planning narrative

Budget

The 5-year total budget consists of two components — costs attributable to LinkAMERICA ($3,137,521) and the State of Wisconsin's matching contribution ($1,285,012).

LinkAMERICA (80%)

Costs attributable to LinkAMERICA for contractual services will not exceed $3,137,521 for the 5-year period of the project. More work will be performed, and thus more reimbursable costs will be incurred by LinkAMERICA, during the first two years of the project.

State of Wisconsin (PSCW) Matching Funds (20%)

The State of Wisconsin, primarily through the PSCW, will provide matching funds through in-kind and cash contributions in an amount not to exceed $1,285,012. It is difficult to precisely determine the exact proportion of in-kind and cash contributions before the project actually begins. What cannot be covered through in-kind service contributions will be supplemented with direct cash contributions.

In-kind services will comprise a large portion of this matching contribution. State employees, primarily PSCW staff, will play an active role in support of LinkAMERICA's activities, as described elsewhere in this grant application. Moreover, data and systems owned and maintained by the PSCW and the State of Wisconsin will likely be used in this project. A fair market value will be determined, if and when used, based on the relevance to the project. Equipment (hardware and software), as well as travel and miscellaneous meeting and teleconferencing expenses, will also be contributed.

Sources of cash contribution may include funds from PSCW's Gift and Grants Fund, and special assessments on regulated utilities. Debt financing to meet the matching funds obligation is not anticipated.

Wisconsin Mapping Budget Narrative

Program Director: The Program Director will have responsibility for all the program deliverables. The Program Director will have high experiential qualifications in broadband technology and program management. The Program Director will be employed at a base salary of $[redacted] per year (including a 3% COLA for years 2-5) at [redacted] FTE for year 1 and [redacted] FTE for years 2-5. The Program Director will oversee all aspects of the project design including the design and implementation of the data gathering and mapping, development and implementation of Broadband Planning, and on-going coordination with the state and with NTIA.

Project Manager: The Project Manager will ensure that all the deliverables and objectives for the program are met. The Project Manager will have high experiential qualifications in project management and with broadband technology. The Project Manager will be employed at a base salary of $[redacted] per year (including a 3% COLA for years 2-5) at [redacted] FTE through year 5. The Project Manager will develop and manage the timeline and tasks for the design and

implementation of the data gathering and mapping, development and implementation of Broadband Planning, and provide project updates and compliance reporting for the program.

GIS Director: The GIS Director will ensure that all the deliverables and objectives for the data and mapping part of the program are met. The GIS Director will have high experiential qualifications and educational credentials Geospatial Information Systems and have experience and knowledge of broadband networks. The GIS Director will be employed at a base salary of $[redacted] per year (including a 3% COLA for years 2-5) at [redacted] FTE for year 1 and [redacted] FTE for years 2-5. The GIS Director will design and manage the data gathering and mapping efforts for the project.

GIS Programmer: The GIS Programmer will assist with meeting the deliverables and objectives for the data and mapping part of the program. The GIS Programmer will have experiential qualifications and educational credentials Geospatial Information Systems and have a basic understanding of broadband networks. The GIS Programmer will be employed at a base salary of $[redacted] per year (including a 3% COLA for years 2-5) at [redacted] FTE for year 1 and [redacted] FTE for years 2-5.

GIS Associate: The GIS Associate will assist with meeting the deliverables and objectives for the data and mapping part of the program. The GIS Associate will have experiential qualifications in Geospatial Information Systems and have a basic understanding of broadband networks. The GIS Associate will be employed at a base salary of $[redacted] per year (including a 3% COLA for years 2-5) at [redacted] FTE through year 5.

Web Design and Support: The Web Design and Support staff person will assist with meeting the deliverables and objectives for the data and mapping part of the program. The Web Design and Support staff person will have experiential qualifications in web design and have a basic understanding of broadband networks. The Web Design and Support staff person will be employed at a base salary of $[redacted] per year (including a 3% COLA for years 2-5) at [redacted] FTE through year 5.

Project Support Coordinator: The Project Support Coordinator will assist with meeting the deliverables and objectives for the data and mapping part of the program. The Project Support Coordinator will have experiential qualifications in customer support and have a basic understanding of broadband networks. The Project Support Coordinator will be employed at a base salary of $[redacted] per year (including a 3% COLA for years 2-5) at [redacted] FTE through year 5.

Data Validation and Engineering Analyst: The Data Validation and Engineering Analyst will assist with meeting the deliverables and objectives for the data and mapping part of the program. The Data Validation and Engineering Analyst will have high experiential qualifications and educational credential in Network Engineering for broadband networks. The Data Validation and Engineering Analyst will be employed at a base salary of $[redacted] per year (including a 3% COLA for years 2-5) at [redacted] FTE for year 1 and [redacted] FTE for years 2-5. The Data Validation and Engineering Analyst will develop and employ methods to verify data received from services providers based on network engineering standards and parameters.

Relations Director: The Relations Director will work to ensure that service providers and other stakeholders are involved with, and contribute to, the data gathering and mapping effort. The Relations Director will have high experiential qualifications in contract negotiations and expert knowledge of broadband industry. The Relations Director will be employed at a base salary of $[redacted] per year (including a 3% COLA for year 2-5) at [redacted] FTE for year 1 and [redacted] for years 2-5. The Relations Director will oversee the process of developing and negotiating Non Disclosure Agreements with services providers, design the provider survey, and work to establish a Stewardship program for the contribution of data and support for service providers and stakeholders.

Provider Relations Manager: The Provider Relations Manager will assist with ensuring that service providers and other stakeholders are involved with, and contribute to, the data gathering and mapping effort. The Provider Relations Manager will have experiential qualifications in contract negotiations, research and basic knowledge of the broadband industry. The Provider Relations Manager will be employed at a base salary of $[redacted] per year (including a 3% COLA for years 2-5) at [redacted] FTE for year 1 and [redacted] FTE for years 2-5. The Provider Relations Manager will negotiate Non Disclosure Agreements with services providers, facilitate the provider survey, and be the liaison with service providers.

Compliance Manager: The Compliance Manager will assist with ensuring that the program meets all the compliance obligations of the NOFA and of the state. The Compliance Manager will have experiential qualifications in grant compliance and a basic knowledge of the broadband industry. The Compliance Manager will be employed at a base salary of $[redacted] per year (including a 3% COLA for years 2-5) at [redacted] FTE through year 5.

Stewardship Coordinator: The Stewardship Coordinator will assist with ensuring that service providers and other stakeholders have information to support promoting access and demand of broadband across the state. The Stewardship Coordinator will have experiential qualifications in administrative support functions and a basic knowledge of the broadband industry. The Stewardship Coordinator will be employed at a base salary of $[redacted] per year (including a 3% COLA for years 2-5) at [redacted] FTE through year 5. The Stewardship Coordinator will provide data and support to providers and other stakeholders to assist with grant applications and funding of projects.

