



**State Broadband Data and
Development Program
Amended and Supplemental Grant
Application Narrative
U.S. Territory of American Samoa
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Project Abstract

As the Eligible Entity for the U.S. Territory of American Samoa (the Territory), The Office of the Governor has partnered with contracted vendors to collect and verify broadband availability data, including speed and type of technology, following the NOFA specification in the SBDD program. The Office of the Governor is also engaging local partners to support broadband planning efforts focused on collecting broadband adoption information to identify barriers to adoption and the creation of a comprehensive adoption blueprint for the State.

Current Funding: Mapping = \$558,000; Planning = \$500,000

In support of continuing its success with broadband efforts, the Territory, through its relationship with the vendors, has identified four additional project areas by which to engage the SBDD Grant Program as part of the SBDD years 3 - 5 funding application including:

Data Collection, Integration, Verification and Display

Description: Continuation of data collection, validation, verification, enhancement and introduction of additional mapping attribution and geo-referencing on a third-party-supported GIS mapping platform and geospatial data set accompanied by a transition of this platform to the Territory during year five of the SBDD program.

Data Collection, Integration, Verification and Display –Address Improvement

Description: The introduction of sustainable address file improvement processes and geospatial data set interaction enhancements for both populated and rural areas to support broadband adoption and implementation services. Supporting this project would be an integrated feedback loop at both a municipality and address point level.

Technical Assistance - GIS Training Program

Description: A training program to be implemented to provide both American Samoa Government employees and Internet Provider Employees the needed skillsets for the development and management of broadband maps.

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Requested Budget by Project

Project	Requested Budget				
	<u>Yr2</u>	<u>Yr3</u>	<u>Yr4</u>	<u>Yr5</u>	<u>Total</u>
Data Collection	NA	\$129,090	\$98,030	\$81,830	\$308,950
Address Improvement	\$175,165	\$80,305	\$52,015	\$52,015	\$359,500
BB GIS Training	NA	\$50,000.00	\$100,000.00	\$100,000.00	\$200,000.00



**SBDD Data Collection, Integration, Verification and Display
Funding Overview**

1) Current Funding Award (Years 1-2)	2) \$558,000
3) Additional Funding Request (Years 3-5 including supplementation of Territory address file)	4) \$668,450
5) Total Funding Request	6) \$1,226,450

Overview

The following describes the current proven methodology for Data Gathering, Data Integration, Data Verification and Data Display for the Broadband Mapping project and the proposed continuation of these efforts through years 3-5. In addition, we are proposing an expanded effort for address file development and additional data supplementation for Territory address file.

Data Gathering

Broadband Service Area, Middle Mile Aggregation Points and Broadband Service Overview

The collection of Broadband Service areas, Middle Mile Aggregation points and Broadband Service Overview information is handled through Contractor’s established Provider Outreach Process:

- Build and Maintain an Inventory of Broadband Providers through research and Territory inputs.
- Update Provider Material that describes information we need and logistics for data transfer.
- Update NDA for use in project.
- Continue Relationships with Territory-wide and National Alliance groups to foster cooperation.
- Continue Relationships with each Broadband Provider and identify appropriate contacts.
- Maintain a secure Data transfer protocol using SFTP technology.
- Engage in one-on-one technical meetings to ensure understanding and expectations with Provider.



- Walk Provider through Data Upload SFTP site.
- Download and Processing of Provider Data.
- Allow Provider to examine generated coverage patterns and data layers for verification.
- Adjust and tune coverage as necessary.
- Continue to work with Provider to establish a repeatable process.
- Assist with data preparation with Provider as necessary.
- Maintain records throughout Provider Communication and data handling process (dates contacted, data received, etc.)

The Collection of Community Anchor Institution (CAI) Data

The collection of CAI information is handled through Contractor's established CAI collection Process:

- Maintain Inventory of CAIs through Data Mining, Research, and Territory inputs
- Maintain web-based CAI portal for institutions to interactively add or confirm attribution, location and enter broadband-specific information.
- Maintain Inventory of CAIs through Data Mining, Research and Territory inputs.
- Maintain outreach campaign via mail, e-mail or other means as necessary (group conferences, etc.).
- Upload web-based data to Core Database for internal cleansing and processing.
- Translate internal data to deliverable ready format.
- Identify internal data.
- Create secondary campaign to target CAIs who have not responded and repeat as necessary.