Travel: Travel to support planning activities for the mapping program is budgeted to be $51,800. The higher year 1 travel costs are related to project kickoff meetings, meeting with service providers and stakeholders and establishing the mapping and stewardship programs. Travel will support data collection, mapping efforts, and communication with state agencies. Estimated air fare ($600 per trip) is calculated from Cincinnati, Ohio to Madison, Wisconsin. Hotel costs are estimated at $150 per night and per diem of $40 per day and rental car estimated at $60 per day.

Supplies: Project supplies, including such things as a computer for our in-state resources, printers, networking and communications, and office supplies are estimated at $2,950.

Contractual: An estimated $745,000 is budgeted for contractual work related to this program.

Consumer and Business Surveys – Utilizing both qualitative and quantitative research methods a contracted vendor will survey (via phone and other methods) the entire state (with a margin of

error level acceptable to rural and incorporated areas), as well as targeted areas within the state to evaluate the potential Broadband consumer's perception. The vendor will test for awareness of availability and perception of cost and affordability, as well. This information will not be reliable as a test of availability, but rather the perceptions of the public which are as important as actual availability.

Surveys, Sampling and Spectrum Analysis – A vendor will be selected to answer data assurance and mapping questions related to verification of provider data as well as spectrum use, availability, and allocation. A contracted vendor will use GIS broadband supply data, including type, speed and price of connection, carrier coverage areas, and monthly broadband expenditures by individual businesses, organizations, and households to verify and supplement provider data. A multi-source field testing, sampling and survey approach will provide data required but which some carriers cannot or will not provide, as well as independent verification of carrier-provided data needed as a second-source verification of carrier-provided data.

Web Site Design – A contracted vendor will handle web site creation, graphic design and maintenance.

Other: An estimated $190,000 is budgeted for other work related to this program. This includes $105,000 for obtaining and licensing of third-party data to support the data gathering and mapping effort. This data includes, but is not limited to, tower locations and specifications, roads and demand points, demographics, infrastructure, mobile wireless coverage, and business data. Hosting of the interactive web site is also covered in this category at $60,000. There is also a budget of $25,000 for printing and production of maps and reports for the program.

Wisconsin Planning Budget Narrative

Research Director: Experienced PhD trained social science researcher(s) engaged at a total of [redacted] FTE in years 1 and 2; and [redacted] FTE in year 3 at base salary of $[redacted] per year (including a 3% COLA for year 2 and year 3). The Research Director will oversee all aspects of the planning project design including the design and implementation of a statewide broadband visioning process, collection and analysis of relevant planning data, demand-side mapping, development and implementation of regional planning teams, on-going coordination with broadband mapping project components, project communication and report preparation.

Research Associate: Trained social science researcher(s) engaged at total of [redacted] FTE for year 1; [redacted] FTE year 2 and [redacted] FTE year 3 at a base salary of $[redacted] per year (including 3% COLA for year 2 and year 3). The Research Associate(s) will participate in the conduct and analysis of key stakeholder interviews; identify and analyze available planning data, support development of demand side data for anchor institutions; organize and help facilitate regional visioning and R-SAT workshops; and provide on-going research support and technical assistance supporting the Wisconsin broadband planning team and regional planning groups. The Research Associate(s) will also assist in the data collection, analysis and report writing in the development of regional plans.

Research Assistant: Skilled data development and analysis professional engaged [redacted] FTE for year 1 and year 2; and [redacted] FTE for year 3 at a base salary of $[redacted] per year (including a 3% COLA for year 2). The Research Assistant will provide support to the Wisconsin planning project in assembling/organizing relevant planning studies as well as economic and social data. The Research Assistant will build and maintain data bases as appropriate to support planning project needs. The Research Assistant will be responsible for logistical arrangements for day-to-day project operation, including preparation for regional meetings and follow-up summaries.

Travel: Travel to support planning activities for the Research Team is estimated at $16,680 in year 1 and $5,480 in year 2 and year 3. The higher year 1 travel cost reflects a significant commitment to primary data collection through on-the-ground interviews with key stakeholders and validation of data through regional forums. Travel will support all in-state data collection, visioning meetings, regional workgroup meetings and program meetings. Estimated air fare ($600 per trip) is calculated from Spokane, Washington, to Madison, Wisconsin. Hotel costs are estimated at $150 per night and per diem and rental car estimated at $80 per day.

Supplies: Project supplies, including such things as paper, materials, office supplies and project related communications are estimated at $200 per month for each of the three years. Notebooks, printing and other supply costs related visioning meetings and R-SAT operation are estimated at $500 per scheduled regional meeting.

Demand Map Production: An estimated $5,500 is budgeted for year 1 and year 2 for the production of demand maps supporting Wisconsin planning tasks.

Web-Hosting Services: Web-hosting services to support proprietary demand-side web interface software are estimated at $100 per month for years 1 and 2.

In-Kind Matching Obligation Narrative

State of Wisconsin In-Kind Contribution: On-going salary, benefits, and expenses for the State staff will be contributed as in kind, as well as existing data and prior state mapping work. This contribution accounts for $1,285,012 in matching funds over the 5 years of the project, of which PSCW is providing $602,512. This contribution will be validated by the State of Wisconsin with an annual letter.

State or Wisconsin Provider In-Kind Contribution: As part of the process to collect the required broadband information from Wisconsin providers, we estimate that these requests will take on average 50 hours for the two surveys in the first year and 25 hours for the two surveys in succeeding years. With approximately 100 providers, we anticipate a 70% participation rate. To arrive at the estimated $682,500 In-Kind matching funds, we utilized a $65 per hour loaded labor rate multiplied by 50 (25 in succeeding years) for the hours multiplied by 70 providers (70% of 100). Since this cost for the project will not be reimbursed by the Federal grant, it is considered an In-Kind contribution. The contribution amount will be calculated and validated by LinkAMERICA annually by requesting in the surveys the actual hours spent.

This In-Kind contribution of $1,285,012 from all sources easily meets the 20% matching requirement which is $627,504.

(b) Applicant Capacity Knowledge and Experience

This portion of the narrative describes the firms engaged in this project.

The Public Service Commission of Wisconsin (PSC) is an independent regulatory agency dedicated to serving the public interest. The agency is responsible for the regulation of Wisconsin public utilities, including those that are municipally-owned. Typical types of utilities regulated include electric, natural gas, telephone, water, and combined water and sewer. More than 1,100 utilities are under the agency's jurisdiction. For more information about the PSCW, see its website http://psc.wi.gov/aboutus/index.htm.

The lead staff on this project will include the following staff from the PSCW's Telecommunications Division:

- Gary A. Evenson, Administrator
- Nicholas A. Linden, Assistant Administrator
- Judy A. Klug, Telecommunications Engineer
- Peter R. Jahn, Rate Analyst
- Jeffery J. Richter, Rate Analyst
- Duane Wilson, Program and Planning Analyst

Other PSCW staff will be utilized as the need arises.

Since 1999, The PSCW's Telecommunications Division has prepared biennial infrastructure reports to the Wisconsin legislature using mapping software. These reports include deployment of broadband, and other advanced infrastructure technologies and services. Past report and maps can be found at: http://psc.wi.gov/utilityinfo/tele/infrastructureCompetitive/infrastructure-index.htm

The in-house experience producing these infrastructure reports and maps over the past decade gives the PSCW the necessary knowledge and experience to successfully manage this project with LinkAMERICA. The PSCW is well aware of the difficulties in: (1) collecting competitively sensitive information from providers, some of whom we do not regulate; (2) protecting these confidential data; (3) working with and analyzing "messy" and missing data; and (4) aggregating and displaying data on maps so as to mask competitively sensitive, yet provide useful, information. This same knowledge and experience tells us that we cannot go this project alone. To fulfill the technical requirements of NTIA's NOFA, the PSCW will need to partner with an experienced team of professionals like LinkAMERICA who command many more resources. This will be the first time the PSCW has engaged an outside third party vendor to prepare its broadband maps and assessments.

The PSCW also has knowledge and experience in conducting online customer surveys. Currently, the PSCW has a customer broadband survey that identifies some (not all) unserved and underserved areas within Wisconsin where there is a demand for broadband. It should be useful in verifying provider supplied data. We have also shared this data with potential BTOP grant applicants from Wisconsin who will use survey results to support their own applications.

To see the PSCW's customer broadband survey and preliminary results, go to:
http://psc.wi.gov/recoveryAct/sfBroadband.htm

PSCW qualifications and experience do not end with PSCW and its staff. The State of Wisconsin's Graphic Information Officer will be available for consultation to the PSCW and LinkAMERICA. This includes access to the Wisconsin Spatial Data Repository which he manages. This additional wealth of geospatial data will help to keep this project on time and under budget while producing a better end product.

CostQuest Associates – CostQuest is recognized worldwide as an expert in geospatial, economic and network modeling. Its telecommunications models are used in more than 35 U.S. states, and 5 countries. CostQuest's mapping and models are used for network design, growth plans, regulatory proceedings, Broadband analysis, and economic decision making.

EFRsource, Inc. – EFRsource is a technology and research firm specializing in demand-side strategy formation in telecommunications and telehealth sectors. Their focus is to bridge the insights of strategic visioning with the action of strategic planning. The founders of EFRsource have invented and developed a ground-breaking research method called Ethnographic Futures Research (EFR) and have experience in reducing uncertainty for public agencies and private organizations dealing with complex issues involving public policy, private investment and technology planning. The EFRsource team will assist in framing this project, meaningfully engage stakeholders and conduct the community technology planning activities.

L. Robert Kimball & Associates, Inc. – Kimball is a large engineering firm with a deep GIS technical bench that includes the mapping conversion and production resources to deliver complex and demanding GIS data projects. Kimball has been providing GIS services since the early 1980s and has worked on large state and local GIS projects across a number of industries including public safety, telecommunications, regional planning, economic development and tax assessment. Kimball application specialists have also been designing and implementing GIS web applications for many years and have a complete hosting capabilities within a secured company data center. Kimball also has an extensive track record of providing full-service telecommunications and network engineering and consulting. Their experience includes expertise in virtually every aspect of communication systems planning, implementation and operation. Kimball is proficient in building comprehensive broadband telecommunications networks that offer converged access, interoperability, security and flexibility. In addition, they are also capable of providing application support on an as needed basis.

e-Copernicus advises clients on a full range of governmental affairs, public relations and business development strategies. The firm specializes in interfacing with government and industry stakeholders, public safety services, associations, strategic partners and federal funding sources. Since 2001 e-Copernicus has maintained a particular focus on advancing broadband and wireless communications service deployment, particularly in rural and underserved areas. e-Copernicus executives have extensive

experience in establishing and running non-profit associations, coordinating coalitions and committees, and bringing together diverse parties to work around common goals.

LinkAMERICA Staff Qualifications

LinkAMERICA anticipates the project will be staffed with these key individuals:

- Project Executive: James Stegeman
- Geospatial Activities: Mark Guttman, Mark Holmes (leads)
- Online Applications: Mike Krell, Tim Enderlein
- Provider Relations: Mike Wilson
- Broadband Planning: Dr. Bill Gillis, Dr. Matt Mitchell

Knowledge of Broadband Technology, Infrastructure, and Deployment

The project team brings together a unique multi-faceted professional team with deep knowledge and experience in all aspects of high speed Internet technology, infrastructure and deployment. Notably the assembled team has the knowledge and skills with comprehensive approach that analyzes both the supply- and demand-side barriers to broadband infrastructure and information technology deployment. CostQuest Associates and Kimball provide decades of experience in engineering broadband technology solutions as well as modeling economic costs of broadband alternatives. The professionals which make up EFRsource, provide experience and knowledge gained from leading numerous broadband planning initiatives -- ranging from the creation of a statewide telehealth network to building a new statewide community technology network.

Knowledge of the Telecommunications Industry and Service Providers

LinkAMERICA and PSCW are knowledgeable in different aspects of telecommunications network modeling; telecommunications policy; as well broadband deployment, adoption and utilization. The team includes a number of professionals who have worked directly in the telecommunications industry as well as others who have worked in high-level public policy positions such as a former Administrator of the National Telecommunications and Information Agency and a former Washington State Utility and Transportation Commissioner.

Experience Working with Geographic Information Systems (GIS) Mapping

The team has recognized skilled GIS mapping capability, as well as experience applying GIS tools to develop statewide broadband infrastructure maps. Both CostQuest and Kimball have created GIS maps for government and private sector telecommunications clients in numerous states as well as internationally. The team is recognized worldwide experts in telecommunications geospatial, economic and network modeling. The team is involved in statewide broadband mapping initiatives in Alabama and previously Wyoming.

In terms of educational capacity project leads either have graduate degrees in Geography / GIS or are GIS Certified Professionals (GISP).

Experience with Field Data Acquisition, Assessment, Integration and Sampling

The team brings over 50 staff members with GIS experience, from data collection, data conversion, data assurance, database design, GIS programming, web applications, and GIS data analysis. This includes many years of experience in the integration of geospatial information from various types of source documents into GIS using technology and existing proven processes such as tools, scripts and applications to convert paper maps, CAD files and tabular data into a digital information systems. The team has a high level of success with geospatial conversion because of an excellent understanding of map projections, spatial analysis, data queries, specific database formats, database design and familiarity of and accessibility to numerous software packages. The team has experience collecting data not only for statewide broadband project but also critical GIS infrastructure data, enhanced 9-1-1 field verification, GPS asset verification and inventorying and working with telephone companies, wireless carriers and voice of internet protocol (VoIP) providers to collect confidential 9-1-1 database records and provide verification and remediation on those 9-1-1 databases.