Process for Data Integration

Contractor has developed robust data integration and processing mechanisms that effectively translate incoming data sources to the product deliverables. This process allows for multiple types of inputs and results in a standardized output that meets the requirements for the Territory and NTIA deliverables. This process will continue to be modified and/or enhanced to suit the needs of the project continuation in years 3-5.



- Receive Inputs from Providers via SFTP
- Load source material into Sourcing Database and catalog with Provider information.
- Categorize input into data type category (addresses, block lists, coverage areas, paper maps, etc.).
- Process input based on data type into core standardized format in Staging Database.
- Create Compact Polygons (CP)—(internal methodology for generating area based feature for coverage in Staging Database).
- Apply broadband attribution to CP.
- Apply metadata to CP.
- Compare coverage area to available commercial collateral.
- Compare coverage area to third-party data sets.
- Request for more information if required data elements are missing or coverage discrepancies exist to sourcing team for follow-up with Provider.
- Load CP to Core Database.
- Process coverage area to build Census Block and Street Level geography for deliverable input.
- Process Middle Mile attribution.
- Process input data into Service Overview internal format.
- Process CAI data input into internal format.
- Create Product Deliverable based on NTIA and Territory-level requirements and according to MapConnect™ Broadband specification.

Data Display and Data Delivery

Contractor has developed processes that allow for standard delivery of Static NTIA and Territory deliverables as well as an Online Web application for use by the Territory for their Broadband Mapping Program giving access to internal Territory stakeholders as well as the general public.

- Static Deliverables to Territory and NTIA:



Contractor has developed the MapConnect™ Broadband specification that mirrors the NSGIC File Geodatabase model for the broadband layers and has been successfully delivered to the satisfaction of the NTIA and Territory Partners. This process will continue and enhancements/modifications will be made as necessary throughout the continuation of this project under this request for continuation.

- **Online Web Mapping Application:**

Contractor is in the process of developing and maintaining Territory Level Broadband Mapping Portals that allow on-line interactive maps to suit the needs of the Territory’s broadband mapping applications. Under this proposal, this activity will continue through years 3-5 with additional modification and/or enhancements as directed by the Territory and NTIA stakeholders.

Data Verification

Contractor has developed a holistic approach to data validation. Following the initial mapping of providers’ coverage area and serviceability claims, the project team deploys the following methods for verification of data. This activity will continue through years 3-5 under this proposal.

- **Third-Party Data Verification:** Visually and programmatically compare the coverages against third-party aggregate data.

Third-Party Data	Data Product
Media Prints	Cable Boundaries
American Roamer	Wireless Provider Footprints
Pitney Bowes	Telco Exchange Boundaries
	Central Office Locations
ComSearch	Spectrum Holdings
	License Boundaries

- **Broadband Provider Feedback Loop:** Allow carriers to review their data displayed through a controlled web interface to ensure that accurate information was supplied.



- **Sampling:** Creating a geographically distributed sample set of locations for which a follow-up survey will be conducted surveying business and residential consumers through various means such as direct calling, online surveying and e-mail campaigns.
- **Crowd Sourcing:** This is also deployed via the web to the public in order to solicit location, serviceability and Internet diagnostics that can be gleaned (i.e. speed tests).

Security and Confidentiality

Contractor does not propose any changes to its current methodologies for handling of Confidential Information. To address data security and confidentiality, we will be using the security, access-control, authentication and authorization services built into many of the applications described herein. In brief, our security protocol is two-fold: IT-based (role-based user/password and IP-locking as examples) and metadata-based (explicit identification of confidential data within the system to ensure that it is filtered, summarized or otherwise reduced to an acceptably non-confidential level in publicly accessible interfaces).