Beyond the data verification experience outlined for broadband data gathering and mapping within this proposal, the team also brings data assurance and field verification experience from a vast array of project types. Associates have provided statewide verification that included identification and cataloging of radio towers and sites.

Specific examples of intensive data gathering and field verification projects include the following public safety and 9-1-1 GIS projects:

The project was developing a GIS database that locates all wireless communication facilities within a county to assist public safety officials with the deployment of Phase 2 Wireless 9-1-1. This project involved the following tasks:

- Work with wireless carriers to gather tower site location data
- Compare current tower site location data provided by the wireless carriers to Phase 1 tower data currently on file to identify new and or previously unidentified towers
- Compare address data to new or previously unidentified tower to the County current Master Street Address Guide (MSAG)
- Perform field verifications of the locations of all known wireless telecommunication sites in the County
- Identify any unknown wireless telecommunications sites in the County and verifying their locations
- Provide the County with an address discrepancy report
- Complete tower site location validation; create Call Routing Sheets/Master Street Address Guide (CRS/MSAG) updates for Allegheny County for submission to the wireless carrier in order to complete Phase II Wireless Deployment.

Providing GPS testing and 9-1-1 call verification as it pertains to the delivery of wireless 9-1-1 calls made from cell phones. Teams provided an assessment of the location information being reported to call dispatchers by the region's wireless service providers. Using GPS equipment, Kimball created baselines for the actual latitude and longitude compared to the coordinates reported by the wireless service providers using test calls and field data.

Over two decades of providing Enhanced 9-1-1 GIS addressing services which includes understanding all addressing standards published by the National Emergency Number Association (NENA), the United States Postal Service (USPS) and individual state and federal agency standards, where applicable. This experience includes working with the local government, USPS, telephone companies and other agencies with source information as part of an initial data gathering process than again through data verification processes. Projects also involve staff undertaking either door to door field collection or 'windshield' verification by visually determining accuracy of existing addressing information by driving local roads for field survey. Teams have access to efficient and proven data collection tools including applications and field hardware to collect information accurately and efficiently.

Similar Engagements

State of Alabama: the ConnectingALABAMA Project

Current efforts are now underway to:

Work with existing service providers to identify and map where broadband service currently exists across the state – and to identify where there are unserved or underserved areas – particularly in rural Alabama.

Work with governmental, community and industry leaders from across the state to articulate a clear vision for Alabama's broadband future and to develop (and fund) technology adoption and growth plans in all sixty-seven (67) counties.

Work with media and others to communicate with all citizens of Alabama about the ConnectingALABAMA initiative – and to encourage technology adoption as a key to local economic development and an enhanced quality of life.

Work to secure grants and funding for deployment, adoption and use programs.

Efforts will focus on encouraging private investment for high-speed Internet deployment, and on promoting consumer adoption. Through this effort, ConnectingALABAMA will develop a roadmap for the most efficient approach to realizing broadband accessibility and usage throughout the state.

State of Wyoming: the Wyoming Broadband Gap Analysis Project

The study had two objectives. The first was to identify those areas of the state, which were not accessible via terrestrial Broadband services. The second was to estimate (for those areas not receiving Broadband) the investment necessary to deploy terrestrial Broadband or satellite Broadband services.

The Project drew heavily from support of the telecommunications and networking community. The Wyoming Telecommunications Council was reliant on the use of complex and sometimes proprietary data. Without the assistance of the provider community, this study would not be possible. The study was accomplished in four phases.

The first phase identified service providers and obtained information regarding their costs, network architecture and service boundaries.

The second phase developed and cataloged the geospatial information received in the prior phase. In other words, either integrating digital data submitted or developing GIS layer files using paper or non geo-referenced digital data.

The third phase combined the data created in the second phase with baseline demographic and geospatial data. This phase allowed the development of maps, which illustrated areas of the state that were Broadband Gap Areas (BGAs) and calculate population and housing unit count in the BGAs and Broadband Served Areas (BSAs).

The final phase distilled all of the information from the prior phases and combined it with the CostPro-WY cost model. CostPro-WY is a forward-looking model used to estimate the cost of deploying Broadband to housing units in the State. It is based upon well proven forward-looking network engineering and geospatial algorithms.

The study was reliant on three principle sources of data inputs. The first were investment inputs such as material and labor costs. The second were engineering planning rules such as the crossover distance between 24 and 26 gauge cable or the number of amplifiers allowed after a Fiber Node within HFC distribution or, the typical (design) backhaul distance from a wireless antenna of given wavelength. The third were the geospatial data mentioned above. This data described the location of network facilities, potential customers, service boundaries or Broadband served areas.

A survey was circulated to wireline voice, cable and wireless ISP providers throughout the state. Because much of the data requested was proprietary and confidential, CostQuest signed NDAs. Data specific to costs or network engineering were blended with CostQuest's price database to combine a melded, non-provider specific set of cost inputs.

Initial objectives for the contract with Wyoming were met and we continued to set and achieve objectives under the maintenance contract, which ended in July 2008. We were successful in mapping and taking an inventory of telecommunications assets for the state. We were also successful at presenting cost to serve of unserved consumers. The State of Wyoming and service providers have accepted our work, including representation of coverage, survey methodologies, and cost calculations for deployment of service.

CTIA – The Wireless Association: U.S. 3G Broadband Ubiquity project

On behalf of CTIA – the Wireless Association®, CostQuest Associates conducted a groundbreaking study that answered two fundamental questions: (1) How many people in the United States live in areas without access to mobile 3G broadband service, and (2) what will be the initial investment necessary to provide coverage to all Americans? The answers: approximately 23.2 million, and approximately $22 billion, respectively.

In the study, CostQuest measured the current deployment of 3G mobile broadband service technologies Evolution Data Optimized, or EvDO, and High-Speed Downlink Packet Access, or HSDPA, and determined the geographic and population gaps in full coverage. CostQuest then estimated the infrastructure enhancements and new construction necessary to extend both broadband mobile service technologies to those geographic areas and populations lacking full coverage, as well as the costs of making those investments.

The study called on CostQuest to obtain proprietary cost and network data from providers and concluded that 42 percent of road miles in the United States do not have access to any 3G mobile broadband services. In order to achieve full 3G mobile broadband coverage with both technologies, the study estimated that carriers must build approximately 16,000 new towers and enhance about 55,000 existing towers with HSDPA and EvDO equipment. The study has been presented to industry, Congress, FCC Commissioners and staff, Joint Board Members and Staff, and media and has been well accepted and referenced.

3. Expedient Data Delivery

No one has ever done what the BDIA/BTOP programs are requesting. There is no prior plan that can be followed.

Strong project management will be necessary to achieving the goals. But this project management practice must be flexible, evolving and open to iteration.

The team consists of individuals used to working under tight deadlines. There is agreement that a project management framework will be necessary to completing the project. There is also agreement that integrated broadband planning, stakeholder identification and a tapestry approach to data gathering will be necessary.

This section of the narrative will explore two issues. The first will describe the project milestones-key tasks that will be achieved. The second will provide a timeline of the first few project weeks illustrating how the anticipated the data gathering process will proceed.

Project Milestones

Milestone A. Schedule a face to face kick-off meeting

Purpose: At this early stage the initial work should center on getting a team in place that can work quickly and has a strong understanding of priorities and goals. The team believes the best way to kick off a project of this nature is a face to face meeting for approximately two business days.

The outcome of this meeting will be a Project Charter. The team would also anticipate the formation of some sort of steering team and reporting structure. The team and the State will also agree on a highly visible project sponsor who can be used for communication and stakeholder outreach.

Milestone B. Identify Stakeholders

Purpose: As this project is important to a large group of interests it is important to identify champions who can assist with resource sharing, project advocacy and bridge building. The team will begin to structure outreach communication with respect to project champions and key advocates. This milestone will likely evolve to a potential list of candidates involved with the R-SATs (section 5 above)

Milestone C. Develop a Deliverables List

Purpose: There are a number of primary (November, 2009 NOFA required) and subsidiary deliverables due at later points in time. The deliverable list needs to clarify when something is due as well as what subsidiary gating items will be necessary. The deliverable list also needs to clarify human resource and organizational structure with respect to broadband planning activities.

Milestone D. Prioritize this list as to impact on NOFA deliverables

Purpose: Due to extremely limited time, complex deliverables and limited funds the team and the State are going to have to prioritize the deliverables. Although work focus will likely start on BDIA/BTOP requirements, it is important to remain aware of subsidiary deliverable so work processes can efficiently develop the subsidiary deliverables when time allows.

Milestone E. Develop a data and organizational gap analysis

Purpose: There are several NOFA critical data sets that need to be isolated quickly: schools, libraries, computer centers, community centers, emergency services, colleges, universities. The project team will be extremely reliant on these data sets as well as resources that will maintain, update and ultimately propagate this information to entities applying for grants.

Data deliverables walk hand in hand with organizational structure and task deliverables. It may be necessary to divide this milestone but it is still necessary to identify organizational capacity that can be linked into the broadband planning portion of this project.

Milestone F. Clarify owners of deliverables: work-efforts and responsibilities

Purpose: As deliverables, data/organizational gaps and priorities are clarified owners, work-efforts and responsibilities will need to be assigned. It is critical to have a clarification of ownership and deadlines in a project like this.

Milestone G. Identify Communication Paths

Purpose: Each individual wants to communicate in a way most efficient for themselves and the team needs to allow for this. Based upon past experience, the team believes this project will likely benefit from the use of social networking sites where individuals can interact with a community but elect to communicate in a manner most appropriate for them.

Milestone H. Implement Communication Portal

Purpose: The portal will provide a secure and convenient means of sharing data with the provider community; this will include surveys, data transfer and status information. The portal will also contain a public communication piece that provides broadband information to the citizens and consumers of the State.

Milestone I. Modify existing NDA and Data Classification Scheme to respect project priorities.

Purpose: Modification of the NDA will be a critical first step in enlisting provider support and assuaging concern.

Project Timeline

LinkAmerica responses to how to meet these deliverable requirements are estimates for what is believed may happen given prior experience. The best-case scenario is that all providers can provide the data in formats comparable to Technical Appendix A. If so, the deadlines should not be troublesome. What is likely is a gradual evolution in the data product. The early days of this project will be consumed with questions of scope, confidentiality and administrative burden. It will take some time to work through these issues with the provider community. But these issues may need to be put on a parallel track to allow the 11/09 deliverable to move forward.

Work will begin immediately in August well before the awards of the project funds are made by NTIA. When this work begins, some discussion should take place regarding contract negotiation with LinkAMERICA and PSCW. As well, decision making parties from the state should be identified. In addition, the team's project manager will immediately begin the project plan and organize a team planning event to get agreement of project issues, including deliverables and timeframes.

Beginning with the first days of the project, the team will actively engage industry and stakeholders with open and honest dialog to establish ground-rules, expectations and processes that will ensure required data collection will be accomplished in a timely and efficient manner. Throughout the body of this narrative mechanisms have been discussed for accomplishing; project portals, social networking, active on the ground outreach and follow ups.

With respect to obtaining data, the team will use a time box approach to gathering deliverables in order to meet the due date. In regard to the data components, the emphasis within NOFA on address level data provides a number of different response paths from the providers, which are outlined below. The suggested data collection approach to create the first maps is as follows. The PSCW will immediately create a list of all service providers (telco, cable, wireless, broadband over power line, and WISP). The PSCW currently maintains such lists for most of these providers. See the PSCW's website at http://psc.wi.gov/apps/utility/content/findunf.aspx. The PSCW is currently expanding its list of providers to implement recent changes to Wisconsin state law regarding assessment of fees. This update should add several wireless carriers to our current list, among others. For those broadband providers not on our list of providers, the PSCW will work with state entities and provider industry groups to fill in any gaps. Once LinkAMERICA is onboard, it will augment these efforts to finalize a complete list within the first week of the project. If providers are unable to supply address level information the following are two alternatives:

Ask if the provider can supply the most recent address level data used as the basis for FCC 477 filings. If the provider cannot supply this data by the end of week 5 or does not respond, then move to an estimate methodology, below.

To support verification and assessment processes, the team will request the broadband service areas and/or an address level listing of all equipment used to support broadband services (this could also include the shapefile for the engineering boundaries of these broadband nodes). If only broadband nodes are provided, the provider would have to provide standard engineering rules on service distance from these nodes. In addition to the boundary data, we would request a listing of all service addresses (ideally working and non-working). The address data would be

geocoded and then overlaid on the broadband boundaries. From this data, the NOFA address list can be created. The address data fields will be space delimited in standardize Postal Service form, meeting the NOFA requirement and Technical Appendix A.

If by the end of week 2 a provider feels that they cannot comply with either the pure NOFA request or the two alternatives, the team will present them with an estimate of their service area based upon public data. In other words, present an estimate and let the provider correct it. Estimated coverage patterns could be derived via commercial coverage or they may be based upon engineering judgments of subject matter experts. The timeline would be to have these estimates in place by the end of week 4. The provider has 2 weeks to correct them or they are considered accepted.

For a provider who does not provide data, their coverage areas will be based upon estimates using third party data and sampling. Clearly relying on estimated data is not ideal, but the converse of allowing providers unlimited time response path would jeopardize the development of data required for the first NOFA filings.

As stated above, the team's sense is that this initial deadline will be more driven by engineering than actual customer location information. The team is prepared to handle that circumstance.