Address File Development

The two most important geographic data components of the broadband initiative are broadband availability extent and **address location**. Providing accurate tabulation of broadband availability by address or even by Census Block using address information requires locating each address and determining its service. There are numerous methods of locating addresses, each with associated resulting accuracy expectations. Since broadband availability for many technologies can vary even within a large parcel, it is important to locate addresses at as high a positional accuracy as reasonably possible.

It is well understood that not all States and Territories have at their disposal highly accurate address data that can be leveraged for this purpose and the Territory is no exception. Particularly in States with larger rural populations and underdeveloped GIS systems, this problem is pervasive. In addition, while TIGER/Line® files are readily available, they are not at the level of accuracy or completeness needed to satisfy the intent of the Broadband Mapping Project. The result of using poor or inadequate address resources in the context of the Broadband Data Mapping project is a skewed or inaccurate view of the actual broadband serviceability for the Territory's residences and businesses at the detailed level.



Proposed Solution

Contractor's approach to solving this problem is through an exhaustive research and compilation methodology that aims to create the most cost-effective and accurate data set, leveraging wherever possible existing address data for this purpose.

The end result of this process will be a Master Address File (MAF) by which all known addresses in the Territory will be identified and correlated with a discrete latitude and longitude for location identification. An address defines the physical location where services (in this case broadband services) are or are not currently delivered. In addition, physical addresses are used for other critical government functions such as emergency 9-1-1 response. The MAF is a fundamental data set that is easily understood by GIS and non-GIS people in the public sector, the private sector and within the public at large. As a key component of this grant application, the project team proposes to augment its broadband service area mapping solution via the collection/acquisition of a complete set of address data points across the Territory.

The Project Team's approach to creating a MAF is a pragmatic approach that balances the need for good addresses (as a fundamental basis for understanding broadband availability and gaps) against the limitations posed by schedule and budget. We understand that having the most perfect address file is a long-term goal and a start is needed to achieve that goal. With that in mind, our approach is one that allows for the creation of a good initial Territory-wide data set with the aim that local efforts can build upon the initial investment and incrementally improve the data and maintain it over time.

Approach

- Evaluate all available address sources (i.e. Commercial address sources, Parcel data layers, UPSP, Territory, County and Local government sources) by working with data providers and Territory /local entities.
- Standardize Sources into a single spatial reference (geocoded as necessary).
- Stitch Sources into one exhaustive file.
- Perform Gap Analysis—address file completeness and locational accuracy studies.
- Fill Gap: Use various approaches to complete a comprehensive file (this can be done through source acquisition or source build out depending upon availability and quality).
- Ingestion: As all "Fill Gaps" techniques generate data, it needs to be merged back into the core data set appropriately. This has several sub-steps:
 - o Conflation: automated resolution of multiple sources for the same features, attributes and geographic areas.
 - o Editing: manual or semi-automated editing of the data.



- o Conflict resolution: this is also editing, but guided by conflicts detected during quality tests throughout the ingestion process.
- MAF Build and Extraction: Once the database is fully built and passes all quality tests, it is then extracted into the ultimate product model and format.
- Quality Control: This can include field validation as well as imagery evaluation techniques and crowd sourcing activities.
- Create a maintenance system and program for the continual stewardship of the data for use beyond the scope of this project.

Key Benefits

- Higher level of accuracy for broadband data reporting and planning activities.
- Single repository of Territory Address inventory to support multiple Territory agency needs.
- Consistency of location information across Territory agencies.

Supplemental Proposal for Years 3-5 Broadband Mapping Program - Other SBDD Programs

Name: GIS Broadband Infrastructure Training Program

This Project will provide GIS training that is telecommunications/broadband specific to both the American Samoa Government employees that will be coordinating Broadband mapping efforts and training to both Internet Service Providers in the Territory.

Funds Awarded:

\$0

Funds Requested:

\$250,000

Problem:

Currently, there is inadequate GIS knowledge for broadband-specific mapping in the Territory. The main use of GIS at the moment is focused around environmental management and assessment of environmental needs. However the September 29, 2009 Tsunami brought forth the need to map the infrastructure of the Territory as well. While roads and buildings are some-what accurately mapped power lines and telecommunication lines are not very accurately mapped.