The team's anticipation is that by early January many, if not most, providers willing to participate will be able to generate data consistent with Technical Appendix A. It is unknown as to how much of the data will come in, in address format versus Census Block versus road segments within blocks. There may need to be a significant amount of application development between project start and January to enable development of software that supports this normalization process.

Given the 8/7/09 clarification, the team is flexible towards new changes promulgated by NTIA to support data collection. The sense is there will need to be clarification on the data exchange formats given the new Census Block or road segment deliverables.

To summarize the discussion above, a timeline is provided in Gantt chart format. Although the chart implies a linear path toward the deliverable a number of iterative tasks is necessary to get to a March 2010 completion.

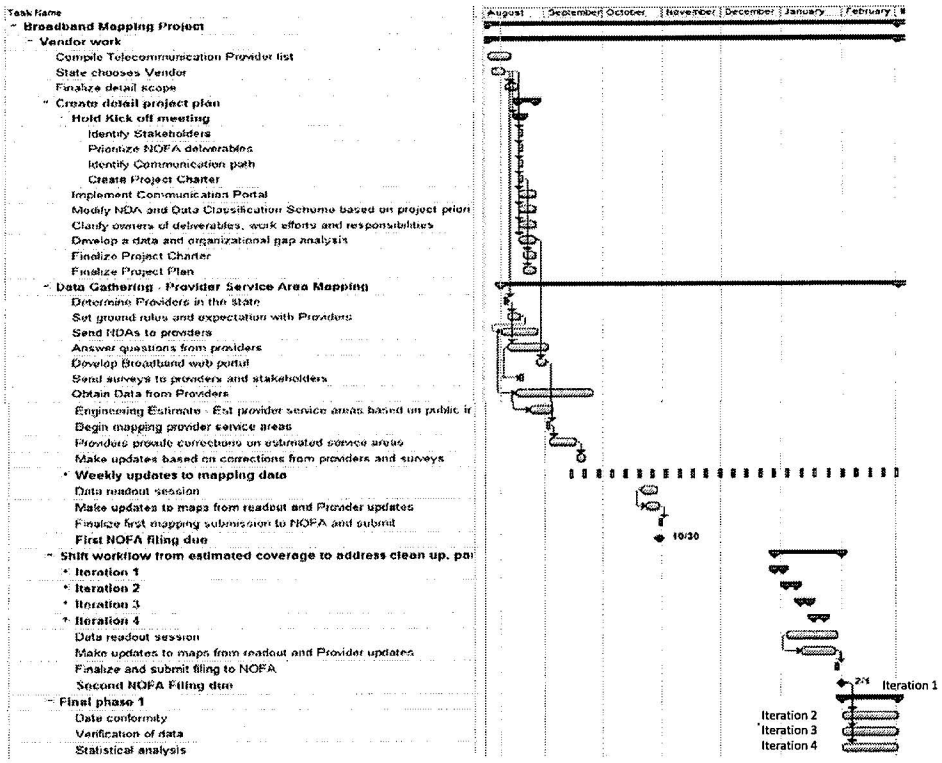


Figure 9 – Iterative timeline through March 2010

4. Process for Repeated Data Updating

Maintaining up to date, accurate and relevant information is critical to drive effective policy. This section of the narrative will focus upon steps necessary to keep data up to date while also maintaining a historical record of changes.

The team will use the outreach methods, communication plan and public portal to store historical and updated data. Thus, there will be a place to find information and updates.

With respect to the two mapping and planning deliverables, updates will be provided as follows:

a) For broadband coverage, middle mile and price information, provider will be surveyed at least 2 times each year. Map updates will be posted no more than 3 months after the survey cycle has completed. The sense is in the early days of the project's updates will be far more frequent than as the project and data mature. After a carrier accepts the coverage image maintained by the system, the team will provide a copy back to them to allow markups.

b) The team will query each service provider, FCC licensing databases and commercial providers for new broadband service providers entering the state. This will be an ongoing process but will culminate 1 month before a new survey request is to be mailed.

c) Historical mapping data will not be maintained live on the site but historical shapefiles which supported prior maps will be available for download

d) Testing results will be displayed as recorded but also available within a historical database for analysis. Testing will be an ongoing activity scheduled as available test data and field conditions allow.

e) Broadband planning deliverables will be updated as necessary to reflect changes and impacted actions at the regional level

f) As described in the Data Gathering Section, the Community Review concept and use of a confidence layer will help consumers know in real time (without waiting for an update cycle) what the current consumer views are.

g) As accessible metadata and methodology descriptions are maintained, the team will note when data changes and for what purpose. This is a process currently in place in Alabama and is helpful to the grant seeking community.

Over the time horizon of this project there will be many changes, the goal of the team is to present the information and always allow the information consumer to see when and why a particular element of data was changed.

5. Planning and Collaboration

Wisconsin is ultimately concerned with how broadband infrastructure can advance social and economic opportunities and improve the quality of life throughout the state. The mapping and deployment of broadband infrastructure is an important step to achieve goals such as improving access to quality jobs, health care, education, library information access, or public safety. However, broadband is only a tool, not a solution in and of itself. LinkAMERICA will implement a comprehensive, inclusive and transparent planning and collaboration approach to ensure that deployed broadband infrastructure and services will be adopted and utilized to achieve Wisconsin's social and economic development priorities.

This application seeks funding to solve four problem areas that inhibit Wisconsin from expanding broadband adoption and utilization. The table below presents these problems, a summary of the tasks designed to solve these problems, anticipated outcomes of each task and attribution of each task to one or more BDIA-related purpose (as listed in footnote 6 of the Broadband Mapping NOFA).

Problem Areas	Proposed Solution	Anticipated Outcomes
1. Limited information exchange and lack of needed collaboration to expand broadband adoption and use to advance Wisconsin's priority social and economic development goals in all regions of the state.	Task 1 – Assess and inventory key Wisconsin assets that can enable greater use of broadband to achieve social and economic objectives. Establish process to facilitate collaboration. ***Eligible BDIA Uses 6 &9***	• Inventory of data, studies, people and other assets to enhance the use of broadband to achieve priority objectives. • Formalized process of knowledge exchange and collaboration.
2. Lack of valid and reliable data regarding Wisconsin broadband service needs and barriers preventing expanded adoption.	Task 2 – Conduct personal interviews, surveys and public meetings to assess broadband services needs and identify barriers to adoption. ***Eligible BDIA Uses 2 &3***	• Accurate data to inform decisions on actions to address barriers to broadband adoption. • Clarity on desired business and household broadband service needs.
3. Inability to accurately articulate levels of current and future demand for broadband services for businesses, households and community anchor institutions.	Task 3 – Collect and analyze market data to profile demand for broadband by Wisconsin businesses, households and community anchor institutions. ***Eligible BDIA Use 8***	• County-specific information on broadband service demands. • Geographic analysis of broadband service demand relative to available infrastructure.
4. Absence of coordinated regional leadership to plan and implement local sustainable adoption efforts.	Task 4 – Facilitate regional technology planning teams to develop effective local action strategies. ***Eligible BDIA Use 5***	• Regional broadband development plans. • All Wisconsin Counties will be better positioned to benefit from initiatives funded through BTOP and BIP.

The four tasks presented in the table above comprise the scope of work for this planning proposal for Wisconsin. Below, each task is described in greater detail. The breakdown of costs and the budget narrative for this proposed planning effort are organized around these tasks.

Task 1 – Promote Collaboration and Information Exchange

Throughout the entire implementation of the Wisconsin broadband mapping and planning project, LinkAMERICA will promote collaboration through 1) on-going inclusive stakeholder

engagement and 2) use of public meetings and web-based tools providing opportunities for transparent information exchange. Plans for extensive engagement of the telecommunications provider community are described in Section 1 Data Gathering. In addition to provider engagement, LinkAMERICA will initiate contact with relevant state and local leadership organizations including, but not limited to, economic development, education and workforce, libraries, health care, Indian tribal organizations, local authorities, law enforcement, and public safety. The purpose of these initial contacts will be to identify and review relevant planning studies as well as to gain an understanding of stakeholder priorities and opportunities for inclusive collaboration. An emphasis will be placed on assessing collaboration which can enhance multiple social and economic development objectives through coordinated actions. A comprehensive contact database will be established and a communications plan will be developed to ensure all key stakeholders remain engaged and that information on Wisconsin's broadband mapping and planning is efficiently and transparently exchanged among stakeholders as it becomes available.

Task 2 – Assess Uses of and Barriers to Broadband Adoption

LinkAMERICA will implement research to: 1) Identity specific sectors in the region with the greatest potential to expand adoption and use of broadband services (e.g., workforce development/education, health care, agriculture, tribal entities, local authorities, technology entrepreneurship, etc.); 2) Discover significant barriers to broadband adoption and use; and 3) Identify local and regional actions with the greatest potential to address broadband adoption barriers and improve beneficial uses for economic development, health care, education public safety and other priority objectives – including where feasible leveraging expanded connectivity to community anchor points. Key elements of the research plan to assess Wisconsin's broadband use and assessment are described below:

Subtask A – Key Stakeholder Interviews

Approximately 20 - 25 key Wisconsin stakeholders will be identified to participate in semi-structured, open-ended interviews. The interviewees will be carefully selected to represent different perspectives whose participation is critical to Wisconsin's social and economic development priorities. The interviews will be holistic, exploring diverse domains such as education, workforce development, library access, health care, public safety, the economy, the environment, government policy, family values, and technology. Exploration in each interview will focus on key actions and decisions that impact the availability of broadband services in the region and explore how the availability of broadband impacts the region's socio-economic conditions. Through these interviews, the research team will identify specific actions that can be taken by both private and public entities to improve the sustainable adoption and use of broadband services and information technologies in Wisconsin – including an understanding of present and future demands.

SubTask B – Initial Wisconsin Broadband Vision Summary

Insights gained though the individual stakeholder interviews will be developed into a brief summary document including:

1. Driving forces underlying broadband demand. For example: declining cost of digital technologies, growing importance of younger consumers, economic pressures to find more cost effective ways of delivering health care or education, etc.
2. Regional assets enabling increased broadband adoption and use. For example: higher education, computer access at libraries, political leadership, regional planning agencies, private industry, community-based organizations, ARRA grant possibilities, etc.
3. Anticipated high demand uses for broadband infrastructure and services in Wisconsin. High demand uses are framed by anticipated opportunities to use broadband services in beneficial ways to achieve desired outcomes.
4. Actions that can promote expanded adoption and use of broadband services in the region. Understanding these options is particularly important to the development of a sustainable business case and plan for regional broadband deployment.

SubTask C – Wisconsin Business and Household Survey

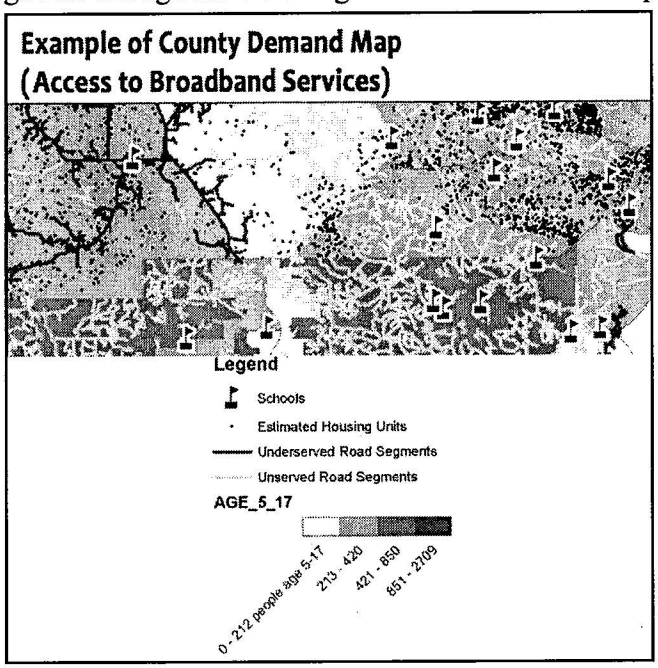
Results from key stakeholder interviews (SubTask A) will be applied to the design of a statewide telephone survey of current and potential future Wisconsin broadband service consumers. This survey will be coordinated with the business and household survey described in Section 1 Data Gathering as component of the mapping program. The survey questions will be designed to: 1) elicit data on current broadband and technology access and adoption in different regions of Wisconsin, 2) collect data on high demand uses, and 3) discover barriers to sustainable broadband adoption and use that must be addressed through programmatic actions. A careful sampling process will be utilized to provide accurate datasets that can be used to discern differences among the designated geographic regions of Wisconsin.

SubTask D – Wisconsin Broadband Visioning Workshops

The initial Wisconsin broadband visioning summary (SubTask B, developed from stakeholder interviews) will be coupled with consumer survey results (SubTask C) and preliminary broadband mapping data for presentation through a series of stakeholder workshops. The workshops will be held at an accessible location and open to the general public. The primary purpose of these workshops will be to validate and refine research data collected through SubTasks A – C (described above). The visioning workshop process will also be utilized to support the planning purpose of promoting inclusive collaboration among diverse stakeholders and facilitating transparent information exchange. The workshops will be designed to encourage as much consensus as possible among diverse participants regarding 1) barriers to sustainable broadband adoption, 2) current and anticipated use of broadband services, and 3) priority actions to be pursued to address those barriers. The workshops will also produce additional information on high demand uses for Wisconsin broadband services contributing the demand analysis described in Task 3 below.