At the American Samoa Department of Commerce (ASDOC), where the SBDD is being coordinated from; GIS is primarily used within the American Samoa Coastal Management Program. There has been increased use of GIS used within other parts of the Department as of late, including within the Planning Division (SBDD is jointly housed here with the Coastal Management Program's GIS staff), Economic Development Division and within the Statistical Division (currently managing the US Census).

There is a second part to this problem, which is the geospatial data collection done by the Internet Service Providers in the Territory. The main problem that has been faced during this project is not a lack of willingness of participation from the ISPs like is occurring in the mainland United State, but willingness to participate, but lack of actual data to provide to support the project.

The Territory-run Internet Provider the American Samoa Telecommunications Authority (ASTCA) has some GIS knowledge and structure, but with their recently awarded Rural Utilities Service grant any assistance we can provide them with properly mapping their infrastructure would be a long-term benefit to the success of the project. The other ISP – Bluesky Communications has both a copper-CATV infrastructure and a wireless internet infrastructure that has very little GIS implemented with it.

Solution:

The GIS Broadband Infrastructure Training Program will allow the Territory to employ training and development for it's own government staff while also bringing the internet providers up to speed with their needs, both assisting them with better organization and allowing them to better provide future data sets to the Territory to continue the development of Broadband mapping.

Planning & Implementation:

Further planning to assess the needs of both ASDOC and the Department of Information Technology as well as the needs of both Internet Providers will allow ASDOC to provide an accurate schedule for planning and implementation of this project.

Stakeholder Collaboration

Coordination between government agencies that will have a need for broadband mapping. The American Samoa Department of Commerce and the newly formed Department of Information Technology being the two significant agencies. As well as



coordination between both internet providers will also be key in the success of the project.

Cost:

The cost of the proposed project consists of estimated costs from bringing several trainers to the Territory over the span of the 3 to 5 years of the grant cycle to provide GIS training to employees of the government as well as employees of the internet providers. The estimated cost is \$250,000.

Name: Lending Practices

The following details support the SBDD Amended and Supplemental Grant Application, specifically for the Leading Practices in Broadband Data Collection, Integration and Verification appendix.

Overall Approach

BroadMap’s approach to the following leading practice activities is to collaborate with the Territory, prototyping various options to represent provider coverage and attribution.

1. Continued collection of provider data to address-level granularity
 1. Follows Provider Outreach Process
2. Expand current infrastructure to include support NSGIC model enhancements, as well as provider specific detail (i.e. Resellers or Free Public WiFi)
3. Identify opportunities within reporting structures currently defined by the NSGIC

Key Benefits

Meaningful and accurate representation of broadband coverage

The Territory is soliciting additional Grant Application funds to support key functional leading practices as described in the following table:

Practice	Description
Method Of Submission	Enhancement to current methods by continuing relationship with NSGIC in the refinement of the NSGIC File Geodatabase model to support ongoing deliverables



	<p>Approach: Continue collaboration with the Territory and NSGIC to ensure each product release supports the requirements defined. This includes documented enhancements suggested to NTIA/FCC/NSGIC based on the below-mentioned activities.</p>
Address Level Data	<p>Enhancement to Current methodology to deliver address level data in blocks greater than 2 sq miles - this is dependent on a adequate address point source as a result of the Address Improvement Initiative</p> <p>Address Level Reporting: BroadMap already has capability to report out at an address level using the provider's coverage footprint polygon and extracting the address point data from that coverage. Specification documentation and coding will be required.</p> <p>Address Level Collection: Since collecting at the subscriber address information is the preferred method and will help reporting at a more granular level; BroadMap initially requested providers to supply this level of data where possible. Continued collection and provider education will be required to fill in the gaps where address-level was not originally available.</p>
Speed Geography	<p>Develop methodology for delivering speed information at finer geographic scales</p> <p>This opportunity allows prototyping various different options to represent a summarized display of speed information in a meaningful way. Some options that have been reviewed internally are reporting at a Census Block or county boundary level, since the CMA display could be considered to general.</p> <p>The approach would be a collaborative effort reviewing different displays with the Territory and suggest the preferred methodology to NTIA.</p>
Resellers	<p>Develop an integration process for data processing of validated Reseller information based on State/Territory collection efforts. Work with the State/Territory to set up a standard format of data collection, so information support Resellers can be integrated into</p>