Task 3 – Collect and Analyze Market Demand Data

Outcomes from Task 2 will be applied to Wisconsin's planning activities to discover and articulate market demand for broadband service for households, businesses and anchor institutions. Information developed in Task 2 will be displayed on a customized demand assessment Web-interface for Wisconsin. This innovative on-line tool will present findings from Task 2 as well as collect and analyze additional market demand data. Specifically, the demand assessment interface will present insights gained through the visioning interviews and workshops in an engaging format using short videos, graphics and text. Participants who enter this Web space will be encouraged to view the presentation and then respond to specific questions that both validate and enhance insights regarding current and potential future demand for broadband services. Beyond simply understanding or documenting present broadband demand, the Web-interface is designed to identify the mechanisms of change that can increase broadband demand to improve the feasibility and sustainability for broadband deployment throughout Wisconsin and linkages with ongoing social and economic development.



The LinkAMERICA research team will also leverage Wisconsin broadband mapping data to create a visual model of current and projected demand for broadband infrastructure and services. Specifically, existing data collected through the mapping process, the visioning process and the consumer survey will be overlaid on a "demand map" to discover how deployed broadband services match demand from key community anchor institutions such as hospitals, schools, libraries, and governmental offices. The geographic location of these key community institutions will be included as a specific data layer available for comparative analysis relative to available broadband infrastructure.

Above is an example of a Broadband Demand Scenario Map developed by the LinkAMERICA research team for a region in the southern end of Mobile County Alabama. This map identifies the geographic location of schools within the region. The color-differentiated boundaries indicate the number of residents between the ages of 5 and 17 living within a census block. Road segments within the region are color coded to describe service areas within the region that are either unserved or underserved by broadband providers. The approximate location of housing units within the region is also identified on the map by small black dots.

In this example, the Demand Map illustrates that these local schools lack the ability to communicate through digital media with parents and students at home in a significant part of its District. Students living in these "unserved areas" are not able to take advantage of a statewide on-line student homework mentoring program from their homes. Additionally, parents living in

this area are unable to neither communicate via email with school personnel nor participate in other web-based outreach programs operated by the schools specifically designed to help parents be more involved in their children's education. By mapping community anchor institutions, the availability of broadband services and the locations of people who need to access the services of their community institutions, Wisconsin will be able to develop highly detailed strategies that target gaps in the current and anticipated market demand for broadband services and information technologies.

In Wisconsin, LinkAMERICA will apply results from Task 1 and Task 2 to create and map future scenarios of broadband adoption and use based on the demand of key community anchor institutions that contribute to the state's economic and business development opportunities including for example: education/workforce, health care, energy production/processing sites, libraries, community centers and government service offices. Examples of demand of community anchor institutions include, but not limited to: 1) Expanding use of high quality interactive video to provide specialized medical consultation to support the economic viability of rural hospitals; 2) Ensuring families living more than a half-hour commute of two-year colleges have the capability to access distance learning from home; and 3) Ensuring residents living greater than 15 minutes from critical government service offices have sufficient connectivity to access government information from home. The availability of broadband infrastructure required to fulfill key priority scenarios such as these will be mapped and analyzed to identify gaps and target action strategies. Examples of such strategies include, but not limited to: 1) Ensuring adequate broadband service connectivity is available to all core community anchor institutions; 2) Targeting investments to unserved and underserved Wisconsin households with specific broadband demands that are consistent with the state's priorities; and 3) Strategically locating public access computer centers to improve broadband service access in presently underserved or unserved areas of high priority.

Task 4 – Facilitate Regional Technology Planning Teams

LinkAMERICA will work with the state of Wisconsin to identify regions within the state for which it is most appropriate to form distinct local planning teams. Leadership from all of Wisconsin counties will be included on an assigned Regional Broadband Sustainable Adoption Team (R-SAT). Membership on the regional teams will be by invitation from the Office of the Governor and intentionally design to be inclusive of all major Wisconsin stakeholder interests including but not limited to education, health care, agriculture, business, libraries, community-based organizations, tribal entities, law enforcement, emergency management and others.

LinkAMERICA will support Wisconsin in the creation of an appropriate governance structure to coordinate the work of the regional teams. For example, establishing a partnership with the Wisconsin Chamber of Commerce, the local library system, or utilizing the outreach capability of the state's higher education network, are three examples of opportunities to utilize an existing network to encourage participation on regional teams.

The regional teams will leverage the information developed on available broadband infrastructure, results from the visioning process, consumer survey information, and the market demand tools (the demand assessment interface and demand maps) in supporting each R-SAT to refine a state-level technology growth plan to meet the unique needs in each region. The following specific deliverable will be accomplished:

1. Approximately nine regional specific work plans with clearly defined goals and objectives as well as priority initiatives to improve broadband access and use. Combined, these regional plans will constitute a statewide plan for Wisconsin and be the basis for future BTOP grant proposals.
2. Strong regional collaborations organized around priority programs responding to local broadband demands. Emphasis will be given to initiatives that advance Wisconsin's economic and business development objectives.
3. Local broadband champions identified and organized in each region.

Knowledge of Unserved and Underserved Area

Based upon prior studies we have evidence of where broadband is present. The figure below indicates the presence of broadband served areas. A number of other attributes of existing broadband investigation are shown on maps located at < http://psc.wi.gov/utilityinfo/tele/infrastructureCompetitive/mapsInfrastructrure.htm>

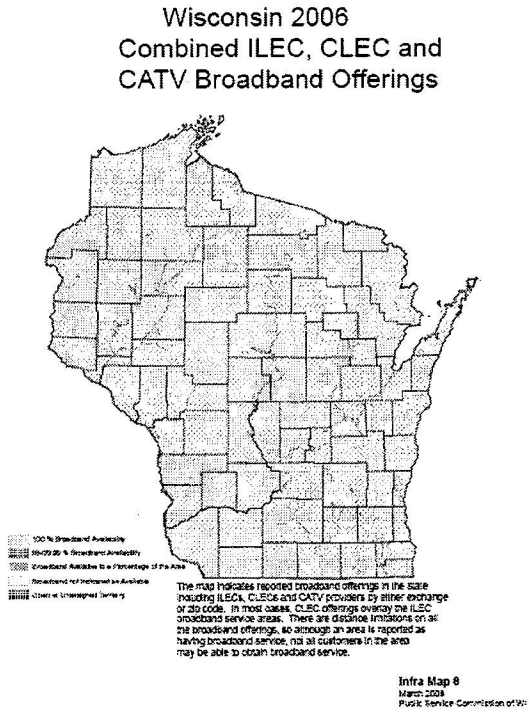


Figure 10 – Presence of broadband served areas

The presence of broadband services shown above, though, does not reflect the current NOFA definitions. The analysis proposed in the narrative will demonstrate unserved and underserved areas.

NOFA Affirmation

The team pledges to deliver the data to NTIA in the manner and timeline requested under Appendix A: Technical Appendix as clarified on 8/7/09. We will maintain appropriate protections to maintain the proprietary and confidential status of data.