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	the overall product.
Integration of Public Data Sources:	<p>Develop an integration and ingestion process around State/Territory collected and mined and validated public data sources</p> <p>The approach for this activity is creating a process using existing data available publically, like web scraping, BTOP grant information, FCC data and building it out to support validation efforts.</p>
Free Public WiFi	<p>Develop an integration process for data processing of validated WiFi information based on Territory Collection efforts</p> <p>Work with the Territory to set up a standard format of data collection, so information support Free Public WiFi information can be integrated into the overall product.</p>
Ongoing Verification Activities	<p>Develop a process and methodology for targeted verification including public and private feedback loops enabled via portal technologies.</p> <p>Included in this effort is streamlining 3rd party data validation processes.</p>
Provider Feedback	<p>Continue and enhance current methodology for Provider Portal feedback loop by making it a more automated and efficient process, including coverage and attribution update submission functionality.</p>
Small Providers	<p>Continue to develop processes to identify and assist small providers in expedient and accurate data submission, including expanding the provider portal to support them in data submission.</p>

Funds Awarded:

\$0

Funds Requested:

\$100,000



SBDD Purpose:

This will aid in the development of the SBDD grant program in the Territory, allowing a successful hand-off of the project to the Territory, in that the Territory will be able to properly maintain the development and management of the broadband maps.

Project Proposal Fit with the Territory’s Digital Economy Approach

The digital economy in the Territory represents the network of economic and social activities that are enabled by platforms requiring access to broadband services. A successful digital economy is essential for the Territory's economic growth and our ability to enhance the quality of life for our citizenry. Incrementally, the digital economy is a driver of the enduring effectiveness and competitiveness of the Territory's businesses, educational institutions, social institutions, and public service capabilities. The Territory's comprehensive approach in leading digital economy efforts is to offer new opportunities for businesses, policy makers, and individuals to connect, collaborate, and increase the productivity of these interactions toward the well being of our entire citizenry regardless of proximity to major cities. The Territory is committed to maximizing opportunities for all citizens to benefit from the digital economy via stewardship, effective policy making and strategic infrastructure investments. This commitment reflects the Territory’s recognition that a world-class digital infrastructure is a key input for our future—similar to electricity, gas and water.

However, to fully develop the Territory’s digital economy, it is essential to understand, steward and accurately represent the current capabilities of our digital infrastructure and how broadband services play a role in accessing this economy. To realize the benefits of what the digital economy represents, the Territory maintains it must take steps to achieve the maximum participation of Territory households, businesses and institutions in the digital economy. Through the SBDD grant projects identified for the Territory, it is our intent to begin realizing digital economy benefits and continue positioning opportunities for businesses and individuals to participate in the digital economy.

Through the Territory’s “Data Collection and Related Activities” project area including **Repeated Data Updating** and **Address File Improvement** projects, the Territory continues the stewardship role for understanding and enhancing its broadband service inventory while introducing mapping accuracy enhancements via address file improvements. Creating and delivering the most accurate and geographically relevant map visualizations / geospatial data representations enables policy makers, infrastructure suppliers, businesses and individuals to pursue and influence new opportunities and interactions in support of broadband investment and deployment efforts. The SBDD Grant Funds applied for in this area support the evolution of our digital economy efforts by sustaining our existing geospatial data and digital mapping capabilities while



supporting the policy development required to enhance broadband connectivity and service level improvement. Additionally, these funds sustain our ongoing submission of data to National Broadband Mapping efforts in support of broader economic and social objectives.

Through the Territory's "Other SBDD Program Purposes" project area, we have identified both **Technology Assistance** and **Implementing Future Lending Practices** projects to specifically advance our digital economy capabilities.

In the case of **Technical Assistance**, the Territory's "GIS Broadband Infrastructure Training Program" ensures the future development and management of broadband mapping in the Territory past the point of where the grant funds.

In the case of **Implementing Future Lending Practices**, the goal is to implement the needed systems to allow further development of lending practices in the Territory.